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BRIEF REPORT

Perceived Partner Responsiveness Moderates the Association Between Received Emotional Support and All-Cause Mortality

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Objective: The aim of this study was to investigate whether perceived partner responsiveness (PPR) moderates the association between received partner emotional support (RPES) and all-cause mortality in a national U.S. sample. ***Method:*** Data were from the National Survey of Midlife Development in the United States, a national probability survey of health and aging. Participants included respondents who were married or cohabiting with a romantic partner. ***Results:*** Hierarchical logistic regression analyses indicated that after adjusting for demographics, physical health status, health behaviors, psychological symptoms, and personality traits, high RPES was associated with increased mortality risk among participants who reported low PPR, but it was unrelated to mortality risk among participants who reported high PPR. ***Conclusions:*** This study is the first to document that perceived partner responsiveness moderates the association between received partner emotional support and mortality risk, thus contributing to the literature on the contextual factors altering the effects of received support on health outcomes.

Keywords: received emotional support, perceived partner responsiveness, mortality, health, romantic relationships, marriage

Although *perceived* availability of emotional support is consistently associated with lower risk for mortality (e.g., Berkman, Leo-Summers, & Horwitz, 1992; Orth-Gomér, Rosengren, & Wilhelmsen, 1993), prior evidence for associations between *received* emotional support and mortality risk has been mixed, with some studies reporting a decrease in mortality risk (e.g., Penninx et al., 1997) and others reporting no association (e.g., Thong, Kaptein, Krediet, Boeschoten, & Dekker, 2007) or an increase in mortality risk (e.g., Krause, 1997).

These mixed findings suggest that there may be moderating factors that influence the association between received emotional support and mortality (Uchino, 2009). In this article, we examine the potential moderating role of perceived partner responsiveness (PPR). PPR reflects the extent to which individuals believe their relationship partners understand, validate, and care for them (Reis, 2007). PPR is conceptually distinct from received support from a partner. Whereas the latter construct refers to the quantity of actual support receipt within a specific time frame, the former reflects a global view of one's partner as understanding, validating, and caring. For instance, a partner who provides high emotional support may be perceived as high or low on PPR. Thus, PPR is critical to understanding the association between received support and health outcomes.

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The seemingly paradoxical negative associations between received support and health have been attributed to potential costs associated with receiving support: Supportive behavior may fail to match the needs of the support recipient or may threaten the recipient's sense of self-efficacy and independence, thereby further increasing distress (e.g., Bolger & Amarel, 2007; Rafaeli & Gleason, 2009). High PPR appears to reduce these potential costs. Partners who are perceived as high in responsiveness are more likely to engage in support behaviors that are appropriately contingent on their partner's needs (Collins, Guichard, Ford, & Feeney, 2006). Moreover, support received from a responsive partner is associated with increased levels of self-efficacy, autonomy, and independent goal pursuit on the part of the support recipient (Feeney, 2007). Finally, high PPR in daily support interactions is associated with lower daily negative affect (Maisel & Gable, 2009). Given these findings, we predicted that high PPR would attenuate the association between high received emotional support and increased mortality.

To test whether PPR moderates the association between mortality risk and received partner emotional support (RPES), we used data from the National Survey of Midlife Development in the United States (MIDUS), a panel survey designed to assess age-related changes in physical and mental health of adults between the ages of 25 and 74 (Brim et al., 2007). In an effort to investigate the unique and combined influences of PPR and RPES on all-cause mortality risk, we tested two models that included a wide range of covariates. In the first model, we examined whether the interaction between RPES and PPR was associated with mortality risk after adjusting for demographic factors (age, gender, ethnicity, education level, and annual household income) and physical health status. On

the basis of prior research on the mechanisms linking romantic relationships with physical health outcomes (e.g., Kiecolt-Glaser & Newton, 2001), we then included health behaviors, psychological symptoms, and personality traits as additional covariates.

Method

Sample

The MIDUS national sample consists of 3,487 individuals who were invited to complete a phone interview and then a self-administered survey in 1995–1996. Of the 2,035 individuals who were married or cohabiting and completed both the phone interview and the self-administered questionnaire, 1,803 had complete data on all variables of interest. Missing data were no more than 4% on any of these variables. We performed all the analyses by using both the original data (n = 1,803) and the complete data (n = 2,035) after estimating missing values by using multiple imputation. The analyses using multiple imputation produced similar results to those obtained using the original data. Therefore, we present all findings using the original data. Of the participants in the final sample, 46% were female and 54% were male; 91% were Caucasian, 4% were African American, 1% Asian, 1% Native American, and 3% were from other ethnic backgrounds; 39% graduated from high school or less and 61% had some college education or more. The mean age of participants was 46.53 (SD = 12.70).

