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The Role of Response Perceptions in Couples' Ongoing Cancer-Related Disclosure

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ABSTRACT

In efforts to better understand the intricate nature of response, we tested a four-dimension structure of response patterns (measured as support, reciprocity, emotional reaction, and avoidance) as well as four single dimension models within the context of couples managing cancer. All models incorporate dyadic data, including both patient and partner perceptions that relational quality influences response patterns, and response patterns influence ongoing disclosure (measured as breadth and depth). Participants were 95 dyads in which one partner had been diagnosed with cancer. We conducted multilevel analyses using an actor-partner interdependence model. Results supported the four-dimension model as well as individual dimension models. All response types predict within person disclosure. However, only reciprocity predicts the other person's disclosure, and only patient's reports of partner reciprocity predict partner disclosure.

Cancer disrupts a couple's life, presenting numerous physical and emotional challenges (Thompson & O'Hair, 2008). Communication between patients and partners following a cancer diagnosis impacts both parties' psychological adjustment (e.g., Jeong, Shin, Kim, Yang, & Park, 2016; Manne et al., 2005). Effective interpersonal communication is central in helping relational partners adapt, negotiate, and manage chronic illnesses such as cancer (Magsamen-Conrad, Checton, Venetis, & Greene, 2015; Steuber & Solomon, 2011). Berg and Upchurch (2007) illustrate how chronic illness management within dyads affects both individuals and their partners. One assumption of dyadic, chronic illness management is that both partners should be able to address concerns and disclose fears and thoughts with each other. Partners' ability to communicate about cancer has been associated with decreased distress for patients and decreased partner burden (Stanton, Danoff-Burg, & Huggins, 2002; Venetis, Magsamen-Conrad, Checton, & Greene, 2014). However, cancer-related interpersonal communication presents challenges, is problematic, and has been categorized as "work" (Donovan-Kicken, Tollison, & Goins, 2012). In other words, oftentimes cancer patients and partners find that they are unable to communicate about cancer (Venetis, Greene, Checton, & Magsamen-Conrad, 2015), influencing their own and their partners' emotional well-being (Jeong et al., 2016; Manne et al., 2005; Segrin, Badger, Dorros, Meek, & Lopez, 2007). We examine one specific element of the disclosure process that may contribute to these communication challenges, namely how dimensions of response serve to encourage or restrict dyadic ongoing cancer-related disclosure.

Recipient response

Information management theories describe individuals' disclosure processes when deciding to disclose to others (e.g., disclosure decision-making model, Greene, 2009; disclosure processes model, Chaudoir & Fisher, 2010). One construct that is consistently described across a variety of disclosure models is recipient response. Disclosure models describe how the potential for disclosure hinges on disclosers' perception and expectation of how recipients will respond to the disclosure. Recipient response has been examined in various forms such as individuals' retrospective recollections of how recipients responded, retrospective reports of anticipated response, and prospective accounts of anticipated response (Magsamen-Conrad, 2012, 2014). As a feedback loop, past negative responses from a specific other, such as from a spouse, may hinder disclosers' current and future information sharing practices (e.g., Afifi & Steuber, 2010; Greene, 2009). That is, how recipients have responded to past disclosures influences how potential disclosers expect those same individuals will respond to future disclosures.

Although existing response research demonstrates how recalled or anticipated response affects disclosure decision-making, there are three major limitations to research to date. First, past research has been inconsistent in conceptualizing or operationalizing of the response concept, limiting comparison across studies (Magsamen-Conrad, 2012). Magsamen-Conrad (2014) offered a four-dimension response structure that captures the various conceptualizations of response: support, emotional reaction, reciprocity, and

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avoidance (described below). Second, most studies explore the concept of anticipated response as it affects the decision to disclose a single piece of information for the first time. However, people manage information continuously, especially within chronic illness contexts that are characterized by stages of disease progression and treatment with repeated opportunity for ongoing disclosure. Finally, although disclosure is an interpersonal, iterative process, most research to date assesses the disclosure process from one person (the discloser's) point of view. These limitations led us to consider the concept of patterns of response (hereafter, response patterns) in dyadic ongoing cancer-related disclosure.

Although the role of response is firmly situated within disclosure theory, less is known about response patterns. Existing literature has framed response primarily as (a) a broad concept related to valence (e.g., when anticipated response is positive, Vangelisti, Caughlin, & Timmerman, 2001), or b) a narrower conceptualization of response that represents one type of potential response (e.g., support, Greene et al., 2012). Magsamen-Conrad (2012, 2014)) proposed a four-dimension structure of response (support, emotional reaction, reciprocity, and avoidance), which we adopt in the context of cancer-communication response patterns. *Support* describes giving assistance, such as emotional (e.g., listens sympathetically), informational (e.g., providing information), and instrumental (e.g., providing tangible resources) components. Support has been associated with increased relational quality, disclosure efficacy (Checton & Greene, 2012), and disclosure likelihood (Greene et al., 2012). *Emotional reaction* is recipients' affective responses provided immediately after the disclosure (e.g., anger), and anticipated negative emotional reaction has been associated with concealing information (Afifi & Steuber, 2010). *Reciprocity* occurs when the recipient discloses personal/private information following the original discloser's sharing, mirroring degree of vulnerability (Magsamen-Conrad, 2014). According to communication privacy management theory (CPM) individuals tend to disclose more with those which they anticipate will be "open in return" and will reciprocate the disclosive behavior (Petronio, 2002). Finally, *avoidance* describes when a recipient refuses to discuss the topic initiated by the discloser (e.g., silence, changing the subject, e.g., Derlega, Winstead, Greene, Serovich, & Elwood, 2004; Greene, Derlega, & Mathews, 2006), which may negatively affect dyadic communication (Afifi & Steuber, 2010). Some contexts require repeated information sharing, or ongoing disclosure, such as when couples are managing chronic illness. We are interested in testing how these four dimensions of response patterns affect the disclosure process both as a latent construct and as individual predictors during chronic illness management.

