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# Stress Hormone Changes and Marital Conflict: Spouses' Relative Power Makes a Difference

*We investigated the impact of relative marital power on 72 newlywed couples' endocrinological responses to marital conflict. Marital power was determined by comparing spouses' reports of dependent love for one another. Less powerful spouses displayed elevated adrenocorticotropic hormone (ACTH) responses to a conflict discussion. Shared power appeared to have a beneficial effect on wives' but not husbands' ACTH responses. Spouses' cortisol levels declined over time, except for wives who were less powerful and for husbands who shared power with their wives. Conflict behaviors did not differ as a function of this marital power index. These data suggest that relative levels of general emotional power in relationships may play an important role in spouses' physiological responses to marital conflict.*

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Romantic relationships, particularly marital relationships, play an especially important role in individuals' lives. Research has documented both direct and indirect effects of marriage on the health of spouses (Burman & Margolin, 1992; Kiecolt-Glaser & Newton, 2001); in general, married individuals are better off both physically and psychologically than their nonmarried counterparts (Goodwin, Hunt, Key, & Samet, 1987; Gordon & Rosenthal, 1995; Kiecolt-Glaser & Newton, 2001).

The potential benefits of marriage are balanced with risks, however. Negative marital interactions affect cardiovascular, endocrinological, and immunological function (Kiecolt-Glaser et al., 1997; Malarkey, Kiecolt-Glaser, Pearl, & Glaser, 1994; Miller, Dopp, Myers, Felten, & Fahey, 1999). For example, hostile interactions increased wives' blood pressure (Ewart, Taylor, Kraemer, & Agras, 1991), and husbands' withdrawal during conflict was associated with increases in wives' norepinephrine and cortisol (Kiecolt-Glaser et al.,

1996). Chronic increases of these stress hormones are linked to poorer cardiovascular and immune outcomes (Ader, Felten, & Cohen, 1991; Kuhn, 1989). Further, negative marital behavior has been associated with dysregulated immune function (Dopp, Miller, Myers, & Fahey, 2000; Kiecolt-Glaser et al., 1997; Miller et al., 1999). Although these data are provocative, most work focuses on physiological effects of specific conflict behaviors, and none of the work to date has addressed a potentially important predictor of individuals' psychological and endocrinological responses to marital conflict: spouses' relative levels of power within their marriage.

Prior to addressing why we might expect relative power to be associated with spouses' stress hormone levels, we first address this important issue: What is meant by marital power, and how should one go about assessing it? Below, we review extant research regarding marital power, focusing on past conceptualizations and measurement. Building on the insights of others (Safilios-Rothschild, 1976; Sprecher, 1985; Waller & Hill, 1951), we argue for a broad, relationship-focused operationalization of power centered on feelings of dependent love between spouses. Finally, we present related evidence from both animal and human models that suggests the likelihood of differential stress hormone responses as a function of relative marital power.

## Assessing Marital Power

Although marital power is a fascinating intrarelationship concept with important consequences (e.g., violence; see Babcock, Waltz, Jacobson, & Gottman, 1993; Sagrestano, Heavey, & Christensen, 1999), it has proved to be a difficult dynamic to assess reliably. This difficulty is driven by the fact that power is not a unitary construct. Consequently, approaches to measuring power seldom converge (Babcock et al.). To date, three primary measurement or assessment approaches have been used: (a) applications of resource theory, (b) spouse reports of the process of decision making, and (c) assessment of behavioral indicators. The resource theory approach is rooted in traditional gender ideology stereotypes, where the spouse who "brings home the bacon" is identified as the most powerful. Spouses are compared with each other in regard to their access to some resource. The spouse with access to (e.g., income) or potential access to (e.g., socioeconomic status) the most resources is presumed to be relatively more powerful (Babcock et al.; Safilios-Rothschild, 1976; Tichenor, 1999). Spouses have also been asked to indicate who most often makes important decisions for the dyad (Gray-Little & Burks, 1983). The rationale behind this approach is that the spouse with greater marital power most likely has final authority over important marital decisions (Cromwell & Olsen, 1975), although the bases of this process of decision making are not explicated. Finally, behavioral indicators of power differentials are often used (Babcock et al.; Christensen & Heavey, 1990; Gray-Little & Burks, 1983). For example, by observing couples' attempts to resolve an area of disagreement, specific displayed behaviors can serve as a sign of power. Withdrawal during discussion is considered one behavioral indicator of marital power. On one hand, those with more power withdraw during conflict as a way of protecting the status quo within the marriage or to avoid conflict escalation. On the other hand, a spouse seeking change in the relationship lacks structural power, hence the attempt to change the status quo (Christensen & Heavey).

These approaches to delineating marital power have some face validity but are limited on a number of levels. With regard to resource theory, the full range of resources that spouses can exchange is often ignored, and resources within the relationship, such as the relationship-level variable love (versus external resources such as income), are seldom considered (Blanton & Vandergriff-Avery, 2001; Kulik, 1999; Safilios-Rothschild, 1976). Reports of the dynamics of decision making are also problematic because husbands tend to overestimate their own power, whereas wives underestimate theirs. As a result, gaining accurate reports are difficult, and self-reports tend to follow traditional gender ideology stereotypes (Gray-Little & Burks, 1983), leading to the presumption that men are more likely to hold power within marriage despite evidence to suggest otherwise (Blanton & Vandergriff-Avery; Trentham & Larwood, 2001). In addition, spouses likely share power in decision making depending on the specific target domain (e.g., the wife may control the budget and the husband most often chooses how to spend leisure time; Gray-Little & Burks), highlighting the importance of a high degree of specificity between the power measure and outcome of interest (Allen & Straus, 1984). Finally, behavioral indicators, although less subject to self-report biases, serve

as an assessment of the consequences of power differentials, or what Cromwell and Olsen (1975) referred to as "power processes"; the root of the power, or lack thereof, remains elusive.

Given the domain-specific nature of these approaches, it is not surprising that their use for delineating power often yields identification of different spouses with power in the same marriage depending on the measure used (Gray-Little & Burks, 1983). Thus, considering these limitations, we sought a more general measure of power that would potentially impact spouses' stress hormone responses across a range of domains. We chose to compare spouses on their levels of dependent love for one another. Interestingly, our approach is not without precedence: Levels of love or emotional involvement between spouses has long been considered a key variable in the power equation (Safilios-Rothschild, 1976; Sprecher, 1985; Waller & Hill, 1951). For example, Waller and Hill noted that when one spouse perceives the other to be more in love, that spouse tends to have more power in decision making. Further, relative levels of emotional involvement have been used to successfully predict control over specific health behaviors in adolescent relationships, such as getting one's way with respect to condom use (Tschann, Adler, Millstein, Gurvey, & Ellen, 2002). In this latter study, a general measure of power in decision making did not differentiate control over this important health behavior (Tschann et al.).

