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# Spouses' Involvement in Their Partners' Diabetes Management: Associations with Spouse Stress and Perceived Marital Quality

**Kristin J. August**,
Department of Psychology, Rutgers University

**Karen S. Rook**,
Department of Psychology and Social Behavior, University of California, Irvine

**Melissa M. Franks**,
Department of Human Development and Family Studies, Purdue University

**Mary Ann Parris Stephens**
Department of Psychology, Kent State University.

## Abstract

Spouses frequently attempt to influence (control) or support their chronically-ill partners' adherence behaviors. Studies have documented effects of spousal control and support on chronically-ill individuals, but little is known about how these two forms of involvement in a partner's disease management may be associated with spouses' stress or the quality of their interactions with their ill partners. The current study sought to address this gap by examining spouses' day-to-day involvement in their marital partner's management of type 2 diabetes ($N$ = 129). Multilevel analyses of daily diary data revealed that on days when spouses exerted control, they reported more stress and more tense marital interactions, although these associations were more pronounced when patients exhibited poor adherence, had been ill for a longer period of time, and had more co-morbid health conditions. On days when spouses provided support, in contrast, they reported less stress and more enjoyable marital interactions. The findings from the current study suggest that spouses' day-to-day stress and quality of interactions with their partners are associated with spouses' involvement in their partners' disease management, with health-related social control and support exhibiting distinctive associations.

### Keywords

social control; social support; chronic disease management; stress; marital quality

Spouses commonly are involved in many of the activities in which their chronically-ill partners must engage to manage a chronic condition successfully (Ell, 1996; Revenson, 2003). Type 2 diabetes is one such condition in which spouses often seek to help their diabetic partners adhere to their prescribed treatment regimen, particularly the diabetic diet (August & Sorkin, 2010; Miller & Brown, 2005; Trief et al., 2003). Two different

Correspondence concerning this article should be addressed to Kristin J. August, Rutgers University, 311 North 5th Street, Camden, NJ 08057. Phone: (856) 225-6431; Fax: (856) 225-6602; kristin.august@camden.rutgers.edu.

ways that spouses attempt to foster greater treatment adherence involve seeking to control (influence) chronically-ill partners' undesirable health behaviors and supporting partners' desirable health behaviors. These interpersonal processes – control and support – have been highlighted in the broader literature on social relationships and health (Cohen, 2004), and have been discussed as two of the key pathways that account for the ways in which social networks influence health (Berkman, Glass, Brissette, & Seeman, 2000; Rook, August, & Sorkin, 2011). Specifically, *health-related social control* refers to attempts by social network members to monitor and influence individuals perceived to be unsuccessfully self-regulating their own health behaviors (Lewis & Rook, 1999). *Health-related social support*, on the other hand, refers to attempts by social network members to provide encouragement and positive feedback to individuals perceived to be successfully self-regulating their own health behaviors (Franks et al., 2006; Gallant, 2003). Thus, both types of network member involvement that are the focus of the current study involve efforts aimed at promoting better health behaviors – specifically, better treatment adherence.

Evidence suggests these two social network functions are unique from each other and from other types of social interactions (e.g., Franks et al., 2006; Franks, Wendorf, Gonzalez, & Ketterer, 2004; Helgeson et al., 2004; Khan, Stephens, Franks, Rook, & Salem, 2012). In addition, these two social network functions are conceptually and theoretically distinct. For example, social support is beneficial to the extent that it is welcome and affirming, whereas social control may be beneficial even when it is not welcome or affirming (Rook, 1990). The two types of involvement differ as a function of the health behavior of the recipient. Specifically, providing health-related social support often involves providing positive feedback about a partner's health behavior, whereas exerting health-related social control often involves challenging or critical feedback about a partner's health behavior. Thus, social control may involve coercive influence attempts, often referred to as negative social control tactics or pressure, although it also may involve less coercive influence attempts (e.g., prompts, reminders), often referred to as positive social control tactics, or persuasion (e.g., Lewis & Butterfield, 2005; Stephens et al., 2009; Tucker & Anders, 2001). or……

Previous research on control and support has examined hypothesized effects on recipients but has devoted little attention to possible effects on spouses of engaging in control or support directed toward promoting treatment adherence in their partners. Because spouses are in a unique position to notice their partners' dietary nonadherence, they often are directly involved in helping their partners manage their dietary behaviors on a daily basis (Trief et al., 2003). Spouses' daily involvement may be associated with stress and the quality of their marital interactions. The nature of these associations, may depend, however, on the strategies spouses use to promote their partners' adherence-related behaviors. The current study accordingly sought to examine two key forms of spousal involvement – control and support – and their associations with spouses' stress and marital interaction quality. Because spouses often engage in *both* control and support to foster positive health behaviors in their partners (Franks et al., 2006; Helgeson et al., 2004), this study further sought to examine the interaction between control and support.

## Associations between Control versus Support and Spouses' Well-Being

Previous research suggests that chronic medical conditions exact a toll not only on patients but also on their spouses (e.g., Revenson, 2003), with most of this work focusing on spouses' emotional distress experienced in response to their partners' illness. Little research, however, has examined the associations with spouses' well-being of attempting to help their partners manage their treatment regimen. Insights about potential associations between spouses' well-being and their efforts to support, or alternatively, seeking to control their partners' health behaviors can be derived by extrapolating from the literature on couples' and families' management of type 2 diabetes and other chronic health conditions. This literature suggests that being involved in a partner's chronic condition entails a long-term commitment and as such, may serve as a chronic stressor (Revenson, Abraidad-Lanza, Majerovitz, & Jordan, 2005), but the level of stress experienced may be particularly substantial among spouses who seek to be involved in the day-to-day management of their partners' illness.

