

Implications of Supportive and Unsupportive Behavior for Couples With Newly Diagnosed Diabetes

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Objective: To examine the relation between daily diary reports of diabetes-specific social interactions to patient and partner mood and patient self-care behaviors, and whether relations are moderated by unmitigated communion. **Method:** Participants were 70 couples in which 1 person had been diagnosed with Type 2 diabetes in the past 3 years. They were interviewed in-person at baseline and completed daily diary reports on an iPad. Daily diary questionnaires measured support, mood, and self-care behavior (patients only). Unmitigated communion, a personality trait characterized by an overinvolvement in others to the exclusion of the self, was measured at baseline. **Results:** Multilevel statistical modeling revealed that daily fluctuations in partner emotional support were related to daily fluctuations in happy mood, more exercise, and dietary compliance. Partner controlling behavior was related to poor mood but was unrelated to self-care. Relations of support and controlling behavior to mood were strongest for individuals high (vs. low) in unmitigated communion. **Conclusion:** Patients newly diagnosed with Type 2 diabetes who felt understood and cared for by partners reported a better mood and were more likely to take care of themselves on a daily basis, whereas patients whose partners were controlling on a daily basis reported poorer mood. Patients characterized by unmitigated communion were most affected by partner supportive and unsupportive behavior.

Keywords: Type 2 diabetes, support, unmitigated communion, daily diary

In the United States, the age-adjusted prevalence of diagnosed Type 2 diabetes has increased between 50% and 100% in most states in the last 15 years (Centers for Disease Control & Prevention, 2012). The diagnosis and treatment of Type 2 diabetes is critical, as poor control has been associated with myriad health problems, including heart disease, neuropathy, nephropathy, retinopathy, and reduced life expectancy (Inzucchi et al., 2012). The key to preventing these complications is good self-care behavior,

which consists of eating a healthy diet, exercising, weight management, and taking medication. However, there is variability in how people adhere to these self-care behaviors (Nicolucci et al., 2013).

Self-management of Type 2 diabetes takes place in an interpersonal context (Berg & Upchurch, 2007). Each of these self-care behaviors involves, is affected by, and affects the person's social environment. It is difficult to eat a healthy diet if family members are eating unhealthy food. It is difficult to exercise if not supported or encouraged by family members. There is a large literature that links the social environment to the self-management of chronic illness—especially chronic illnesses that are associated with complex regimens such as diabetes (Gallant, 2003; Gallant, Spitze, & Prohaska, 2007). With the escalating rate of Type 2 diabetes and scarcity of health care resources, practitioners must recognize the importance of the social environment—specifically, the family—in helping those with diabetes take care of themselves. A prominent person in an adult's social environment is the spouse or romantic partner. Romantic partners are likely to be most strongly affected by the person's diabetes and to most strongly influence how the person with diabetes manages his or her disease (Searle, Norman, Thompson, & Vedhara, 2007). Therefore, the present investigation focuses on the role that spouses or romantic partners play in how the person with diabetes responds to the disease. Partners may influence patients' health behavior in both supportive

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and unsupportive ways. In the present study, both are examined. Here the theory and rationale for the specific social interactions examined in the present research are reviewed.

Social Support

Historically, the social support literature identified three main support functions: emotional, instrumental, and informational (House, 1981; House & Kahn, 1985; Kahn & Antonucci, 1980; Thoits, 1985). Emotional support was defined as the communication of caring and concern, including listening, "being there," empathizing, reassuring, and comforting. Informational support was defined as the provision of information to guide or advise, and instrumental support was defined as the provision of concrete assistance or aid. Later, Cutrona and Russell (1990; Cutrona, 1990) reviewed the different taxonomies of support in an effort to match the most effective kind of support to specific stressors and grouped instrumental and informational support together. They set forth a theory of "optimal matching" and argued that emotional support would be most effective in the case of uncontrollable stressors where needs to feel loved, comforted, and accepted were highest, and instrumental/informational support would be most effective in the case of controllable stressors where needs for information and assistance to help prevent or solve problems were highest. Their literature review supported this theory.

Despite these theoretical distinctions among support functions, the vast majority of research focuses on emotional support or creates support indices that combine different support functions without distinguishing among them. Evidence is often strongest for the health benefits of emotional support, but to be fair, other kinds of support are not nearly as often the subject of investigation (Helgeson & Cohen, 1996; Uchino, 2004). As discussed above, the theory of optimal matching suggests that the most effective kind of support depends on support needs (Cutrona & Russell, 1990). There is some evidence that informational support or instrumental support may be most important in the context of physical disease (Helgeson, 1993) and that informational support is particularly useful during the transition phase of an illness when one realizes there is a health threat that will persist and that a return to the preexisting situation is not possible (Jacobson, 1986). Thus, these theories suggest that persons with newly diagnosed Type 2 diabetes would benefit from both emotional support and informational support, as there are both controllable and uncontrollable aspects of the disease, and this is a time in which persons realize the health threat is persistent. In the present study, the extent to which both partner emotional support and informational support are related to mood and health behaviors is examined among persons newly diagnosed with Type 2 diabetes.

Unsupportive Social Interactions

It has been long known that supportive interactions are not the only way in which network members can influence disease adjustment. Support members may behave in negative ways, either intentionally or unintentionally (Burg & Seeman, 1994; Gallant et al., 2007). Studies that distinguish the supportive from the unsupportive behaviors of network members often find that unsupportive behaviors show even stronger links to health outcomes (Helgeson, 1993; Rook, 1984). In the context of a

disease that requires daily self-care behaviors for maintenance, a likely type of unsupportive interaction is one that is controlling. Network members may have good intentions in trying to convince one to engage in appropriate self-care behavior but the interactions evolve into ones that are critical, argumentative, and nagging.

These interactions have often been studied in the context of the social control literature. Social control in the context of chronic disease has been defined as "attempts to induce needed changes in the health behavior of a partner who has been unable or unwilling to make such changes" (Franks et al., 2006). The relations of social control to health behaviors and affect have been mixed (Helgeson, Novak, Lepore, & Eton, 2004; Lewis & Rook, 1999; Westmaas et al., 2002), largely because this term captures a variety of distinct strategies. One distinction that has been made is between positive and negative social control tactics. Positive strategies have been defined as motivating and encouraging (e.g., complimenting), which have some conceptual overlap with emotional support as described above, whereas negative strategies have involved pressure, criticizing, and nagging (Fekete, Stephens, Druley, & Greene, 2006; Stephens, Rook, Franks, Khan, & Iida, 2010). In one study, the positive and negative strategies were positively correlated and combined into a single index, obscuring the distinction (August, Rook, Franks, & Parris Stephens, 2013).