Modeling response in ongoing disclosure

Disclosure theory argues that relational variables (e.g., relational quality) predict anticipated responses, which in turn predict disclosure (e.g., Afifi & Steuber, 2009, 2010; Checton & Greene, 2012; Greene et al., 2012) and actual recipient reactions, which filter back into the process (Greene et al., 2006). Prior research of *anticipated* response in a single-disclosure episode finds that it is a mediator between relational quality and disclosure likelihood (Greene et al., 2012). We seek to test this relationship with the four-dimension conceptualization of response patterns within the context of ongoing disclosure. The following describes a parsimonious model to test the associations between relational quality, response patterns, and ongoing disclosure. We begin with relational quality because it is pervasive in previous research and therefore allows for convergent validity. Thus, we first discuss associations between relational quality and response. Then, consistent with theoretical prediction (i.e., the disclosure decision-making model, Greene, 2009), we turn to rationale of how response predicts disclosure.

Self-perceptions and own behavior

To date, scholars have studied the associations between relationship quality, response, and disclosure primarily from the discloser's perspective. However, this approach may operate under the assumption that the study participant is the information owner (CPM), when indeed that may not strictly be the case, particularly in committed relationships. Within ongoing communication, each partner is both a discloser and a receiver at some point. The following sections describe the hypothesized associations between variables from the perspective of the participant. Each member of the dyad could be reflecting as either discloser or receiver, but our focus is less on role and more on how individuals' perceptions influence their own evaluation of the other's response, which in turn affects their assessment of their own disclosure behavior.

Relational quality

Individuals may evaluate their relationship with an intended receiver in terms of closeness or relational quality and trust (Greene, 2009), recognizing that some relationships are characterized with greater relational quality than others. Furthermore, individuals evaluate, construct, and access responses to disclosure within the context of these relationships. Increased relational quality is associated with disclosers' reports of a positive anticipated response to a potential disclosure (Afifi & Olson, 2005; Afifi & Steuber, 2009, 2010; Checton & Greene, 2012; Greene et al., 2012). Thus, we hypothesize individuals' increased relational quality will predict their own reports of their partners' ongoing cancer-communication response patterns that are more "positive" in nature (see Figure 1; please note, A denotes Patient and B denotes Partner):

H1(A, B): Participants' relational quality is associated with their own positive reports of the other's response patterns to their ongoing cancer-related disclosure.

Response and disclosure

Research consistently supports the association between response (both anticipated and actual) and disclosure as individuals make decisions about sharing information. Afifi and Steuber (2010) found that anticipated response

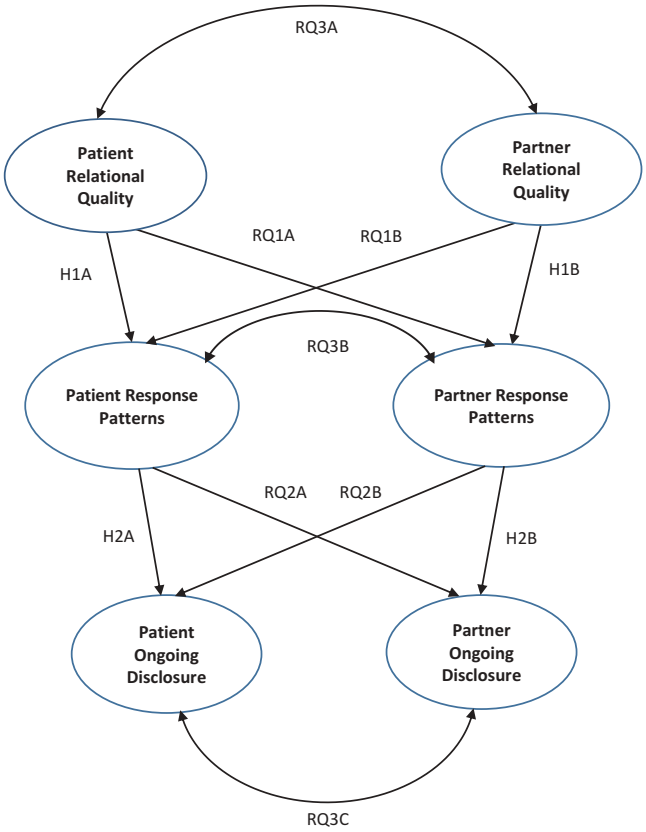

Figure 1. Proposed patient and partner ongoing disclosure model.

is one determining factor in whether or not individuals are willing to disclose secrets. Greene et al. (2012) reported that individuals' perceptions of supportive responses predicted likelihood of disclosure as well as actual disclosure (reported retrospectively) in initial health diagnosis disclosure decision-making. Furthermore, perceptions of actual and anticipated negative responses serve to suppress disclosure as well as promote continued concealment of secrets (Afifi & Olson, 2005; see also, "the chilling effect" Cloven & Roloff, 1993). Thus, past research demonstrates that individuals' appraisals of others' responses affect their disclosure patterns such that reports of "negative" responses hinder and "positive" responses facilitate future disclosures. Thus, we predict the following hypotheses:

H2A-B: (A) Patient reports of partner response patterns are positively associated with patient ongoing disclosure. (B) Partner reports of patient response patterns are positively associated with partner ongoing disclosure.