Exerting social control is likely to be related to spouses' level of stress because such influence attempts implicitly or explicitly convey disappointment and anxiety that their chronically-ill marital partners are unable to self-regulate their own health behaviors effectively (Franks et al., 2012; Rook, 1990). The partners, in turn, may resent or resist spouses' attempts to question their autonomy (Hughes & Gove, 1981; Rook, 1990). Similar to findings on miscalibrated support, recipients may view such attempts as intrusive, critical, or demanding (Coyne, Wortman, & Lehman, 1988), thereby provoking negative reactions in recipients, such as feelings of resentment and incompetence (Newsom, 1999). Patients' negative reactions may be communicated to the spouse, contributing to feelings of stress in the spouse.

In addition, spouses may feel a need to monitor and seek to influence their partners' diabetes management frequently, given high rates of dietary nonadherence (Vijan et al., 2005). Ensuring that their partners are properly adhering to their diets has the potential to disrupt spouses' own routines and consume their energy (Beverly, Penrod, & Wray, 2007), contributing to feelings of stress. Moreover, spouses' day-to-day stress may be associated with having to shoulder responsibility for keeping their partners on track with the prescribed diet. For example, in a study of couples managing type 2 diabetes, many spouses reported feeling burdened by the responsibility they felt to keep their diabetic partner on track with their diet (Miller & Brown, 2005). Another study found that spouses who exerted more frequent social control directed toward their nonadherent diabetic partners reported more burden (August, Rook, Stephens, & Franks, 2011). Research on spousal involvement in partners' management of other health conditions documented both burdensome and stressful effects on spouses (e.g., Karmilovich, 1994); thus, it is important to determine whether exerting social control is associated with within-person differences in daily feelings of stress in the context of diabetes management, as previous research has largely demonstrated between-person differences. It is also important to determine whether, as posited in the literature, social control and support are differentially related to spouses' stress.

Unlike exerting control, providing support is less likely to elicit feelings of stress, but rather, may actually contribute to decreased stress. Some researchers suggest that providing support may be a rewarding experience in which support providers feel fulfilled and validated (Liang, Krause, & Bennett, 2001). Spouses who are able to support and facilitate sound health behaviors in their chronically-ill partners may experience feelings of usefulness, consistent with research suggesting that providing support may bolster feelings of self-worth (Krause, Herzog, & Baker, 1992). In a daily diary study of couples in which one member had multiple sclerosis, spousal provision of instrumental support was related to positive mood among both members of the couple, independent of whether this support was reciprocated by the ill partner (Kleiboer, Kuijer, Hox, Schreurs, & Bensing, 2006). Such positive mood among spouses in the absence of reciprocated support presumably could have stemmed from spouses' feelings of usefulness in being able to aid their ill partners. These positive aspects of providing support for an ill partner may be related to reduced stress for the spouse, as positive emotions have been found to help regulate, or undo, negative feelings (Frederickson, Mancuso, Branigan, & Tugade, 2000).

## Associations between Control versus Support and Spouses' Interaction Quality

The disease-related interactions that occur within couples also may be related to the quality of spouses' interactions with their partners. As is the case with spouse feelings of stress, spouse perceptions of marital interaction quality may exhibit distinctive associations with exerting control versus providing support.

Spouses' attempts to influence their partners' dietary behaviors by engaging in more social control are likely to be associated with less enjoyable and more tense marital interactions. Social control theorists argue that regulatory actions by others are unlikely to be welcome or affirming (Rook, 1990). This unwelcome involvement may be related to conflicts and emotional distance between spouses (Trief, Ploutz-Snyder, Britton, & Weinstock, 2004). Consistent with this idea, spouses of patients with type 2 diabetes have been found to express fear that the quality of their relationship with their marital partner would be limited by diabetes, potentially due to tensions and conflicts arising from disease management (Beverly et al., 2007). Similarly, research documents that family members' efforts to regulate the dietary behaviors of patients with type 2 diabetes are related to family tensions (Denham, Manoogian, & Schuster, 2007). When spouses provided regimen-specific reminders (akin to social control) in another study, relationship conflicts resulted (Trief et al., 2003).

In contrast to the postulated associations of exerting control, spousal support for partners' dietary behaviors may be related to more enjoyable and less tense marital interactions. Spouses may find it rewarding or satisfying to be able to support and affirm their partners' efforts to engage in sound health behaviors. Indeed, support provision has been found to lead to better relationship quality and greater relationship intimacy (Gleason, Iida, Bolger, & Shrout, 2003; Gleason, Iida, Shrout, & Bolger, 2008; Liang et al., 2001). For example, among couples facing an acute stressor, greater support provision was associated with

higher quality daily interactions (Iida, Seidman, Shrout, Fujita, & Bolger, 2008). Patients may appreciate their spouses' efforts to encourage and affirm their efforts to adhere to the diabetic regimen. Such appreciation, in turn, could contribute to rewarding marital interactions.

Although the studies reviewed above suggest that spouses' stress and the quality of their interactions with their partners may be related to spouses' involvement in their partners' diabetes management, most previous studies have not differentiated between spousal control and support. Gaining a better understanding of the associations of spousal involvement in their partners' management of a chronic illness is important because if such involvement is related to negative psychological and relational consequences, spouses may experience adverse health effects themselves or may withdraw their involvement to the detriment of their partners.