## Emotional Involvement, Marital Power, and Conflict

Taking these diverse viewpoints into account, we conceptualized marital power as inextricably linked to perceptions of dependence and control within a marriage, which are inherently tied to levels of emotional involvement, or love. Rusbult, Arriaga, and Agnew (2001) argued that more dependent individuals hold less power in a relationship and are considerably more distressed when that relationship is threatened (for example, during conflict), so much so that dependence exerts profound effects on interaction. Further, according to the principle of least interest (Thibaut & Kelley, 1959; Waller & Hill, 1951), "that person is able to dictate the conditions of association whose interest in the continuation of the affair is least" (Waller & Hill, p. 191). With regard to love, we, in line with others, suggest that the person less emotionally involved in a relationship holds more power within that relationship (Babcock et al., 1993; Kulik, 1999; Tschann et al., 2002). Notably, less powerful spouses are at a greater risk for psychological distress and illness (Fowers, 1994; Suls & Mullen, 1981), whereas partners who hold more power can exercise control within their marriages (Leik, Owens, & Tallman, 1999).

In addition, we focused on the manifestation of these general power differentials in one particular context—namely, marital conflict regardless of the source of that conflict. Rollins and Bahr (1976) emphasized power as "the relative potential of marriage partners to influence the behavior of each other when conflict exists between them" (p. 620). In other words, power within marriage is not an attribute of a single individual in the marriage, but rather a dynamic between dyad members. A key characteristic of their definition is that power comes into play when spouses are at odds with one another, suggesting that differences in power are particularly relevant during resolution of a disagreement (Ball, Cowan, & Cowan, 1995; Ballard-Reisch & Weigel, 1999; Cromwell & Olsen, 1975; Safilios-Rothschild, 1970, 1976).

## Physiologic Effects of Power Differentials

Relatively few studies have addressed the physiological impact of power differentials. Fortunately, related processes in animal and human studies offer some insights. Social dominance, a function of social status in animals and behavioral control in humans, differentially affects physiological responses across a wide range of species, including rats, rabbits, monkeys, and humans (Shively, 1998; Stefanski, 1998, 2001; Virgin & Sapolsky, 1997). For example, nondominant male laboratory rats show elevated adrenal hormones and decreases in body mass over time (Stefanski, 2001). Similarly, increased heart rates were characteristic of subordinate rabbits, but the effect disappeared when they achieved more dominant positions within the social system (Eisermann, 1992). Additionally, subordinate cynomolgus monkeys were more reactive to novel environments, and they also demonstrated increased cortisol production relative to their dominant counterparts (Shively). Lower-status monkeys also had increased rates of infection

from a common cold-like virus, presumably reflecting immunological dysfunction (Cohen et al., 1997).

What about physiological effects on humans? Perhaps the most compelling line of work linking relative power to physiological outcomes comes from a series of studies by Smith, Brown, and colleagues that detail profound effects of *interpersonal control* on cardiovascular function (Brown & Smith, 1992; Brown, Smith, & Benjamin, 1998; Smith & Brown, 1991; Smith, Gallo, Goble, Ngu, & Stark, 1998). In one study, spouses engaged in discussions about nonmarital topics, and each spouse was instructed to advocate different sides of an issue (e.g., how a mythical school district should handle budget shortfalls; Brown et al.). In general, relatively less dominant spouses, as assessed by spouses' ratings of their own and their spouse's levels of dominance and submissiveness in the relationship, had heightened blood pressure reactivity during these discussions (Brown et al.).

Although this past work has not directly addressed the impact of marital power on stress hormone responses, social and marital dominance can be considered behavioral manifestations of power, suggesting that there are good reasons to expect that power differentials within a marriage would impact spouses' stress hormone responses to conflict. We note that a number of researchers have implicated dependency, love, and emotional involvement in the marital power equation, but to our knowledge, this is the first attempt to use such a measure in the context of physiologic outcomes.

We hypothesized that less powerful spouses would display increased levels of the stress hormones adrenocorticotropic hormone (ACTH) and cortisol following a conflict discussion relative to their more powerful wife or husband, and relative to spouses in relationships in which power is shared. Readers may be most familiar with cortisol, the primary stress hormone considered in stress- and health-related research; however, ACTH and cortisol are both released via activation of the hypothalamic-pituitary-adrenal (HPA) axis. During stress, the hypothalamus secretes corticotropin-releasing factor, which in turn activates the pituitary to secrete ACTH into the bloodstream. ACTH circulates through the blood and eventually stimulates the adrenal cortex to secrete cortisol, the human body's primary glucocorticoid (Rabin, 1999). Importantly, chronic elevations in glucocorticoids (i.e., cortisol) have been implicated in immune dysfunction (Lovallo, 1997; Rabin), suggesting important health consequences. Because individuals' perceptions of control are associated with levels of psychological distress and illness (Fowers, 1994; Suls & Mullen, 1981), we expected that a conflict discussion would lead to a heightened stress response for less powerful spouses, who lack control in the marriage given their greater dependence and emotional involvement relative to their more powerful wife or husband. Finally, we noted at the outset that the majority of extant work on marital dynamics and physiological responses has almost exclusively focused on behaviors displayed by spouses during conflict. Given these findings, we also investigated the extent to which positive and negative behaviors during the conflict discussion differed as a function of our operationalization of spouses' relative power. If relative marital power is in some way systematically related to conflict behaviors, any significant effects of power on hormone responses would be suspect. Evidence of no systematic associations between power and marital behaviors would argue for an independent effect of marital power dynamics on spouses' hormonal responses to conflict.

## Method

### *Subject Selection*

As part of a longitudinal study, immunological, endocrinological, autonomic, behavioral, and self-report data were collected from 90 newlywed couples during a 24-hour admission to the Ohio State Clinical Research Center, a hospital research unit. Participants were paid a total of $375 for their participation ($10 and $15 payments for screening interviews and $350 for participation in the Clinical Research Center portion of the study). The intensive three-stage process used for screening and recruitment, described elsewhere (Kiecolt-Glaser et al., 1993; Malarkey et al., 1994), excluded subjects with any current or past mental or physical health problems. Specifically, participants were excluded if they reported any health problems that would impact biological endpoints, thus reducing error variance in the physiological parameters we assessed. To date, analyses on this sample of newlywed couples have focused on the link between spouses' conflict behaviors and endocrine and immune function, as well as the use of hormonal

responses to predict marital outcomes (Kiecolt-Glaser et al., 1993, 1996; Kiecolt-Glaser, Bane, Glaser, & Malarkey, 2003; Kiecolt-Glaser, Glaser, Cacioppo, & Malarkey, 1998; Malarkey et al.). This work represents the first assessment with these data of the impact of marital power on spouses' stress hormone responses.