Interdependent associations

Due to the scarcity of dyadic disclosure studies, we know less about how individuals' relational quality is associated with perceptions of their partners' response patterns to their ongoing disclosure. Furthermore, research to date has not examined how individuals' perceptions of their partners' response patterns to their disclosure in turn influences their own ongoing disclosure. However, evidence suggests that dyadic partners report similarly about their relationship and communication behaviors (Laurenceau, Barrett, & Rovine, 2005; Shelton, Trail, West, & Bergsieker, 2010). To the degree that markers of relational quality are demonstrated in behavior (Gottman & Porterfield, 1981; Manne et al., 2004), dyadic partners may perceive their partner's state of relational quality (i.e., one partner can perceive the other's behavioral evaluation of being satisfied or unhappy in a relationship). As such, individuals' perception of how their partner views the couple's relational quality (i.e., "I think my partner is satisfied in our relationship") may be associated with how one partner expects that the other will respond to the partner's disclosure (Manne et al., 2015). Considering response patterns, the interpersonal process model of intimacy (Reis & Shaver, 1988) and the Disclosure Decision-Making Model (DD-MM) (Greene, 2009) discuss the importance and iterative nature of partner responsiveness and disclosure such that disclosure influences response, and accordingly, response influences subsequent disclosure. As part of our exploratory research, we ask the following research questions to address the interdependent relationships established within our model:

RQ1A-B: (A) How is patient relational quality associated with partner reports of patient response patterns? (B) How is partner relational quality associated with patient reports of partner response patterns?

RQ2A-B: (A) How are patient reports of partner response patterns associated with partner ongoing disclosure (depth and breadth)? (B) How are partner reports of patient response patterns associated with patient going disclosure (depth and breadth)?

RQ3A-C: What is the relationship between patient and partner reports of (A) relational quality, (B) response patterns, and (C) ongoing disclosure?

Response dimensions

Much of past disclosure research has examined theoretical models of the disclosure process using a single, but inconsistent, conceptualization of response (e.g., emotional reaction, Afifi & Steuber, 2010; support, Greene et al., 2012). Although we employ Magsamen-Conrad's (2012) conceptualization and operationalization of response dimensions, limited other research uses this approach. We acknowledge that the individual dimensions of response do not necessarily need to cohere as an operationalization of the more abstract concept. Thus, we seek to determine if the four dimensions are parallel in the ongoing cancer-disclosure context, and if a second-order factor model is an improvement over a four factor, first-order measurement model. A potential contribution of this paper is testing the four response dimensions, however considering them as a second-order factor may undermine scholars' ability to understand how individual dimensions contribute uniquely to the disclosure process.

For example, one recent study, Shields (2017) discovered that when contemplating disclosure of an eating disorder, disclosers reported that only reciprocity, and not the other anticipated response dimensions, influenced disclosure intention. Thus, in order to better understand the relative influence of response dimensions, we ask:

RQ4: How does each response pattern dimension influence ongoing disclosure?

Method

Participants

Participants (N = 95 dyads, 190 individuals) included couples in a committed relationship (M = 24.11 years, SD = 12.98) in which *one* partner (n = 95) had been diagnosed with cancer (the "patient"). Cancer diagnoses included breast (37.5%), hematologic (14.6%), gynecologic (11.5%), male genitourinary (10.4%), throat/neck (9.4%), digestive (5.2%), lung (3%), and other (1%). Patients included 65 (68%) women and 30 (32%) men ranging in age from 32 to 91 years (M = 53.67, SD = 10.97). Participants identified as Caucasian (84%), Asian (5%), African American (4%), and other (< 4%). Most patients continued to be under cancer-related medical care (88%), and average time since diagnosis was five years (M = 5.14, SD = 5.10).

Procedure

We used a network sampling technique. As part of a course research component, undergraduate researchers in an upper-level communication research methods class recruited couples with cancer to complete surveys individually and privately (e.g., in couples' own homes, with partners separated). Each undergraduate researcher received extensive training, institutional review board certification, and the research protocol was approved by a university institutional review board. Researchers explained the purpose of the study to couples during pre-arranged face-to-face meetings. After signing consent forms, the couples *individually* completed a survey (~15 min), placed the survey in an envelope, sealed it, and returned the envelope. Undergraduate researchers returned the signed consent forms and sealed envelopes (separately) to the researchers. Finally, to verify consent and to ensure participation of only couples managing cancer, participants were asked to provide their phone number for random callbacks. Researchers conducted verification callbacks (23% contact) and excluded all data from one investigator.

Measures

We measured for both patients and partners: relational quality, response perceptions (support, emotional reaction, reciprocity, avoidance), and ongoing disclosure (depth and breadth). We developed two versions of the survey: one for patients and one for partners. Scale items were the same, and modifications between surveys reflect patient and partner perspectives. We used confirmatory factor analysis (CFA) to evaluate the dimensionality of all measures. We created composite scores by averaging responses to individual items and estimated reliability using Cronbach's alphas. We used similar items when creating patient and partner composite variables.

Relational quality

We assessed participants' perceptions of relational quality using Rubin's (1970) Love scale. A sample item included, "If I couldn't be with my partner, I would feel miserable," and Likert-type responses ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). CFAs revealed that the items loaded onto one latent construct for patients, $\chi^2(2)$ = 2.15, relative χ^2 = 1.08, p = .34, CFI = .99, $RMSEA$ = .03 and partners, $\chi^2(2)$ = 1.29, relative χ^2 = 0.65, p = .52, CFI = .99, $RMSEA$ = .001. The items had good reliability for patients (α = .85; M = 5.93, SD = 1.05) and partners (α = .84; M = 5.97, SD = 1.06).