In examining how spousal well-being and perceived marital quality may be related to control and support, it is important to recognize that control and support often co-occur in close relationships (e.g., Franks et al., 2006). The interactive effects of such co-occurring forms of involvement have, however, received little attention. Given possible distinctive spousal and relational associations with exerting control versus providing support, the interaction between both forms of involvement warrant investigation. It is plausible, for example, that spousal provision of support can offset the posited negative effects of spousal exertion of control. Just as support serves to buffer the adverse effects of stressful experiences (Cohen & Wills, 1985), providing support also may serve to buffer the possible adverse effects of exerting control.

## The Current Study

The current study sought to address a gap in the literature that has emphasized the implications of health-related social control or support on recipients but has paid little attention to implications for individuals who exert control and/or provide support. We accordingly examined how spouses' feelings of stress and the quality of their marital interactions were related to their efforts to control and/or support their diabetic partners' adherence to a prescribed dietary regimen.

We expected that exerting more control would be associated with more stress and poorer marital interaction quality (i.e., less enjoyable and more tense marital interactions). We expected that providing social support, in contrast, would be associated with less stress and better marital interaction quality (i.e., more enjoyable and less tense marital interactions). Given the hypothesized positive associations of providing support and negative associations of exerting control, we expected that when spouses provided support and exerted control on the same day, support would serve as a buffer to the adverse implications of exerting control.

# Method

## Participants

The sample for the current study was comprised of 129 spouses whose partners were diagnosed with type 2 diabetes. Inclusion criteria for spouses included living in the same household as the patient and not being diagnosed with diabetes. Inclusion criteria for patients included having a primary diagnosis of type 2 diabetes, being aged 55 years or older, being in a married or marital-like relationship, residing in the community, and having received a recommendation from a health care provider to make dietary improvements in the prior three months. Both partners had to be cognitively functional, and be free of any major hearing, speech, or language problems that would interfere with the comprehension and completion of interviews in English. Of the 235 couples screened for eligibility, 58 couples were ineligible and 48 declined to participate. The final sample size was 129 couples (72.9% response rate).

Approximately half (50.4%) of the 129 spouses who participated in the current study were men. Spouses ranged in age from 46 to 89 years old ($M = 66.07$, $SD = 8.76$). Couples were married, on average, 37.90 years ($SD = 13.70$). Most (81.1%) couples lived alone in their household. A majority of spouses were non-Hispanic white (76.6%); the rest were African-American/black (21.9%), or other races/ethnicities (1.6%). Patients reported that they had been diagnosed with type 2 diabetes, on average, for 11.80 years ($SD = 9.40$). The sociodemographic characteristics of the study sample are representative of the surrounding geographic area.

## Procedure

After receiving Institutional Review Board approval, couples were recruited from medical offices, diabetes education centers, and senior citizen organizations, as well as through newspaper advertisements and radio announcements. Recruitment brochures described the study, eligibility criteria, and financial incentives. Interested couples could provide their contact information for project staff to contact them to explain further details about the study, as well as to determine interest and eligibility. Once both members of the couple agreed to participate, letters and consent forms were sent to the couple, and subsequent meetings were scheduled. (For additional information about recruitment and study procedures, see Stephens et al., 2012.)

Data for the current study were derived from the baseline assessments, in which spouses completed in-person interviews, self-administered questionnaires, and end-of-day computerized diaries for 24 days in their home. Each diary was time- and date -stamped and only could be accessed during a 4-hour period during the evening (8:00–11:59pm), using a participant-specific password. In addition, this software tracked daily diary compliance, which was 97.3% across all couples. Spouses completed between 7 to 21 days daily records ($M = 20.24$, $SD = 1.79$).

Only spouse reports were examined in the current study, as this study sought to examine spouses' subjective experiences of stress and marital interaction quality in relation to efforts to support or control their diabetic partners' health behaviors. Moreover, evidence

of convergence between spouses' and patients' reports of control and support suggests that spouses' reports meaningfully capture the exchanges of control and support that are occurring in the marital relationship (Franks et al., 2004). Furthermore, many studies have found that when both partners report their perceptions of social support, these support attempts may go unnoticed by the recipient (e.g., Bolger, Zuckerman, & Kessler, 2000); therefore, recipients' reports of support and control would be less useful in the current study.

## Measures

The key study variables were derived from the daily diary data, with each variable assessed daily for 24 days. Because the monitoring of behaviors using a daily diary may increase the likelihood that participants would modify their behaviors (see Litt, Cooney & Morse, 1998), the first three days of the 24-day diary period were treated as an adjustment period and thus were excluded from analyses. This decision was further supported by findings from paired *t*-test analyses (data not shown) that suggested that spouses reported significantly lower levels of support provision, as well as tense and enjoyable marital interactions, on the first three days of the diary period compared to the remaining 21 days. Covariates were derived from the daily diaries, in-person interviews, and self-administered questionnaires.

The generalizability theory approach was used to assess scale reliability for measures of health-related social control and support, using procedures developed for daily diary data by Cranford et al. (2006). The between-person reliability estimate ($R_{1F}$) reflects between-person reliability of the measures assessed on the same study day; within-person reliability ($R_{change}$) reflects the reliability of change within persons across study days. We also report Cronbach's alpha ($\alpha$) because it is a widely used estimate of reliability and is often reported in studies using daily diary methods (e.g., Cichy, Stawski, & Almeida, 2012; Pasipanodya et al., 2012).