### *Clinical Research Center Admission*

*Overview.* Following a 7:00 a.m. admission to the Clinical Research Center, a heparin well was inserted in each participant's arm so that we could draw blood regularly across the 24-hour stay and minimize additional discomfort. After the 1½-hour adaptation period following insertion of the heparin well, subjects were positioned in chairs facing each other in front of a curtain. The couples completed several questionnaires and then sat quietly for 10 minutes.

At the end of the baseline period, a 10- to 20-minute interview helped to identify the best topics for a problem (conflict) discussion. On the basis of this interview and their ratings on a list of common marital problems and while the research team remained out of sight, couples were asked to discuss and to try to resolve two or three marital issues for 30 minutes that the interviewer judged to be the most likely to produce conflict. After a 30-minute break following the conflict discussion, the couples responded to questions about the history of their relationship, generally a pleasant interview that lasted 30–45 minutes. The couples had no further experimental tasks and were left alone together in the room except for the hourly blood draws until 5:00 p.m., when we assessed cardiovascular reactivity during 2-minute mental arithmetic serial subtraction tasks (Kiecolt-Glaser et al., 1993).

*Blood sampling protocol.* For unobtrusive endocrine sampling during the problem discussion task, a long polyethylene tube was attached to the heparin well, allowing nurses to draw blood samples at set intervals out of participants' sight. During the marital interaction tasks, the couples were seated facing each other in front of a curtain, with the polyethylene tubes easily accessible to two nurses who sat behind the curtain. Two psychology team members were also seated behind the curtain during the interviews and monitored the videotaping of the interactions.

Approximately 90 minutes after the heparin well had been inserted, subjects were asked to sit quietly in the chairs used for interviews for 10 minutes, and then the baseline blood samples were drawn. Additional blood samples were drawn at the beginning, middle, and end of the 30-minute conflict task, and at the end of a 30-minute recovery period following the end of the conflict task. Because we were interested in the cumulative effect of the conflict discussion on spouses' physiological responses, endocrine analyses focused on change across time for the baseline, end of conflict, and end of the 30-minute recovery period. These hormonal assessments allow us to determine the extent to which spouses, as a function of relative marital power, react physiologically to the conflict discussion, and whether any physiological reactions persist or subside once the discussion is over.

### *Determining Psychological Power*

The Love Attitudes Scale (Hendrick & Hendrick, 1986) is a multidimensional measure of love, and its subscales are related to both relationship satisfaction and outcomes (Hendrick, Hendrick, & Adler, 1988). Because of its focus on levels of dependent love, the mania subscale of the Love Attitudes Scale was used to classify couple members as more or less powerful relative to their spouse. The seven items index a type of love characterized as possessive and dependent. The majority of items refer specifically to the current partner, although some are worded more generally: (a) "Sometimes I get so excited about being in love that I can't sleep"; (b) "When things aren't right with my lover and me, my stomach gets upset"; (c) "When my love affairs break up, I get so depressed that I have even thought of suicide"; (d) "When my lover doesn't pay attention to me, I feel sick all over"; (e) "When I am in love, I have trouble concentrating on anything else"; (f) "I cannot relax if I suspect that my lover is with someone else"; and (g) "If my lover ignores me for a while, I sometimes do stupid things to get his/her attention back." Participants were asked to indicate the degree with which they agree with each statement: 1 (*strongly disagree*) to 5 (*strongly agree*). Mania scores are less related to other relationship quality indices compared with the other Love Attitudes Scale subscales (e.g., Eros; Hendrick et al., 1988). Hendrick and Hendrick (1986) reported good internal ($\alpha = .73$) and test-retest reliability ($r = .75$). Internal reliability for the current sample was also satisfactory ($\alpha = .73$). Spouses completed this

measure, along with a number of other measures unrelated to the study here, during the 1½-hour adaptation period following insertion of the heparin well.

Eighteen of the original 90 couples were dropped from analyses because one or both spouses' scores were missing (missing values reflect that the Love Attitudes Scale was not initially included in data collection when the study began). For the remaining 72 couples, spouses' ratings were summed. Wives' scores ($M = 24.21$, $SD = 3.91$) were compared with husbands' scores ($M = 24.88$, $SD = 3.63$) within each couple to determine relative levels of emotional involvement in the relationship. The modal difference between spouses' scores was 3. Spouses' scores were modestly correlated, $r\ (72) = .27$, $p < .05$, and were not significantly different from one another, $t\ (71) = -1.24$, ns. Scores were within normal ranges for this measure (Hendrick & Hendrick, 1986, 1989).

The frequency distribution of difference scores indicated that a tertiary split of the sample would be obtained by using cutoff values of −3 and +2. Negative values indicate that husbands' scores were greater than wives' and vice versa. The asymmetrical cutoff values reflect a difference in husbands' and wives' distribution of scores that approached significance ($p < .10$). Given the small average and modal difference between spouses' scores, we took a conservative approach to delineating the power structure in each marriage via comparisons of wives' and husbands' mania score differences. In other words, we did not assume that a wife (or husband) held the power in a given marriage based simply on a few points' difference. Rather, we created groups that maximized these differences so that they might truly reflect power differentials as a function of relative emotional involvement in each marriage. Thus, when wives' scores were more than 2 points higher than their husbands', these relationships were delineated as ones in which the husband was more powerful than the wife (i.e., the wife demonstrated greater levels of emotional involvement; $n = 18$ couples; mean difference = 6.72, $SD = 2.36$, range = −12 to −4). Alternatively, when husbands' scores were more than 3 points greater than their wives', wives were presumed to be relatively more powerful ($n = 20$ couples; mean difference = 4.45, $SD = 1.96$, range = 3 to 9). The remaining couples ($n = 34$ couples; mean difference = −.47, $SD = 1.90$, range = −3 to 2) were delineated as being equal in power (marriages in which power was shared). Although this division of the marital power structure results in disproportionately more couples considered equal in power, we felt this to be advantageous because it maximized the difference in scores for the unequal power groups, while leaving us a sufficient sample for analyses. In addition, based on the distribution of scores and overall small average differences, we felt that the unequal distribution best represented the actual power distribution in our sample. Thus, analyses are based on data from 72 couples, with occasional reductions in degrees of freedom during analyses as a result of missing values or the removal of outliers as noted below.

