REGULAR ARTICLE

Links of communal coping to relationship and psychological health in type 2 diabetes: actor-partner interdependence models involving role, sex, and race

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Abstract

Background Communal coping is one person's appraisal of a stressor as shared and collaboration with a partner to manage the problem. There is a burgeoning literature demonstrating the link of communal coping to good relationships and health among persons with chronic disease.

Purpose We examined links of communal coping to relationship and psychological functioning among couples in which one person was recently diagnosed with type 2 diabetes. We distinguished effects of own communal coping from partner communal coping on both patient and spouse relationship and psychological functioning, as well as whether communal coping effects were moderated by role (patient, spouse), sex (male, female), and race (White, Black).

Methods Participants were 200 couples in which one person had been diagnosed with type 2 diabetes (46%)

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Black, 45% female) within the last 5 years. Couples completed an in-person interview, participated in a discussion to address diabetes-related problems, and completed a postdiscussion questionnaire.

Results Own communal coping and partner communal coping were related to good relationship and psychological functioning. Interactions with role, sex, and race suggested: (i) partner communal coping is more beneficial for patients than spouses; (ii) own communal coping is more beneficial for men, whereas partner communal coping is more beneficial for women; and (iii) White patients and Black spouses benefit more from own communal coping than Black patients and White spouses.

Conclusion These findings demonstrate the benefits of communal coping across an array of self-report and observed indices, but suggest there are differential benefits across role, sex, and race.

Keywords Communal coping • Health • Diabetes • Gender • Race

Chronic illness often presents substantial challenges for not only the individual with chronic illness, but also the individual's romantic partner. Patients and partners alike must learn to make major lifestyle adjustments, possibly renegotiate relationship roles, and cope with the psychological distress that may accompany this transition. One concept that has shown to be particularly promising in understanding the experience of couples undergoing chronic stress is communal coping, an interpersonal form of coping that involves one person's appraisal of a stressor as shared and reports of collaborative behavior with a partner to manage the stressor [1, 2]. When applied to dyads, each couple member may perceive the stressor to be "our problem" rather than "my" or "your"

problem and perceive that they work together to manage the problem. Communal coping has been applied to stressors shared by communities, such as those experienced in Palestinian refugee camps [3] or following natural disasters [4], and also to stressors that more directly affect one person in a dyad, such as alcohol and smoking addiction [5, 6] or chronic disease [7, 8]. In each case, people seem to benefit from communal coping in terms of enhanced relationships, reduced psychological distress, and improved health. Because we find it especially interesting that communal coping would be helpful when the stressor is not objectively shared, here we examine communal coping in the context of couples in which one person has a chronic illness. We also broaden our understanding of communal coping by attending to important potential moderating factors.

Actor Versus Partner Communal Coping Effects

Although communal coping is conceptualized as how members of a dyad think about and behave in regard to illness, communal coping is typically assessed by each person's individual perception of the stressor and how it is managed. Assessing communal coping in this way allows us to examine links of both own communal coping and partner communal coping to relationship and psychological functioning. A meta-analytic review of the communal language literature that examined links of we-talk to relationships and health found stronger effects of partner we-talk than actor we-talk using actorpartner interdependence models (APIM) [9], suggesting that both patients and spouses benefit more from their partner's communal language than their own communal language. Consistent with this review, when APIM was applied to a subset of the present sample, there were more consistent effects of partner communal coping than actor communal coping: partner communal coping was more strongly linked to problem-solving and mood for women than men, and more strongly linked to reduced psychological distress for patients than spouses [10].

Partner communal coping might be helpful because it directly signifies that partners are actively involved in illness management and adding to the resources that actors have available. One would expect partner communal coping to be especially beneficial to patients, as they are the ones facing the illness. Given that partner communal language has been examined by previous research but partner communal coping has been rarely investigated, the first study goal is to examine whether partner communal coping adds to the benefits of actor communal coping in predicting relationship and psychological functioning using APIM. Although we predict partner communal coping will be related to better relationship and psychological functioning for patients and spouses, we predict that these relations will be stronger for patients than spouses.

Benefits of Communal Coping for Spouses

Empirical research that has examined communal coping in the context of chronic illness has shown clear benefits for patients in terms of higher relationship quality, less psychological distress, improved health behaviors, and better physical health (see [2] for a review) but has failed to adequately address the implications of communal coping for spouse relationships and health. (We use the term "spouse" to refer to spouses and romantic partners to distinguish it from the term "partner" as defined in APIM, which can apply to the partner of either patients or spouses.) Because spouses who engage in communal coping appraise the patient's health problem as their own and jointly take responsibility for managing the health problem, it is possible that there are costs of communal coping for spouses in terms of increased burden and distress. However, it is also possible that communal coping benefits spouses by providing them with better ways to cope with not only the patients' distress but also their own distress.

Research has shown that spouses are often as distressed as patients and tend to withdraw and avoid illness-related discussions, in part because they do not know how to help patients and in part to manage their own distress [11, 12]. By appraising the patient's health problem as their own and becoming involved in managing it, spouse communal coping could indirectly reduce spouse distress by enhancing self-efficacy [13]. That is, spouses may feel more capable of managing their own distress and more efficacious in helping patients cope with health problems by knowing that they are "in this together." In support of this idea, a meta-analysis on family-based support interventions found benefits to both patients and family members, in terms of less distress and reduced burden [14]. Thus, the second study goal is to determine whether communal coping is related to good relationship and psychological functioning for spouses as well as patients. We predict that own communal coping will be related to better relationship and psychological functioning for both patients and spouses. As stated in the previous paragraph, however, partner communal coping is more likely to be beneficial for patients than spouses.