**Health-related social control.—**Seven items from the daily diaries assessed the extent to which spouses reported engaging in health-related social control tactics to influence their marital partners' dietary choices each day, which spouses rated on a 3-point scale (1=*not at all*, 2=*somewhat*, 3=*very much*). Items for this measure were adapted from other studies of health-related social control, and include both positive and negative control tactics, or persuasion and pressure, respectively (e.g., Franks et al., 2006; Lewis & Rook, 1999; Stephens et al., 2009). Sample items that assessed positive tactics included, "Regarding your wife's/husband's meals and snacks today, you…" "let her/him know that her/his poor food choices worry you" and "tried to persuade her/him to do more to follow her/his diabetic diet " Sample items that assessed negative tactics included, "Regarding your wife's/husband's meals and snacks today, you…." "criticized her/his poor food choices" and "did something to try to restrict her/him from making poor food choices." Items were averaged to create a composite measure of health-related social control ($R_{1F}$ = .86, $R_{change}$ = .72; Cronbach's $\alpha$ = .94).

**Health-related social support.—**Three items from the daily diaries assessed the extent to which spouses reported providing social support for their marital partners' dietary adherence each day, which spouses rated on a 3-point scale (1=*not at all*, 2=s*omewhat*,

3=*very much*). The items for this measure were adapted from other studies of health-related social support (e.g., Franks et al., 2006). Sample items included, "Regarding your wife's/husband's meals and snacks today, you…" "showed appreciation for her/his efforts to stay on track with her/his diabetic diet" and "did something to help her/him stick with her/his diabetic diet." Items were averaged to create a composite measure of health-related social support ($R_{1F}$ = .80, $R_{change}$ = .51; Cronbach's $\alpha$ = .87). Thus, these items captured support that is directed explicitly toward the partner's dietary adherence rather than general emotional support for the partner.

**Stress.—**Daily stress was assessed from the daily diaries with one item, "How trying or stressful was your day?" Spouses rated on a 3-point scale how stressful their day was (1=*not at all*, 2=*somewhat*, 3=*very much*). Single-item assessments of daily stress have been used successfully in other daily diary studies (e.g., Armeli, Todd, & Mohr, 2005),

**Quality of marital interactions.—**Two items from the daily diaries assessed how tense or enjoyable spouses perceived their interactions with their marital partners to have been during the day. The items were derived from the Interaction Record Form for Intimacy (Prager & Buhrmester, 1998). Spouses were asked "Overall, how tense were your interactions with your wife/husband today?" and "Overall, how enjoyable were your interactions with your wife/ husband today?" Each item was rated on an 11-point scale (0=*not tense at all* to 10=*as tense as they could possibly be* and 0=*not enjoyable at all* to 10=*as enjoyable as they could possibly be)*.

**Covariates.—**All covariates included in analyses initially were chosen *a priori* based on whether they previously have been included in studies on social relationships and psychological or relational outcomes. These included variables from in-person interviews and self-administered questionnaires: the patient's illness duration ("How many years has it been since your diagnosis with diabetes?"); the number of chronic health conditions reported by the spouse, as well as the patient; overall marital quality, assessed using an abbreviated (5-item) version of the Quality of Marriage Index (Norton, 1983; $\alpha$ = .95); and the spouse's gender (0=*male*, 1=*female*). In addition, we examined one variable from the daily diaries: spouses' perceptions of patients' daily dietary adherence, using a 5-item modified measure from the diet subscale of the Summary of Diabetes Self-Care Activities Measure (Toobert, Hampson, & Glasgow, 2000; $\alpha$ = .80). We used a common empirical strategy in the literature (e.g., Khan et al., 2012) to select our final set of covariates. A variable was included as a covariate in final analyses if it was at least marginally associated with the dependent variables ($p < .10$) or if it moderated associations among key independent and dependent variables. Using these procedures, the final set of covariates included patients' daily dietary adherence (level 1); and overall marital quality, patients' illness duration, and patients' co-morbid health conditions (level 2).

## Data Analysis

Hierarchical linear modeling (HLM 6.03; Raudenbush & Byrk, 2002) was used to examine day-to-day variability in spouses' levels of stress and perceived marital quality as a function of engaging in social control, social support, and the interaction between control

and support. Level 1 models represented within-spouse variability, and level 2 models represented between-spouse differences in variability. Variables at level 1 were person-mean centered and variables at level 2 were grand-mean centered (Raudenbush & Byrk, 2002). We included the prior day's dependent variable as a level 1 covariate in analyses to account for autoregressive effects (Bolger, Davis, & Rafaeli, 2003). We also included within-person (level 1) means of predictors as level 2 covariates to allow for an examination of the unique within-person association between the predictors and dependent variables.

Separate models were estimated for each dependent variable (stress, tense marital interaction quality, enjoyable marital interaction quality), and covariates were added to level 1 if the covariate was assessed with daily diaries or level 2 if the covariate was assessed with self-administered questionnaires or in-person interviews. Finally, to examine whether control and support exhibited independent or interactive associations with the dependent variables, we first examined the main effects of control and support (model 1), and then added the interaction between control and support in a subsequent model (model 2). In addition, we examined the interactions between control and patients' adherence and support and patients' adherence in model 2, as well as cross-level interactions between level 2 covariates and both support and control. Nonsignificant interaction effects were trimmed from tables, and only results for the significant models are presented. If data were missing at level 2, we excluded the spouse ($n$=1) from analyses; if data were missing at level 1, we used listwise deletion when running analyses.