For this final sample of 72 couples, the average age of wives and husbands was 25.26 ($SD = 2.89$) and 26.19 ($SD = 2.99$), respectively (range = 21 to 37). Participants were well educated: 6.3% were high school graduates, 20.8% had some college training, 56.3% were college graduates, and 16.7% had additional postgraduate training. The average couple's combined income was $44,218 ($SD = 16,304$). The majority were White (96%). Couples dated an average of 36.80 months ($SD = 25.13$) before marriage, and 41 couples (56.9%) lived together before marriage. An average of 10.40 months ($SD = 2.13$; range = 6 to 15) elapsed between their marriage and their Clinical Research Center admission.

### *Marital Interaction Coding System*

The majority of extant work on the physiological effects of marriage on health has focused on the effect of specific problem-solving behaviors. Keeping consistent with this tradition, we also explored the relationships between marital power and problem-solving behaviors of spouses. In doing so, we were able to determine whether any observed effects of marital power on hormone responses could likely be considered independent of conflict behaviors. The Marital Interaction Coding System-IV (Weiss & Summers, 1983) provided data on problem-solving behaviors during the 30-minute marital conflict resolution task. The videotapes were coded by the Oregon Marital Studies Program under the direction of Robert L. Weiss. The Marital Interaction Coding System, the most widely used marital behavioral coding system, is designed to describe couples' behaviors as they attempt to resolve a relationship issue (Weiss & Heyman, 1990). A number of

studies have shown that the Marital Interaction Coding System discriminates well between happy and unhappy couples, and marital therapy studies show changes in coded behaviors from pre- to posttreatment (Sayers, Baucom, Sher, Weiss, & Heyman, 1991). Following the Oregon Marital Studies Program coding conventions, each coder maintained code-by-code agreement with a master coder on at least 70% of a random sample of 20% of the tapes. Tapes were recoded when agreement fell below this criterion.

Most marital communication studies use a positive-negative distinction when assembling summary codes (Sayers et al., 1991) because distressed marriages are characterized by negative affect, conflictual communication, and poor listening skills (Markman, 1991; Sher & Weiss, 1991). To capture these indices in composite indices, we conducted separate factor analyses of Marital Interaction Coding System code frequencies for the positive and negative dimensions. Three positive factors emerged (i.e, eigenvalues greater than 1), and were similar or identical to the dimensions described by Weiss and Summers (1983): a *problem solving–propose change* cluster (negative solution, internal and external problem description, compromise, and positive solution), a *validation–facilitation* cluster (agree, approve, accept responsibility, assent, and positive mind reading), and a *humor* cluster (humor, compliance, and smile or laugh). Although there was not a clear factor solution for negative codes, two clusters emerged that were consistent with the dimensions used by other investigators (Ewart, Taylor, Kraemer, & Agras, 1984; Weiss & Summers). The first cluster included *active negative behaviors* (criticize, disagree, deny responsibility, excuse, interrupt, negative mind reading, noncompliance, put down, turn off, disapprove, and dysphoric affect). These behaviors represent the combined blame and invalidation categories from Weiss and Summers. In addition, they are the same as those used by Ewart et al. (1984) for their *hostile* dimension, with four exceptions: disapprove and dysphoric affect were not included in their earlier version of the Marital Interaction Coding System, and interrupt and noncompliance were not codes that they used. Our second negative dimension tapped *avoidance or withdrawal behaviors* (not tracking, withdrawal, off-topic, and disengage). Several codes were excluded because they did not clearly fit either the positive or negative dimensions (talk, question, paraphrase, and command), their nonoccurrence was related to experimental constraints (positive physical contact), or they overlapped with other codes (e.g., attention and not tracking are correlated, $r = -.98, p < .001$).

### *Endocrine Assays*

The ACTH and cortisol assays were performed in our laboratory with established methods. ACTH levels were determined by an immunoradiometric assay using materials supplied by Nichols Institute (Capistrano, CA). The sensitivity of this assay was 1 pg/ml, which was adequate for detection of basal levels. The intra- and interassay coefficients of variation for this assay were less than 10%. Plasma cortisol was assayed using a fluorescent polarization technique (Abbott Lab, Chicago, IL). This assay has a sensitivity of 0.5 µg/100 ml and an intra- and interassay coefficient of variation of less than 10%. The coefficients of variation of these assays were calculated using at least one high and one low serum control sample. Further, all of the serum samples from each couple for ACTH and cortisol were run in the same assay to diminish interassay variability.

### *Analytical Strategy*

Data for ACTH, cortisol, and conflict behaviors were analyzed at the couple level using repeated-measures analysis of variance (ANOVA). To account for the lack of independence between spouses, spouse (wife vs. husband) served as a within-subjects variable in all analyses. For ACTH and cortisol, change across the three time points (Time) served as an additional repeated measure. Power (husband more powerful, spouses equally powerful, wife more powerful) served as a between-subjects variable. Paired *t* tests were used to test simple effects and to probe any interactions. Following our main analyses, we report results from secondary analyses to rule out potential third-variable explanations of our findings.

## RESULTS

Descriptive statistics and correlations for all study variables can be found in Table 1 (wives below the diagonal, husbands above the diagonal). Not surprisingly, related hormonal measurements (e.g., end of conflict and break cortisol levels) tended to be associated. In addition, for wives, active negative behaviors were moderately

Table 1. *Correlations Among Wives' (Below the Diagonal) and Husbands' (Above the Diagonal) Love Attitudes Scale Mania Score, Mania Score Difference, Physiologic Assessments, and Conflict Behaviors*