Measures

Mortality status. Names of individuals who could not be contacted for a 10-year follow-up assessment were submitted to the National Death Index through 2004. One hundred and two out of 1,803 individuals were identified as deceased.

Received partner emotional support (RPES). RPES was measured with a single item asking how many hours per month participants receive emotional support (e.g., getting comfort, having someone listen to them) from their spouse or romantic partner. Given its high skewness (6.33), this variable was log-transformed prior to the analyses. Replicating previous work (e.g., Bolger, Zuckerman, & Kessler, 2000), high RPES was associated with lower psychological well-being (r = .06, $p < .05$, for depression; r = .06, $p < .01$, for generalized anxiety disorder; r = .05, $p < .05$, for neuroticism).

Perceived partner responsiveness (PPR). For the present study, we created a PPR score using three items in the MIDUS self-administered questionnaire (revised from Schuster, Kessler, & Aseltine, 1990). The items asked participants to indicate how much their spouse or partner cares about them, understands the way they feel about things, and appreciates them. The items matched the three components of PPR (i.e., understanding, validating, and caring) identified in the literature (Reis, 2007). Moreover, the content and wording of the items were similar to those of a short-PPR measure used in a recent study (Maisel & Gable, 2009). Participants responded to the items on a 4-point scale, ranging from 1 (*a lot*) to 4 (*not at all*; α = .84). Responses were reverse scored so that higher scores reflected greater PPR. In this sample, PPR and RPES scores were moderately correlated (r = .28, $p < .001$).

Physical health status. Physical health variables used in this study included participants' perception of their physical health (1 = *poor* to 5 = *excellent*), self-reported cardiovascular problems (0 = *no*, 1 = *yes*), and cancer (0 = *no*, 1 = *yes*); and the sum of remaining chronic physical health symptoms (range = 0–22).

Health behaviors. Participants indicated the amount of effort they put on maintaining their health (0 = *none* to 10 = *very much*) and the quality of their sleep (i.e., how frequently they experience sleeping problems; 1 = *almost every day* to 6 = *not at all*). In addition, participants completed a five-item modified version of the Michigan Alcohol Screening Test (Selzer, 1971). The test assesses whether participants experienced any alcohol-related problems during the past year (0 = *no*, 1 = *yes*). The responses were summed (α = .62) and then dichotomized (0 = *no alcohol problems*, 1 = *otherwise*).

Psychological symptoms. Psychological symptoms were assessed with the depression (0 = *lowest* to 7 = *highest*) and generalized anxiety disorder (0 = *lowest* to 10 = *highest*) scales of the Composite International Diagnostic Interview-Short Form (Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998).

Personality. Five major personality traits were measured by using the Midlife Development Inventory (MIDI) Personality Scales, a 25-item adjective list specifically designed for the MIDUS project (Lachman & Weaver, 1997). The adjectives were mostly selected from existing personality inventories (e.g., John, 1990) and pilot tested with a separate probability sample of 1,000 men and women between the ages of 30 and 70. Participants were asked to indicate how much each adjective described them (1 = *a lot* to 4 = *not at all*). Responses were reverse scored so that higher scores reflected higher standing on each trait. Cronbach's alphas in the current sample were .79 for extraversion (outgoing, friendly, lively, active, talkative), .75 for neuroticism (moody, worrying, nervous, calm), .80 for agreeableness (helpful, warm, caring, soft-hearted, sympathetic), .57 for conscientiousness (organized, responsible, hardworking, careless), and .77 for openness to experience (creative, imaginative, intelligent, curious, broad minded, sophisticated, adventurous). The MIDI scales have been found to be associated with psychological and physical well-being in theoretically meaningful ways (e.g., Keyes, Shmotkin, & Ryff, 2002; Turiano et al., 2012), providing evidence for their construct validity. Moreover, the scales show strong measurement invariance across adult age groups (Zimprich, Allemand, & Lachman, 2012).

Data Analytic Strategy

We conducted hierarchical logistic regression analyses to predict mortality risk. Specifically, two models were tested. Model 1 included only demographic factors and physical health status variables as covariates. Demographic factors were entered in Step 1; physical health status variables were entered in Step 2; RPES and PPR were entered in Step 3; and the two-way interaction between RPES and PPR was entered in Step 4. Model 2 examined the extent to which the association between mortality and RPES $\times$ PPR interaction was explained by any of the pathways (i.e., health behaviors, psychological symptoms, and personality traits) linking romantic relationships to health outcomes (e.g., Kiecolt-Glaser & Newton, 2001). Specifically, in Model 2, demographic factors were entered in Step 1; physical health status variables were entered in Step 2; health behaviors were entered in Step 3; psy-

chological symptoms were entered in Step 4; personality traits were entered in Step 5; RPES and PPR were entered in Step 6; and the two-way interaction between RPES and PPR was entered in Step 7. All continuous variables were standardized before being entered into the models.