## Results

### Descriptive Analyses

Table 1 presents the means, standard deviations, and intercorrelations for the key daily diary study variables. For these descriptive analyses, variables were averaged for each spouse across study days, and means were calculated for all spouses. Spouses reported, on average, that they provided support more frequently than they exerted social control ($Ms$ = 1.94 vs. 1.32; $t(128) = 17.21$, $p < .001$). Spouses also reported, on average, a mild level of daily stress ($M$ = 1.52 on a 3-point rating scale). Finally, spouses reported, on average, that their daily marital interactions with their partners were more likely to be enjoyable than tense ($Ms$ = 8.15 vs. 2.16; $t(128) = 23.21$, $p < .001$).

Correlational analyses indicated that exerting more control was significantly associated with providing more support ($r$ =.62, $p$ <.001), consistent with the view that some spouses engage in both support and control in their efforts to facilitate their partners' dietary adherence. Although the measures of control and support were significantly intercorrelated, including both control and support in the same multilevel model did not violate statistical assumptions as each predictor variable was group-mean centered, and we did not find any problematic values (i.e., > 1) in HLM variance-covariance (tau) matrices (Raudenbush & Byrk, 2002). Marital tensions and enjoyability were negatively related ($r = -.54$, $p < .001$), consistent with studies showing relatively strong inverse correlations between positive and negative aspects of daily well-being, such as positive and negative affect (Diener & Emmons, 1984). Research also suggests that these dimensions of daily well-being, despite relatively strong intercorrelations, often have distinctive predictors (e.g., Ingersoll-Dayton, Morgan, &

Antonucci, 1997). By extension, positive and negative aspects of marital interaction quality also may have distinctive predictors (cf. Finch & Linfield, 1997) and, therefore, warrant separate analyses.

### Associations between Support versus Control with Stress and Marital Interaction Quality

As shown in Table 2, on days when spouses exerted more control, they experienced more stress (coefficient = .13, $p = .008$). This association was moderated by patients' dietary adherence and illness duration (3-way interaction coefficient = −.03, $p = .023$). As shown in Figure 1, when patients were not adhering well to their dietary regimen, spousal control was related to more spouse stress, but this relationship was particularly strong among spouses whose partners had been diagnosed with diabetes for a longer period of time. When patients were adhering well to their dietary regimen, in contrast, exerting social control was related to less stress, and this relationship was particularly strong among spouses whose partners had been diagnosed with diabetes for a longer period of time. On days when spouses provided more support, they experienced less stress (coefficient = −.12, $p = .002$). The control X support interaction was not significant. Social control and support, along with the covariates, accounted for 12.25% of within-spouse (level 1) variance in spouse stress.

As shown in Table 3, on days when spouses exerted more control, they experienced more tense marital interactions. This association was moderated by patients' co-morbid health conditions (interaction coefficient = .43, $p = .03$) and patients' illness duration (interaction coefficient = .05, $p = .047$). The positive relationship between spousal control and tense marital interactions was stronger among spouses whose partners had more co-morbid health conditions and who had diabetes for a longer period of time. On days when spouses provided more support, they experienced less tense marital interactions (coefficient = −.41, $p = .02$). The control X support interaction was not significant. Social control and support, along with the covariates, accounted for 9.44% of within-spouse variance in tense marital interactions.

As shown in Table 4, the relationship between exerting control and enjoyable marital interactions was dependent on patients' daily dietary adherence (interaction coefficient = .71, $p = .02$). Exerting social control only was associated with less enjoyable marital interactions on days when patients' were not adhering well to their dietary regimen. On days when spouses provided more support, they experienced more enjoyable marital interactions (coefficient = .41, $p < .001$). The control X support interaction was not significant. Social control and support, along with the covariates, accounted for 14.80% of within-spouse variance in enjoyable marital interactions.

## Discussion

Spouses frequently engage in health-related social control and support as they seek to facilitate the disease management of their partners, but little research has examined how the two forms of involvement may be related to spouses' well-being. The current study thus sought to investigate whether spousal involvement in marital partners' management of type 2 diabetes was associated with spouse stress and perceived marital quality. The study also

examined the interaction between control and support, but the anticipated buffering effects of support in the context of control was not detected.

Taken together, the findings suggest that exerting control directed toward a marital partner managing diabetes is related to worse spousal and relational well-being, although these associations were moderated by patients' health. On days when spouses sought to monitor and influence their partners' unsound health behaviors, they reported greater stress and poorer quality marital interactions. In contrast, the findings suggest that providing support is related to better spousal and relational well-being. Specifically, on days when spouses encouraged and affirmed their partners' sound health behaviors, they reported decreased stress and better quality marital interactions. The inclusion of the previous day's dependent variables in multilevel analyses helps to rule out the possibility that the previous day's value is responsible for such findings.

Given the same-day associations examined in the current study, it is possible that stress and marital interaction quality also may influence control and support attempts and, more generally, that reciprocal and contingent relationships exist between control or support, stress, and marital interaction quality. Although the design of the current study did not allow us to disentangle the directionality of findings, previous research and theory suggest that engaging in control versus support may have differential associations with spousal and relational well-being.