A more useful distinction has been made between persuasion and pressure, with persuasion being the gentler, more acceptable form of control and with pressure being the more direct, overtly controlling behavior. In some sense, persuasion is the positive version of social control, and pressure is the negative version of social control. However, these two strategies also seem to be positively correlated (Martire et al., 2013), and findings have been inconsistent across studies. A study of couples in which one person had knee replacement therapy for osteoarthritis showed that both predicted better adherence, but were differentially related to affect (i.e., pressure related to negative affect and persuasion related to positive affect; Stephens, Fekete Franks, Rook, Druley, & Greene, 2009), whereas another study of the same population showed that persuasion was unrelated to physical activity but pressure was related to less activity among males (Martire et al., 2013). Persuasion and pressure also have been studied in the context of couples in which one person has Type 2 diabetes. Here diet-related pressure and persuasion were both related to decreases in dietary adherence (Stephens et al., 2013). In the present study, a single type of unsupportive behavior is examined, which is referred to as controlling behavior. It is best captured by the pressure construct in the social control literature. A construct that reflected pressure rather than persuasion was chosen because the concept of pressure is more clear theoretically. Pressure is a direct form of controlling behavior that has been consistently linked to poor psychological well-being and reveals mixed relations to health behavior. Pressure is also a clearly negative interaction between patients and partners, whereas the valence associated with persuasion is less clear. In addition, pressure is the kind of direct controlling behavior thought to undermine self-efficacy (Hagedoorn et al., 2000). Thus, it is expected that the controlling behavior measured in the present study will be related to poor mood, but it is unclear whether it will be related to health behavior.

Interactions With Personality

Supportive and unsupportive behaviors may interact with personality characteristics to influence health. A personality characteristic that may be relevant to how a person manages diabetes and adjusts to the disease is unmitigated communion. Unmitigated communion is defined as an overinvolvement in others to the exclusion of the self (Fritz & Helgeson, 1998; Helgeson & Fritz, 1998), and has been linked to increased psychological distress, poor health behavior, and poor adjustment to chronic illness (Helgeson & Fritz, 1999, 2000), including Type 1 diabetes (Helgeson & Palladino, 2012). These relations stem in part from the individual's unwillingness to attend to the needs of the self because of a focus on others' needs. Unmitigated communion may not only affect disease adjustment directly, but may also influence the relation of social environmental factors to disease adjustment.

Whether unmitigated communion moderates the relation of support to disease management and disease adjustment has not been fully examined by previous research. A daily diary study of college students showed that unmitigated communion did not moderate the relation of support receipt to well-being, but that study involved healthy individuals (Helgeson et al., 2015). Because individuals who score high on unmitigated communion are more heavily invested in relationships, as indicated by its connection to an externalized self-perception (i.e., judging self by others' standards), a desire for others to heed one's advice, and intrusive thoughts over the problems of a friend and a stranger (Fritz & Helgeson, 1998; Helgeson & Fritz, 1998), they may be more sensitive to both supportive and unsupportive behavior. That is, when someone behaves in a positive or supportive fashion, those who score high on unmitigated communion may benefit more than those who are low in unmitigated communion because relationships are central to their self-esteem. However, when someone behaves negatively or in an unsupportive fashion, those who score high on unmitigated communion may suffer more than those who are low in unmitigated communion again, not only because relationships are critical to self-esteem but also because they are overly concerned with how others view them and are sensitive to negative evaluations (Helgeson & Fritz, 1998). Thus, the prediction is that unmitigated communion will moderate the relations of partner supportive and unsupportive behavior to psychological well-being and health behaviors, such that relations of supportive behavior to positive outcomes and relations of unsupportive behavior to negative outcomes will be stronger among high than low unmitigated communion persons.

Unmitigated communion also may have implications for the health of the support provider—the partner. In a cross-sectional study of healthy college students (Jin, Van Yperen, Sanderman, & Hagedoorn, 2010) and a daily diary study of healthy college students (Helgeson et al., 2015), unmitigated communion moderated the relation of support provision to health. Both studies showed that people who scored low on unmitigated communion benefited from being able to provide support but those who scored high on unmitigated communion did not. Here, this question is investigated in the context of partners who are providing support to their loved one newly diagnosed with diabetes. Because support provision is more critical in this situation, it is possible that individuals who score high on unmitigated communion will ben-

efit more from support provision than others because providing support is self-defining for these individuals.

The Present Study

The primary goal of the present study was to examine the relations of daily partner supportive and unsupportive interactions to patient and partner mood and patient self-care behaviors among couples in which one person was recently diagnosed with Type 2 diabetes. Much of the research on couples with chronic illness, in particular diabetes, has focused on those who have had the disease for some time. Partners may have a greater impact on patient's psychological well-being during the initial period of diagnosis, as this is a period of heightened stress. According to the stress-buffering hypothesis, support is most influential under conditions of high stress (Cohen & Wills, 1985). Partners also may have a greater influence on patient health behaviors early in the diagnosis period, as health behavior patterns are likely to be in a state of flux as patients consider the diagnosis and how they are going to respond to it. It is possible that patients are more receptive to support and more reactive to control shortly after diagnosis, although this line of reasoning is speculative. (There are a host of other variables that may influence whether patients react to partner behavior, including the quality and length of the relationship.)

To obtain more proximal information on the role that partners play in disease management and psychological health, a daily diary design was used. With this method, one can link partner behaviors on a given day to disease management and psychological health on that same day. Three types of social interactions were examined on a daily basis. First, two kinds of supportive interactions were distinguished, emotional and informational, as previous daily diary research that has examined support has often combined the two into a single index, making it difficult to discern whether one or both kinds of support are beneficial. The prediction is that partner emotional support and informational support will be linked to patient good mood and good self-care behavior, and that these would exert independent effects. Second, one kind of unsupportive interaction was examined, which is referred to as controlling. The prediction is that partner controlling behavior will be linked to poor mood, but relations to self-care behavior are not clear. Because both patient reports of support receipt and partner reports of support provision were available, hypotheses were tested first from the point of view of the patient and second from the point of view of the partner to see if findings were replicated.