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | *n* | *M* | *SD* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Mania score | – | −.57** | .16 | −.16 | .06 | −.05 | −.03 | .05 | −.23 | −.02 | −.12 | −.35** | −.13 | 72 | 24.88 | 3.63 |
| 2. Mania difference | .64** | – | −.14 | .11 | −.15 | −.18 | −.18 | −.36** | .27* | −.12 | .15 | .25* | .29* | 72 | −.67 | 4.56 |
| 3. Baseline ACTH | −.04 | .19 | – | .72** | .77** | .09 | .07 | −.10 | −.05 | −.03 | −.07 | .04 | −.02 | 60 | 17.33 | 10.28 |
| 4. End-con ACTH | −.11 | −.14 | .53** | – | .81** | −.05 | .09 | −.03 | .09 | −.02 | −.03 | .23 | .01 | 55 | 15.02 | 9.01 |
| 5. Break ACTH | .12 | .03 | .49** | .56** | – | −.14 | −.03 | −.12 | −.11 | −.11 | .04 | .12 | .02 | 50 | 12.67 | 8.66 |
| 6. Baseline cortisol | .03 | .12 | .10 | −.30* | −.10 | – | .68** | .65** | −.05 | .05 | −.09 | −.09 | .14 | 72 | 12.30 | 4.90 |
| 7. End-con cortisol | −.23 | −.06 | −.06 | −.15 | −.05 | .83** | – | .74** | −.07 | .09 | −.16 | −.07 | −.20 | 62 | 9.76 | 3.33 |
| 8. Break cortisol | −.17 | −.05 | −.03 | −.18 | −.09 | .79** | .93** | – | .03 | .02 | −.20 | −.05 | −.24* | 70 | 9.02 | 3.56 |
| 9. Prob solving | .01 | .12 | .08 | .01 | −.16 | −.10 | −.16 | −.07 | – | .06 | .04 | .39** | −.21 | 72 | 178.13 | 54.85 |
| 10. Validation | .06 | .10 | .01 | .00 | −.10 | .00 | .06 | .12 | .11 | – | .32** | −.14 | −.10 | 72 | 112.22 | 54.91 |
| 11. Humor | −.01 | .12 | .04 | −.06 | .16 | .12 | .02 | .05 | .13 | .12 | – | .13 | .20 | 72 | 98.47 | 34.69 |
| 12. Active | .01 | .12 | .30* | .16 | .33* | .03 | .00 | −.02 | .27* | −.15 | .03 | – | .07 | 72 | 70.43 | 40.91 |
| 13. Withdrawal | .17 | .12 | .10 | −.07 | .10 | .06 | .02 | −.03 | .07 | −.18 | .18 | −.08 | – | 72 | 9.51 | 11.05 |
| *n* | 72 | 72 | 57 | 52 | 48 | 71 | 61 | 68 | 72 | 72 | 72 | 72 | 72 | – | | |
| *M* | 24.21 | −.67 | 10.85 | 9.24 | 9.07 | 19.58 | 16.19 | 15.43 | 178.13 | 112.22 | 98.47 | 70.43 | 9.51 | | – | |
| *SD* | 3.91 | 4.56 | 11.62 | 6.42 | 5.60 | 8.77 | 8.07 | 6.72 | 49.11 | 63.52 | 49.80 | 44.24 | 8.76 | | | – |

*Note:* Mania difference = Difference between wives' and husbands' Love Attitudes Scale Mania scores; positive values indicate wife's score greater than husband's score and vice versa. ACTH = adrenocorticotropic hormone. End-con = end of conflict. Prob = problem. Variables 8–13 are categories of conflict behaviors. Variations in sample size are a result of missing data.

*$p < .05$. **$p < .01$.

Table 2. *Wives' and Husbands' ACTH Levels as a Function of Marital Power*

| | | Wives' ACTH | | | Husbands' ACTH | | |
|---|---|---|---|---|---|---|---|
| Power | | Baseline | End-Conflict | Break | Baseline | End-Conflict | Break |
| Wife | *M* | 9.90 | 8.34 | 9.41 | 19.37 | 16.73 | 13.13 |
| | *SE* | 2.16 | 1.95 | 1.76 | 2.67 | 2.66 | 2.42 |
| Equal | *M* | 9.10 | 8.94 | 8.96 | 15.44 | 15.63 | 11.98 |
| | *SE* | 1.43 | 1.29 | 1.16 | 1.76 | 1.75 | 1.59 |
| Husband | *M* | 6.26 | 8.71 | 7.93 | 21.58 | 11.03 | 13.44 |
| | *SE* | 2.42 | 2.18 | 1.97 | 2.98 | 2.97 | 2.70 |

*Note:* $n = 41$ couples, ATCH = adrenocorticotropic hormone.

associated with ACTH and cortisol levels. Husbands' withdrawal behaviors were associated with their break cortisol levels, albeit also of a moderate magnitude. Only 3 associations out of a possible 22 between mania scores or mania difference scores were significant: Husbands' mania scores were correlated with their active negative behaviors, and the mania difference score was correlated with husbands' active negative and withdrawal behaviors. Overall, these associations were modest and do not appear to indicate any systematic relationship between the measure used to create power groups and dependent variables.

### *ACTH*

As predicted, hormones differed across measurement occasion as a function of marital power and spouse (i.e., significant three-way interaction), with the less powerful spouse typically demonstrating a relatively elevated ACTH response to conflict, $F(4, 76) = 4.11$, $p < .01$, $\eta^2 = .18$. Wives' and husbands' ACTH levels at each time point as a function of marital power are presented in Table 2. The ANOVA summary table for analysis of change in spouses' ACTH levels across the three time points is presented in Table 3. Twenty-seven couples are not included in analyses because of missing ACTH data (e.g., insufficient blood sample for assay). Four additional couples were dropped from analyses because one spouse's ACTH levels were greater than three standard deviations from the mean for their gender (three wives and one husband). Thus, all ACTH analyses are based on data from 41 couples (husband more powerful in 8 couples, wife more powerful in

Table 3. *ANOVA Summary Table for Changes in Spouses' ACTH as a Function of Marital Power*

| Source | *df* | *SS* | *MS* | *F* | $\eta^2$ |
|---|---|---|---|---|---|
| Between subjects | 40 | 5037.84 | | | |
| Power (A) | 2 | 59.27 | 29.64 | 0.23 | 0.01 |
| Residual between | 38 | 4978.57 | 131.02 | | |
| Within subjects | 205 | 10408.64 | | | |
| Spouse (B) | 1 | 2367.93 | 2367.93 | 21.19** | 0.36 |
| A × B interaction | 2 | 79.79 | 39.89 | 0.36 | 0.02 |
| Residual within (B) | 38 | 4247.30 | 111.77 | | |
| Time (C) | 2 | 273.42 | 136.71 | 6.22* | 0.14 |
| A × C interaction | 4 | 80.76 | 22.69 | 1.03 | 0.05 |
| Residual within (A) | 76 | 1670.61 | 21.98 | | |
| B × C interaction | 2 | 344.82 | 172.41 | 11.86** | 0.24 |
| A × B × C interaction | 4 | 239.20 | 59.80 | 4.11* | 0.18 |
| Residual within (B × C) | 76 | 1104.81 | 14.54 | | |
| Total | 245 | 15446.48 | | | |

*Note:* $n = 41$ couples. ACTH = adrenocorticotropic hormone.
*$p < .01$. **$p < .001$.

10 couples, and spouses equally powerful in 23 couples).

*Wife more powerful.* Overall, husbands' ACTH levels were higher than wives', a finding consistent with extant research on gender differences in ACTH (Born, Ditschuneit, Scheiber, Dodt, & Fehm, 1995; Horrocks et al., 1990). When wives were more powerful, their ACTH levels showed no changes from baseline; end of conflict and break ACTH levels remained at baseline levels, $t\,(9) = 1.11$ and 0.36, respectively, ns. In contrast, husbands' end of conflict ACTH levels did not differ from baseline when their wives were more powerful, $t\,(9) = 1.73$, ns, but their ACTH levels at break were significantly lower than baseline, $t\,(9) = 2.56$, $p < .05$.

