The Thesis Committee for April Allen Buck
Certifies that this is the approved version of the following thesis:

Stress Spillover in Early Marriage: The Role of Self-Regulatory Depletion

APPROVED BY
SUPERVISING COMMITTEE:

Supervisor:

Lisa A. Neff

Timothy J. Loving

Marci E. J. Gleason

Stress Spillover in Early Marriage: The Role of Self-Regulatory Depletion

by

April Allen Buck, B.A.

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Abstract

Stress Spillover in Early Marriage: The Role of Self-Regulatory Depletion

April Allen Buck, M.A.

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Supervisor: Lisa A. Neff

Stressful experiences external to a marriage (e.g., work stress, finances) are often associated with poor relationship functioning and lowered marital satisfaction, a phenomenon called stress spillover. To date, however, little attention has been devoted to understanding the specific mechanisms through which stress may lead to maladaptive relationship patterns. Drawing from theories of self-regulatory depletion, it was predicted that coping with external stress is an effortful process that consumes spouses' regulatory resources, leaving spouses with less energy to effectively respond to their relationship issues. The current study relied on a sample of 171 newly-married couples to examine whether self-regulatory depletion may mediate the link between external stress and relationship well-being. Couples were asked to complete a 14-day daily diary, which assessed their daily stress, their state of self-regulatory depletion, their marital behaviors, and their daily marital appraisals. Within-person analyses revealed that, on average, couples experienced stress spillover, such that on days when their stress was higher than

usual they reported enacting more negative behaviors towards their partner and endorsed less positive appraisals of the relationship. Further evidence revealed that self-regulatory depletion accounted for a majority of these spillover effects. These findings suggest that even happy and committed couples may find it difficult to engage in adaptive relationship processes under conditions of stress.

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INTRODUCTION

Some fragile relationships survive forever because they never encounter a relationship-toxic environment and some very strong relationships dissolve—not because they weren't close or committed or loving—but because fate…put their relationship in harm's way.

-Ellen Berscheid (1999, p. 265).

When asked to explain the success or failure of their relationships, individuals rarely acknowledge the role the relationship context may have played in shaping those outcomes (Berscheid, Lopes, Ammazzalorso, & Langenfeld, 2001). Rather, it is a common belief in Western society that successful marriages result when both partners "work" at the relationship by engaging in active efforts to think and behave in relationship-promotive ways (Levine & Markman, 2001). In other words, as long as partners are committed enough and work hard enough, the marriage should survive. Yet, as the above quote elegantly asserts, this perspective overlooks the important reality that some environmental contexts render it more difficult for spouses to effectively maintain a happy and healthy relationship. When the marital context contains numerous stressful life events, such as work stress or financial strains, marriages often suffer. For instance, stressors originating in domains external to the marriage predict increases in maladaptive relationship behaviors and decreases in marital satisfaction, a phenomenon referred to as *stress spillover* (Story & Bradbury, 2004; Randall & Bodenmann, 2009).

Although it has been well-established that relationships falter under conditions of stress, the mechanisms underlying these stress spillover effects are less clear. In other words, why do stressors external and presumably unrelated to relationships negatively influence behaviors and thoughts within relationships? To address this question, the current paper adopts the perspective that even the most motivated spouses may find it difficult to behave in a relationship-promoting manner if they do not also possess the

energy and resources necessary for engaging in those acts. Drawing from theories of self-regulation, it is argued that stressful environments should hinder efforts to engage in constructive relationship functioning by draining spouses' self-regulatory resources, thus leaving spouses with less energy to manage relationship issues (Baumeister, 2002). In this way, stress may reduce spouses' capacity to respond well to those issues, despite strong desires to preserve the marriage.

Accordingly, the goal of the current study was to examine whether self-regulatory depletion mediates the link between stress and relationship well-being. To this end, the remainder of the introduction is divided into three sections. The first section more thoroughly reviews research linking external stress to relationship behaviors and appraisals. Next, the role self-regulatory depletion may play in this process is explored. Though some prior work has speculated that depletion may account for stress spillover effects (e.g., Neff & Karney, 2009), to date there have been no direct empirical tests of this possible mechanism. The final section describes a daily diary study designed to evaluate these ideas by examining the within-person associations between external stressors, self-regulatory depletion, and relationship quality in a sample of happy and committed newly-married couples.

STRESS AND MARITAL QUALITY: SPILLOVER EFFECTS

Growing research indicates that external stress may render spouses less likely to respond to and interact with their partner in adaptive, relationship enhancing ways. For instance, increases in stress have been shown to impede effective communication between spouses. In one of the few studies manipulating spouses' levels of stress, couples' interactions were observed before and after couples engaged in a stress induction task. Following this stress task, couples exhibited a 40% decrease in the quality of their communication (Bodenmann & Shantinath, 2004). Moreover, daily diary

research has demonstrated that tensions between partners are more likely to occur on days when spouses experienced tension at work (Bolger, DeLongis, Kessler, & Wethington, 1989). Specifically, negatively arousing workdays have been linked with more withdrawn behavior in the home (Repetti, 1989; Schulz, Cowan, Cowan, & Brennan, 2004). Conditions of high stress also appear to diminish spouses' propensity for engaging in forgiving responses to a partner's transgressions (Neff & Karney, 2004; Neff & Karney, 2009). One study examining stress and attributions at eight assessments over a 4-year period revealed that when spouses were experiencing higher levels of stress than normal, they were more likely to rely on a maladaptive attributional style, viewing the partner as blameworthy for negative marital behaviors. Conversely, at times when stress was lower, these same spouses were more likely to excuse any transgressions and give the partner the "benefit of the doubt" (Neff & Karney 2004).