## Associations between Spousal Involvement with Spousal and Relational Well-Being

The findings that spouses who exerted more social control reported both more daily stress and poorer quality marital interactions expands upon previous research suggesting that attempting to regulate the health behaviors of a partner with type 2 diabetes is a burdensome experience (August et al., 2011). We found, however, that association between spousal control and worse spousal well-being was amplified by patients' poor health, assessed in the current study by patients not adhering well, having more co-morbid health conditions, and being diagnosed with diabetes for a long period of time. In contrast, when patients were adhering well, had fewer co-morbid health conditions, and had been diagnosed with diabetes for a shorter period of time, the associations between spousal control and spousal and relational well-being were dampened. The adverse associations with control are especially strong for spouses whose partners are less adherent to their diet *and* have had diabetes for a longer period of time. Low levels of adherence, however, seem particularly likely to amplify the association between exerting control and psychological and relational outcomes.

The moderating role of patients' daily dietary adherence extends previous research suggesting that between-person differences in adherence may be responsible for the negative associations with engaging in social control (e.g., August et al., 2011). Evidence that spouses do not necessarily want to be involved in their partners' dietary management (Miller & Brown, 2005), coupled with the frustration and disappointment spouses may feel associated with unsuccessful efforts at regulating their partners' diet, may be responsible for the feelings of daily stress and poor quality marital interactions, especially when spouses feel that ongoing efforts are needed in the future to regulate their partners' diet. When spouses' partners are adhering well to their medical regimen, in contrast, spouses may have

fewer worries, feel less need for continual monitoring of their partners' health behavior, and have greater confidence that their partners will be able to manage their diabetic diet on their own (August et al., 2011). In turn, spouses may feel less stressed and have better quality marital interactions.

Furthermore, the longer patients have been diagnosed with diabetes and the more co-morbid conditions they have, the more routine spouses' involvement has become in multiple areas of their partners' health, as evidenced by the frequency with which spousal control is reported in studies of other health conditions (e.g., Franks et al., 2006; Helgeson et al., 2004; Stephens et al., 2009). Thus, when spouses must engage in recurring efforts to monitor and influence many of their partners' health behaviors, such continued and varied efforts may be associated with spouses' feelings that their efforts are going unnoticed or unappreciated. This, in turn, might be related to spousal and relational well-being. On the other hand, spouses whose partners have been diagnosed with diabetes for a shorter period of time and have less co-morbid health conditions are less likely to routinely monitor and influence their partners' health behaviors, thereby dampening the adverse associations of these less frequent control attempts.

Several factors may underlie the associations between spouses' provision of support for their partners' dietary behaviors and spousal and relational well-being. First, consistent with studies that have found that caregivers report positive feelings from their role, such as self-worth (Krause et al., 1992), spouses likewise may experience positive emotions as they help their partners manage a serious chronic disease. These positive feelings may decrease spouse stress and engender greater relationship intimacy (Liang et al., 2001).

Second, when spouses are able to provide support to partners who are making efforts to adhere to the treatment regimen, they may feel relieved that they do not have to nudge or criticize their partners and, instead, may appreciate that they can aid and affirm their partners' health behavior. Moreover, when spouses provide support, patients may be less likely to react with resentment and resistance, but instead, may react with appreciation, thereby reducing the likelihood of stress and friction between the spouses.

Contrary to expectations, control and support did not interact in predicting spouse stress, marital tensions, and marital enjoyment. This suggests that these two social network functions are independently related to spousal and relational well-being. We also did not find that any covariates moderated the association between support and any spouse dependent variables, suggesting that support is related to less stress and better marital interaction quality regardless of the context in which it is provided.

Other noteworthy findings relate to within- and between-person variation in marital interaction quality as a function of partners' adherence and marital quality. Specifically, we found that better patient dietary adherence was associated with more enjoyable and less tense daily interactions, extending previous research that has reported between-person differences in the relationship between dietary adherence and positive marital attributes (Trief et al. 2004). We also found that spouses who reported better overall marital quality also reported more enjoyable and less tense daily interactions, which is consistent with other

research suggesting that how spouses act toward their partners is a function of whether they are satisfied with the overall quality of their marriage (Sagrestrano, Christensen, & Heavey, 1998).

## Limitations and Future Directions

Several limitations of the findings and implications for future research should be noted. First, given that participants had been married for a long time ($M$ = 37.90 years, $SD$ = 13.81) and reported relatively high levels of marital satisfaction ($M$ = 6.31, possible range = 1–7), they may have been more committed to helping their marital partners manage their condition, consistent with evidence that long-term marriages are often characterized by shared goals (Lauer, Lauer, & Kerr, 1990). Individuals with shorter or less satisfying marriages might exhibit different patterns of involvement in their partner's illness or might react to such involvement differently. In addition, the current results cannot be generalized to other health conditions with markedly different disease characteristics and regimens. Findings from this study are likely to be seen, however, in conditions that, like type 2 diabetes, require daily adherence to a complex medical regimen with behavioral components that are readily visible to close family members. Additionally, the short-term longitudinal design of the study did not allow us to examine the long-term, cumulative toll on the spouse of engaging in control or support, although we did find evidence that when patients had diabetes for a longer period of time, the adverse associations between exerting social control with spouses' well-being and marital quality were particularly strong. It would be advantageous for future studies to examine how the effects of spousal control and support accrue or change over time, as well as examine possible shifts in key variables themselves or in their functional relations during the course of daily diary assessments.