The implications of partner support provision (emotional or informational) for partner outcomes, specifically partner mood, also were examined. Predictions were not made as to the direction of these relations as prosocial behavior has been linked to good mood (Lyubomirsky, Sheldon, & Schkade, 2005), but support provision can also be considered a burden that taxes resources (Pinquart & Sörensen, 2003).

The second study goal was to examine the extent to which these findings were moderated by the personality trait of unmitigated communion. For patients, supportive and unsupportive interactions should be more strongly linked to outcomes for high than low unmitigated communion individuals because they are more heavily invested in relationships. For partners, it was not clear whether unmitigated communion would strengthen or weaken the link of support provision to mood.

Method

Participants

Participants were 70 couples (34 male patients, 36 female patients), in which one person had been recently diagnosed with Type 2 diabetes ($M = 1.4$ years ago, $SD = 1.1$). Couples were either married (64%) or living in a marital-type relationship (36%). The average marriage or cohabitation length for couples was 18.46 years ($SD = 13.73$). Relationship quality was high, as indicated by scores on the Quality of Marriage Index ($M = 6.20$, $SD = 1.04$, on a 7-point scale; Norton, 1983). Because patients were recently diagnosed, their average hemoglobin A1c was good—6.81 ($SD = 1.62$). Medication regimen was oral medication only for 63%, insulin for 7%, both oral medication and insulin for 19%, and no medication for 11%. Of the 70 couples, both members were White in 34 couples, both members were Black in 20 couples, one member was Black and one member was White in 3 couples, 6 patients were Black with mixed-race partners, and 7 patients were White with mixed-race partners. The average age of patients was 54.6 years ($SD = 9.8$) and of partners was 55.6 years ($SD = 9.9$). Median education was some college for both persons.

Patients were eligible for the study if they had Type 2 diabetes, did not have another illness that affected their daily life more than diabetes, were married or living with a partner who did not have diabetes, and had been diagnosed with diabetes in the past 3 years. However, subsequent review of physician records after obtaining informed consent revealed that 3 persons had been diagnosed between 3 and 6 years ago. These 3 persons were retained in the analysis, because their inclusion did not alter the findings.

Procedure

Participant couples were recruited from a variety of sources, including health fairs, church and community events, physician offices, and advertisements. Interested participants contacted our office, were screened for eligibility, and if eligible, an in-person visit was arranged. Of the 229 people who contacted us, 144 were determined not to be eligible. Of the remaining 85, 4 refused without us being able to determine eligibility, 11 refused after screening, and the remaining 70 agreed and completed the interview. Couples had the choice of being interviewed in their homes ($n = 56$; 80%) or coming to the university with mileage reimbursement ($n = 14$; 20%). After informed consent was obtained, patient and partner were interviewed separately. Only measures completed during the interviews that are relevant to the present article are included here. At the end of the in-person visit, each person was provided with an iPad to complete a brief questionnaire at the end of the day for the next 14 days. These data are the focus of the present investigation.

Compliance with the daily diary protocol was good based on time-stamped entries. The data from the first day for patients and partners were discarded, as interviews were conducted at varying times of day. Thus, the day following the interview was the first full set of data used. Both patients and partners completed an average of 12 days, with 23% of patients and 27% of partners completing all 14.¹

Instruments

Unmitigated communion. The 9-item Unmitigated Communion Scale (Fritz & Helgeson, 1998) was administered during the in-person interview (e.g., “I always place the needs of others above my own” and “I often find myself getting overly involved in others’ problems”). Respondents indicate the extent to which they disagree (1) or agree (5) with each item on a 5-point scale. The internal consistency was good for patients and partners (both alphas = .80).

IPad questionnaire. The patient daily iPad questionnaire assessed supportive and unsupportive social interactions with partners, mood, and diabetes self-care. The partner daily iPad questionnaire assessed provision of supportive and unsupportive interactions and mood. Patients were provided with a list of social interactions and asked how often each occurred, on a 3-point scale ranging from *none*, to *a little*, to *a lot*. Partners were asked parallel questions about how often they provided these supportive and unsupportive behaviors.

Variance component analysis outlined by Bolger and Laurenceau (2013) was used to calculate the internal consistencies of daily diary data for patient and partner mood and support. These are the internal consistencies reported below. When a scale consisted of only two items, one item was used to predict the other and the beta coefficient is reported below.

The three emotional support items were taken from Fekete, Stephens, Mickelson, and Druley’s (2007) support scale used in the context of lupus which predicted higher levels of well-being and good illness adjustment (partner was there for me by giving undivided attention, understood my situation, pointed out strengths in managing diabetes; alphas = .53 and .47 for patient and partner, respectively). The two informational support items (suggested things that might help me manage my diabetes, helped me figure out how to take care of diabetes; betas = .70 and .66 for patient and partner, respectively; $ps < .001$) and the three controlling behavior items (criticized how I take care of diabetes, argued with me about diabetes self-care, nagged me to take care of diabetes; alphas = .66 and .67 for patient and partner, respectively) were taken from Schafer, McCaul, and Glasgow’s (1986) supportive and unsupportive diabetes behaviors scales. The support scale was related to good adherence and good glycemic control, whereas the unsupportive behavior scale was related to poor adherence and poor glycemic control. All items were rephrased accordingly for partners to report support provided. Because participants had to respond to these items every day, abbreviated measures of these social interaction scales were used. The within-subject relations among the social interaction variables were examined with mixed models. For patients, instrumental support was associated with more emotional support (estimate = .53, $p < .001$) and marginally related to more controlling behavior (estimate = .10, $p = .06$). Controlling behavior was not associated with emotional support (estimate = $-.01$, $p = .91$). For partners, instrumental support was

¹ Although previous research has suggested that reactivity poses little threat to the validity of daily diaries (Bolger, Davis, & Rafaeli, 2003; Stone et al., 2003), all of the analyses in this article were rerun by discarding the first 3 days of data. The overall pattern of the results was the same. There were a couple of significant findings that became marginal, and one marginal finding that became significant.

associated with more emotional support (estimate = .44, $p < .001$) and more controlling behavior (estimate = .35, $p < .001$). Controlling behavior was marginally related to more emotional support (estimate = .08, $p = .09$).