In addition to affecting relationship behaviors, the experience of external stressors has also been associated with lowered marital appraisals. For instance, between-subjects comparisons of couples experiencing high versus low levels of external stress indicate that those facing greater stress exhibit steeper declines in marital satisfaction during the early years of marriage, as well as higher rates of marital dissolution (Bahr, 1979; Conger, Rueter, & Elder, 1999; Morris & Blanton, 1994). Furthermore, daily diary research suggests that increases in daily work stress are associated with less accepting views of family members (Crouter, Bumpas, Head, & McHale, 2001). Similarly, longitudinal work examining changes in acute stress and marital satisfaction over a four-year period has revealed that individuals are less satisfied with their relationships during times of greater stress (Karney, Story & Bradbury 2005; Neff & Karney, 2004). Together, these findings highlight how stress may shape and constrain the nature of spouses' behaviors and appraisals within the relationship.

MEDIATING ROLE OF SELF-REGULATORY DEPLETION IN STRESS SPILLOVER

Though prior work has established that stress often hinders adaptive relationship functioning, this still begs the question of why external stress can prevent spouses from engaging in the maintenance efforts that are so important for relationships. Explaining this phenomenon may involve recognizing that doing the right thing in one's relationship is a difficult process. Research has shown that enacting the types of behaviors that are beneficial for relationships (e.g., responding with kindness when your partner criticizes you) is not automatic and requires greater effort compared with more impulsive, self-centered behaviors (Rusbult, Yovetich, & Verette, 1996; Yovetich & Rusbult, 1994). Indeed, the expression of relationship-promoting behaviors is often described as a two-step process in which partners first must exert self-control to inhibit impulsive inclinations to act in self-promotive ways, and then make the decision to engage in more positive, relationship-promoting behaviors (Rusbult et al., 1996).

Unfortunately, theories of self-regulatory depletion (e.g., Baumeister, 2002) argue that self-control is a limited resource that can become depleted through use, making further acts of self-control more difficult. In fact, self-regulatory resources are often compared to a muscle; just as a muscle can become fatigued after exertion, our self-regulatory capabilities can be weakened after use (Muraven, Tice, & Baumeister, 1998; Vohs & Heatherton, 2000). Thus, if relationship-promoting behaviors require effort and self-regulation (Finkel & Campbell, 2001; Rusbult et al., 1996), spouses may find it more difficult to engage in positive relationship functioning at times when their regulatory resources are being divided among several effortful acts.

In this way, theories of self-regulatory depletion (e.g., Baumeister, 2002) may provide insight regarding a possible mechanism by which the experience of external stress impairs spouses' capacity to enact relationship-promotive behaviors. Prior work

has shown that coping with external stressors requires the use of self-control to manage the negative emotions and arousal that result from stress (Hancock & Warm, 1989; Hockey, 1984; Schonpflug, 1983). As coping with stressful events consumes spouses' self-regulatory resources, this coping should leave spouses with less energy to effectively navigate their interactions with a partner. In fact, self-regulatory depletion has been associated with a host of negative interpersonal behaviors, from less accommodating responses to relationship conflict (Finkel & Campbell, 2001) to increases in intimate partner violence (Finkel, DeWall, Slotter, Oaten, & Foshee, 2009). Together, this research suggests that spouses facing high levels of external stress may find themselves in a state of self-regulatory depletion that both increases the likelihood of destructive behaviors within the relationship and decreases marital satisfaction.

Importantly, this detrimental influence of self-regulatory depletion on relationships may occur regardless of spouses' motivation to maintain the relationship. Intimates' dispositional level of self-control has been shown to predict the performance of pro-relationship behaviors independent of their commitment level (Finkel & Campbell, 2001), suggesting that a commitment to preserving the marriage may not be sufficient to buffer the marriage against stress and depletion. In other words, and as Berscheid (1999) noted in the aforementioned quote, even committed relationships can unravel if placed in a toxic setting.

OVERVIEW OF THE CURRENT STUDY

To clarify the mechanisms of stress spillover effects, newlywed couples participating in a broader study of marriage provided information on their external stress, self-regulatory depletion, specific relationship behaviors, and marital appraisals as part of a 14-day daily diary task. The use of a fairly homogeneous sample of newlywed couples provided several advantages. First, selecting newlyweds ensured that all couples were at

a similar marital duration and that the motivation to maintain the relationship should be strong and fairly uniform across spouses. In this way, we were able to examine the role of depletion in stress spillover processes within a sample of highly committed couples. Second, couples in the early years of marriage are more likely to be exposed to a variety of stressful events, as a number of stressors tend to accompany youth and the transition to marriage (e.g., relocation, starting a new job).

Analyses of these data addressed two specific questions. First, can evidence of stress spillover be found even within this sample of happy and committed couples? Consistent with prior work (e.g., Neff & Karney, 2004), the current study derived an index of stress spillover by examining the within-person association between spouses' daily external stress and daily marital behaviors and appraisals across the 14 diary days. It was predicted that, on average, spouses would exhibit significant stress spillover, such that on days when spouses experienced higher than usual levels of stress, they would report enacting more negative and fewer positive behaviors towards their spouse, controlling for how negatively their partner behaved towards them. In addition, on days of greater stress, spouses also were expected to report less positive appraisals of the marital relationship.

Second, does self-regulatory depletion mediate stress spillover effects? Further analyses examining the within-person association between daily stress and self-regulatory depletion were expected to reveal that increases in daily stress would be associated with greater feelings of depletion, and this depletion would then mediate the stress spillover effects. In other words, even the most motivated spouses were expected to have difficulty engaging in pro-relationship behaviors and relationship appraisals if they did not also possess the energy and resources necessary for enacting those behaviors and appraisals.

METHOD

PARTICIPANTS

The current study relied on a sample of newlywed couples participating in a broader study of marriage. Couples were recruited using several methods. First, advertisements were placed in community newspapers and with local wedding vendors (e.g., bridal shops, floral shops, etc.). Second, advertisements were placed on websites such as theknot.com and the social networking site *Facebook*. Third, premarital counselors were given fliers about the study to relay to potential participants. Couples responding to all methods of solicitation were screened in a telephone interview to determine whether they met the following eligibility requirements: (a) this was the first marriage for each partner, (b) the couple had been married less than six months, and (c) neither spouse had any children. The final sample consisted of 171 couples.