Sex and Communal Coping

Communal coping has been examined among both men and women, but researchers have rarely explored whether men and women are equally likely to benefit from communal coping. To our knowledge, the only study that has explicitly examined this issue is our previous report on a subset of the present sample [10], which showed some evidence for greater benefits among women than men. Other research shows that women are more strongly affected

than men by the quality of their relationship ([15, 16], see[17] for a more nuanced treatment of this issue), suggesting that women might be more likely than men to benefit from communal coping. In fact, one study showed that greater noncommunal language was more strongly associated with marital distress for women than men [18]. However, it is also possible that men benefit from communal coping more than women because wives have been socialized to be caregivers more than husbands. Consistent with this possibility, the chronic illness literature shows that wives are more likely than husbands to be involved in their spouses' health problems [19, 20]. Thus, our third study goal examines whether own and partner communal coping is more strongly related to women's or men's relationship and psychological functioning. Because there is a theoretical basis for competing predictions, we do not make a directional hypothesis here.

Race and Communal Coping

There are individual difference variables related to race. ethnicity, and culture that might alter the implications of communal coping for interpersonal and psychological health. Previous communal coping research has failed to address this issue, but there is work that has compared the social support structure of Black and White adults that might enable us to make predictions about our sample. Blacks are more likely than Whites to construe family broadly by including extended family members [21, 22] and fictive kin in their social networks [22]. In addition, Black adults are less likely to rely on spouses for support [23, 24] compared with White adults. There also is some evidence that interpersonal relations and connections may be more impactful for Blacks than Whites. Communalism or interdependence is more strongly related to healthy blood pressure for Black than White adults [25], and social support has been shown to be a greater buffer of the impact of economic stress for Black than White adults [26]. However, these studies do not explicitly examine the role of spouse support. Therefore, our fourth study goal is to examine whether communal coping is differentially related to relationship and psychological functioning for Black and White adults. Because previous research leads to competing predictions, we do not make a prediction as to whether communal coping with a spouse will be more strongly related to psychological health for Black than White adults in the present study.

Intersectionality

It is becoming increasingly accepted that the health and well-being of individuals is not a function of a single

social identity or even the sum of multiple identities. Rather, intersectionality theory [27, 28] provides a framework for understanding that identities like role, sex, and race interact multiplicatively, creating a unique experience of advantage and disadvantage for each subgroup. For example, the life of a young Black woman does not equate with the disadvantages of being female and the disadvantages of being Black. A young Black female in the United States faces unique problems that cannot be reduced to gender or race alone or even the addition of the two factors. Intersectionality emphasizes the fact that specific combinations of categories create a unique category that cannot be reduced to a combination of its parts. Because this study recruited roughly equal numbers of White and Black females and males, we took the opportunity to address intersectionality. Thus, a fifth study goal is to examine the interactive effects among role, sex, and race. Because of a dearth of research focusing on intersectionality within a health context, we view this goal as the study's novel contribution to the literature.

Introduction to the Present Study

We examine communal coping in the context of chronic illness, specifically among White and Black couples in which one person has been recently diagnosed with type 2 diabetes. We focus on a stressor with a more recent onset because this is the time during which couple members are likely negotiating their roles in conceptualizing and handling the stressor. Previous research has focused on the benefits of communal coping for patients, but we examine whether communal coping is equally beneficial for relationship and psychological functioning for both patients and spouses (i.e., role). We explore sex and race as additional moderators and examine the intersections among role, sex, and race. We also employ an observational measure of communal coping, a departure from a literature that has largely relied on self-reports.

In this study, we expand on previous research by employing APIM to examine the effects of own (i.e., actor) communal coping as well as partner communal coping on patient and spouse interpersonal behavior and psychological health. In an earlier report on a subsample of this group (n = 119), we applied this model to a subset of the dependent variables in this report, but the sample size limited our ability to examine race or its intersection with role or sex. Here, we report the results for the full sample of individuals, expand the range of relationship and psychological functioning measures, and, for the first time, simultaneously examine the effects of role (patient vs. spouse), sex, and race in a single report on actor and partner effects. Couples completed a set of questionnaires, had a discussion about difficulties in managing diabetes that was videotaped and coded by trained research assistants, and completed a postdiscussion questionnaire that reflected their views of and feelings about the discussion. From these activities, we examined three sets of relationship and psychological functioning measures: (i) relationship quality and psychological distress, (ii) observed behavior during the discussion (warmth, hostility), and (iii) self-reported discussion measures (discussion evaluation, progress, mood). Communal coping was measured by behavior observed during the diabetes discussion.

We had five specific goals, each of which expands on previous research. First, we examined the extent to which patients and spouses benefited from their own as well as their partner's observed communal coping. We hypothesized that couple members would benefit from partner communal coping in addition to their own communal coping and that partner communal coping would be especially beneficial for patients. Second, we examined whether communal coping was equally beneficial to spouses as it was to patients. We hypothesized that both patients and spouses would benefit from communal coping. Third, we examined sex differences in the benefits of communal coping, and fourth, we examined race differences in the benefits of communal coping. Fifth, we examined the intersection of role, sex, and race. We did not make directional predictions regarding the last three goals due to prior research being lacking or inconclusive. Rarely has previous research addressed any of these issues, let alone in the context of a single study.

Method

Participants

Participants were 200 couples in which one person had been recently diagnosed with type 2 diabetes. The majority were married (73%), whereas remaining couples were living together. Patients included 42 Black women (21%), 51 Black men (26%), 47 White women (23%), and 60 White men (30%). The majority (95%) of both participants and spouses were of the same race. Complete demographic information is shown in Table 1.

Recruitment

Couples were recruited from the community (i.e., health fairs, mass media advertising, brochures in physician offices). Interested persons contacted the research team by phone and were screened for eligibility. To be eligible, patients had to have been diagnosed with type 2 diabetes within the past 5 years, not have another illness that affected their daily life more than diabetes (e.g., cancer), have a partner who did not have diabetes, and be married or cohabiting with their partner in a marital-type relationship for at least 2 years.