Mood was assessed by asking both patients and partners how often they had felt the following ways over the course of the day on a 5-point scale, ranging from 1 = *not at all* to 5 = *a lot*. Three items were used to measure depressed mood (sad, depressed, unhappy; alphas = .72 and .78 for patient and partner, respectively), and three items were used to measure happy mood (happy, pleased, cheerful; alphas = .78 and .82 for patient and partner, respectively). Mixed models were used to examine the relation between happy and depressed mood and found moderate relations for patients (estimate = $-.35$, $p < .001$) and partners (estimate = $-.42$, $p < .001$).

Patients were asked two questions to measure adherence to the two health behaviors most relevant to taking care of Type 2 diabetes: (1) How much did you follow your diet today? (1 = *not at all*, 5 = *very much*) and (2) Did you exercise today? (no, yes).

Whether there were relations between patient reports of support received and partner reports of support provided were examined by using the partner daily support provided variable to predict the patient daily support receipt variable with mixed models. As expected, there was some agreement between patients and partners about support partners provided to patients. Coefficients were all significant at $p < .001$, but were quite modest ranging from .12 to .25.

The same procedure was used to see if patient and partner daily mood were related. Patient and partner happy mood were related (coefficient = .10, $p = .014$), as were patient and partner depressed moods (coefficient = .07, $p = .045$).

Overview of the Analysis

The analyses examined the relation of partner support to patient and partner outcomes, and also determined whether relations differed as a function of patient and partner unmitigated communion. First, the relations of patient reports of partner support (emotional, informational, controlling behavior) to patient outcomes (depressed mood, happy mood, exercise, diet compliance) were examined. Second, whether findings were similar by using partner reports of support provision to the same patient outcomes was examined. Finally, whether partner reports of support provision were related to their own outcomes (depressed mood, happy mood) was examined. Before proceeding with the hypothesis-testing analyses described below, the relation of patient age, education, race, marital status, and length of time since diagnosis to the three social interaction predictor variables and the four outcomes were examined. With one exception, none of these variables were related to both an independent and dependent variable, so they were not statistically controlled in the analyses reported below. Time since diagnosis was related to one predictor and one outcome variable—more controlling behavior ($\beta = .14$, $p < .001$) and less dietary adherence ($\beta = -.19$, $p < .001$). However, when this variable was included in the analysis of dietary adherence, the results presented below remain unchanged.

Multilevel statistical models. Because daily diary data are hierarchical in nature, multilevel models were used to account for the lack of independence between observations at the lower levels

of the model. For this model, days (Level 1) are nested within persons (Level 2). The daily support variables are Level 1 variables, and unmitigated communion is a Level 2 person variable. Multilevel modeling is appropriate because individuals may have different baseline values for outcomes as well as different relations between support and outcomes. Multilevel modeling allows us to model individual participant differences in the form of a random per-participant intercept when estimating the relation between support and outcomes.

To examine the relation of support to outcomes, we used a model that examined the relation between support on one day and outcomes on that same day using a two-level model, with days (Level 1) nested within each participant (Level 2). Because the primary interest was in determining how individuals respond to support on a daily basis, within-person-centered support variables were created by subtracting the individual's average support from the support reported on a given day. Thus, support on any given day reflects the amount that an individual deviates from his or her normal level of support. Between-persons-centered support predictor variables were created to account for differences between individuals who receive or provide more support than other individuals. These were calculated by subtracting the grand mean of support across all participants from the individual's average level of support. Between-persons-support variables are included to control for this variance, but within-person variables are the focus of this research. Because exercise was a dichotomous variable, a generalized linear mixed model was used that allowed response variables to be binary. This procedure applies a logistic link function to model the independent variables' (IVs) effects on the dependent variable (DV) on the scale of log odds of exercising on a given day.

To determine whether the relation between daily support and outcomes differed for individuals high compared to low in unmitigated communion, we created interactions between the Level 2 unmitigated communion variable and each of the three Level 1 support variables (within-person emotional support, informational support, controlling behavior) and each of the three Level 2 support variables (between-persons emotional support, informational support, controlling behavior). Although this was done for both within- and between-persons support variables, the primary interest was in how outcomes vary as a function of personal fluctuations in support—that is, the within-person support variables. To aid in interpretations of the significant interactions, plots were created showing the predicted values of the outcome at all levels of support for each of the following levels of unmitigated communion: 25th (low), 50th (average), and 75th (high) percentiles. Values were entered into the regression equation for low, medium, and high unmitigated communion and the minimum and maximum scores for support. The unstandardized betas from the final model (i.e., intercept, support term, unmitigated communion, and interaction term) were used in the regression equation. The regression equations were used to calculate slopes of the estimated linear relations between the patient DV and the IVs at low, medium, and high unmitigated communion (UC) by adding the coefficient estimate in the model for the specific IV main effect to the coefficient estimate for the UC by IV interaction which was multiplied by the appropriate UC values chosen to represent low, medium, or high UC (shown in Figures 1–3). The simple slopes and standard errors for the three lines are provided in the figure captions.