On average, husbands were 29.1 (*SD* = 5.3) years old and had received 16.0 (*SD* = 2.3) years of education. Seventy-seven percent were employed full-time and 14% were full-time students. Seventy-seven percent of husbands identified themselves as White, 15.8% as Hispanic/Latino, 1.8% as Asian American, and 2.3% as African American. Wives averaged 27.2 (*SD* = 4.9) years old and had received 16.3 (*SD* = 1.9) years of education. Sixty-eight percent were employed full-time and 13.5% were full-time students. Seventy-five percent of wives identified themselves as White, 15.2% as Hispanic/Latino, 2.3% as Asian American, and 3.5% as African American. About 50% of the sample was Christian. The median combined income of couples was $60,000.

PROCEDURE

Within the first six months of their marriage, couples were contacted to complete two tasks relevant to the current study. First, couples were mailed a packet of questionnaires that included a self-report measure of relationship commitment, as well as

a letter instructing couples to complete all questionnaires independently of one another. Couples were paid $50 for completing this part of the study. Second, couples were asked to complete a 14-day daily diary task. Spouses were given the option to complete the diaries online or to complete them using a paper version. Spouses opting to complete their diaries online were given a participant identification number which they used to log on to a website every evening to complete their diaries. Spouses who chose the paper version were given all 14 days of the paper diaries along with a set of pre-stamped envelopes. They were instructed to independently fill out one diary each night before going to bed and to send the diary in the mail the next morning. Couples were paid $30 for completing this part of the study.

Overall, 165 couples (96%) participated in the daily diary portion of the study. Seventy three percent of participants elected to complete their diaries online, while the remaining 27% chose the paper diary option. Eighty percent (129 husbands, 133 wives) of spouses completed all 14 nights of the diary. Ninety-nine percent (160 husbands, 163 wives) of participants provided at least three days of diary data. In all, husbands completed a total of 2,144 diary days and wives completed a total of 2,174 diary days. The time stamp of those spouses completing their diaries online and the postmarks of each paper diary day returned were checked to confirm spouses' compliance with the diary instructions. A total of 81% (3,511) of diary days were returned with the correct time stamp and postmark. There were no differences between spouses completing their diaries online and those choosing the paper diary in the number of days completed or their compliance. Spouses completing all 14 nights of the diary did not differ from spouses providing less data in their average external stress, depletion, relationship behaviors or marital appraisals over the diary days. Notably, as data were examined through growth curve modeling, participants who did not provide all 14 days of data

could be included in the analyses. Thus, results reported are based on data from all 165 couples that completed the diary.

MATERIALS

Daily stressful life circumstances. To assess spouses' daily stress, the diary presented participants with nine events likely to occur in the daily lives of young couples and asked that they indicate whether any of the events had occurred that day. These items were taken from measures of daily stress used in prior diary research (Bolger, DeLongis, Kessler, & Schilling, 1989). Events were chosen that would not be a likely consequence of marital satisfaction or marital distress. Thus, the measure taps only stressors that are external to the marriage. Examples of items are, "received poor evaluation or feedback at work or school," "a lot to do at work or at school," "problems with transportation," "sickness or injury," and "argument with friends." A composite stress score was computed for each spouse on each day by summing the number of stressors reported, with higher scores indicating greater stress.

Daily self-regulatory depletion. Four items were taken from measures of depletion used in prior research (Finkel & Campbell, 2001) to assess daily self-regulatory depletion. All depletion items were assessed on a 7-point Likert scale ranging from 1 (*I didn't feel this way at all*) to 7 (*I felt this way a lot*). These items are, "I felt overwhelmed with work/school," "I felt preoccupied with things other than my marriage," "I felt tired," and "I exerted a lot of 'willpower' to get through the workday." As the first item may conceptually overlap with the daily stress item referring to work/school, it was omitted from the computation of daily depletion. An average depletion score was computed for each spouse on each day, with higher scores indicating greater depletion. The internal consistency of the measure was high across days, ranging between .70 and .83 for husbands, and between .66 and .83 for wives.

Daily relationship behaviors. To assess the positive and negative relationship behaviors exchanged between partners, spouses were presented with a checklist of relationship behaviors and asked to indicate whether any of the behaviors took place that day. Five of these items were negative behaviors participants could have enacted towards their spouse. Example items include: "You showed anger or impatience toward your spouse," "You criticized/blamed your spouse." Four items represented positive behaviors participants could have enacted towards their partners. Example items include: "You listened to or comforted spouse," "You tried to make your spouse feel loved." Additionally, spouses were asked to report whether or not their partner enacted any of these same behaviors towards them. Summed composite scores were created for both positive behaviors and negative behaviors, given and received, for each spouse on each day, with higher scores indicating a greater number of behaviors reported.

Daily marital appraisals. Three items modified from the Kansas Marital Satisfaction Scale (Schumm, Paff-Bergen, Hatch, & Obiorah, 1986) were used to measure spouses' daily appraisals of their marital relationship. These questions are, "How satisfied are you with your partner today?" "How satisfied are you with your relationship with your partner today?" and, "How satisfied are you with your marriage today?" Participants responded to all items on a 7-point Likert scale ranging from 1 (*very unsatisfied*) to 7 (*very satisfied*). A summed composite score was created for each spouse on each day, with higher scores indicating more positive appraisals. The internal consistency of the measure was high across days, ranging between .93 and .98 for husbands, and between .94 and .98 for wives.