In a related vein, the current study could not definitively establish the directionality of findings. Our analyses controlled for the previous day's stress and marital quality, which allowed us to rule out the possibility that the previous day's dependent variable is responsible for such findings (Bolger, Davis, & Rafaeli, 2003), and a supplemental analyses (data not shown) yielded no evidence that stress or marital interaction quality predicted the following day's control or support, but it is possible that reciprocal same-day associations exist between stress, marital quality, and spousal involvement. Furthermore, although the focus of this study was on the spouse's subjective experience of day-to-day stress and marital interaction quality and day-to-day engagement in control and support, we also believe it would be useful for future research to supplement self-report data with objective data, such as physiological measures of spouses' stress. The specificity of our findings, however, suggest that they are not due entirely to self-report bias, given that both control and support were associated with positive and negative outcomes. Finally, the current study did not evaluate the mediating mechanisms that may have accounted for the findings reported, and investigating such mechanisms is a valuable direction for future research. For example, exerting health-related social control may be particularly likely to contribute to feelings of stress among spouses when their partners react with resentment or resistance. Similarly, spouses may be likely to derive benefits from providing health-related social support to the extent that they derive psychological rewards (e.g., positive affect, feelings of self-worth) from such actions or experience positive reactions from their partners.

Despite these limitations, the current study is among the first to attempt to examine potential associations between engaging in health-related control and support and spousal well-being. The results of this study add to an emerging literature that thus far has emphasized implications of control and support on recipients but has largely neglected implications for providers (Franks et al., 2006). The results extend this research by suggesting that control and support exhibit distinctive associations with aspects of providers', as well as recipients' well-being and health behavior. The findings from this study also add to the accumulating evidence suggesting that health-related social control and support indeed are unique constructs (e.g., Helgeson et al., 2004) that, nonetheless, commonly co-occur in couples' attempts to promote positive health behaviors integral to chronic disease management. Finally, the results from this study highlight the need to consider spousal and relational well-being in the design of interventions that involve both members of a married couple to improve adherence among patients with type 2 diabetes and reduce daily stress and tension experienced by their spouses.

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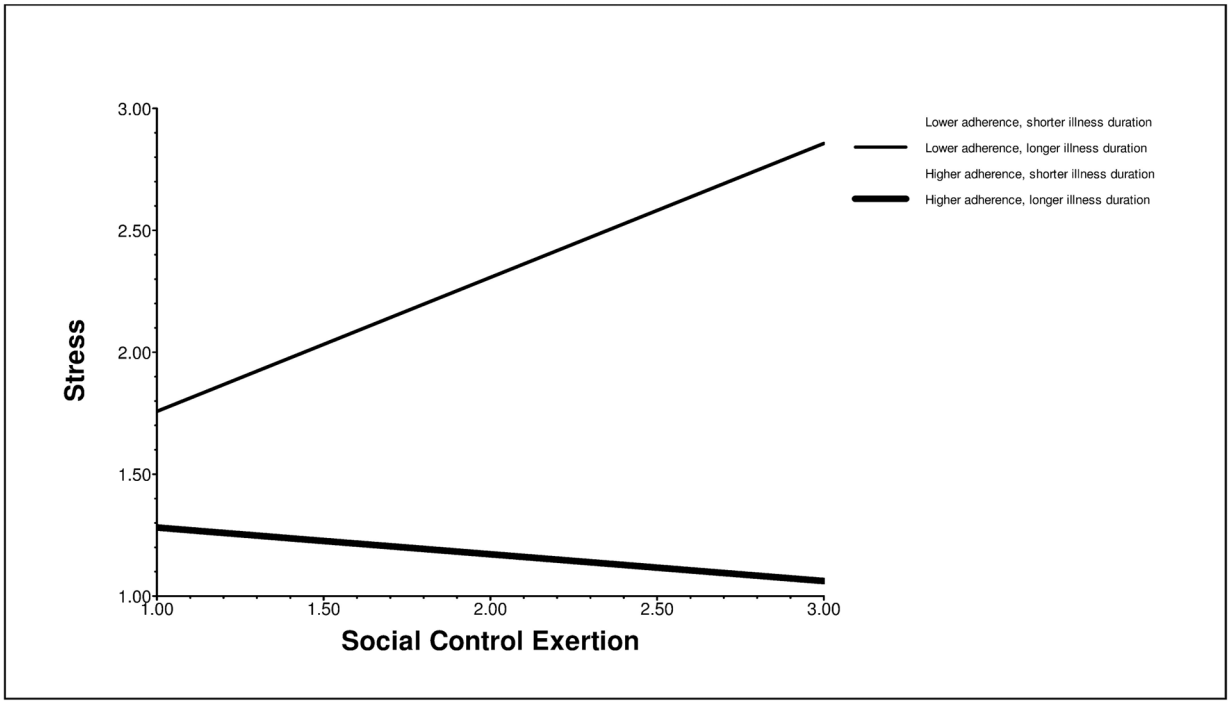


**Figure 1.**

Patients' dietary adherence and illness duration moderate the association between spousal control and stress.

**Table 1**

Means, Standard Deviations, and Intercorrelations for Key Study Variables (N = 129)

| Variable | Range | *M* | *SD* | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|---|---|
| 1. Control | 1–3 | 1.32 | .33 | ____ | .62*** | .17 | .10 | .01 |
| 2. Support | 1–3 | 1.94 | .52 | | ____ | −.04 | −.19* | .19* |
| 3. Stress | 1–3 | 1.52 | .36 | | | ____ | .47*** | −.49*** |
| 4. Tense marital interactions | 0–10 | 2.26 | 1.64 | | | | ____ | −.54*** |
| 5. Enjoyable marital interactions | 0–10 | 8.15 | 1.65 | | | | | ____ |

*Note*. Mean value reflects average across study days. Control refers to health-related social control; support refers to health-related social support.