Response patterns

We adapted the Disclosure Anticipated Response Scales (DARS; Magsamen-Conrad, 2014) to measure patients' and partners' reports of their partners' response patterns to their own cancer disclosure (e.g., patients reported on how partners had responded to patients' cancer-related disclosures). This scale includes four dimensions of response: support, emotional reaction, reciprocity, and avoidance.

All dimensions of response patterns were measured with Likert-type responses ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) as a response to "when I talk about my [my partner's] cancer." A sample *support* item included "My partner supports me emotionally," and higher scores indicated greater support. The items had good reliability for patients (α = .84, M = 6.13, SD = .95), and partners (α = .88, M = 5.94, SD = .96). A sample *emotional reaction* item included "My partner is critical or judgmental" (reverse scored, R), and higher scores indicated greater positive emotional reaction. The items had good reliability patients (α = .78, M = 5.95, SD = 1.81), and partners (α = .82, M = 5.87, SD = 1.16). A sample *reciprocity* item included "My partner communicates openly in return," and higher scores indicated greater reciprocity. The items had good reliability for patients (α = .73, r = .59, M = 5.50, SD = 1.34) and partners (α = .81, r = .69, M = 5.63, SD = 1.20). A sample *avoidance* item included "My partner changes the subject or somehow avoids talking about my cancer" (recoded), and higher scores indicate less topic avoidance. The items had good reliability for patients (α = .88, M = 6.31, SD = .96), and partners (α = .87, M = 6.30, SD = .83).

We conducted a second-order CFA to test the dimensional structure of the DARS. The initial patient model did not fit, χ^2 (100) = 264.32, *relative* χ^2 = 2.64, p < .001, CFI = .83, $RMSEA$ = .13. After item removal and correlating two variables on the same scale, the model fit, $\chi^2(48)$ = 77.74, *relative* χ^2 = 1.62, p = .01, CFI = .96, $RMSEA$ = .08 (patients). The partner model was modified to replicate the patient model and achieved good fit, $\chi^2(49)$ = 81.24, *relative* χ^2 = 1.66, p = .001, CFI = .95, $RMSEA$ = .08.

Ongoing disclosure

We measured two dimensions of ongoing disclosure (breadth and depth) adapted from Checton and Greene (2012) and Checton & Greene (2015). All items were measured with Likert-type responses ranging from 1(*strongly disagree*) to 5 (*strongly agree*). A sample breadth item included "I discuss a wide variety of issues related to my [my partner's] cancer," and higher scores indicated greater breadth. The items had good reliability for patients (α = .85, M = 3.76, SD = .88), and partners (α = .86, M = 3.52, SD = .88). A sample depth item included "I have heart-to-heart talks with my partner about my [my partner's] cancer," and higher scores indicated greater depth. The items had adequate reliability for patients (α = .71, M = 3.87, SD = .80) and partners (α = .75, M = 3.62, SD = .81).

We conducted a second-order CFA to test the dimensional structure of disclosure. Six items were assigned to breadth and five items to depth. The initial patient model did not fit, χ^2 (43) = 116.10, relative χ^2 = 2.70, p = .001, CFI = .84, $RMSEA$ = .14. After correlating three items within the depth and breadth scales and the removal of one item, the patient model achieved adequate fit, $\chi^2(31)$ = 40.92, *relative* χ^2 = 1.32, p = .110, CFI = .98, $RMSEA$ = .06. The initial partner model was modified to replicate the patient model and achieved good fit, $\chi^2(31)$ = 48.37, *relative* χ^2 = 1.56, p = .02, CFI = .96, $RMSEA$ = .08.

Results

Preliminary analyses

Data were screened for normality at the item and composite levels (skewness or kurtosis approaching 2/−2 or greater) as well as for multivariate outliers, and no transformations were needed. Table 1 presents bivariate correlations. We conducted independent samples t-tests to evaluate participant type (patient/partner) differences by study variables using a Bonferroni adjustment, and found no significant differences. That is patients and partners did not report significantly different relational quality, response patterns (support, emotional reaction, reciprocity, and avoidance), and ongoing disclosure. We also conducted independent-samples t-tests to evaluate sex differences on the study variables and found no significant differences. That is, independent of role as patient or partner, women and men did not report significantly different relational quality, response patterns (support, emotional reaction, reciprocity, and avoidance), and ongoing disclosure.

Substantive analyses

We estimated an actor partner interdependence model (APIM; Arbuckle, 2010; Cook & Kenny, 2005; Cook & Snyder, 2005) to investigate the associations among relational quality, the four perceived response patterns (i.e., support, reciprocity, emotional reaction, and avoidance), and two ongoing disclosure dimensions (i.e., breadth, and depth) for patients and partners using maximum likelihood structural equation modeling (SPSS Amos 23). APIM uses the dyadic interaction as the unit of analysis, accounting for the dyadic nested nature of our data (Kenny, Kashy, & Cook, 2006). Three goodness-of-fit indices were used to evaluate the models. We determined that the model fit the data if the relative $\chi^2(\chi^2/df)$ was less than 3, CFI was .93 or greater, and $RMSEA$ was ≤ .08 (Browne & Cudeck, 1993; Kline, 2011; see also West, Taylor, & Wu, 2012). Our final model reports unstandardized path coefficients. This method is favored in studies that compare across groups (i.e., the comparisons made here between patients and partners) because different groups may produce indicators,