Of the 658 people who contacted us, the majority (n = 419) were ineligible because they reported being diagnosed more than 5 years ago. Of the remaining 239, 22 refused after screening, 4 refused before eligibility could be determined, and 3 were determined to be ineligible after signing the consent form but before completing the protocol (1 couple was not romantically involved; in 2 couples, both persons had diabetes). Of the 210 couples who completed the study, 3 were dropped from analyses (1 couple was intoxicated during the study, 1 couple was not romantically involved, 1 participant had type 1 diabetes instead of type 2 diabetes). Because we were specifically interested in the effects of sex and race on the relation of communal coping to relationship and psychological functioning, we excluded same-sex couples (n = 4) and mixed-race participants (n = 3) from these analyses, which resulted in a final sample of 200 couples.

Although being diagnosed less than 5 years ago was an eligibility requirement, participants referred themselves to the study and diagnosis date was obtained from physicians after informed consent and study procedures had been completed. Of the 200 patients in this report, we later learned 11 had been diagnosed 5–8.5 years ago (7 within 5–6 years). Because removal of these persons did not alter the results, we retained the full sample of 200 couples.

Procedure

The study received Institutional Review Board approval from the University of Pittsburgh and Carnegie Mellon University. Couples were met by two experimenters in either their homes (n = 141; 71%) or at the university research laboratory with mileage reimbursement (n = 59; 29%). After explaining the study and obtaining signed consent forms from patients and spouses, couple members were separated to complete an interview. The psychological health and relationship quality instruments, described below, were administered aloud to reduce participant burden and to allow participants the opportunity to ask questions. After the interview, couple members were reunited and asked to have a conversation about the difficulties in managing diabetes with the goal of finding solutions. The experimenters left the room, and discussions were videotaped for later coding. After 8 min, experimenters returned to the room and administered a postdiscussion questionnaire to patients and spouses. Patients and spouses were each paid \$50.

Observed Communal Coping

We assessed communal coping by having trained raters code the behavioral observation portion of the protocol

Table 1	Patient and	spouse	demographic	charact	eristics

	Overall	Black		White		Sex	Race
	(n = 200)	Female $(n = 42)$	Male $(n = 51)$	Female $(n = 47)$	Male $(n = 60)$	<i>p</i>	p
Patient							
HbA1c; mean (SD)	7.20 (1.82)	7.63 (2.40)	7.75 (2.06)	6.87 (1.46)	6.70 (1.05)	n.s.	***
Age (years); mean (SD)	53.41 (11.13)	50.05 (10.08)	50.41 (10.32)	54.74 (1.81)	57.25 (11.55)	n.s.	***
Education level; n (% 4-year degree)	51 (26%)	6 (14%)	10 (19%)	15 (33%)	20 (33%)	n.s.	n.s.
Household income (median range)	\$40-\$59,000			_		+	***
Years since diagnosis; mean (SD)	1.89 (1.69)	2.20 (1.91)	2.16 (1.71)	1.51 (1.23)	1.73 (1.76)	n.s.	*
On insulin; n (% yes)	51 (26%)	15 (36%)	17 (33%)	12 (26%)	7 (12%)	n.s.	**
Marital status; n (% married)	146 (73%)	24 (57%)	27 (53%)	38 (81%)	57 (95%)	n.s.	***
Relationship length (months); mean (SD)	226 (177)	133 (126)	156 (132)	273 (174)	314 (192)	n.s.	***
Number of children; mean (SD)	1.34 (1.61)	.76 (1.38)	1.16 (1.59)	1.53 (1.91)	1.73 (1.42)	n.s.	n.s.
Spouse							
Age (years); mean (SD)	53.16 (12.02)	55.33 (11.12)	47.08 (11.63)	56.85 (11.34)	55.32 (11.77)	*	***
Education level; <i>n</i> (% 4-year degree)	69 (35%)	8 (19%)	16 (31%)	22 (47%)	23 (38%)	n.s.	**

p values are from *t*-tests for continuous variables and chi-square analyses for categorical variables; no means are shown for income because there were seven missing values and multiple imputation was used. *n.s.* nonsignificant.

 $p^{+} < .10; p < .05; p < .01; p < .001.$

(i.e., the conversation about difficulties managing diabetes). We adapted the observational coding system and training method of Feeney and colleagues [29-31] for the videotaped conversations. Raters were trained to reliability (i.e., kappa ≥ 0.80) on a set of behavioral codes, including communal coping. Once trained, two persons coded the patient, and two different persons coded the spouse. Coders watched the videotape once to get a sense of the interaction. Then they watched the videotape a minimum of two additional times, stopping it at least every 2 min (in reality, most coders paused more frequently) to take detailed notes on each of the codes. Coders typically took 1 hr to code a single video.

Communal coping in both patients and spouses was defined conceptually as the "extent to which the current situation seems to be a joint problem, from the participant's point of view. The patient/spouse talks about the problem in a way that indicates diabetes is viewed as a joint problem." Coders took into consideration the language that the person used to talk about the problem (i.e., "we-language may be indicative of communal coping"), and also the content of the statements made as to whether they reflected joint problem-solving. For example, "we watch what we eat" is an example of communal coping.

Coders evaluated the entire exchange between couple members to determine whether each couple member seemed to consider diabetes to be the patient's own problem or a joint problem. Coders provided a communal coping score using the following 5-point scale: 1 = not at all, 2 = behavior is rare or behavior is of low quality, 3 = behavior occurs occasionally or behavior is of moderate quality, 4 = behaviors occur often or behaviors are of high quality, 5 = behaviors occur consistently and are of the highest quality. Coders took into consideration frequency (i.e., how often communal coping behaviors occurred) as well as quality or magnitude of the communal coping instances when providing their rating, consistent with previous researchers' behavioral coding schemes [29–31]. For example, "we view this illness as both of our problems" would be an example of a high magnitude communal coping behavior, and "We talk about it every day" would be an example of a low magnitude communal coping behavior. See Van Vleet et al. [10] for further examples of communal coping.