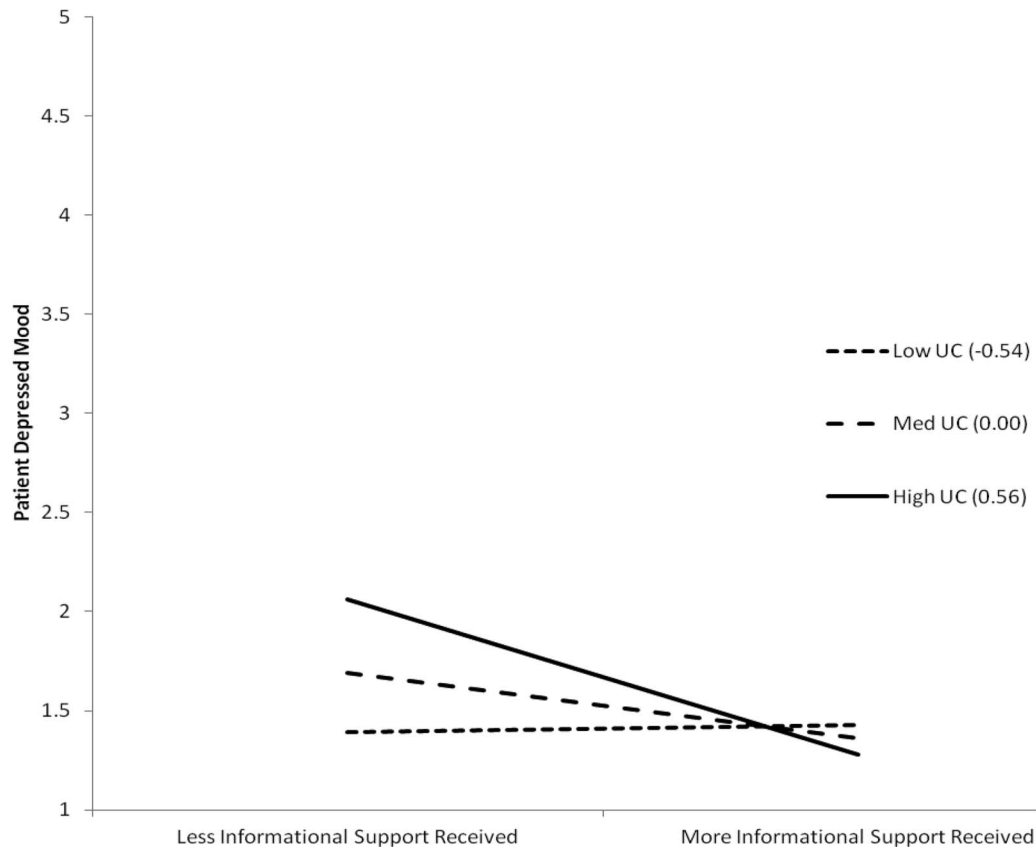


Figure 1. Depressed mood decreased as informational support increased for patients high in unmitigated communion (UC), but there was no relation between informational support and depressed mood for patients low in unmitigated communion. Simple slopes were as follows: Low UC = .02, $SE = .04$; Med UC = $-.07$, $SE = .03$; and High UC = $-.16$, $SE = .04$. Med = medium.

Model selection. To select the model with the best fit for the data for each dependent variable, a model selection process based on Bayes information criterion (BIC) was used which achieves a good balance between model fit and model complexity (Raudenbush & Bryk, 2002, pp. 38–67). The autocorrelation of errors was allowed, recognizing that measures on days in closer proximity are more likely to be correlated than measures on days spaced further apart. Whether each of the six cross-level unmitigated communion by support interactions needed to be retained in the model was examined by eliminating them one at a time and examining the effect on the BIC, starting with the interaction term that had the highest p value. If the BIC was lowered, the interaction was eliminated from the model. This process was repeated until only significant interaction terms remained. Finally, the fixed effects for the between-persons support variables were eliminated one at a time, starting with the term with the highest p value in the baseline model. This process was repeated until only significant fixed effects for the Level 1 support variables (and any support variables involved in a significant interaction) remained. Note that all variables were not eliminated from the model; the three Level 1 within-support variables were retained as they were the subject of primary interest. This model-trimming approach was used to check for additional potential interesting effects. Not checking for additional effects leaves us open to bias, whereas including all possible

effects reduces the precision of the model, an issue referred to as the bias/variance tradeoff (Wit, van den Heuvel, & Romeijn, 2012).

Results

Background Analyses

Consistent with previous research, there were sex differences in unmitigated communion, $t(68) = 2.66$, $p = .01$, such that female patients ($M = 3.38$, $SD = .82$) scored higher than male patients ($M = 2.89$, $SD = .73$). There were sex differences in partner unmitigated communion, $t(68) = 2.85$, $p = .006$, such that female partners ($M = 3.56$, $SD = .72$) scored higher than male partners ($M = 3.07$, $SD = .73$). When patient or partner sex was statistically controlled in the analyses presented below, the effects involving unmitigated communion remained.

Relations of Patient Reports of Support Receipt With Patient Outcomes

Multilevel models examining the relations of patient report of support receipt from partners to patient outcomes are presented in Table 1. Because the purpose of the study is to examine the

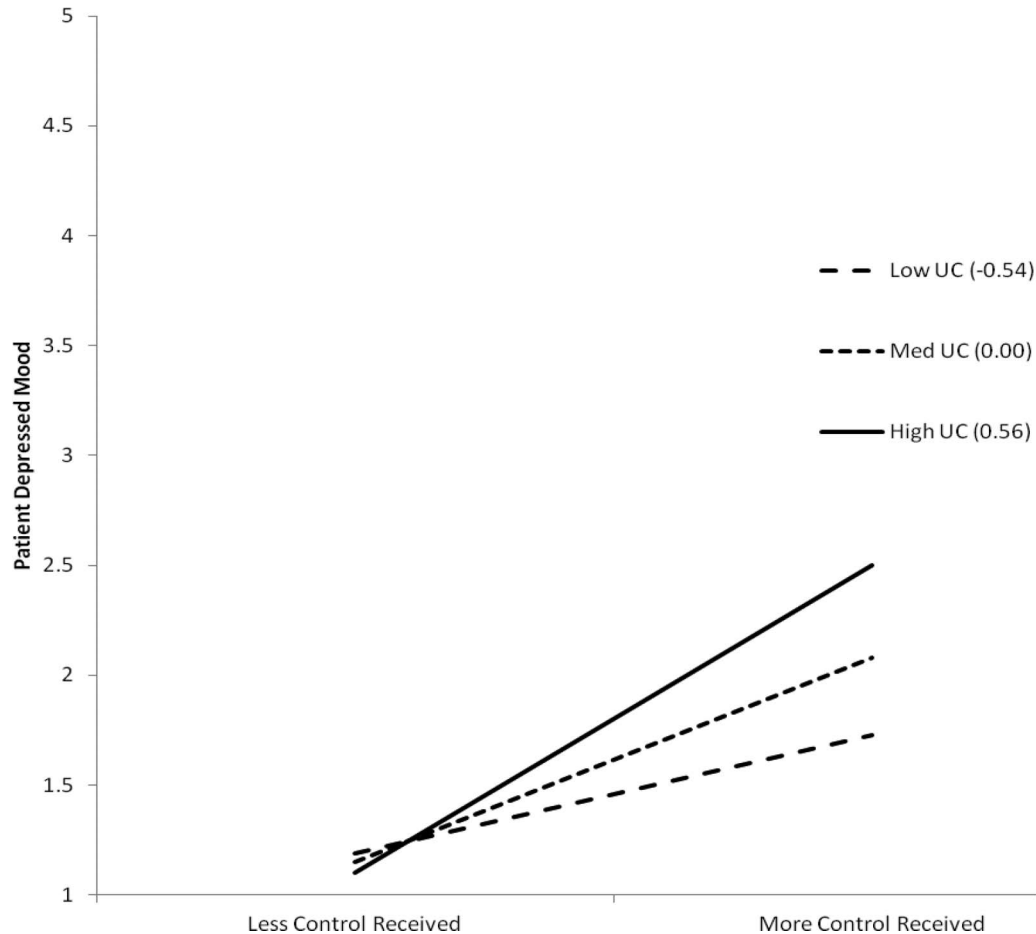


Figure 2. Days on which patients reported more partner controlling behavior than usual were related to increased feelings of depressed mood. This relation was strongest for patients high in unmitigated communion (UC). Simple slopes were as follows: Low UC = .13, $SE = .06$; Med UC = .22, $SE = .05$; and High UC = .34, $SE = .07$. Med = medium.

relations of daily changes in support to daily outcomes, the focus is on the within-person effects rather than the between-persons effects. Main effects are only discussed in the absence of interactions; in the presence of interactions, main effects are not interpreted.