*Equally powerful.* Interestingly, when spouses shared marital power, changes in ACTH levels were similar to the changes seen when the wife was more powerful. Wives' ACTH levels again showed no changes. Their end of conflict and break ACTH levels did not differ from baseline, $t\,(22) = 0.16$ and 0.09, respectively, ns. Husbands' end of conflict ACTH levels did not differ from baseline when they shared power with their spouse, $t\,(22) = -0.15$, ns, but their ACTH levels at break were significantly lower than baseline, $t\,(22) = 3.86$, $p < .01$.

*Husband more powerful.* On one hand, when husbands were more powerful than their wives, their wives' ACTH levels increased from baseline to the end of conflict, $t\,(7) = -2.66$, $p < .05$, and returned to baseline levels by break, $t\,(7) = -1.25$, ns. On the other hand, husbands' ACTH levels significantly decreased relative to baseline at the end of conflict and break, although the decrease at break failed to reach significance, $t\,(7) = 2.75$ and 2.26, $p < .03$ and .06, respectively.

*Summary.* Wives' ACTH levels showed no changes when they were more powerful or if they shared power with their husbands; however, their ACTH levels increased following the conflict and then returned to baseline levels when their husbands were more powerful. ACTH levels of husbands consistently declined when they were more powerful than their wives, but did not decline until 30 minutes after the conflict, both when their wives were the more powerful spouse or when power was shared by spouses.

*Cortisol.* Cortisol levels also differed across measurements as a function of marital power and spouse, $F(4, 102) = 3.26$, $p < .05$, $\eta^2 = .11$. Wives' and husbands' cortisol levels at each time point are presented in Table 4. The ANOVA summary for analysis of change in spouses' cortisol levels across the three time points is presented in Table 5. Thirteen couples are not included in analyses because of missing cortisol data (e.g., insufficient blood sample for assay). Five additional couples were dropped from analyses because one spouse's (three wives, two husbands) cortisol levels were greater than three standard deviations from the mean for their gender. Thus, all cortisol analyses are based on data from 54 couples (husband more powerful in 12 couples, wife more powerful in 15 couples, and spouses equally powerful in 27 couples).

*Wife more powerful.* Overall, wives' cortisol levels were higher than husbands', a finding at odds with past research on cortisol responses to psychological stress (Kirschbaum & Hellhammer, 1989; Kirschbaum, Wust, & Hellhammer, 1992).

Table 4. *Wives' and Husbands' Cortisol Levels as a Function of Marital Power*

| | | Wives' Cortisol | | | Husbands' Cortisol | | |
|---|---|---|---|---|---|---|---|
| Power | | Baseline | End-Conflict | Break | Baseline | End-Conflict | Break |
| Wife | *M* | 19.17 | 15.40 | 14.67 | 11.77 | 8.26 | 7.06 |
| | *SE* | 1.62 | 1.65 | 1.50 | 1.04 | 0.73 | 0.64 |
| Equal | *M* | 19.08 | 16.33 | 14.51 | 10.80 | 9.63 | 8.60 |
| | *SE* | 1.21 | 1.23 | 1.12 | 0.77 | 0.54 | 0.48 |
| Husband | *M* | 16.43 | 14.58 | 15.84 | 13.63 | 10.28 | 9.13 |
| | *SE* | 1.81 | 1.85 | 1.68 | 1.17 | 0.81 | 0.71 |

*Note:* $n = 54$ couples.

Table 5. *ANOVA Summary Table for Changes in Spouses' Cortisol as a Function of Marital Power*

| Source | *df* | *SS* | *MS* | *F* | $\eta^2$ |
|---|---|---|---|---|---|
| Between subjects | 53 | 3119.19 | | | |
| Power (A) | 2 | 16.54 | 8.27 | 0.14 | 0.01 |
| Residual between | 51 | 3102.65 | 60.84 | | |
| Within subjects | 270 | 8029.19 | | | |
| Spouse (B) | 1 | 2881.08 | 2881.08 | 49.62** | 0.49 |
| A × B interaction | 2 | 90.35 | 45.17 | 0.78 | 0.03 |
| Residual within (B) | 51 | 2961.42 | 58.07 | | |
| Time (C) | 2 | 655.48 | 327.74 | 51.49** | 0.50 |
| A × C interaction | 4 | 50.12 | 12.53 | 1.97 | 0.07 |
| Residual within (A) | 102 | 649.24 | 6.37 | | |
| B × C interaction | 2 | 6.72 | 3.36 | 0.53 | 0.01 |
| A × B × C Interaction | 4 | 83.36 | 20.84 | 3.26* | 0.11 |
| Residual within (B × C) | 102 | 651.42 | 6.39 | | |
| Total | 323 | 11148.38 | | | |

*Note:* $n = 54$ couples.
*$p < .05$. **$p < .001$.

Further, as indicated in Table 5, spouses' cortisol levels tended to decrease across the three measurement occasions, reflecting the diurnal pattern of cortisol (Kirschbaum & Hellhammer, 1994). Importantly, as a function of marital power, the pattern of these declines varied. On one hand, when wives were more powerful, their end of conflict and break cortisol levels decreased relative to baseline, $t\ (14) = 4.32$ and 4.32, $ps < .01$, respectively. Their break cortisol levels were only marginally different from end of conflict levels, $t\ (14) = 2.00$, $p = .06$. On the other hand, husbands' cortisol levels decreased at both the end of conflict and break relative to baseline, $t\ (14) = 4.40$ and 6.16, $ps < .01$ and .001, respectively. Husbands' cortisol levels also decreased at break relative to the end of conflict, $t\ (14) = 4.21$, $p < .01$ when their wives held the power in the marriage.

*Equally powerful.* When power was shared, wives' cortisol levels decreased at both the end of conflict and break relative to baseline, $t\ (26) = 2.62$ and 4.73, $ps < .02$ and .001, respectively. Wives' cortisol levels also decreased at break relative to the end of conflict, $t\ (26) = 4.53$, $p < .001$. The pattern was different for husbands. On one hand, husbands' end of conflict cortisol levels did not decrease relative to baseline, $t\ (26) = 1.81$, ns. On the other hand, husbands' break cortisol levels did significantly decrease relative to baseline, $t\ (26) = 3.44$, $p < .01$.