When the two coders' ratings differed by one point, the average was taken. When the difference was more than one point, or one coder selected "not at all" and the other coder selected any other code, the issue was resolved with a third party who arbitrated the discussion. Coders would make their case for their rating with detailed notes they had taken. The third party made the final decision. Inter-rater reliability was good for patients (ICC = .78) and spouses (ICC = .80).

Interview Measures

Relationship quality.

We adapted the 5-item Quality of Marriage Index [32] (α = .94 for patients and spouses) for cohabiting couples (i.e., "We have a good marriage" changed to "We have

a good relationship") and administered the 6-item emotional intimacy subscale, which measures feelings of closeness, from the widely used and well-validated Personal Assessment of Intimate Relationships scale (e.g., "My spouse listens to me when I need someone to talk to"; PAIR [33]; $\alpha = .86$ patients; $\alpha = .85$ spouses). Because the two instruments were strongly correlated (r = .76, p < .001 for patients; r = .77, p < .001 spouses), we standardized the two scales and took the average to form a relationship quality index for patients and spouses.

Psychological distress.

We measured three aspects of psychological well-being: depressive symptoms, life satisfaction, and perceived stress. We administered the Center for Epidemiological Depression Scale (CES-D [34]; $\alpha = .91$ patients; $\alpha = .89$ spouses), the Life Satisfaction Scale ([35]; $\alpha = .86$ patients; $\alpha = .84$ spouses), and the four-item Perceived Stress Scale ([36]; $\alpha = .79$ patients; $\alpha = .77$ spouses). Because the three scales were strongly correlated for patients (*r*'s range from .63 to .70) and spouses (*r*'s range from .57 to .70), we standardized the three scales, reverse scored life satisfaction, and took the average to form a psychological distress index for each couple member. This enabled us to reduce the number of analyses and is consistent with the approach that we have taken in other publications using these data set [7, 10].

Observed Discussion Behaviors

In addition to communal coping, two other behavioral codes are examined in this article. As with communal coping, each behavior was rated on a single 5-point scale, which captured the entire interaction.

Warmth.

Warmth/positive affect/friendliness was defined as "Interacting in a warm, friendly, and positive manner with patient/spouse, often through smiles, laughter, positive voice tone (positive and enthusiastic inflections), positive facial expressions. Includes humor but not ridiculing." Inter-rater reliability was good for patients (ICC = .73) and spouses (ICC = .88).

Hostility.

Negative or hostile affect was defined as "Exhibiting any negativity or hostility toward or dissatisfaction with the patient/spouse. Examples include patronizing tones, showing annoyance and irritation at patient/ spouse. Nonverbal behaviors include rolling eyes, negative sighing, and irritated/annoyed tone of voice. Note that the affect here is more active than sad." Inter-rater reliability was good for patients (ICC = .73) and spouses (ICC = .81).

Postdiscussion Measures

The postdiscussion questionnaire consisted of three measures: one that evaluated the discussion in terms of its overall positive and negative quality, one that reflected how much progress was made in terms of resolving the diabetes management difficulties, and a measure of overall current positive and negative affect following the discussion.

Postdiscussion evaluation.

Participants completed three postdiscussion scales developed by Feeney and Cassidy [37]. First, participants indicated the extent to which six words described their discussion (argumentative, pleasant, disagreeable, cooperative, helpful, annoying) on a 5-point scale, ranging from not at all (1) to very much (5). After recoding the three negative words, we took the average ($\alpha = .75$ for patients; $\alpha = .82$ for spouses). Second, participants indicated the extent to which they experienced eight emotions during the discussion (disappointed, angry, happy, nervous, satisfied, enthusiastic, sad, excited) on a 5-point scale, ranging from not at all (1) to a lot (5). The four negative terms were reverse coded, and the items were averaged ($\alpha = .84$ for patients; $\alpha = .81$ for spouses). Finally, participants were asked to think about how their spouse treated them during the discussion and to indicate how much they felt a certain way (cared about, accepted, ignored, listened to, put down, respected, disliked, attacked, understood) using the same 5-point scale. Again, the four negative items were reverse coded, and the average was taken ($\alpha = .87$ for patients; $\alpha = .90$ for spouses). Because the three scales were highly intercorrelated for patients and spouses (r's ranged from .58 to .72), we took the average to represent indices of overall positive or negative assessment of the discussion.

Progress.

Patients and spouses responded to two items: "How much progress did you make in resolving this diabetes problem?" and "Do you think discussing this problem helped to resolve it?" Responses ranged from none (1) to a lot (5) for the first item and not at all (1) to a lot (5) for the second item. Because the two items were highly correlated (r's = .60, p < .001 for patients and spouses), they were averaged to form a diabetes progress index.

Positive and negative affect.

The Positive and Negative Affect Scale (PANAS) [38] was used to measure positive and negative affect.

Participants were asked to indicate on a 5-point scale the extent to which 10 positive and 10 negative mood words described how they felt at that moment: (1) very slightly or not at all, (2) a little, (3) moderately, (4) quite a bit, (5) extremely. The internal consistency was good for positive affect ($\alpha = .92$ patients; $\alpha = .91$ spouses) and negative affect ($\alpha = .89$ patients; $\alpha = .85$ spouses).

Overview of the Analyses

Prior to conducting the main analyses, we examined whether patient demographic and illness variables were associated with sex and/or race (Table 1). We statistically controlled for variables that covaried with sex or race in subsequent analyses. We also examined whether there were role, sex, and race differences in level of communal coping with a repeated-measures analysis of covariance.