Table 1. Bivariate zero-order correlation matrix for study variables.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	RelQual Pat	1.00													
2.	Support Pat	.28**	1.00												
3.	Recip Pat	.07	.59**	1.00											
4.	Avoid Pat	.25*	.72**	.51**	1.00										
5.	EmReac Pat	.39**	.67**	.45**	.66**	1.00									
6.	Depth Pat	.20	.45**	.48**	.58**	.39**	1.00								
7.	Breadth Pat	.13	.38**	.52**	.47**	.37**	.77**	1.00							
8.	RelQual Part	.33**	−.09	−.10	−.17	−.05	−.09	−.17	1.00						
9.	Support Part	.14	.25*	.16	.07	.12	.13	.09	.18	1.00					
10.	Recip Part	.17	.12	.25*	.08	.08	.24*	.31**	.07	.66**	1.00				
11.	Avoid Part	.18	.16	.03	.08	.16	.05	−.20	.05	.61**	.58**	1.00			
12.	EmReac Part	.22*	.23*	.19	.19	.21*	.08	.08	.11	.68**	.49**	.63**	1.00		
13.	Depth Part	.20	.21*	.43**	.20*	.19	.38**	.43**	.09	.43**	.46**	.21*	.28**	1.00	
14.	Breadth Part	.12	.18	.46**	.17	.24*	.38**	.48**	.12	.43**	.53**	.23*	.30**	.80**	1.00

Note. RelQual Part is partner relational quality; Support Part is partner support: Recip Part is partner reciprocity; Avoid Part is partner avoidance; EmReac Part is partner emotional reaction; Depth Part is partner disclosure depth; Breadth Partner is partner disclosure breadth. Pat denotes similar patient variables.
* p < .05, ** p < .01; two-tailed.

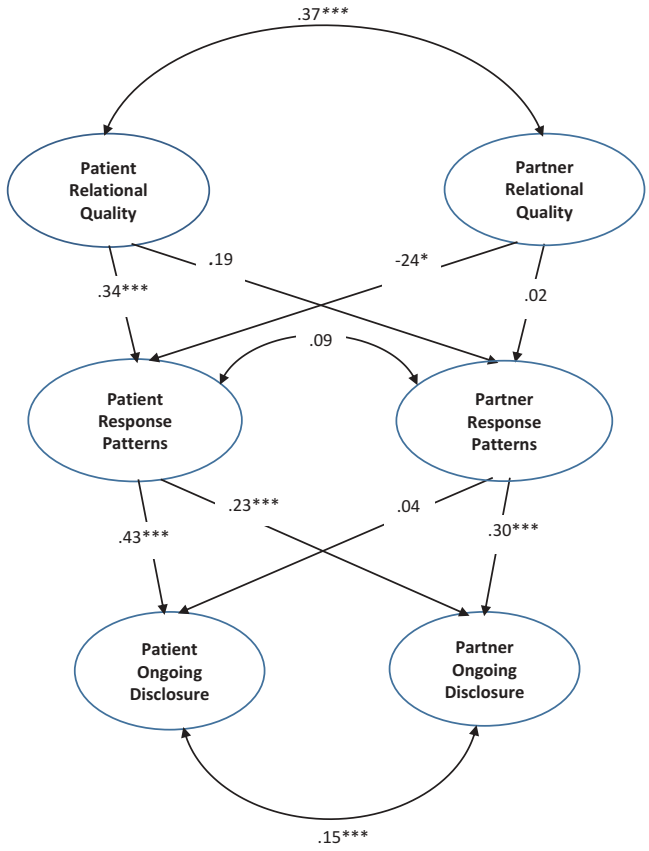

Figure 2. Final ongoing disclosure model for patients and partners.
Note. *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$

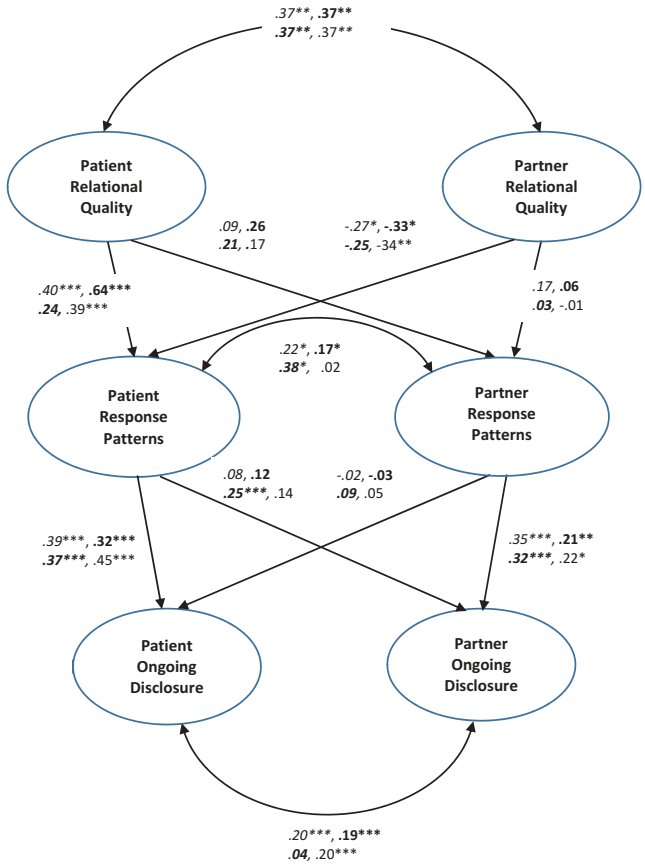

Figure 3. Final models for patient and partner response patterns.
Note. Italics denotes Support; **Bold** denotes Emotional Reaction; ***Bold italics*** denotes Reciprocity; Regular font denotes Avoidance.*$p \leq .05$, **$p \leq .01$, ***$p \leq .001$

latent variables, or error terms with different variance (e.g., Knobloch & Theiss, 2010).