Patient depressed mood. There were no main effects of emotional or informational support on depressed mood. There was a main effect of patient unmitigated communion on depressed mood, such that higher unmitigated communion was associated with greater depressed mood. Patient unmitigated communion also interacted with within-person informational support to predict depressed mood (see Figure 1). Depressed mood decreased as informational support increased for patients high in unmitigated communion, but there was no relation between informational support and depressed mood for patients low in unmitigated communion.

There were main effects of within- and between-persons controlling behavior on patient depressed mood, but also an interaction between patient unmitigated communion and within-person partner controlling behavior. As shown in Figure 2, within-person controlling behavior was related to depressed mood, especially for

patients high in unmitigated communion (see Figure 2). The between-persons effect reflects the idea that patients who reported more partner controlling behavior relative to other patients had greater depressed mood.

Patient happy mood. There were main effects of within- and between-persons emotional support on patient reports of happiness, as well as an interaction between within-person emotional support and patient unmitigated communion. Similar to the pattern shown in Figure 1, emotional support was related to happy mood, but only for patients high in unmitigated communion. High unmitigated communion individuals with low emotional support scored especially low on happy mood. Again, the between-persons effect reflects the idea that patients who report more partner emotional support relative to other patients had greater happy mood.

There were main effects of within- and between-persons controlling behavior on patient reports of happy mood, as well as an interaction between within-person controlling behavior and patient unmitigated communion. The interaction was the same pattern as that shown for depressed mood in Figure 2. Happy mood increased as controlling behavior decreased, but this relation was stronger for

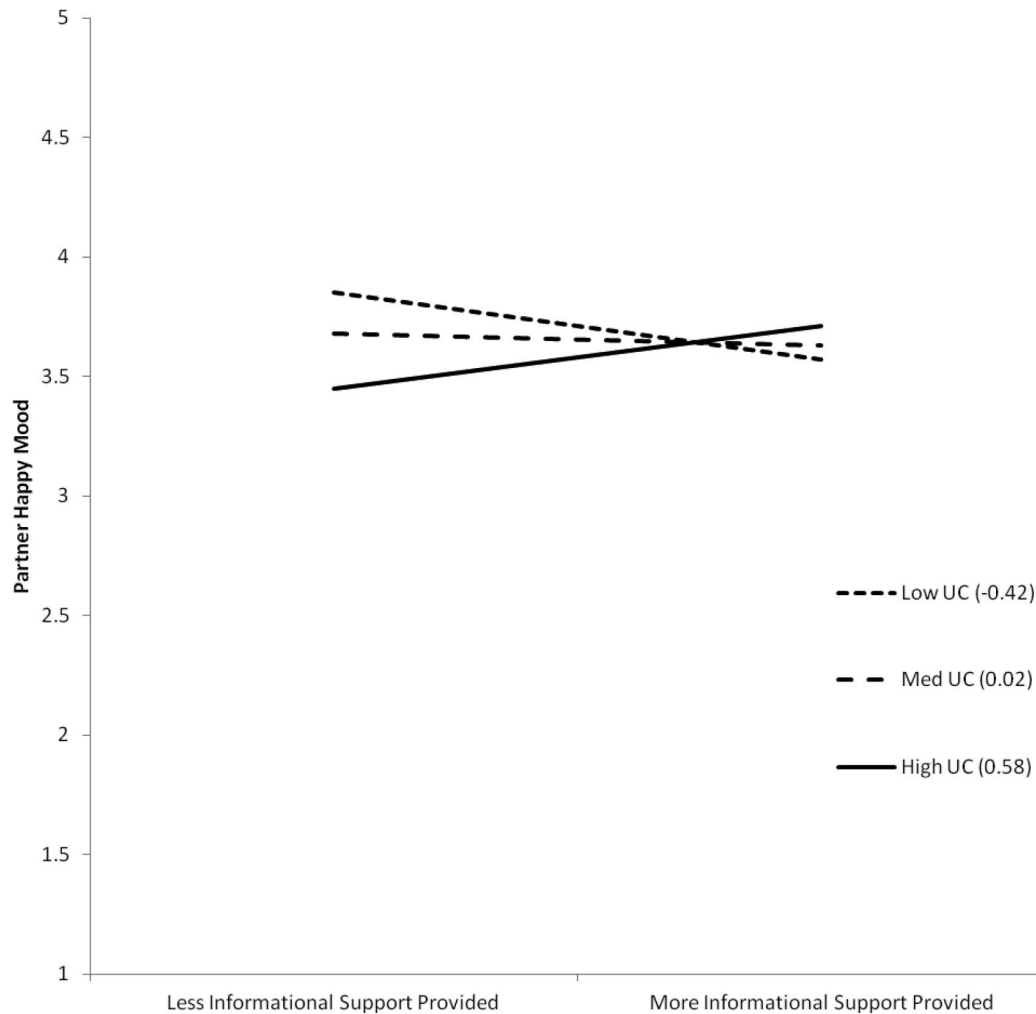


Figure 3. Partner happiness increased as informational support provided increased for partners high in unmitigated communion (UC), but partner happiness decreased as informational support provided increased for partners low in unmitigated communion. Simple slopes were as follows: Low UC = -0.06 , $SE = .06$; Med UC = -0.01 , $SE = .05$; and High UC = 0.06 , $SE = .06$. Med = medium.

patients high in unmitigated communion compared to patients low in unmitigated communion. There were no main effects of informational support on happy mood.

Patient exercise. There was a main effect of within-person emotional support on patient exercise behavior, such that patients were more likely to exercise on days in which patients reported receiving more emotional support than usual. There were no other main effects of support or interactions with unmitigated communion.