To examine the effects of role, sex, and race on the association of each person's communal coping to own and partner interview measures, observed discussion behavior, and postdiscussion measures, we performed APIM for distinguishable dyads [39] using R [40, 41]. Role (patient vs. spouse) was the distinguishing variable. This statistical model accounts for nonindependence in dyadic responses and allows us to estimate the effects of both dyad members on each other's outcomes through actor effects and partner effects. An actor effect occurs when a person's behavior predicts his or her own outcomes. Examples are *patient* communal coping predicting *patient* negative affect, and *spouse* communal coping predicting spouse negative affect. A partner effect occurs when a person's behavior predicts the other dyad member's outcomes. Examples are patient communal coping predicting spouse negative affect, and spouse communal coping predicting *patient* negative affect.

To test main effects of communal coping and interaction effects between communal coping and role, sex, and race on each dyad member's outcomes, we started with the most complex model and performed stepwise backwards elimination to reduce the complexity of the model. This was the procedure that we used in our previous report on a subset of this sample [10] and has been supported by previous research [42]. In other words, we started with a model that included covariates, main effects of communal coping, role, sex, and race; two-way interaction terms between predictors (e.g., communal coping \times role); three-way interaction terms between predictors (e.g., communal coping \times role \times sex); and the single four-way interaction term between predictors (i.e., communal coping \times role \times sex \times race). Then, stepwise backwards elimination reduced the full models to a stage where only significant interactions remained, if any. Thus, only significant interactions and lower-order terms are presented in Tables 2 and 3. Because there were

no four-way interactions (which we would not have had the power to detect), this term is not shown in the tables. Actor communal coping and partner communal coping were grand mean-centered for interpretability.

Simple slopes of significant interactions are presented in the text. Simple slopes were calculated from the table of estimates for the regression model. Because we code all categorical independent variables (IVs) using 0/1 coding, computing simple slopes for any combination of factors in interaction with the variable of interest only requires adding in the pertinent interaction slopes (when the factor is at its level that is coded as "1") or ignoring it (for the level coded as "0"). For three-way interactions, the slope is added only when both categorical variables are coded as "1." If a continuous variable interacted with another continuous variable, simple slopes were calculated at specific levels of the second IV. In this case, the value added to the slope for the variable of interest is the product of the interaction slope and the chosen value of the second IV. SE for the simple slopes were calculated using the slope estimates and the variance-covariance matrix according to the standard theory of Gaussian linear combinations.

Results

Background Analyses

As shown in Table 1, there was a marginal sex difference in household income, such that male patients had a higher household income than female patients. There were race differences in age, household income, years since diagnosis, whether the patient was on insulin, marital status, relationship length, and glycemic control (HbA1c). Black patients were younger, had a lower household income, had been diagnosed less recently, were more likely to be on insulin, were less likely to be married, had relationships of a shorter duration than White patients, and had poorer glycemic control. Because there were race differences in several demographic factors, we thought that there might be overlap among these variables. Thus, we sought to limit the redundancy by entering the six demographic covariates into a multiple logistic regression to predict patient race. Results showed that Black race was predicted by lower income, B = -0.21; SE = 0.07; p = .002, shorter relationship length, B = -0.004; SE = 0.001; p = .003, longer time since diagnosis, B = 0.18, p = .08, cohabiting rather than being married, B = -0.87, SE = 0.46; p = .06, but not by age, B = -0.01, SE = 0.02; p = .62, being on insulin, B = 0.21, SE = 0.43; p = .62, or HbA1c, B = 0.20; SE = .12, p = .11. Thus, income, years since diagnosis, relationship length, and marital status were used as covariates in all analyses.

Overall descriptive statistics and zero-order correlations of communal coping to relationship and psychological functioning are shown in Supplementary Table 1. Patient and spouse communal coping were moderately correlated (r = .49, p < .001).

We also examined whether there were sex and race differences in communal coping with a three-way (role by sex by race) repeated-measures analysis of covariance, with role being the within-subject factor and sex and race being between-subject factors. There was only a main effect of race: there was greater observed communal coping for White persons (M = 2.39, SE = 0.10) than Black persons (M = 2.04, SE = 0.11), F(1, 188) = 4.93, p < .05 (eta² = .03).

Links of Communal Coping to Interview Measures

Relationship quality.

As shown in Table 2, there were significant actor (i.e., own) and partner effects of communal coping on relationship quality. Both own communal coping and partner communal coping were associated with higher relationship quality. There were no interactions involving role, sex, or race.

Psychological distress.

There was an actor communal coping effect that interacted with race on psychological health (see Table 2). As shown in Supplementary Figure 1, actor communal coping was related to reduced psychological distress for White participants (B = -0.18, SE = 0.05, confidence interval [CI] [-0.28, -0.09]) but was unrelated for Black participants (B = 0.06, SE = 0.06, CI [-0.06, 0.17]). That is, White participants' own communal coping was related to less distress but Black participants' own communal coping was not. There also was a partner communal coping by role interaction. As shown in Supplementary Figure 2, partner communal coping was related to reduced psychological distress for patients (B = -0.15, SE = 0.05, CI [-0.25, -0.05]), but was unrelated for spouses (B = 0.07, SE = 0.05, CI [-0.03, 0.18]). In other words, spouse communal coping was associated with reduced distress for patients, but patient communal coping was not associated with distress for spouses.

Links of Communal Coping to Observed Discussion Behaviors

Observed warmth.

As shown in Table 2, there were significant main effects of actor communal coping, partner communal coping, role, and sex on observed warmth during the videotaped discussion. Spouses and females had higher observed warmth than patients and males. In addition, both actor communal coping and partner communal coping were associated with higher levels of warmth. There was also a role by race interaction that did not involve communal coping. Controlling for mean levels of actor and partner communal coping, White spouses displayed the highest warmth (M = 2.59) and Black patients the lowest warmth (M = 2.13); the level of warmth exhibited by White patients (M = 2.37) and Black spouses (M = 2.35) fell between these two groups.

Observed hostility.