Relationship commitment. To assess the motivation to maintain the marriage, two items from a commitment scale developed by Rusbult, Martz, and Agnew (1998) were used. These items are, "I am committed to maintaining my relationship with my

partner," and "I want our relationship to last for a very long time." Items were assessed on a 7-point Likert scale ranging from 1 (*Disagree Strongly*) to 7 (*Agree Strongly*). A summed composite score was created for each spouse, with higher scores indicating greater marital commitment.

DATA ANALYSIS

In order to examine stress spillover effects, as well as potential mediators of these effects, a within-person approach was adopted. Within-person analyses allowed us to examine whether changes in a spouse's stress were associated with changes in the spouse's marital behaviors and appraisals, controlling for spouses' idiosyncratic tendencies to view their relationship and their stress more or less favorably. This approach also allowed us to examine whether daily changes in levels of self-regulatory depletion may mediate these effects. Due to the nested and interdependent nature of these data, multilevel modeling analyses were conducted using Hierarchical Linear Modeling (HLM; Bryk & Raudenbush, 1992). This approach was adopted for several reasons. First, in contrast to other approaches to analyzing multilevel models (e.g., structural equation modeling), HLM provides reliable estimates of within-subject parameters even when sample sizes are relatively small. Second, HLM provides maximally efficient estimates of these parameters by weighting individual estimates according to empirical Bayes theory. When the within-subject parameter for an individual can be estimated precisely, the final estimate relies heavily on the individual data. When the parameter cannot be estimated precisely (e.g., because of missing data), the final estimate relies more heavily on the mean of the sample. Because the most precise estimates therefore contribute more to the final estimated variance of the sample, variances estimated in this way tend to be more conservative than those obtained through

traditional OLS methods. Thus, HLM is particularly appropriate for data with expected attrition, such as an intensive repeated measures daily diary design.

To account for statistical interdependence within couples when examining spillover effects, we followed procedures described by Laurenceau and Bolger (2005), which are based on recommendations by Raudenbush, Brennan, and Barnett (1995). Specifically, husbands' and wives' effects were estimated simultaneously and dummy variables were used to nest husband and wife data within each couple. Tests for mediation, however, were more complex. As all variables were measured at the within-person level, our primary hypotheses required tests of lower level mediation (also known as 1 → 1 → 1 mediation) in which standard mediation equations are modified to include the covariance between the random effects. Currently, there is some debate regarding the most appropriate method for estimating lower level mediation with random effects in multilevel models. Thus, to provide the most comprehensive analysis of this issue, we utilized two different analytic strategies. Below, we briefly review these two methods but direct the reader to the original sources for more detailed explanations.

First, we followed procedures outlined by Kenny, Korchmaros, and Bolger (2003). Using this piecemeal approach, the effects of *X* on *M* and *Y* are estimated separately and the sample covariance of the slope estimates is then calculated. One advantage of this approach is that the data are structured in such a way that allows for parameters describing husbands' and wives' data to be estimated simultaneously to control for the non-independence of couple data, as described above. However, though this approach reveals the percent of the overall effect of *X* on *Y* which is mediated by *M*, it does not provide a significance test of the indirect effect.

Second, we followed procedures outlined by Bauer, Preacher, and Gil (2006). In this approach, the entire mediation model is estimated within a single equation through

the use of indicator variables. Thus, this method allows for the direct estimation of the covariance of random effects. It also provides a significance test of the indirect effect. Unfortunately, this approach is not ideal for modeling daily diary data from couples as due to the complexity of model, husbands' and wives' parameters are not able to be estimated simultaneously, but rather must be estimated in separate analyses.

RESULTS

DESCRIPTIVE STATISTICS AND CORRELATIONS

Table 1 presents descriptive statistics for all measures. Not surprisingly, these newlywed couples generally maintained highly positive views of the marriage and exchanged more positive than negative behaviors with their partner across the diary days. Spouses also reported low to moderate levels of stress and self-regulatory depletion. Finally, as expected, these couples were highly committed to maintaining the marriage; in fact, 96% of spouses reported a perfect score on the measure of commitment. Thus, this sample provides a strong test of the hypothesis that stress may affect relationship functioning even among happy and committed couples. To test for possible gender differences on any of the variables, paired-sample t-tests were conducted. Wives experienced significantly greater stress, $t(160) = -2.13$, $p < .05$, and self-regulatory depletion, $t(160) = -3.65$, $p < .001$, as well as reported enacting more negative behaviors, $t(160) = -2.05$, $p < .05$, than did husbands across the diaries days. Additionally, husbands reported that they received significantly more negative behaviors from their spouse, $t(160) = -2.59$, $p < .05$, and that they enacted more positive behaviors towards their wives $t(160) = 2.05$, $p < .05$.

Table 2 presents the within-spouse and between-spouse correlations for all measures. For both husbands and wives, average daily stress was significantly positively associated with their feelings of self-regulatory depletion and their self-reported negative relationship behaviors, such that spouses experiencing greater stress reported feeling greater depletion and exhibiting more negative behaviors toward their partner across the diary days. Likewise, average daily stress also was positively associated with partner-reported negative relationship behaviors, such that spouses reporting greater stress had partners who reported receiving more negativity from their spouse. Average daily self-

regulatory depletion was significantly positively associated with self- and partner-reported negative behaviors for wives and with self-reported negative behaviors for husbands. Thus, spouses reporting greater levels of depletion tended to engage in more negative interactions with their partner. Overall, then, preliminary analyses indicate that all measures performed generally as expected. Nevertheless, these bivariate correlations do not address the within-subjects association between changes in stress and changes in marital processes. To examine the hypotheses of the current study, the following sections present results of analyses investigating these associations directly.

EVIDENCE FOR STRESS SPILLOVER: IS STRESS ASSOCIATED WITH MARITAL BEHAVIORS AND APPRAISALS?

The first goal of the current study was to replicate and extend prior research on stress and marital quality by examining whether evidence of stress spillover could be found even within a sample of happy and highly committed couples.