Fit of four-dimension response model

In order to explore our overarching question about the role of response in ongoing disclosure, we analyzed the theoretical disclosure models (relationship quality to response pattern reports to disclosure) using both a second-order factor structure (described here) and as four single dimension APIM models (next section). Initial results using the second-order factor structure indicated the hypothesized model (see Figure 2) fit the data, χ^2 (48) = 77.75, *relative* χ^2 = 1.62, $p < .01$; *CFI* = .96, *RMSEA* = .08.

Fit of single dimension response models

A final goal of this project was to explore the nature of the contribution of response dimensions in this context (cancer), RQ4. In what follows we describe the fit statistics for the hypothesized model when using a single dimension of response as the only mediator in each model. Results for support indicate that the hypothesized model (see Figure 3) fit the data, $\chi^2(18)$ = 15.90, *relative* χ^2 = 0.88, p = .56; *CFI* = .99, *RMSEA* < .01. Results for emotional reaction indicate that the hypothesized model (see Figure 3) fit the data, $\chi^2(18)$ = 11.42, *relative* χ^2 = 0.63, p = .88; *CFI* = .99, *RMSEA* < .01. Results for reciprocity indicate that the hypothesized model (see Figure 3) fit the data, χ^2 (19) = 19.15, *relative* χ^2 = 1.008, p = .45; *CFI* = .99, *RMSEA* < .009. Results for avoidance indicate that the hypothesized model (see Figure 3) fit the data, $\chi^2(18)$ = 16.43, *relative* χ^2 = 0.91, p = .56; *CFI* = .99, and *RMSEA* < .01.

Overall results of all models

As hypothesized, patient relational quality positively predicted patients' reports of their partners' response patterns in all models except the reciprocity model (H1A supported in four-dimension, support, emotional reaction, and avoidance models). Partner relational quality did not predict partners' reports of patients' response patterns in any of the models (H1B not supported). As hypothesized, patients' reports of their partners' response patterns positively predicted patient ongoing disclosure in every model and partners' reports of patients' response patterns positively predicted partner ongoing disclosure in every model (H2A & B supported in four-dimension, support, emotional reaction, reciprocity, and avoidance models).

In answer to our research questions about dyadic effects, patient relational quality did not predict partners' reports of patients' response patterns in any of the models (RQ1A). Partner relational quality predicted patients' reports of their

partners' response patterns in all models except the reciprocity model (confirmed in four-dimension, support, emotional reaction, and avoidance models), however, this association was negative (RQ1B). Patients' reports of their partners' response patterns positively predicted partner ongoing disclosure in the four-dimension model and the reciprocity model, but not the support, emotional reaction, or avoidance models (RQ2A). Partners' reports of patients' response patterns did not predict patient ongoing disclosure in any of the models (RQ2B). Patients' and partners' perceptions of relationship quality were significantly correlated in every model (RQ3A). Patients' and partners' reports of their partners' response patterns were correlated only in reciprocity and support models (RQ3B). Finally, patients' and partners' perspectives of their own ongoing disclosure were correlated in all models except reciprocity (RQ3C).

Discussion

The goal of this project was to examine how response patterns are associated with ongoing cancer-related disclosure (vs. initial disclosure decisions), employing two perspectives. The first perspective examined an expanded, four-dimension conceptualization of response, testing response patterns using an APIM in order to incorporate the perspective of both interactional partners (Arbuckle, 2010; Cook & Kenny, 2005; Cook & Snyder, 2005) in the ongoing, interpersonal process of communicating about cancer. The second perspective measured the influence of each of the response pattern dimensions via four APIM models. As such, we are able to scrutinize which strategy enables the most useful interpretation. We describe below how this research supports the four-dimension structure, but examining dimensions separately may be most important in dyadic contexts, where there is more variation across findings. We address the implications of our findings via the progression of the model, beginning with relational quality. We then discuss theoretical and practical considerations of study results.

Relational quality

Results provide an entry point to further discussion of the role of relational quality within ongoing cancer disclosure. In couples managing cancer, patients and partners have similar reports of relational quality and patients' perceptions of relational quality predict patients' reports of partner response patterns with some consistency. Aligned with prior research, relational quality was consistently correlated between patients and partners (e.g., Derlega, Winstead, & Folk-Barron, 2000) across all models. At the dyadic level, and consistent with prior literature, we find that couples tend to evaluate their relationship attributes similarly (Segrin et al., 2007).

Participant relational quality and their reports of other's response patterns (within subject associations)

We hypothesized that patients' and partners' increased relational quality would predict their positive reports of their partner's response patterns (see Figure 1, H1A & B). Within patient data, results supported this prediction in every model except the reciprocity model. Cancer patients' relational quality was positively associated with their reports of their partners' response patterns overall, as well as in three of four individual dimensions model. That is, patients with increased relational quality reported that when talking about cancer, their partners had generally responded in ways they perceived as less avoidant, more supportive, and with increased positive emotion. Only one response pattern dimension, reciprocity, was not associated with patients' relational quality.

Results within partner data did not parallel patient data. Rather, and contrary to H1B, we found that partner perceptions of relational quality did not predict partner reports of patient response patterns in any of the models. Thus, these findings are inconsistent with previous research that suggested a positive relationship between partner relational quality and positive disclosure responses (e.g., Greene et al., 2012). We discuss the implications of these findings in detail in the next section.