There was an actor communal coping by role interaction that was qualified by a three-way actor communal coping by role by race interaction. As shown in Supplementary Figure 3a, actor communal coping was associated with lower observed hostility for both White patients (B = -0.23, SE = 0.07, 95% CI [-0.37, -0.08]) and Black spouses (B = -0.21, SE = 0.09, 95% CI [-0.38, 0.00]), but was unrelated to observed hostility for White spouses (B = 0.00, SE = 0.08, 95% CI [-0.15, 0.15]) and Black patients (B = 0.10, SE = 0.10, 95% CI [-0.09, 0.29]). There was also a main effect of partner communal coping, a partner communal coping by race interaction, and a three-way partner communal coping by role by race interaction. This interaction, shown in Supplementary Figure 3b, is the reverse of the one in Figure 3a. Greater partner communal coping was associated with decreased observed hostility for Black patients (B = -0.23, SE = 0.09, 95% CI [-0.40, -0.06]), revealed a trend toward decreased hostility for White spouses (B = -0.15, SE = 0.08, 95% CI [-0.30, 0.00]), but was unrelated to hostility for White patients (B = 0.07, SE = 0.07, 95% CI [-0.08, 0.22]) and Black spouses (B = 0.14, SE = 0.10, 95% CI [-0.05, 0.34]).

Links of Communal Coping to Postdiscussion Measures

 Table 3 presents the APIM results for the four self-reported postdiscussion measures.

Postdiscussion evaluation.

There was a significant main effect of race on the postdiscussion evaluation, such that Black participants rated the discussion more positively than White participants. There was also a main effect of actor communal coping that was qualified by an interaction with sex. As shown in Supplementary Figure 4a, increased actor communal coping was associated with evaluating the discussion more positively among men (B = 0.19, SE = 0.04, 95% CI [0.11, 0.27]), but was unrelated among women (B = 0.02, SE = 0.04, 95% CI [-0.06, 0.10]). There was

	Relatio	nship q	luality	Psychologic	al distre	SSS	Observed	warmth		Observed ho	ostility	
	В	SE	CI	В	SE	CI	В	SE	CI	B	SE	CI
Income	0.03	0.03	[-0.02, 0.08]	-0.08***	0.02	[-0.11, -0.05]	0.02	0.02	[-0.02, 0.07]	-0.03^{+}	0.02	[-0.07, 0.002]
Marital status	-0.12	0.17	[-0.46, 0.21]	-0.18^{+}	0.11	[-0.39, 0.03]	0.04	0.15	[-0.26, 0.33]	-0.09	0.12	[-0.33, 0.15]
Relationship length	0.001	* 0.00	[0.00, 0.001]	0.00^{***}	0.00	[-0.001, 0.00]	0.00	0.00	[0.00, 0.00]	0.00	0.00	[0.00, 0.00]
Years since diagnosis	0.07^{+}	0.04	[-0.001, 0.15]	-0.06*	0.02	[-0.10, -0.01]	-0.01	0.03	[-0.08, 0.05]	-0.002	0.03	[-0.06, 0.05]
Role	0.05	0.09	[-0.12, 0.0.22]	0.01	0.07	[-0.14, 0.15]	-0.22*	0.09	[-0.39, -0.04]	0.10	0.09	[-0.09, 0.28]
Sex	-0.14	0.08	[-0.30, 0.03]	-0.02	0.07	[-0.16, 0.12]	0.30^{***}	0.06	[0.18, 0.43]	0.09	0.07	[-0.04, 0.22]
Race	-0.07	0.15	[-0.37, 0.23]	-0.01	0.10	[-0.20, 0.17]	-0.24	0.15	[-0.53, 0.05]	-0.08	0.13	[-0.34, 0.17]
ACC	0.11*	0.05	[0.01, 0.21]	-0.18^{***}	0.05	[-0.28, -0.09]	0.10^{*}	0.04	[0.02, 0.18]	0.00	0.08	[-0.15, 0.15]
PCC	$0.14^{*:}$	* 0.05	[0.04, 0.24]	0.07	0.05	[-0.03, 0.18]	0.13^{**}	0.04	[0.05, 0.21]	-0.15*	0.08	[-0.30, -0.004]
Role \times Race							0.31^{*}	0.13	[0.06, 0.56]	-0.01	0.14	[-0.28, 0.26]
ACC × Role										-0.23*	0.11	[-0.45, -0.001]
PCC × Role				-0.23^{***}	0.07	[-0.36, -0.09]				0.22^{+}	0.11	[-0.001, 0.45]
ACC × Race				0.24^{***}	0.07	[0.09, 0.39]				-0.21^{+}	0.12	[-0.43, 0.02]
PCC × Race										0.30^{*}	0.13	[0.05, 0.54]
ACC \times Role \times Race										0.54^{**}	0.18	[0.18, 0.89]
PCC × Role × Race										-0.60^{***}	0.18	[-0.95, -0.24]
							-	.				

 Table 2
 Results from actor-partner interdependence models for interview and observed discussion outcomes

Role is 1 = participant, 0 = spouse, sex is 1 = female, 0 = male, race is 1 = Black, 0 = White. ACC actor communal coping; PCC partner communal coping. $^{+}p < .10; *_p < .05; **_p < .01; ***_p < .001.$