Results

Table 1 shows the regression coefficients, odds ratios, 95% confidence intervals for odds ratios, and Nagelkerke's R^2s for the final step of Models 1 and 2. Including demographic factors significantly improved the null model, $\chi^2(5) = 143.17$, $p < .001$. Being older and male predicted increased mortality risk. Physical health status significantly improved the model as well, $\chi^2(4) = 53.28$, $p < .001$, with being in poor perceived health and having a cardiovascular problem predicting increased mortality risk. Adjusting for health behaviors, psychological symptoms, and personality traits in Model 2 did not significantly improve the model, χ^2s < 4.47, ps $> .48$. Similarly, adding the main effects of RPES and PPR did not improve the models either: Model 1, $\chi^2(2) = 3.97$, $p = .14$; Model 2, $\chi^2(2) = 2.87$, $p = .24$. However, as predicted and shown in Table 1, RPES by PPR interaction significantly predicted all-cause mortality in both Models 1 and 2: Model 1, $\chi^2(1) = 4.63$, $p = .031$; Model 2, $\chi^2(1) = 4.94$, $p = .026$.

To probe the interaction, we conducted region of significance analyses (Hayes & Matthes, 2009), using the full set of covariates. Adjusted for demographic factors, physical health status, health behaviors, psychological symptoms, and personality traits, high RPES was associated with an increase in all-cause mortality risk for values of PPR below 1.91 (odds ratios >1.70, ps $< .05$), but was unrelated to mortality risk for values of PPR above 1.91, suggesting that high PPR eliminates the association between high RPES and increased mortality.

Given prior research showing that health effects of romantic relationships may differ between men and women (e.g., Kiecolt-Glaser & Newton, 2001), supplementary analyses tested whether the three-way interaction term between RPES, PPR, and gender was associated with mortality risk. In neither of the models was the three-way interaction term significantly associated with mortality risk: Model 1, $B = 0.21$, $SE = 0.26$, $p = .42$; Model 2, $B = 0.25$, $SE = 0.26$, $p = .33$.

Discussion

This study is the first to document that PPR moderates the association between received emotional support and all-cause mor-

Table 1
Descriptive Statistics and Hierarchical Logistic Regression Models Predicting All-Cause Mortality

			Model 1				Model 2			
Variable	*M*	*SD*	*B*	*SE*	*OR*	95% CI	*B*	*SE*	*OR*	95% CI
Demographic										
Gender[a]	—	—	0.51*	0.25	1.67	[1.03, 2.71]	0.67*	0.27	1.96	[1.16, 3.29]
Age	46.53	12.70	1.14***	0.15	3.14	[2.35, 4.19]	1.16***	0.16	3.20	[2.35, 4.34]
Ethnicity[b]	—	—	0.29	0.42	1.34	[0.58, 3.06]	0.34	0.43	1.40	[0.60, 3.26]
Education[c]	—	—	0.31	0.24	1.37	[0.85, 2.20]	0.38	0.25	1.46	[0.89, 2.40]
Income ($1,000s)	80.91	62.00	−0.13	0.15	0.88	[0.66, 1.17]	−0.13	0.15	0.88	[0.66, 1.18]
Physical health										
Perceived	3.52	0.96	−0.62***	0.12	0.54	[0.42, 0.69]	−0.63***	0.13	0.53	[0.41, 0.69]
Cardiovascular[d]	—	—	0.64*	0.26	1.90	[1.15, 3.13]	0.63*	0.26	1.89	[1.13, 3.15]
Cancer[d]	—	—	−0.01	0.33	0.99	[0.52, 1.91]	−0.02	0.34	0.98	[0.51, 1.91]
Other chronic	1.93	2.16	0.14	0.10	1.16	[0.95, 1.41]	0.12	0.11	1.13	[0.91, 1.40]
Health behaviors										
Effort on health	7.13	2.01					−0.14	0.12	0.87	[0.68, 1.10]
Sleep quality	4.70	1.62					−0.07	0.12	0.93	[0.74, 1.18]
Alcohol[d]	—	—					−0.45	0.47	0.64	[0.26, 1.60]
Psych. Symptoms										
Depression	0.65	1.76					0.04	0.14	1.04	[0.78, 1.38]
Anxiety	0.16	0.95					−0.09	0.13	0.92	[0.71, 1.19]
Personality										
Extraversion	3.18	0.56					0.09	0.16	1.09	[0.80, 1.50]
Neuroticism	2.23	0.65					0.08	0.14	1.08	[0.83, 1.42]
Agreeableness	3.46	0.49					0.13	0.16	1.14	[0.83, 1.57]
Conscientiousness	3.42	0.44					0.11	0.13	1.12	[0.87, 1.42]
Openness	3.02	0.51					−0.08	0.15	0.92	[0.69, 1.23]
Partner variables										
RPES	31.50	77.52	0.00	0.12	1.00	[0.80, 1.25]	0.00	0.12	1.00	[0.80, 1.26]
PPR	3.53	0.59	0.17	0.14	1.18	[0.90, 1.55]	0.13	0.14	1.14	[0.86, 1.51]
RPES × PPR	—	—	−0.27*	0.12	0.77	[0.60, 0.98]	−0.27*	0.12	0.77	[0.61, 0.97]
Nagelkerke's R^2				.31				.31		