*Husband more powerful.* Finally, when husbands were the more powerful spouse, their wives' cortisol levels did not change relative to baseline (all $ps > .20$). In contrast, husbands' cortisol levels decreased at both the end of conflict and break relative to baseline, $t\ (11) = 6.41$ and 6.30, $ps < .001$, respectively. Similar to wives who held the power in the marriage, husbands' cortisol levels also decreased at break relative to the end of conflict when they held the power in the marriage, $t\ (11) = 2.94$, $p < .05$.

*Summary.* Wives' cortisol levels declined both when they held the power in the marriage and particularly when they shared power with their spouse, but their cortisol levels demonstrated no declines across the three measurement occasions when their husbands were more powerful. Husbands' cortisol levels consistently decreased over time—both when they held the power and when their wives held the power in the marriage—but did not decline until break when marital power was shared.

### *Conflict Behaviors*

Means and standard deviations for spouses' conflict behaviors are presented in Table 1. Overall, wives' and husbands' conflict behaviors did not differ as a function of marital power, but two differences by spouse did emerge. Specifically, wives displayed significantly more active

negative behaviors, $F(1, 69) = 7.40$, $p < .01$, $\eta^2 = .10$, and humor behaviors, $F(1, 69) = 6.26$, $p < .02$, $\eta^2 = .08$. No other main effects or interactions emerged.

### *Secondary Analyses*

One of the challenges of psychoneuroimmunological research is ruling out the potential impact of a number of key variables that can be related to the physiological parameters of interest. Thus, we also conducted the above hormone analyses with the following variables included as covariates: marital adjustment, age, weight, consumption of caffeine, amounts of exercise, number of cigarettes smoked daily, evidence of depression, social desirability, positive or negative affect, and total number of words used by each spouse (which can affect individuals' physiological responses during discussion; Ewart et al., 1991). When including couple averages of these variables as covariates in the hormonal analyses, none of the effects reported above was significantly modified.

## Discussion

Spouses' relative levels of power within their marriages had overall theoretically consistent effects on their endocrine responses to conflict. These effects do not appear to be impacted by behaviors enacted during the conflict discussion. We operationalized marital power as a function of spouses' relative levels of dependent love for one another. This focus on emotional involvement is an important component of the marital power equation (Safilios-Rothschild, 1976; Waller & Hill, 1951). Less powerful spouses showed relative increases or sustained elevations in ACTH at the end of a conflict discussion. Specifically, when wives held more power than their husbands, their ACTH levels did not change as related to the conflict. When husbands were more powerful than their wives, wives' ACTH levels after conflict were higher than before the discussion, falling back to baseline levels after break. Husbands who were more powerful than their wives showed significant declines in ACTH at the end of conflict and break. When wives were more powerful, however, husbands' ACTH levels did not decrease until after break. Interestingly, when spouses shared power in the marriage, the pattern of ACTH responses for both spouses mirrored those seen when the wife held the power. Overall, relative marital power demonstrated significant relationships with spouses' ACTH responses to conflict discussions.

Cortisol levels also related to marital power, but the pattern was somewhat different. Wives' cortisol demonstrated significant declines both when they held power in the marriage and when they shared power in the marriage. Given the diurnal rhythm of cortisol (i.e., cortisol tends to naturally decrease throughout the morning hours), this finding suggests that when wives are more powerful than their husbands, or when they share power with their husbands, their cortisol levels follow a normal diurnal pattern. When husbands were more powerful than their wives, wives' cortisol levels did not demonstrate this normal rhythm; their cortisol levels showed no declines across the measurement occasions.

Relative marital power also impacted husbands' cortisol, but in a different fashion. Husbands' cortisol levels also demonstrated normal diurnal declines both when they held the power in the marriage and when their wives were more powerful. When marital power was shared, husbands' cortisol did not decline until 30 minutes after the end of the conflict discussion.

That husbands' cortisol did not consistently decline when they shared power with their wives but did decline when they were less powerful is noteworthy. Equal marital power is typically considered to have beneficial effects on couple and individual functioning (Gray-Little & Burks, 1983; Le & Agnew, 2001; Mirowsky, 1985). Indeed, wives in marriages in which power was shared demonstrated normal cortisol rhythms. It may be that husbands in these marriages found the conflict discussion to be relatively more stressful because there was no clear emotionally dominant spouse to lead the discussion. Recall that ACTH levels of husbands in marriages in which power was shared also did not decline until 30 minutes after the conflict session. Taken together, these findings suggest that shared power may pose a unique challenge for husbands during these discussions. Admittedly, this conclusion is speculative and further research and replication are needed to fully understand this dynamic.

Analyses of cortisol responses also indicated that wives' average cortisol levels were higher than husbands', a gender difference we noted was unexpected given past research on physiological responses to stressors. Discussions about romantic relationships may affect women more

than men (Kiecolt-Glaser & Newton, 2001). Notably, women, compared with men, tend to be more attentive to and concerned with relationship dynamics (Dindia & Allen, 1992; Hochschild, 1983; Reisman, 1990) and are more likely to make a conscious effort to manage the presentation of their relationships to researchers (Loving & Agnew, 2001). Thus, having couples air their dirty laundry, so to speak, might have been particularly stressful for wives given the public nature of the conflict discussion. That said, there is a lack of consensus in the cortisol literature regarding the potential for gender differences in basal cortisol levels, and we are hesitant to draw a firm conclusion regarding this finding (e.g., Kirschbaum, Kudielka, Gaab, Schommer, & Hellhammer, 1999). In other words, the possibility exists that the main effect for spouse might simply be a result of biological differences between husbands and wives. The pattern of changes in spouses' cortisol levels, however, remains meaningful.

What might be the long-term effects of these hormonal response patterns? Stressful behaviors or perceptions of stress resulting in ACTH or cortisol increases could have health repercussions. ACTH and cortisol are both released via activation of the hypothalamic-pituitary-adrenal (HPA) axis. Chronic HPA activation may lead to immune system dysfunction (Lovallo, 1997; Rabin, 1999). In this way, differences in power may have important health consequences. Although the human body can be quite resilient to stress hormone fluctuations, increased stress levels both in and out of marriage are associated with immune and health outcomes (Cohen, Tyrrell, & Smith, 1991; Kiecolt-Glaser, Malarkey, Cacioppo, & Glaser, 1994; Kiecolt-Glaser, Marucha, Malarkey, Mercado, & Glaser, 1995; Marucha, Kiecolt-Glaser, & Favagehi, 1998). For example, oral punch biopsies placed on the hard palate of dental students took, on average, three days longer to heal when the biopsy was administered prior to the first major examination of the term, versus when the biopsy was administered during summer vacation (Marucha et al.). This finding is particularly remarkable in light of the fact that the students were very accustomed to examinations, and the examinations were predictable. In addition, an epidermal punch biopsy (i.e., small piece of skin removed from the upper arm) took significantly longer to heal in persons caring for a demented relative versus carefully matched control participants (Kiecolt-Glaser et al., 1995). Although more work is needed, these studies, along with studies from the animal literature (Eisermann, 1992; Shively, 1998; Stefanski, 2001), certainly suggest that lack of marital power, which could potentially play the role of both a chronic and an acute stressor depending on the nature of the relationship, can have a variety of health effects.