	Evaluatio	n index		Progress			Positive afi	fect		Negative a	uffect	
	B	SE	CI	В	SE	CI	B	SE	CI	В	SE	CI
Income	0.03*	0.01	[0.01, 0.05]	-0.005	0.02	[-0.05, 0.04]	0.02	0.02	[-0.01, 0.06]	-0.04^{**}	0.01	[-0.06, -0.01]
Marital status	-0.04	0.08	[-0.21, 0.12]	-0.13	0.14	[-0.41, 0.16]	-0.12	0.12	[-0.35, 0.12]	0.07	0.08	[-0.09, 0.22]
Relationship length	0.00	0.00	[0.00, 0.00]	0.00	0.00	[0.00, 0.00]	0.00	0.00	[0.00, 0.00]	0.00	0.00	[0.00, 0.00]
Years since diagnosis	0.02	0.02	[-0.02, 0.06]	-0.02	0.03	[-0.08, 0.05]	0.02	0.03	[-0.03, 0.07]	0.01	0.02	[-0.02, 0.05]
Role	0.06	0.05	[-0.04, 0.15]	0.03	0.13	[-0.23, 0.30]	-0.10	0.09	[-0.27, 0.07]	0.05	0.06	[-0.06, 0.17]
Sex	0.05	0.05	[-0.04, 0.14]	-0.05	0.10	[-0.24, 0.14]	0.05	0.08	[-0.11, 0.22]	0.01	0.06	[-0.10, 0.12]
Race	0.21^{**}	0.08	[0.07, 0.36]	0.30^{+}	0.16	[-0.02, 0.61]	0.49***	0.11	[0.27, 0.70]	-0.004	0.07	[-0.14, 0.13]
ACC	0.19^{***}	0.04	[0.11, 0.27]	-0.02	0.09	[-0.19, 0.15]	0.16^{***}	0.04	[0.07, 0.25]	-0.02	0.03	[-0.07, 0.04]
PCC	0.03	0.04	[-0.04, 0.11]	0.13*	0.05	[0.03, 0.23]	*60.0	0.04	[0.01, 0.18]	-0.02	0.03	[-0.08, 0.04]
Role \times Race				-0.15	0.20	[-0.53, 0.24]						
ACC × Role				0.24^{*}	0.11	[0.02, 0.47]						
$ACC \times Sex$	-0.17^{**}	0.06	[-0.29, -0.05]									
$PCC \times Sex$	0.13*	0.06	[0.01, 0.25]									
ACC × Race				0.31^{*}	0.13	[0.05, 0.56]						
ACC \times Role \times Race				-0.37*	0.19	[-0.74, -0.004]						
Role is 1 = participant, 0 = $\frac{1}{n} < 10 \cdot *_n < 0 \cdot *_{n} < 10$	= spouse, sex $01 \cdot **n < 00$	is $1 = f\epsilon$	smale, 0 = male, rac	e is 1 = Blac	ck, 0 =	White. ACC actor 6	sommunal cop	ing; PC	C partner comm	nunal coping		

Table 3 Results from actor-partner interdependence models for postdiscussion outcomes

2 2 also a significant interaction between partner communal coping and sex. As shown in Supplementary Figure 4b, increased partner communal coping was associated with evaluating the discussion more positively for women (B = 0.17, SE = 0.04, 95% CI [0.08, 0.25]) but was unrelated among men (B = 0.03, SE = 0.04, 95% CI [-0.04, 0.11]).

Progress.

There was a significant main effect of partner communal coping on reports of problem progress, such that more partner communal coping was associated with greater progress in resolving the diabetes problem. There were also actor communal coping by role and actor communal coping by race interactions, both of which were qualified by a three-way actor communal coping by race by role interaction. As shown in Supplementary Figure 5, increased actor communal coping was associated with greater progress in problem-solving for White patients (B = 0.22, SE = 0.09, 95% CI [0.05, 0.40]) and Black spouses (B = 0.29, SE = 0.10, 95% CI [0.09, 0.49]), but was unrelated for Black patients (B = 0.16, SE = 0.12, 95% CI [-0.07, 0.39]) and White spouses (B = -0.02, SE = 0.09, 95% CI [-0.19, 0.15]).

Positive affect.

There was a significant race difference in reported positive affect after the discussion, such that Black participants reported higher positive affect than White participants. There were also actor and partner communal coping main effects, such that own and partner communal coping were related to higher positive affect.

Negative affect.

There were no main effects or interactions involving role, sex, or race for actor or partner communal coping on postdiscussion negative affect.

Discussion

The overall goal of the present study was to examine the relation of observed communal coping to relationship and psychological functioning for patients with type 2 diabetes and their spouses and to see whether these relations were moderated by role, sex, and race. Generally, communal coping was associated with positive relationship and psychological functioning for both patients and spouses. Observed communal coping was cross-sectionally linked to better relationship quality and lower psychological distress. In the context of discussing difficulties coping with diabetes, observed communal coping was related to observer ratings of more warmth and less

hostility during that discussion. Observed communal coping was also related to participants' evaluation of the discussion as a more beneficial experience, perceptions of having made more progress toward resolving diabetes problems, and reports of greater positive affect following the discussion. These findings suggest that communal coping is not only related to general feelings about one's relationship and overall feelings of well-being, but is also related to observations and self-reports of more progress in problem-solving. Longitudinal data, including future follow up of these couples, will reveal whether communal coping has a lasting impact on behavior.

Not only was one's own communal coping linked to good relationship and psychological functioning, but partner communal coping was also related to good relationship and psychological functioning. That is, having a partner who engaged in communal coping was related to one's own higher relationship quality and reduced psychological distress, as well as positive behaviors related to the discussion: expressions of greater warmth during the discussion, a more positive discussion evaluation, and reports of having made more progress during the discussion. These findings speak to the importance of communal coping as a dyadic process, as both couple members contribute to positive relationship and psychological functioning.

However, importantly, the links of communal coping to relationship and psychological functioning depended on role, sex, and race. Not every group benefitted equally from communal coping. For example, partner communal coping was linked to patients' overall psychological well-being, but not spouses' overall psychological well-being. Because communal coping involves patients and spouses working together to manage a problem that is objectively linked only to the patient, it is not surprising that patients might benefit more than spouses from their partner's communal coping. In fact, given the prior review on communal language [9], we expected more interactions of this nature. Regardless, the results of this study show that one's own communal coping is generally related to good relationship and psychological functioning for spouses as much as patients. At a minimum, these results show that there is no evidence of negative links of communal coping for spouses. Research on the benefits-or potential costs-of communal coping for spouses requires further investigation in future research.