Note. OR = odds ratio; CI = confidence interval; RPES = received partner emotional support; PPR = perceived partner responsiveness. For continuous variables, higher scores reflect higher standing on the variable. All continuous variables are standardized.
[a] 0 = female, 1 = male. [b] 0 = White, 1 = non-White. [c] 0 = high school or less, 1 = some college degree or more. [d] 0 = no, 1 = yes.
* $p < .05$. ** $p < .01$. *** $p < .001$.

tality risk, thus shedding light on the mixed findings obtained in previous studies. As predicted, the elevated mortality risk associated with high RPES was observed only among participants who perceived their partner as being low on responsiveness. In contrast, RPES was unrelated to mortality risk among those who perceived their partner as high in responsiveness. It is important to note that the analyses adjusted for a wide range of covariates (i.e., demographic factors, physical health status, health behaviors, psychological symptoms, and personality traits) that could have accounted for the findings. These findings suggest that high PPR may be protective against the potential costs associated with received emotional support. The pattern of findings is also consistent with prior work showing that the existence of close relationships with available and responsive others provides a "social baseline" (Coan, 2010) for healthy human functioning, with deviations from it (e.g., unresponsive partners, low-quality relationships, loneliness) increasing the risk for poor health outcomes (e.g., Robles & Kiecolt-Glaser, 2003).

Why does PPR moderate the association between RPES and mortality? Although more research on theoretical mechanisms is clearly needed, one hypothesis is that responsive partners provide support behavior that appropriately matches the needs of the recipient without decreasing the recipient's sense of self-efficacy and independence. Although this hypothesis was not directly tested in this study, other work suggests that the costs associated with received support are indeed reduced when the support provider avoids communicating a sense of inefficacy to the recipient (Bolger & Amarel, 2007). Future experimental studies that build on this work are needed to confirm the extent to which PPR's role in altering the effectiveness of received support is mediated by the skillfulness of support behavior and self-efficacy appraisals of the support recipient.

In addition, future studies should test whether perceived responsiveness of other social network members (e.g., relatives, friends) moderates the association between received support from these individuals and health outcomes. Whether the current findings would generalize to other types of received support (e.g., instrumental) is also a question for future research.

Although PPR is different from received emotional support, is it different from perceived emotional support? Perceived emotional support has usually been defined as individuals' potential access to emotional support when they are distressed or in need. PPR, on the other hand, is a more general construct that entails not only the feeling of being cared for when needs arise but also the belief that relationship partners understand and appreciate what is important to one's self (e.g., Reis, 2007). Despite this theoretical distinction, no studies so far have investigated whether PPR is empirically distinct from perceived emotional support, which is an important question for future research.

Finally, a limitation of this work was its reliance on the report of one partner to assess PPR and RPES. Future studies that use different methods (e.g., observing received support rather than asking to the participant) and measure PPR and RPES from both partners would help reduce potential biases due to collecting self-report data from a single source. Moreover, such studies will also enable testing other interesting hypotheses in regard to the interplay among PPR, received support, and health outcomes (e.g., whether received support is most effective when both partners report high responsiveness and least effective when both partners report low responsiveness). This limitation notwithstanding, this study makes an important contribution to the recently growing literature on the health consequences of received support (Uchino, 2009) by providing the first evidence that perceived partner responsiveness attenuates the association between received partner emotional support and all-cause mortality.

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