Stress spillover: Marital behavior. It was predicted that on days when spouses were experiencing greater levels of stress than usual, they would enact more negative and fewer positive behaviors towards their partner. To test this hypothesis, we examined the within-person association between changes in spouses' daily stress and changes in daily negative marital behaviors using the following HLM equation:

$$\text{Spouse's Marital Behavior} = \beta_{1j}\,(\text{husbands}) + \beta_{2j}\,(\text{wives}) + \beta_{3j}\,(\text{husbands' day}) + \beta_{4j}\,(\text{wives' day}) + \beta_{5j}\,(\text{husbands' own stress}) + \beta_{6j}\,(\text{wives' own stress}) + \text{error} \quad \text{[Equation 1]}$$

where spouse's behaviors captures the total number of positive or negative behaviors exhibited on a given day. In this equation, day and stress were centered within-person for each spouse. Centering stress in this way allows for the examination of whether being high or low in stress relative to the individual's own mean rating is associated with

changes in their daily marital behaviors. In other words, this centering strategy controls for individual differences in the amount of stress experienced. β_{1j} and β_{2j} represent an estimate of the average number of positive or negative relationship behaviors across the diary days for a given spouse. β_{3j} and β_{4j} represent the slope of relationship behaviors over time. β_{5j} and β_{6j} represent the within-person association between changes in stress and changes in relationship behaviors over time, controlling for the spouse's average behavior as well as any linear changes in behavior over the diary days. To address the potential role of self-report biases, this model was estimated using behaviors obtained from both self-report and partner report.

Table 3 presents the results of four separate analyses estimating the associations between daily stress and daily positive and negative behaviors, as described by self-report and partner report. Results revealed that for both husbands and wives, increases in external stressors were significantly associated with increases in the number of self-reported negative relationship behaviors, such that on days when spouses were experiencing greater stress than normal, they were more likely to enact negative relationship behaviors towards their partners. Interestingly, partner reports of behavior confirmed the link between daily stress and wives' negative behavior, but not the link between daily stress and husbands' negative behavior. In other words, on days when wives' experienced greater stress, their husbands reported receiving more negative behaviors from wives. Husbands' daily stress, however, was not associated with wives' reports of husbands' negative behavior.

Further analyses were conducted to ensure results held when controlling for the partner's negative behaviors. In other words, we examined whether spouses were more likely to engage in negative behavior on days of greater stress, controlling for the number of negative behaviors that their partners enacted toward them that day. Results confirmed

that spouses reported engaging in more negative behavior on days in which their partners enacted more negative behaviors toward them (β = .35, *SE* = .03, *t* (158) = 10.84, $p <$ .001, 95% CI [.30, .41] for husbands and β = .44, *SE* = .04, *t* (158) = 11.53, $p <$ .001, 95% CI [.36, .52] for wives). Including this control variable did not affect the reported spillover effects.

Turning to positive relationship behaviors, changes in daily stress were not associated with self-reported positive behaviors for either spouse, though there was a marginal tendency for husbands to report receiving fewer positive behaviors from their wives on days when their wives reported experiencing greater stress. As spillover effects were generally not found for positive behaviors, further analyses examining the potential mediating role of self-regulatory depletion were conducted for negative behaviors only.

Stress spillover: Marital appraisals. It was also predicted that on days when spouses were experiencing greater levels of stress they would report less positive appraisals of the marriage. Thus, we examined the within-person association between changes in spouses' daily stress and changes in daily marital appraisals using the following HLM model:

$$\text{Daily Relationship Appraisals} = \beta_{1j}\,(\text{husbands}) + \beta_{2j}\,(\text{wives}) + \beta_{3j}\,(\text{husbands' day}) + \beta_{4j}\,(\text{wives' day}) + \beta_{5j}\,(\text{husbands' own stress}) + \beta_{6j}\,(\text{wives' own stress}) + \text{error} \quad \text{[Equation 2]}$$

where day and stress were centered within-person for each spouse. Again, centering stress in this way allows for the examination of whether being high or low in stress relative to the individual's own mean rating is associated with changes in daily marital appraisals. In this equation, β_{1j} and β_{2j} represent an estimate of the average daily appraisals across the diary days for a given spouse. β_{3j} and β_{4j} represent the slope of appraisals over time. β_{5j} and β_{6j} represent the within-person association between changes

in stress and changes in appraisals, controlling for the spouses' average daily appraisals and any linear changes in appraisals over time. Thus, these last two parameters capture an index of stress spillover. As seen in Table 3, results confirmed that on days when spouses were experiencing greater level of stress than usual, they reported decreases in their daily marital appraisals. Overall, then, results indicate that these loving, newlywed couples were susceptible to stress spillover effects.

DOES SELF-REGULATORY DEPLETION MEDIATE STRESS SPILLOVER EFFECTS?

The second goal of the study was to examine whether stress may interfere with effective relationship functioning by draining spouses of the self-regulatory resources necessary to navigate relationship issues.

Self-regulatory depletion and marital behavior. In order to examine whether self-regulatory depletion may account for the link between stress and marital behavior, we first followed steps outlined by Kenny et al. (2003). Using this approach, we first estimated the association between changes in daily stress and changes in self-regulatory depletion using the following equation:

$$\text{Daily Depletion} = \beta_{1j}\,(\text{husbands}) + \beta_{2j}\,(\text{wives}) + \beta_{3j}\,(\text{husbands' day}) + \beta_{4j}\,(\text{wives' day}) + \beta_{5j}\,(\text{husbands' own stress}) + \beta_{6j}\,(\text{wives' own stress}) + \text{error} \quad \text{[Equation 3]}$$

where day and stress were centered within-person for each spouse. In this equation, β_{1j} and β_{2j} represent an estimate of the average level of depletion experienced over the diary days. β_{3j} and β_{4j} capture the slope of a spouse's depletion over time. β_{5j} and β_{6j} capture the within-person association between a spouse's daily depletion and level of stress, controlling for the spouse's average depletion and any linear changes in depletion over time. Results confirmed that on days when spouses were experiencing greater stress than normal, they also reported increased feelings of self-regulatory depletion (β = .53, *SE* =