Patient diet compliance. There was a main effect of within-person emotional support on patient diet compliance, such that on days in which patients reported more emotional support than usual, they had higher diet compliance. There was a main effect of between-persons controlling behavior such that patients who reported more controlling behavior from partners relative to other patients also tended to have worse diet compliance. There was a main effect of patient unmitigated communion on diet compliance such that patients higher in unmitigated communion reported

worse diet compliance than those lower on unmitigated communion.

Relations of Partner Reports of Support Provided With Patient Outcomes

The above analyses were repeated by replacing patient reports of support received with partner reports of support provided. There were main effects of partner informational support provision on patient depressed mood ($\beta = -.12$, $p = .049$) and happy mood ($\beta = .10$, $p = .042$) such that patients reported less depressed mood and greater happy mood on days when their partners provided more informational support than usual. Those were the only significant main effects. There were no significant interactions with patient unmitigated communion. Partner reports of support provided did not predict diet adherence or exercise.

Table 1
Patient Reports of Support Receipt Predicting Patient Outcomes

Variable	Depressed mood	<i>p</i>	Happy mood	<i>p</i>	Exercise	<i>p</i>	Diet	<i>p</i>
Intercept	1.55	<.001	3.65	<.001	.07	.80	3.30	<.001
Day	-.00	.61	.00	.92	-.01	.59	.01	.33
W informational	-.07	.06	.02	.72	.03	.84	.02	.79
B informational					.53	.18	.14	.36
W emotional	-.06		.09	.04	.44	.007	.19	.001
B emotional	-.13	.10	.28	.01	.15	.69	.28	.07
W controlling	.22	<.001	-.29	<.001	.12	.61	-.14	.10
B controlling	.66	<.001	-.70	.003	-.11	.85	-.65	.005
Patient UC	.23	.006	-.15	.18	-.15	.57	-.22	.04
UC × W informational	-.16	<.001	.11	.07				
UC × B informational								
UC × W emotional			.15	.006				
UC × B emotional								
UC × W controlling	.19	.003	-.16	.04				
UC × B controlling								
AR1 diagonal	.30 (.02)	<.001	.41 (.02)	<.001			.67 (.04)	<.001
AR1 rho	.18 (.04)	<.001	.16 (.04)	<.001			.13 (.04)	.001

Note. Values represent estimates of the fixed effects. W = within-person variance; B = between-persons variance; UC = unmitigated communion; AR1 = first order autoregressive.

Relations of Partner Reports of Support Provided With Partner Outcomes

The last multilevel model examined the relation of partner reports of support provision to partner outcomes as well as the interaction of partner unmitigated communion with support provision to partner outcomes. These results are presented in Table 2.

Partner depressed mood. There was a main effect of within-person emotional support such that partners report less depressed mood on days when they provided more emotional support than usual. There was a main effect of within-person controlling be-

havior, such that partners report greater depressed mood on days when they provide more controlling behavior than usual. There were no effects involving partner unmitigated communion.

Partner happy mood. There was a main effect of within-person emotional support on happiness such that partners report greater happy mood on days when they provided more emotional support than usual. Within-person informational support interacted with partner unmitigated communion to predict partner happy mood (see Figure 3), such that partner happiness increased as informational support provided increased for partners high in unmitigated communion. However, for partners low in unmitigated communion, partner happiness decreased as informational support provided increased. There was a main effect of within-person controlling behavior, such that partners reported less happiness on days when they provided more controlling behavior than usual. There were no effects of partner unmitigated communion.

Table 2
Partner Reports of Support Provided Predicting Partner Outcomes

Variable	Depressed mood	<i>p</i>	Happy mood	<i>p</i>
Intercept	1.45	<.001	3.66	<.001
Day	-.01	.25	.00	.98
W instrumental	-.03	.47	-.01	.80
B instrumental	-.00	.97	.04	.79
W emotional	-.16	<.001	.23	<.001
B emotional	-.11	.23	.24	.07
W controlling	.32	<.001	-.19	.009
B controlling	.26	.09		
Partner UC	.02	.76	-.19	.12
UC × W informational			.12	.05
UC × B informational			.27	.07
UC × W emotional				
UC × B emotional				
UC × W controlling				
UC × B controlling				
AR1 diagonal	.35 (.02)	<.001	.49 (.03)	<.001
AR1 rho	.27 (.04)	<.001	.16 (.04)	<.001

Note. Values represent estimates of the fixed effects. W = within-person variance; B = between-persons variance; UC = unmitigated communion; AR1 = first order autoregressive.

Discussion

The primary study goal was to examine how supportive interactions on a daily basis—both emotional and informational—would be linked to how a patient with newly diagnosed diabetes feels in terms of mood as well as how the person manages the disease. The kind of support that appeared to be most beneficial was emotional support rather than informational support, consistent with previous research (Helgeson & Cohen, 1996). The extent to which patients felt understood and that partners were available if needed was related to happier mood, a greater tendency to exercise, and a better dietary adherence on a day-to-day basis. By contrast, information and advice were not linked to mood or self-care behavior. It is especially noteworthy that patients took the best care of themselves when partners made them feel good about themselves and understood their situation rather than when partners were trying to assist them with managing their diabetes. Thus, a warm and supportive environment may be the environment most conducive to good disease management.

In fact, too much advice or assistance from partners in the form of controlling behavior appeared to be ineffective at best, and detrimental at worst. Specifically, when partners nagged, criticized, and argued with patients about how to take care of themselves, patients reported a more negative mood but not a greater or lesser likelihood of taking care of themselves. These findings are consistent with another daily diary study of couples in which one person had Type 2 diabetes (average disease duration of 11.6 years) that showed patients were more distressed on days when spouses provided more pressure to adhere to a healthy diet (Stephens et al., 2013). As previously noted, the controlling behavior index in this study was most similar to the pressure social control strategy in that study. Thus, controlling behavior even early on in the disease process is not helpful. However, the previous study showed that pressure was related to poor dietary adherence (Stephens et al., 2013) and a daily diary study of couples coping with osteoarthritis for 12.7 years showed links of pressure to reduced activity among males (Martire et al., 2013), whereas there were no links of controlling behavior to exercise or diet in this study. It may be that the negative effects of controlling behavior on health behavior become stronger with time. Early in the disease process, patients may disregard partner controlling behavior. With time, reactions may intensify. One concern with partner controlling behavior is that it might elicit psychological reactance (Brehm, 1966), where the feeling that freedom or choice is restricted results in the person doing the opposite of what the controlling person intended. Repeated controlling behavior from partners may become more problematic with time. It is likely that partners realize that their controlling behavior is ineffective, as partner reports of controlling behavior in this study were linked to their own poor mood. Thus, taken collectively, partner controlling behavior was ineffective with respect to self-care and linked to poor mood for both patients and partners.

