Marital Satisfaction and Psychophysiological Responsiveness in Spouses of Patients with Chronic Pain

Daniel B. Stampler,1 Jacqueline Remondet Wall,2,5 Jeffrey E. Cassisi,3 and Hugh Davis4

The primary purpose of this study was to investigate the relationship between spouse marital satisfaction and spouse solicitousness to their physiological responsiveness during marital interactions about pain. Twenty-six couples engaged in a series of structured marital interactions about neutral and pain-related topics while monitored for skin conductance (SC) and heart rate (HR). There was strong support for the role of spouses' marital satisfaction in predicting their physiological responsiveness. The more satisfied a spouse, the more physiologically reactive the spouses were when listening to the patient describe pain, and the less reactive when responding to it. Dissatisfied spouses demonstrated the opposite pattern. They autonomically deactivated when hearing about the pain and became reactive when responding to it. Solicitousness was not a significant predictor of the spouses' physiological responsiveness. Block's (1981) proposed physiological mechanism for the origin of solicitousness in spouses did not receive support. It appears that responding in any fashion may lessen the magnitude of arousal in maritally satisfied spouses, whereas dealing with pain-related topics produces unpleasant arousal in dissatisfied spouses.

KEY WORDS: marital satisfaction; spousal solicitousness; psychophysiology; pain.

INTRODUCTION

Numerous reports suggest that spouses can unintentionally contribute to the maintenance of patient pain behaviors (FORDYCE, 1976; KHATAMI and RUSH, 1978; LOUSBERG et al., 1992; MARUTA et al., 1981). These pain behaviors can be nonverbal and include facial expressions of pain, wincing, and limping, or they can be verbal

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statements indicating pain, functional limitations, or concerns (Romano et al., 1992, p. 779). Fordyce (1976) suggests that spouses contribute to the problem by selectively reinforcing patient pain behaviors through attention and various "care-giving" activities. Alternately, he argues that a spouse who ignores chronic pain behaviors decreases their frequency. Spousal reinforcement of pain behavior has become termed solicitousness (Block et al., 1980; Flor et al., 1987).

Block et al. (1980) provided evidence that a solicitous spouse can serve as a discriminant cue for pain behavior and increase its frequency. Lousberg et al. (1992) also demonstrated that patients' interpretations of their spouses responses to their pain influenced patients' pain intensity ratings and activity levels (measured by length of a treadmill walk). Patients with nonsolicitous spouses walked farther and reported lower pain levels than those with solicitous spouses. Flor et al. (1987) also found that perceived spouse reinforcement of pain significantly related to perceived pain and activity levels of patients with chronic pain.

The literature also suggests that spouse solicitousness influences marital satisfaction (Kremer et al., 1985). For instance, Flor and colleagues (1987) found that patients with reinforcing spouses feel more satisfied with their marriages than do patients with nonreinforcing spouses, despite the fact that patients with reinforcing spouses report more intense pain than do patients with nonreinforcing spouses. Evidence regarding the relationship between spouse solicitousness and spouse satisfaction has been mixed, however. Most studies in marriages where one spouse suffers from chronic pain have found substantial marital dissatisfaction between patients and spouses (Ahern and Follick, 1985; Flor et al., 1987; Kerns and Turk, 1984; Maruta et al., 1981). Spouses usually view the marital relationship less favorably than do patients (Flor et al., 1987; Maruta et al., 1981). Secondary gain due to reinforcement of pain behavior may account for asymmetry in marital satisfaction because the patient receives rewards for disability at the expense of the spouse.

Observers respond with physiological arousal when viewing others in pain (Berger, 1962). In spouses of pain patients, the magnitude of their response varies directly in relation to the level of marital satisfaction (Block, 1981). Satisfied spouses appear more vulnerable to adverse arousal in response to their partners' pain, and less satisfied spouses appear less reactive to similarly perceived pain. Block (1981) proposed that satisfied spouses may respond in ways to reduce their aversive arousal. That is, solicitous care-giving responses by spouses are an attempt to reduce the unpleasant physiological arousal brought about by observing expressions of pain and suffering. This potential relationship has proven difficult to empirically study. The occurrence of genuine pain behavior by partners is difficult to arrange in an experimental situation.

Block's (1981) research on spouses' reactions utilized videotapes of patients' nonverbal pain behavior. The purpose of the present study was to examine the relationship between marital satisfaction and spouse solicitousness to the physiological responsiveness of spouses in the actual presence of their partner. Thus, the purpose of this study was systematically to extend and replicate the findings of earlier research by examining spouses' reactions during a series of standardized face-to-face marital interactions.
METHOD

Participants

Twenty-six patients with chronic low back pain (CLBP) and their spouses participated in the study. Members of the research team recruited subjects from the Orthopedics Clinic and the Neurological Surgery Clinic at Shands Teaching Hospital and the Veterans Administration Medical Center in Gainesville, Florida. Selection criteria for patients included low back pain exceeding 6 months in duration, a medical diagnosis of CLBP, and a spouse willing to participate in the study. We excluded from the study subjects who showed obvious cognitive impairment, severe psychopathology, or an inability to read or speak English.