.05, t (163) = 11.23, $p < .001$, 95% CI [.43, .63] for husbands and $\beta = .69$, $SE = .05$, t (163) = 13.11, $p < .001$, 95% CI [.59, .79] for wives). Next, the following equation was used to estimate the effects of both self-regulatory depletion and stress on the expression of self-reported negative relationship behaviors:

$$\text{Daily Negative Relationship Behaviors} = \beta_{1j}\,(\text{husbands}) + \beta_{2j}\,(\text{wives}) + \beta_{3j}\,(\text{husbands' day}) + \beta_{4j}\,(\text{wives' day}) + \beta_{5j}\,(\text{husbands' own stress}) + \beta_{6j}\,(\text{wives' own stress}) + \beta_{7j}\,(\text{husbands' own depletion}) + \beta_{8j}\,(\text{wives' own depletion}) + \text{error}$$

[Equation 4]

where day, stress, and depletion were centered within persons. As seen in Table 4, on days when spouses reported greater levels of self-regulatory depletion, they also reported enacting more negative behaviors toward their partner. Moreover, the association between stress and negative behaviors was reduced to non-significance when including depletion in the model for husbands only. Results from these equations were then used to calculate the percent variation of stress on negative behaviors that is accounted for by depletion according to procedure outlined by Kenny and colleagues (2003). Namely, the total effect was first estimated using the following equation

$$c = c' + ab + \sigma_{ab} \qquad \text{[Equation 5]}$$

Next, the percent of variation of daily stress on daily negative relationship behaviors explained by daily depletion was calculated using:

$$c - c'/c \qquad \text{[Equation 6]}$$

Results revealed the percent variation of stress on negative behaviors explained by depletion to be 40% for husbands and 11% for wives.

Mediation effects were also examined using a second procedure outlined by Bauer et al. (2006). As previously mentioned, this approach estimates the entire

mediation model within a single equation. However, as this approach is not suitable for data nested within three-levels, it was necessary to estimate husbands and wives effects in separate models. Bauer and colleagues (2006) provided an online spreadsheet (available at www.quantpsy.org) for calculating the indirect and total effects, 95% confidence intervals, standard errors, and significance test.

For husbands, the average indirect effect was estimated to be -.001, SE = .01, p > .05, 95% CI [-.02, .02] and the average total effect was estimated to be .05, SE = .02, p < .05, 95% CI [.01, .10]. For wives, the average indirect effect was estimated to be -.001, SE = .01, p > .05, 95% CI [-.03, .03] and the average total effect was estimated to be .10, SE = .02, p < .001, 95% CI [.06, .15]. In contrast to the Kenny approach, then, this procedure did not support the notion that depletion may account for the effects of stress on negative relationship behaviors, as tests of the indirect effects failed to reach significance.

Self-regulatory depletion and marital appraisals. To examine whether self-regulatory depletion may account for the link between stress and marital appraisals, the following equation was used to estimate the effects of both self-regulatory depletion and stress on daily appraisals:

$$\begin{aligned}\text{Daily Relationship Appraisals} = {} & \beta_{1j}\,(\text{husbands}) + \beta_{2j}\,(\text{wives}) + \beta_{3j}\,(\text{husbands' day}) + \\ & \beta_{4j}\,(\text{wives' day}) + \beta_{5j}\,(\text{husbands' own stress}) + \beta_{6j}\,(\text{wives' own stress}) + \\ & \beta_{7j}\,(\text{husbands' own depletion}) + \beta_{8j}\,(\text{wives' own depletion}) + \text{error}\end{aligned}$$

[Equation 7]

where day, stress, and depletion were centered within persons. As seen in the bottom half of Table 4, on days when spouses reported greater levels of self-regulatory depletion, they reported less favorable appraisals of the marriage. In addition, the association between stress and marital appraisals was reduced to non-significance for both spouses

when including depletion in the model. Results from Equations 2, 3, and 7 were then used to calculate the percent variation of stress on marital appraisals that is accounted for by depletion (Kenny et al., 2003). Results revealed the percent variation of stress on marital appraisals explained by depletion to be 56% for husbands and 82% for wives.

Again, we also examined the mediating role of self-regulatory depletion using the previously described method outlined by Bauer et al. (2006). For husbands, the average indirect effect was estimated to be -.08, SE = .02, p < .001, 95% CI [-.12, -.04] and the average total effect was estimated to be -.12, SE = .04, p < .01, 95% CI [-.20, -.05]. For wives, the average indirect effect was estimated to be -.08, SE = .02, p < .001, 95% CI [-.12, -.05] and the average total effect was estimated to be -.11, SE = .04, p < .01, 95% CI [-.18, -.04]. As tests of the indirect effects were significant for both spouses, these results indicate that self-regulatory depletion accounts for the association between daily stress and daily marital appraisals.

DISCUSSION

SUMMARY OF RESULTS

One challenge to maintaining a happy and healthy marriage involves navigating the stressful life events external to the relationship that often disrupt functioning within the relationship. The current paper proposed that stressful environments should hinder adaptive relationship functioning by draining spouses of the self-regulatory resources needed to effectively respond to relationship issues. In order to examine whether self-regulatory depletion may mediate the link between stress and marital functioning, we first investigated whether stress spillover effects could be found within a sample of happy and highly committed newlywed couples. Examination of the within-person covariance between daily stress and daily relationship behaviors revealed a significant association between stress and the expression of negative behaviors for both spouses, such that on days of greater stress, spouses were more likely to enact negative behaviors toward their partner. Two statistical methodologies were then used to examine the potential mediating role of self-regulatory depletion. The first method, proposed by Kenny et al. (2003), revealed that when stress and depletion were entered simultaneously into a model predicting daily negative relationship behaviors, depletion was a significant positive predictor of behavior, while the link between stress and behavior was reduced to non-significance. Furthermore, daily depletion accounted for close to half of the effect of daily stress on the increase in negative behaviors for husbands, and around 11% of the effect for wives. When using the method proposed by Bauer et al. (2006) however, the indirect effects testing for mediation did not reach significance. It is worth noting that this latter method did not allow for husbands and wives to be run in the same model, and that this failure to account for the interdependence of couple-level data might be what is

responsible for this failure to replicate the previous results. Given that our data is non-independent, the first method is likely the most appropriate test of mediation.