Interestingly, when the connections of partner reports of support provided to patient outcomes were examined, a different picture emerged. Here, the only significant findings involved informational support, in the direction of partner informational support being associated with better patient mood. Thus, it may be that patients benefit from partner assistance only when they are unaware of it. This alleviates any concerns about support receipt inducing feelings of incompetence and reducing feelings of self-efficacy. This finding is consistent with the literature on invisible support that has shown support provided but not perceived by the recipient is most strongly connected to health (Bolger, Zuckerman, & Kessler, 2000). More recent research with couples showed that the benefits of invisible support stem from a combination of the provider's skillful behavior and the recipient's lack of awareness that support is being provided (Howland & Simpson, 2010). In that study, invisible support was related to an increase in self-efficacy.

It was hypothesized that patients characterized by the personality trait of unmitigated communion would be more sensitive to their partner's behavior because they are heavily invested in relationships. Several findings supported this hypothesis. First, perceiving partners as controlling was related to poor mood (i.e., less happy mood and more depressed mood) for all individuals, but these relations were especially strong for individuals with high levels of unmitigated communion. These findings are consistent with previous research that has shown that individuals who are high in unmitigated communion are more sensitive to conflict in

their relationships (Reynolds et al., 2006). Because people characterized by unmitigated communion have a low sense of self-worth and their evaluations of themselves depend on others' views, it is not surprising that others' criticism, arguments, and nagging leads to especially strong negative affect.

Second, there also was evidence that people characterized by unmitigated communion were more sensitive to the positive aspects of social interactions. Receipt of information and advice was linked to lower depressed mood, only for individuals who scored high on unmitigated communion, but parallel findings did not appear for happy mood. Feeling understood and cared for was linked to higher happy mood, only for individuals characterized by high levels of unmitigated communion, but parallel findings did not appear for depressed mood. These findings expand on previous research by providing some support for the idea that people characterized by an overinvolvement in others to the exclusion of themselves are more sensitive to the supportive aspects of their relationships. People characterized by unmitigated communion often have more problematic relationships with network members, an overall low regard for the self, and a concern that others view them negatively (Helgeson & Fritz, 1998, 2000). Thus, when network members communicate caring and concern as well as intentions to provide assistance, those high in unmitigated communion might be especially pleased.

Consistent with research on prosocial behavior, partner mood was elevated in the context of providing support. Although the study is longitudinal, the data are collected within the same day, so it is not clear whether a good mood leads to support provision or support provision leads to an improvement in mood. Both have been shown to be true in the literature (Carlson, Charlin, & Miller, 1988). For both mood indicators, partner controlling behavior was linked to a worse mood. Again, it is not clear if behaving in a controlling way leads to a deterioration in mood or if being in a bad mood increases controlling behavior. In the context of diabetes, one can imagine that partners who perceived that patients were not taking care of themselves ended up in a bad mood which then motivated them to engage in controlling behavior in an effort to alter the situation. However, as noted above, when patients perceived the behavior as controlling, the net effect was not positive.

There also were implications of partner unmitigated communion for the relation of support provision to the partner's mood. Providing diabetes-related assistance was linked to elevations in feelings of happiness, but only among partners who scored high on unmitigated communion. Individuals high in unmitigated communion might have benefited because they saw themselves as fulfilling their role as support providers. Although individuals who score high on unmitigated communion aim to be focused on the needs of the recipient, they are actually more focused on fulfilling their own needs as support provider. Previous research has shown that high unmitigated communion individuals are more concerned with providing support than with having the support recipient's needs being met (Helgeson & Fritz, 1998). By contrast, providing assistance was linked to lower feelings of happiness for those who scored low on unmitigated communion. For these individuals, providing support may have been more taxing, or they may have been aware that their behaviors were ineffective. These findings are in contrast to two previous studies showing that low rather than high unmitigated communion individuals reaped the benefits of support provision (Helgeson et al., 2015; Jin et al., 2010). How-

ever, neither of those studies focused on a patient population in which support needs are higher and the consequences of support more critical.

Before concluding, several study limitations must be noted. Although the daily diary design was an overall study strength and our compliance rate was quite good, asking people to respond to questions on a daily basis required the use of abbreviated measure of support and mood. In some cases, the reliabilities of these scales were not as high as one would expect. However, the lowest reliabilities were for emotional support and that index revealed the most robust relations to outcomes. Poor reliability typically detracts from the ability to obtain significant relations. Second, there were only single-item measures of diet and exercise, and they were based on self-report. Replication of these health behavior data with accelerometers and 24-hr dietary recall data collection methods would strengthen these findings. Other health behaviors, such as medication adherence, would be important to study. This health behavior was not examined in this study because participants were on a variety of medical regimens and a portion of participants did not take medication. Finally, there are other kinds of unsupportive interactions that were not examined in this study, such as avoidant strategies or temptations that undermine health behaviors, that are worth examining in the context of diabetes.

In summary, this study showed that partner emotional support is related to better mood and good self-care behavior on a daily basis among persons newly diagnosed with Type 2 diabetes. It was also the case that partner controlling behavior was related to poor mood among both patients and partners and did not motivate patients toward better self-care. Patients characterized by the personality trait of unmitigated communion were most responsive to the ways that their partner behaved, suggesting the importance of taking individual differences into consideration. In research on social factors and health, it is critical to take into consideration the fact that some people are characterized by personality traits that make them more or less sensitive to their social environment.

Given the increased rate of Type 2 diabetes in our country and the critical role that self-care behavior plays in preventing complications, these results suggest that early intervention efforts aimed at persons who are newly diagnosed with diabetes ought to target couples and families. A diagnosis of a chronic illness such as diabetes can be traumatic in many ways, as families come to terms with the fact that the illness is persistent and that they need to figure out ways to best manage the disease to prevent life-threatening complications. The findings from this study suggest that the partner or spouse can play a prominent role in negotiating these tasks. Intervention efforts should focus on cultivating emotional support, optimizing subtler forms of informational support that are acceptable to patients, and minimizing controlling behaviors.

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