Measures

The following measures were obtained from patients and spouses.

Marital Adjustment Test (MAT). The MAT is a widely used, validated, and reliable self-report measure of marital adjustment and satisfaction (Locke and Wallace, 1959). This 15-item scale assesses various aspects of marriage, such as communication, affection, sexual compatibility, social activities, and value differences, with the total score representing overall satisfaction with the marriage. We classified scores below 100 as dissatisfied and scores higher than 100 as satisfied.

Multidimensional Pain Inventory (MPI). The MPI (Kerns et al., 1985) assesses the impact of pain on patients’ lives, patients’ perceptions of the range of behavioral responses of significant others to their expressions of pain, and the extent to which patients participate in common daily activities (Kerns et al., 1985). We quantified spouses’ levels of solicitousness based upon patients’ responses on the MPI Solicitous (SOL), Punishing (PUN), and Distracting (DIS) subscales. Patients completed the 66-item MPI, whereas their spouses completed a spouse version of the MPI that assesses items similar in content but from a spousal perspective (e.g., my partner’s pain severity).

Symptom Checklist-90 Revised (SCL-90R). The SCL-90R (Derogatis, 1983) is a 90-item self-report measure with subscales quantifying various psychological symptom patterns (e.g., Somatization, Depression, Anxiety, etc.). In addition, it includes summary scales of overall psychological distress [e.g., Global Symptom Index (GSI)].

Follow-up Questionnaire. We assessed quality of marital interactions with a series of 6-point rating scales. Specifically, patients and spouses rated how natural and typical the various marital interactions were as well as how “neutral” the mutually chosen neutral topic was for them.

Autonomic Measures. We collected skin conductance (SC) and heart rate (HR) measures continuously during each experimental condition. We measured skin conductance with 10-mm Beckman electrodes attached to the thenar and hypothenar eminences of the left palmar surface (Venables and Christie, 1973). We applied a water-soluble transmission gel to the electrodes as a contact medium and prepared
the electrode sites with distilled water. The SC signal was processed through a Coulbourn skin conductance coupler (S71-22).

We measured heart rate with a photoplethysmographic sensor placed on the center portion of the distal phalanx of the left index finger. The HR signal was processed through a Coulbourn pulse monitor optical densitometer (S71-40) and a Coulbourn tachometer (S77-26).

We sampled both SC and HR signals at 2 Hz relayed through a Coulbourn 8-bit, analog-to-digital convertor (L25-08) to Labtech Notebook software on an AT-compatible personal computer.

Procedures

Potential subjects received information about the nature of the study and of the procedure. Upon arrival to the lab, the couple proceeded to a waiting area, where they signed an informed consent form and completed questionnaires. The couple then proceeded into an experimental room that contained two chairs and two sets of psychophysiological sensors, which we attached as described above. Following a 5-min habituation period, the couple engaged in a series of structured interactions. The first set of interactions involved a mutually chosen neutral topic. For the first 90 sec, the patient talked about the topic while the spouse listened. When signaled, the spouse had the opportunity to respond and engage in a two-way discussion of the topic for 3 min. The second set of interactions involved the impact of the chronic pain on daily life of the couple. Similarly, for the first 90 sec, the patient talked about the pain while the spouse listened. When signaled, the spouse again had the opportunity to respond and engage in a two-way discussion of the pain for 3 min. Thus, there were four conditions during which the couples interacted about neutral and pain topics. From the perspective of the spouse, these conditions were “neutral-listen,” “neutral-respond,” “pain-listen,” and “pain-respond.” Following the interactions, patients and spouses completed qualitative ratings of the interactions. Upon completion of the experiment, the couple underwent debriefing concerning the study’s purpose.

RESULTS

The means and standard deviations of patient and spouse characteristics appear in Table I. There was a nearly even gender distribution of patients (14 males and 12 females) as well as spouses (14 females and 12 males). Marital duration did not differ significantly in comparisons by patient gender \([F(1,48) = 0.09, \text{ ns}].\) No significant differences were evident in age between patients and spouses, between husbands and wives, or between the genders in each group \([F(3,48) = 0.54, \text{ ns; overall } M = 42.5 \text{ years}].\) No significant difference was evident in mean education level of marital partners \([F(3,48) = 0.63, \text{ ns; overall } M = 12.7 \text{ years}].\)

Patient pain duration averaged 6 years. In male patients, pain chronicity was about 3 years longer than in female patients; however, this difference was not sta-
Responsiveness in Spouses of Patients with Chronic Pain