* $p < .05$;

** $p < .01$;

*** $p < .001$.

## Table 2

Multilevel Model Examining Associations between Spouse Stress and Spouse Engagement in Health-Related Social Control and Support

| | Model 1: Main effects of control, support, and adherence | | Model 2: Interactive effects of control, support, and adherence | |
|---|---|---|---|---|
| | **Fixed effect (*SE*)** | ***t* (124)** | **Fixed effect (*SE*)** | ***t* (124)** |
| Intercept | 1.51 (.03) | 52.52*** | 1.51(.03) | 52.49*** |
| *Level 1 variables* | | | | |
| Control | .13 (.05) | 2.72** | .08 (.06) | 1.33 |
| Support | −.12 (.04) | −3.20** | −.11 (.04) | −2.96** |
| Adherence | −.17 (.04) | −4.39*** | −.15 (.04) | −3.78*** |
| Control × Support | _____ | _____ | .12 (.08) | 1.40 |
| Control × Adherence | _____ | _____ | −.22 (.09) | −2.34* |
| Support × Adherence | _____ | _____ | .04 (.06) | .70 |
| *Level 2 variables* | | | | |
| Illness duration (patient) | <−.01 (<.01) | −.96 | <−.01 (<.01) | −.97 |
| Number of health conditions (patient) | −.02 (.02) | −.94 | −.02 (.02) | −.94 |
| Marital quality | −.11 (.03) | −3.40** | −.11 (.03) | −3.37** |
| *Cross-level interactions* | | | | |
| Control × adherence × illness duration | _____ | _____ | −.03 (.01) | −2.31* |
| Level 1 variance: | .24 | | .24 | |

*Note*. Control refers to health-related social control; support refers to health-related social support; adherence refers to patients' dietary adherence. *SE* = standard error. Analyses also controlled for stress reported on the previous day (level 1) and within-person means of control, support, and adherence (level 2).

* $p < .05$;

** $p < .01$;

*** $p < .001$.

## Table 3

Multilevel Model Examining Associations between Spouse Reports of Tense Marital Interactions and Spouse Engagement in Health-Related Social Control and Support

| | **Model 1: Main effects of control, support, and adherence** | |
|---|---|---|
| | **Fixed effect (*SE*)** | ***t* (124)** |
| Intercept | 2.22 (.12) | 18.12*** |
| *Level 1 variables* | | |
| Control | .97 (.26) | 3.75*** |
| Support | −.41 (.18) | −2.35* |
| Adherence | −.41 (.17) | −2.37* |
| *Level 2 variables* | | |
| Illness duration (patient) | <.01 (.01) | .28 |
| Number of health conditions (patient) | .01 (.10) | .07 |
| Marital quality | −.79 (.14) | −5.46*** |
| *Cross-level interactions* | | |
| Control × patient health conditions | .43 (.20) | 2.19* |
| Control × illness duration | .05 (.03) | 2.00* |
| Level 1 variance | 5.78 | |

*Note*. Control refers to health-related social control; support refers to health-related social support; adherence refers to patients' dietary adherence. *SE* = standard error. Analyses also controlled for tense marital interactions reported on the previous day (level 1) and within-person means of control, support, and adherence (level 2).

* $p < .05$;

** $p < .01$;

*** $p < .001$.

## Table 4

Multilevel Model Examining Associations between Spouse Reports of Enjoyable Marital Interactions and Spouse Engagement in Health-Related Social Control and Support

| | Model 1: Main effects of control, support, and adherence | | Model 2: Interactive effects of control, support, and adherence | |
|---|---|---|---|---|
| | **Fixed effect (*SE*)** | ***t* (124)** | **Fixed effect (*SE*)** | ***t* (124)** |
| Intercept | 8.15 (.12) | 67.67*** | 8.15 (.12) | 67.68*** |
| *Level 1 variables* | | | | |
| Control | −.32 (.17) | −1.82 | −.29 (.20) | −1.46 |
| Support | .41 (.11) | 3.89*** | .47 (.12) | 4.08*** |
| Adherence | .40 (.11) | 3.59** | .44 (.11) | 3.84*** |
| Control × Support | _____ | _____ | .13 (.22) | .60 |
| Control × Adherence | _____ | _____ | .71 (.30) | 2.33* |
| Support × Adherence | _____ | _____ | .10 (.19) | .53 |
| *Level 2 variables* | | | | |
| Illness duration (patient) | .03 (.01) | 1.86 | .03 (.01) | 1.83 |
| Number of health conditions (patient) | .16 (.09) | 1.71 | .16 (.09) | 1.69 |
| Marital quality | .94 (.14) | 6.63*** | .94 (.14) | 6.66*** |
| Level 1 variance | 1.73 | | 1.66 | |

*Note*. Control refers to health-related social control; support refers to health-related social support; adherence refers to patients' dietary adherence. *SE* = standard error. Analyses also controlled for enjoyable marital interactions reported on the previous day (level 1) and within-person means of control, support, and adherence (level 2).

* $p < .05$;

** $p < .01$;

*** $p < .001$.