The current study also examined whether self-regulatory depletion may mediate the link between stress and daily relationship appraisals. Supporting previous work (e.g., Karney et al., 2005), the current study found that on days of greater daily stress, both husbands and wives reported lower appraisals of the marriage. Extending prior work, results from both of the mediation analyses indicated that self-regulatory depletion accounted for a large majority of the effect of stress on appraisals. In fact, estimates suggested that depletion accounted for 82% of the effect of stress on relationship appraisals for wives and for 56% of the effect for husbands. Thus, these results are consistent with the idea that stress may drain spouses of the energy and resources necessary for adaptive relationship functioning.

Interestingly, increases in daily stress were not associated with the frequency of positive relationship behaviors reported, suggesting that negative behaviors are more strongly influenced by the experience of stress and depletion than are positive behaviors. It may be that while self-regulatory depletion drains spouses of the energy necessary for inhibiting impulsive, destructive relationship behaviors, it does not overwhelm the overall positivity of the marital climate that is characteristic of early marriage (e.g., Huston, Caughlin, Houts, Smith, & George, 2001). In other words, although newlyweds are more likely to engage in negative behaviors when experiencing greater stress, the glow of the "honeymoon period" may help buffer couples from the full detrimental effects of stress. A sample of couples married for a longer duration may provide stronger evidence that self-regulatory depletion both increases negative behaviors and decreases positive behaviors.

Overall, the current findings have important theoretical and practical implications for understanding the role stress may play in relationship development. As even these highly committed newlyweds found it more difficult to engage in relationship promotive ways under conditions of greater stress, these results highlight the notion that relationship success requires more than a strong motivation to persevere marriage. Rather, spouses also must have a supportive environment in which to exercise their relationship skills. Put another way, even couples who generally exhibit good marital functioning may find it difficult to use those skills if stressful environments impede couples' capacity to draw upon and use those skills. Thus, interventions aimed at improving marriages may want to incorporate a focus on aiding couples in their stress management techniques.

STRENGTHS AND LIMITATIONS OF THE STUDY

Our confidence in the results of this study is supported by a number of strengths in the methodology and design. Foremost among these was our use of multiple analytical approaches that served to limit the possibility of third variables influencing the results. For instance, within-subject analyses were used to examine the associations between stress, depletion, and relationship quality. Therefore, we could estimate the association between changes in stress and changes in relationship functioning while controlling for spouses' idiosyncratic tendencies to view their stress and their relationships more or less favorably over the course of the diary. Moreover, to assess daily stress, we used a checklist of stressful events, which provides an estimate of each individual's exposure to stress independent of their subjective ratings of the negativity of the event. A checklist format helps to limit the possibility that third variables, such as general negative affectivity, influenced the results. A final strength of our study was the use of a fairly homogenous sample. Relying on a sample of uniformly happy and committed couples

reduces the likelihood that our effects result from uncontrolled differences such as marital duration and also provides a more conservative test of our hypotheses.

Although there are several strengths of the current study, there are some factors that nevertheless limit interpretations of the current results. First, the data reported are correlational, and thus we are unable to make strong causal inferences. For instance, these data cannot rule out the possibility that the nature of spouses' marriages may have led to changes in the amount of external stress experienced. To address this issue, stressors were chosen that were external to the relationship and not likely to be a consequence of marital quality. Furthermore, as reviewed earlier, experimental and longitudinal work on stress and marital processes confirms that stress can lead to changes in marital quality. Nonetheless, some work also suggests that marital issues can spill over to affect other areas of one's life (e.g., Bolger, DeLongis, Kessler, & Wethington, 1989), suggesting that links between stress and marital quality may be reciprocal in nature. Thus, future research should examine whether poor marital relations may deplete individuals, leaving them more vulnerable to difficulties in coping with other life stressors.

A second limitation of our study is the restricted quantity of data that could be gathered with the daily diary design. Such a design necessitates that measures be short and easy to complete in order to prevent participant attrition. Though a stress checklist helped to reduce self-report biases in our measure of stress, it may also have missed important events in spouses' daily lives and thus may represent a conservative estimate of spouses' levels of daily stress. A more comprehensive stress measure likely would provide even stronger results.

Lastly, while we believe our homogenous sample is an important strength of the study, the sample limits the generalizability of our findings. For instance, for less

satisfied couples, who may not have the same motivation to perceive the relationship positively, stress may have an even stronger effect on relationship cognitions. However, stress was significantly associated with spouses' relationship cognitions even in this conservative sample of happy couples which not only serves to enhance our confidence in these findings, but also attests to the fact that even among the happiest of couples, external stress may strain relationship well-being.

DIRECTIONS FOR FUTURE RESEARCH

Future research should attempt to identify factors that may reduce the degree of self-regulatory depletion experienced when managing stress. For instance, according to the strength model of self-control (Muraven et al., 2008) practice engaging in small acts of self-control can build individuals' self-regulatory resources, thereby enhancing individuals' ability to maintain self-control when faced with future effortful tasks. Consistent with this model, recent research has found that practice coping with small manageable stressors early in a marriage may help inoculate couples against the detrimental effects of future stressors (Neff & Broady, 2011). However, additional research is needed to address the potential mechanisms underlying these practice effects. It is possible that practice overcoming manageable stressors may improve individual's coping efficiency, leaving them greater self-regulatory resources for managing relationship issues.