Participant sex was another important moderator that we aimed to examine. There was evidence that men benefitted from their own communal coping and women benefitted from their partner's communal coping on the postdiscussion evaluation. Because women are more likely than men to be socialized to be communal and focus on others [43], it is not surprising that women are more likely than men to be affected by their partner's behavior. In fact, this finding is consistent with other research that has shown qualities of husbands are more likely to affect wives than vice versa [44].

Another aim was to examine whether Black and White persons were equally likely to benefit from communal coping. Some findings appeared with regard to race that bear on this issue. First, we found that Black persons were less likely than White persons to engage in communal coping. Second, there was evidence that Black persons tended to view the interaction more positively than White persons, in terms of reporting more positive affect after the discussion and a more positive evaluation of the discussion. However, communal coping was more strongly related to reduced psychological distress for White persons than Black persons. Because psychological distress may be interpreted differently by Black and White persons [45], we interpret this finding with caution. Research has paradoxically shown that Blacks report higher psychological distress but lower depression than Whites, possibly due to differential item functioning. Blacks may express distress more somatically, and depression instruments are focused on more psychological symptoms.

When examining the intersection between our moderating factors of interest, we found a more complicated pattern of interactions with actor communal coping, role, and race on two dependent variables: observed hostility and discussion progress. The pattern was consistent across these two measures: own communal coping was related to less hostility and more progress for White patients and Black spouses, but was unrelated to hostility and progress for Black patients and White spouses.

Because we expect communal coping to be beneficial, it may be easier to interpret this finding by focusing on the two subgroups that appeared not to benefit from own communal coping: Black patients and White spouses. Black patients may not benefit as much as White patients from communal coping because Black persons may rely less on romantic partners for support compared with White persons [23, 24]. A meta-analytic review of the literature on caregiving showed that caregivers in Black families were less likely to be a spouse than caregivers in White families [23]. In one study, when adults over 45 were asked to identify a potential caregiver in the event they fell ill, White respondents were most likely to identify a spouse to serve in that capacity, but Black women were more likely to identify a daughter [24]. Thus, Black patients may not have been interacting with their most significant support resource in this study, as evidenced by lower communal coping among Blacks compared with Whites. By contrast, White spouses may not have gained as much from communal coping because spouses are expected to be the central source of support in the White community—which could lead communal coping to be associated with more burden.

Interestingly, there was a reverse interaction for partner communal coping on observed hostility: partner communal coping was related to less hostility for Black patients and White spouses but was not related to hostility for White patients or Black spouses. This finding is consistent with the previous interpretation. Black patients and White spouses may benefit from their partner's communal coping because it is unexpected in both cases. It may be unexpected for Black patients because they have stronger relationships with other support partners, and unexpected for White spouses because they appreciate their partner's contributions. Admittedly, these findings are highly speculative, but worthy of further investigation.

Taken collectively, these findings have implications for fostering the mental health of persons with type 2 diabetes while also helping them to manage their disease. Health care practitioners should consider including partners in health care visits to better understand how the couple copes with and manages diabetes. By having conversations with the couple as a unit, partners may feel more involved in disease management and patients may be more receptive to partner assistance. However, practitioners also need to be sensitive to the possibility that people will construe partner involvement differently. Because the findings from this study showed that sex and race altered some of the relations of communal coping to relationship and psychological functioning, there may be a variety of ways to construe how patients and partners can best work together to manage diabetes.

Before concluding, it is important to acknowledge several study limitations. First, because this article focused on heterosexual couples, we do not know if the findings generalize to same-sex couples. An examination of samesex couples would help to further clarify the findings related to sex, as participant sex in this study is confounded with a heterosexual context. Second, it is not clear if these findings would be maintained, strengthened, or weakened if the participant with diabetes had had the disease for a longer period of time and sustained complications. Communal coping might be more important for all couples if the problems they face become more severe. Third, the study was focused on linear relations of communal coping to relationship and psychological functioning. Future research should examine potential curvilinear relations. For example, it is possible that very high levels of communal coping are experienced by spouses as a burden and by patients as intrusive. If the relationship comes to be defined by the illness, couples could become enmeshed, a state that is associated with poor relationship functioning [46]. In addition, our lack of findings for self-reported negative affect could be due

to a floor effect. The overall level of negative affect was low, and there was little variability.

Finally, although these results shed light on each of the proposed moderators, there is the possibility that the true picture involves more complicated interactions among the moderators for which we did not have the power to detect. We view our examination of multiple moderating factors that could affect the communal coping process as a study strength, but we also recognize that in reality, the picture is likely to be even more complex. Researchers in the area of sex and race have become increasingly aware of the fact that these categories cannot be dissociated from one another and that an intersectional approach to the examination of health is an important avenue for future research [27, 28]. There may be findings unique to particular sex by race subgroups of patients or spouses that we were not able to extract with our sample size.

In sum, we examined the links of communal coping to relationship and psychological functioning among a diverse community sample that varied on several dimensions, including sex and race. We used a measure of communal coping that may be more likely to reflect how couples actually engage with one another rather than relying on selfreport. Across a wide array of self-report and observed dependent variables, we found that own and partner communal coping was associated with positive relationship and psychological functioning. We also found clear benefits of communal coping for both patients and spouses, though our findings highlight that these benefits may differ based on an individual's background. In extending this research to other racial and ethnic groups, it will be especially important to consider communal coping in the context of relationships other than romantic partners.

Supplementary Material

Supplementary material is available at *Annals of Behavioral Medicine* online.

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Compliance with Ethical Standards

Conflict of Interests The authors have no conflicts of interest to declare.

Authors' Contributions V.S.H. designed the study. H.S. provided statistical support for the analyses, and J.B.N. conducted

the analyses. V.S.H. and J.B.N. wrote the manuscript, and M.K., L.R.M.H., and T.L.G.W. read multiple versions of the manuscript and provided critical feedback.

Ethical Approval The research was approved by the Institutional Review Boards of Carnegie Mellon University and the University of Pittsburgh Medical Center.

Informed Consent All participants provided written informed consent prior to data collection.

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