Our results suggest that, for wives, relatively greater levels of emotional involvement might lead to more negative health outcomes in the long term. This conclusion is based on wives' hormonal response patterns to conflict when their husbands were more powerful versus when wives were more powerful or shared power with their husbands. Past research lends some credence to this possibility. One commonly used index of power, decision-making inequality, is negatively associated with health parameters (Hibbard & Pope, 1993; Hindin, 2000). For example, Zimbabwe women with no authority over household decision making had both lower body mass indices, and signs of chronic energy deficiency (Hindin). The extent to which these effects might be due to increased stress hormone responses is an empirical question, but they do suggest that lacking power in relationships might pose a number of health risks for wives.

For husbands, when considering their ACTH and cortisol responses, it would appear that being less powerful and sharing power are potentially detrimental with regard to hormonal responses to marital conflict. Thus, over time, husbands in marriages with these dynamics may be more likely to suffer poor health outcomes if their marriages are high in conflict. Unfortunately, other than research regarding the effects of individual-level dominance on cardiovascular reactivity reviewed earlier (Brown et al., 1998), we are aware of no studies that investigate the relationship between levels of marital power and health outcomes for men. Our findings also suggest that relatively equal levels of power is also a marital dynamic worthy of future consideration because it may not impact couple members equally.

It is important to note that our sample consisted of a highly selective group of newlywed couples. A number of caveats are in order as a result. First, it is possible that newlywed spouses, who are still becoming accustomed to married life, could be affected by relative power dynamics differently than would more established couples. Although we used a general measure of marital power not necessarily dependent on relationship or marriage length, investigation

of these dynamics in more established couples is warranted. Second, the couples in this study were very healthy individuals. We attempted to control for a number of important social and health behaviors that might impact our findings, but it is possible that the homogeneous nature of the sample made it difficult to rule out additional variables unique to these couples. Again, additional studies with a wider range of couples with respect to age, marital length, and marital quality would be useful. Overcoming the sample selection bias in this type of research is indeed difficult. Couples must be willing to put their relationships in the limelight. As a result, those most comfortable with their marriages are most likely to participate. In addition, to avoid contamination of physiological parameters, spouses must be quite healthy and demonstrate no current signs or a history of specific physical or mental conditions related to the outcomes of interest, making it difficult to obtain a truly representative sample.

In some respects, the limitations regarding our sample may actually enhance the practical significance of the findings. We found marital power to differentially impact psychological and stress hormone outcomes in a sample of highly educated, maritally satisfied, young, healthy couples. These effects would likely be exacerbated in less healthy, distressed couples in which relative levels of marital power may be an issue.

One of the difficulties of conducting research with physiologic assessments is minimizing missing data. A number of factors can contribute to this loss, such as equipment failure, participant noncompliance, and so forth. In our case, a large number of couples had to be removed from analyses because insufficient blood samples did not allow for assessment of ACTH and cortisol. As a result, for example, analyses involving cortisol were conducted on only 54 of the 72 couples. This reduction in sample size and subsequent loss in statistical power to some degree undermines the strength of our conclusions. For example, we may not have had enough statistical power to uncover more subtle hormonal effects. In addition, we were forced to draw some conclusions based on a very small number of couples. Those planning future studies of a similar nature would be well served to use samples large enough to offset these types of uncontrollable physiologic assessment challenges. We should note that even with these reductions in sample size, analyses of ACTH and cortisol data revealed similar patterns of results.

Our operationalization of marital power, using a measure of dependent love, warrants discussion. We wanted a general measure of power that would be relevant across a broad range of domains (Sexton & Perlman, 1989). Because we could not predict what couple members would talk about during their conflict discussion, it was important to focus on a general relationship dynamic rather than a more specific one (e.g., have them indicate who tends to make decisions in the marriage). Not surprisingly, given the highly selective nature of our sample, there was not a considerable amount of variance in spouses' dependent love ratings, particularly with regard to differences between spouses' ratings. As a result, we delineated relative marital power disproportionately toward marriages in which power was shared between spouses, a distribution that may reflect the communal nature of these relationships (Blanton & Vandergriff-Avery, 2001; Trentham & Larwood, 2001). Unfortunately, as a result of this distribution and missing hormone data, follow-up analyses for individuals in unequal power groups were conducted on small subsamples. A number of significant, theoretically consistent effects still emerged despite this limitation.

It would be fruitful to explore the relationship between relative marital power and hormone responses in a substantially larger sample, particularly one that considers the sample shortcomings noted above. In addition, because there is no agreed-upon method for delineating power in marriage, the effects found here may not hold if power is operationalized in some other manner. Clearly, given the lack of consensus, consideration of multiple methods for assessing marital power would be advantageous on both a practical and theoretical level. The type of research reported here is very costly and time consuming, but the potential relevance of this dynamic to spouses' health likely deems it a justifiable expense.

Any discussion of the effects of marital power and health would be incomplete without mentioning marital violence. Marital power is an important predictor of marital violence (Babcock et al., 1993; Coleman & Straus, 1986; Sagrestano et al., 1999), and egalitarian marriages tend to evidence the least amounts of violence. The incidence of violence tends to increase to the extent that one spouse is more powerful than the other (Coleman & Straus). We are aware of no studies in the marital violence literature that operationalize

power as we have here, but it would be an interesting research avenue.

Overall, when using a measure of dependent love to determine power differentials within marital couples, hormonal data suggest that this variable is an important determinant of conflict-associated stress. Within the conflict and social support literature, a number of researchers have noted the important role that intraindividual variables play in affecting spouses' interactions and the behaviors they elicit (Cutrona, Hessling, & Suhr, 1997; Kiecolt-Glaser & Newton, 2001; Pasch, Bradbury, & Davila, 1997; Pasch, Bradbury, & Sullivan, 1997). Our results suggest that intrarelationship variables are also worthy of consideration during spouses' discussions. Specifically, the particular dynamics couple members have already developed prior to their participation in these types of studies can significantly impact couples' physiological responses to discussions. We suggest that consideration of couple-level variables such as power will provide a more complete picture of how conflicts affect spouses' endocrinological responses.

## NOTE

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