CONCLUSIONS

Traditionally, theories and research on relationship maintenance have focused on identifying the characteristics of individuals (e.g., personality traits) and their relationships (e.g., commitment, relationship happiness) that predict more constructive forms of relationship functioning. In other words, much of the existing literature suggests that adaptive relationship processes are a consequence of factors situated within the dyad. Yet, this perspective overlooks the fact that the environmental context is an important factor for determining why some relationships last while others dissolve. The current study highlights how stressful environments make it more difficult for spouses to engage in pro-relationship behaviors and effectively maintain happy and healthy relationships. In this way, and as Berschied once noted (1999), even the knot tied by the most committed of spouses can come undone if the relationship is situated in a toxic setting.

Table 1. Means and Standard Deviations

	Husbands	Wives
Commitment		
M	13.91	.52
SD	13.94	.43
Average Daily Stress		
M	.65	.44
SD	.74	.41
Average Daily Self-Regulatory Depletion		
M	2.59	.99
SD	2.95	1.00
Average Daily Relationship Appraisals		
M	6.20	.82
SD	6.21	.71
Average Daily Self-Reported Positive Behaviors		
M	2.24	.93
SD	2.06	.91
Average Daily Partner-Reported Positive Behaviors		
M	2.14	.87
SD	2.05	.84
Average Daily Self-Reported Negative Behaviors		
M	.30	.35
SD	.35	.34
Average Daily Partner-Reported Negative Behaviors		
M	.31	.35
SD	.39	.43

Note: Commitment scores could range from 2 to 14. Average daily stress could range from 0 to 9. Average daily self-regulatory depletion scores could range from 1 to 7. Average daily relationship appraisals could range from 1 to 7. Average daily self-reported positive behaviors could range from 0 to 5. Average daily partner-reported positive behaviors could range from 0 to 5. Average self-reported negative behaviors could range from 0 to 4. Average partner-reported negative behaviors could range from 0 to 4.

Table 2. Within-spouse and Between-spouse Correlations for Commitment and Average Daily Diary Variables

	1	2	3	4	5	6	7	8
(1) Commitment	**-.02**	-.01	-.08	.27***	.19*	.07	-.04	.01
(2) Average Daily Stress	-.11	**.26*** **	.55***	-.08	.16*	.10	.17*	.19*
(3) Average Daily Self-Regulatory Depletion	-.18*	.45***	**.22** **	-.12	.09	.04	.16*	.07
(4) Average Daily Relationship Appraisals	.19*	-.10	-.08	**.45*** **	.25***	.15^{+}	-.40***	-.42***
(5) Average Daily Self-Reported Positive Behaviors	.12	.12	.02	.40***	**.31*** **	.34***	.19*	.01
(6) Average Daily Partner-Reported Positive Behaviors	.12	-.05	-.10	.32***	.28***	**.28*** **	.09	.00
(7) Average Daily Self-Reported Negative Behaviors	-.07	.24**	.18*	-.36***	.11	-.08	**.53*** **	.51***
(8) Average Daily Partner-Reported Negative Behaviors	-.07	.17*	.16*	-.36***	.05	-.03	.59***	**.48*** **

Note: Husbands' correlations are above the diagonal and wives' correlations are below. The diagonal (in bold) contains between-spouse correlations. $^{+}$ *p<.10, *p<.05, **p<.01, ***p<.001.*

Table 3. Stress Spillover: Within-person associations between daily stress and marital functioning.

	β	SE	*t*	95% CI LL	95% CI UL
Daily Negative Marital Behaviors					
Husbands					
Stress Spillover (self-reported behavior)	.05	.02	2.72**	.01	.09
Stress Spillover (partner-reported behavior)	.03	.02	1.44	-.01	.07
Wives					
Stress Spillover (self-reported behavior)	.09	.02	4.57***	.05	.13
Stress Spillover (partner-reported behavior)	.06	.02	2.64**	.02	.10
Daily Positive Marital Behaviors					
Husbands					
Stress Spillover (self-reported behavior)	.03	.04	.70	-.05	.11
Stress Spillover (partner-reported behavior)	-.01	.04	-.10	-.09	.07
Wives					
Stress Spillover (self-reported behavior)	.02	.03	.61	-.04	.08
Stress Spillover (partner-reported behavior)	-.07	.04	-1.92^{+}	-.15	.01
Daily Marital Appraisals					
Husbands					
Stress Spillover	-.09	.04	-2.53*	-.17	-.01
Wives					
Stress Spillover	-.07	.03	-2.32*	-.13	-.01

Note: All effects are reported as unstandardized regression coefficients.
$^{+}p<.10$, *$p<.05$, **$p<.01$, ***$p<.001$. *df* = 158 for partner-reported behavior. For all other analyses *df* = 163.

Table 4. Self-regulatory depletion as a mediator of stress spillover.

	β	SE	*t*	95% CI	
				LL	UL
Daily Negative Marital Behaviors					
Husbands					
Self-regulatory depletion	.04	.01	3.05**	.02	.06
Stress	.03	.02	1.36	-.01	.07
Wives					
Self-regulatory depletion	.03	.01	2.08*	.01	.05
Stress	.08	.02	3.70***	.04	.12
Daily Marital Appraisals					
Husbands					
Self-regulatory depletion	-.09	.02	-4.23***	-.13	-.05
Stress	-.04	.04	-1.17	-.12	.04
Wives					
Self-regulatory depletion	-.08	.02	-4.71***	-.12	-.04
Stress	-.02	.03	-.78	-.08	.04

Note: All effects are reported as unstandardized regression coefficients.
$^{+}p<.10$, *$p<.05$, **$p<.01$, ***$p<.001$. *df* = 163

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