Participant relational quality and the other's reports of the participants' response patterns (interdependent associations)

As an effort to extend dyadic disclosure literature, we asked if dyads' perceptions of relational quality are correlated (RQ3A) and if patient relational quality predicts partners' reports of patient response patterns to partner disclosure (RQ1A). Likewise, we asked if partner relational quality predicts patient reports of partner response patterns to patient disclosure (RQ1B). Perceptions of relational quality are consistently correlated across all models. Within the patient data, none of the paths were significant within the five models. As such patient relational quality does not appear to be a meaningful indicator of how partners perceive patient response to partner disclosure. Within the partner data, although we found that partner relationship quality significantly predicted patient reports of partner response to patient disclosure in all models (except reciprocity), this association was in the opposite direction predicted. Our findings suggest that when partners perceived higher relational quality, they perceived that patients responded to partners' cancer-related disclosure in more globally negative ways to partners' disclosure needs (i.e., less supportive, less open, more negative emotional reaction, and more avoidant). Perhaps increased relational quality indicates that patients and partners know how to anticipate the other's disclosure, including when that disclosure will not be positively valenced. For example, recent research demonstrates that some breast cancer patients recognize that they cannot talk about their cancer because their husband "can't handle it" or because husbands prefer the patients to be upbeat (Lillie, Venetis, & Chernichky-Karcher, 2017). Similarly, partners may operate under similar privacy boundaries or expectations of how cancer patients want to talk about the cancer or what the patient can emotionally manage. In the same vein, we found that patients' relational quality did not have an effect on partners' reports of patients' response patterns in any of the models. This finding underscores the need for more

research incorporating actor and partner perceptions, as well as research focusing on partner disclosure in the context of co-managed illness.

These associations may be explained by individuals' orientation to information, especially in terms of *ownership* (Petronio, 2002). Ownership, or the belief that information belongs to a particular person, suggests that perceptions of relational quality matter when predicting response, especially from patients' point of view. CPM integrates communicative partners as the central component to understanding tensions between openness and closedness in communication. These nuances of information management are relevant in illness contexts where one person, the patient, may possess stronger feelings of illness information ownership than the partner, or patients may feel more entitled to information ownership than partners. Other research supports the idea of asymmetry and couples' illness management (Kenny et al., 2006; Miller & Caughlin, 2013). These findings also emphasize the value of dyadic research, demonstrating how partners differently influence each other.

Response patterns and ongoing disclosure

Individuals perceptions of how another person will respond, or has responded, to their private information affects how they make decisions about disclosing. Although we know this to be true across myriad conceptualizations of response, our study examines a relatively new construction of response, one comprised of four dimensions: support, emotional reaction, avoidance, and reciprocity. We found support for this conceptualization of response, as our hypotheses about response patterns and disclosure were consistently supported across all models (H2 A & B).

Participant reports of other's response patterns predicting own disclosure behavior

Similar to our predictions about the associations between relational quality and response patterns, we expected that individual reports of their partners' response patterns would predict their own ongoing disclosure (H2 A & B). Within the patient data, and consistent with our findings related to relational quality (H1A), we found that patient reports of partner response patterns consistently predict patient ongoing disclosure in all five models (the four-dimension model and the support, emotional reaction, reciprocity, and avoidance models). Furthermore, among the partner data we found that partners' perceptions of patient response patterns consistently predict partner ongoing disclosure (H2B). These associations for both patient and partners aligns with disclosure theory in that greater expectations of positive recipient response promotes disclosure behavior, and offer support for Magsamen-Conrad's (2012, 2014) four- dimension conceptualization of response.

Participant reports of other's response patterns predicting other's disclosure behavior (interdependent associations)

In our dyadic exploration, we asked if patient reports of partner response patterns are associated with partner ongoing disclosure (RQ2A). Likewise, we asked if partner reports of patient response patterns to partner disclosures are associated with patient ongoing disclosure (RQ2B). Unlike the results for H2 A and B in which participants' reports of the other's responses influence their own ongoing disclosure, within the interdependent paths, we found limited evidence to support these associations. Patients' reports of partner response patterns to patient disclosure are associated with partner ongoing disclosure in only two models, the reciprocity model and the four-dimension model (RQ2A). Partners' reports of patient response patterns to partner disclosure are not associated with patient ongoing disclosure in any of the models (RQ2B).

We look to reciprocity to interpret such findings. Within ongoing cancer-communication, dyadic partners are familiar with the others' response patterns. The nature of reciprocity may be closely tied with depth and breadth of disclosure. In fact, review of the correlation matrix (see Table 1) indicates that patient reports of partner reciprocity to patient disclosure is associated with partner depth and partner breadth. Similarly, partner reports of patient reciprocity to patient disclosure is associated with patient depth and patient breadth. It may be that within ongoing disclosure, evaluations of partner reciprocity are tied to how partners globally talk about cancer, both in initiating cancer-related discussions as well as responding to patients' disclosures. Unlike partner ongoing disclosure, patient ongoing disclosure is not associated with partner reports of patient response to partner disclosure. Future research may further explore the rather one-sided role of reciprocity as well as the connection between reciprocity and ongoing disclosure.

Disclosure theory

Study results provide a unique contribution to disclosure theory. We achieved good model fit for all models, including the four-dimension model and each individual model, without modifying any initial models. This study provided additional support and validation of the four-dimension conceptualization of response, with some caveats. However, despite statistical support of this variable, use of a four-dimension conceptualization of response provides challenges in narrowing how specific response patterns may serve to promote or hinder cancer patients and partners in ongoing disclosure. Examining each dimension one at a time allowed for the consideration of how response dimension patterns operate similarly or differently within the ongoing cancer-disclosure process.

Overall, the models and support, emotional reaction, and avoidance response dimensions function consistently within the disclosure process. First, patient and partner relational quality were correlated in all five models. Second, although patient relational quality predicts patient reports of partner response patterns to patient disclosures in all five models, partner relationship quality does not predict partner reports of patient response to partner disclosure in any of the models. This contradiction highlights the unbalanced dynamic of how patients are able to influence and perhaps control cancer-related communication. Third, patient relationship quality did not predict partner reports of patient response patterns in any of the models. Thus, how patients evaluate their

relationships are not necessarily associated with how their partners view their response to partner disclosures. Partner relational quality consistently did not predict their own reports of patient response patterns, but did consistently predict their partner's reports of their response patterns, however in the opposite direction as hypothesized. Fourth, for both patients and partners, positive evaluations of how the other respond to their disclosure is associated with greater ongoing disclosure across all models. Fifth, the interdependent paths between reports of the other's response patterns and one's own ongoing disclosure lack overall support. The exception included the path between patient reports of partner response patterns to patient disclosure and partner ongoing disclosure within the four-dimension and the reciprocity models, however, it is important to note that the reciprocity dimension was the exception in many cases.

Our findings support disclosure theory such that in some contexts (e.g., cancer) in which one person is more directly affected by the information (i.e., the cancer patient), the individual with greater connection to the information has greater influence in how that information is managed. As noted above, this aligns with Communication Privacy Management concept of ownership. This investigation provides empirical evidence of how ownership may manifest within interdependent relationships.

Consideration of the response dimensions separately highlights both subtle and pronounced differences, especially within the reciprocity dimension. First, patient relationship quality predicts patient reports of partner response patterns to patient disclosure in every model except the reciprocity model. The lack of association for reciprocity is surprising, especially given that patient reports of partner reciprocity is the only model where an individual response dimension predicts partner ongoing disclosure. Taken together, results suggest that higher relational quality is not necessarily associated with patient expectations that partners will reciprocate, but if patients do report that partners generally reciprocate, there is a higher likelihood that partners engaged in greater depth and breadth of disclosure.

Second, partner relationship quality significantly, negatively predicts all patient reports of partner response to patient disclosure except within the reciprocity model. Thus, the greater partner relational quality, the less that patients perceive partner responses as supportive or emotionally positive and the greater the avoidance. An interesting parallel between patient relational quality and partner relational quality and patient reports of partner response patterns to patient disclosures is that for both dyadic partners, greater relational quality is not associated with patient reports of partner reciprocity to patient disclosure. Future research should examine the degree to which cancer patients desire partner reciprocity and the relational impact of reduced reciprocity. Further, research may more explicitly examine specific motivations and barriers to partner reciprocity to patient disclosures, particularly if patients value reciprocity.

Our research suggests that individual dimensions of response, reciprocity in particular, function differently in both ongoing and initial disclosure decision-making. This is consistent with at least two studies examining multiple dimensions of response. Venetis, Gettings, and Chernichky-Karcher (forthcoming) found that within the context of initial disclosure of mental illness diagnosis, reciprocity functioned differently than did other response options. Similarly, within the context of eating disorders, only reciprocity, and not support, positive emotional reaction, or lack of avoidance, was associated with women's disclosure of their disorder (Shields, 2017). Furthermore, earlier research on reciprocity (Won-Doornink, 1979, 1985) reported a curvilinear relationship between reciprocity of intimate information and relationship development, such that those in early or highly intimate relational stages are less likely to reciprocate disclosure. Although we achieved statistical support for the four-dimension conceptualization of response, future research should invest in trying to determine how response pattern dimensions fit together, and if reciprocity is indeed a dimension of response or a different communicative process.

Limitations and future research

In light of study results, we discuss limitations and particular findings warranting future research. First, the study sample was small and not representative of the entire range of cancer diagnoses, or of patients at different points in their health management trajectory. The sample includes couples within and years beyond treatment, relying on retrospective accounts. Future research should include a larger sample and consider narrowing to a specific cancer diagnosis or stage in treatment to allow for greater specificity of how response influences disclosure behavior. As an alternative to retrospective data, future research could employ daily journaling to examine how individuals engage in ongoing disclosure during the treatment periods (e.g., Laurenceau et al., 2005; Manne et al., 2004). Our sample included participants in well-established and long-term relationships in which critical health diagnoses may have occurred after (or before) the couple experienced other life stressors. Individuals in long-term relationships often describe that cancer diagnoses do not define their communicative patterns because diagnoses are an additional life stressor following a series of others (Neff & Broady, 2011). The life span point at which people experience cancer may influence how couples manage and discuss life stressors, such as couples experiencing divorce and/or other life crises. Future research should also examine how younger couples, those in which a health diagnosis may be among the first if not the first life stressor, share ongoing health conditions, particularly attending to the role of response in ongoing conversations. Finally, the predominantly Caucasian, heterosexual sample limits generalization to other groups. There are likely differences in how various cultures manage health information (Halm, Mora, & Leventhal, 2006). Future studies should seek more diverse participants.

Future research may wish to examine initiation of ongoing disclosure in the context of illness. One limitation of our study is that how survey questions were phrased suggested that individuals completing the survey initiated illness

disclosure. We, however, did not specifically ask about who initiated conversations. Conversation initiation may have implications for disclosure, especially if perceptions of illness ownership are not congruent within a dyad. Relatedly, future research could examine dyads' perceptions of both their own and their partner's disclosure style.

Conclusion

Examining dyadic communication, we tested both a four-dimension conceptualization of response and individual response dimensions to explore the role of response in cancer-related, ongoing disclosure. Results support the use of the four-dimension conceptualization of response. Examination of the individual response models suggests that reports of one's partners' response patterns as supportive, reciprocating, emotionally positive, and less avoidant responses promote ongoing disclosure. However, the dimension of reciprocity operates differently than the other response dimensions, particularly in interdependent associations. We argue for additional research in dyadic ongoing information management, especially examining the role of partners' perceptions of relational quality and the importance of reciprocity and avoidance. Such research can inform individuals across health management contexts – from practitioners to counselors – on how to advise individuals coping with illness (partners, children, and close others) about communicating with their loved ones.

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