Table I. Means (Standard Deviations) of Selected Characteristics of Couples

<table>
<thead>
<tr>
<th>Variable</th>
<th>Patient</th>
<th>Spouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (% male)</td>
<td>53.8</td>
<td>46.2</td>
</tr>
<tr>
<td>Age (years)</td>
<td>42.0 (9.1)</td>
<td>42.9 (9.5)</td>
</tr>
<tr>
<td>EDUC (years)</td>
<td>12.8 (2.3)</td>
<td>12.7 (2.0)</td>
</tr>
<tr>
<td>MDUR (years)</td>
<td>13.2 (11.2)</td>
<td>13.2 (11.2)</td>
</tr>
<tr>
<td>PDUR (years)</td>
<td>6.0 (7.9)</td>
<td></td>
</tr>
<tr>
<td>PRAT</td>
<td>4.3a (1.2)</td>
<td>4.2b (1.2)</td>
</tr>
<tr>
<td>MAT</td>
<td>107 (32.1)</td>
<td>103 (27.4)</td>
</tr>
<tr>
<td>PUN</td>
<td>1.8 (1.6)</td>
<td></td>
</tr>
<tr>
<td>SOL</td>
<td>3.9 (1.27)</td>
<td></td>
</tr>
<tr>
<td>DIS</td>
<td>2.7 (1.34)</td>
<td></td>
</tr>
</tbody>
</table>

Note. EDUC, education; MDUR, marital duration; PDUR, pain duration; PRAT, pain severity rating; MAT, marital adjustment test; PUN, punishing responses; SOL, solicitous responses; DIS, distracting responses.

a0- to 6-point scale, patient rated.
b0- to 6-point scale, spouse-rated.

tistically significant \[ F(1,24) = 0.83, \text{ ns} \]. Patients and spouses viewed pain severity levels similarly \[ F(1,48) = 0.16, \text{ ns} \].

Patients and spouses produced mean MAT scores in the satisfied range (107 and 103, respectively); however, 27% of the patients and 42% of the spouses scored in the dissatisfied range (MAT < 100). When categorized by gender and patient status, the wives of patients with chronic pain had the greatest prevalence (50%) of marital dissatisfaction while males with chronic pain had the greatest prevalence of marital satisfaction (78.6%). Most couples jointly felt satisfied (54%) or jointly felt dissatisfied (23%). The marriages in which only one partner felt satisfied were predominantly those with dissatisfied wives married to satisfied male patients.

A correlation matrix showing the relationships between PUN, SOL, and DIS and patient and spouse MAT scores appears in Table II. Solicitous responses to pain negatively related to punishing responses and positively related to distracting responses. Spouses who were more solicitous tended to be less punishing and more distracting (i.e., diverting patient attention from pain) than were spouses who were less solicitous. Patient marital satisfaction was positively related to spouse solicitousness and distraction and negatively related to spouse punishing responses. Satisfied patients had less punishing and more solicitous and distracting spouses than did unsatisfied patients. Spouse marital satisfaction negatively related to punishing responses but did not relate to either solicitous or distracting responses. Satisfied spouses were less punishing in response to the pain than were dissatisfied spouses. None of these measures evidenced an association with pain duration, pain severity, or measures of symptom distress in either marital partner.

Four stepwise regression analyses were used to analyze the psychophysio logic measures. We analyzed skin conductance (SC) and heart rate (HR) separately, computing two dependent measure change scores for each autonomic measure. These scores reflected the spouse's autonomic reactivity to patient pain descriptions under
Table II. Intercorrelations of Marital and Pain Variables for All Spouses

<table>
<thead>
<tr>
<th></th>
<th>SPOUSE MAT</th>
<th>PATIENT MAT</th>
<th>PUN</th>
<th>SOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATIENT MAT</td>
<td>0.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUN</td>
<td>-0.44</td>
<td>-0.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOL</td>
<td>ns</td>
<td>0.39</td>
<td>-0.39</td>
<td></td>
</tr>
<tr>
<td>DIS</td>
<td>ns</td>
<td>0.53</td>
<td></td>
<td>0.48</td>
</tr>
</tbody>
</table>

Note. SPOUSE MAT, spouse marital satisfaction; PATIENT MAT, patient marital satisfaction; PUN, punishing responses; SOL, solicitous responses; DIS, distracting responses. $p < .05$.

pain-listen and pain-respond conditions. We derived “pain-listen” reactivity scores by subtracting spouses’ mean autonomic level during the “neutral-listen” condition from spouses’ autonomic level during the “pain-listen” condition. Thus, these scores reflected how much more or less aroused spouses were when presented with the pain topic compared to the neutral topic. We derived “pain-respond” reactivity scores by subtracting spouses’ mean autonomic level during the “neutral-respond” condition from spouses’ autonomic level during the “pain-respond” condition. Thus, reactivity scores reflected how much more or less aroused spouses were when able to discuss the pain topic compared to the neutral topic. In all, there were four dependent measures: “pain-listen” and “pain-respond” for both SC and HR reactivity. Because we measured change in autonomic reactivity from one condition to another in each instance, it is possible that the magnitude of change between conditions was partly determined by initial psychophysiological level. An examination of the change scores incorporating Andreassi’s (1980) law of initial values suggested that the initial values did not affect the data.

Predicting Spouses’ Skin Conductance

Pain-Listen Condition. The stepwise regression for spouses’ SC reactivity under the “pain-listen” condition appears in Table III. The most predictive variable of spouses’ SC reactivity during the pain-listen condition was spouses’ MAT scores, which accounted for 20% of the variance in SC change. The more satisfied the spouses, the more aroused they became during the pain-listen condition; the more dissatisfied the spouses, the less aroused they became during the pain-listen condition. Satisfied spouses showed a mean SC change of +0.2 μmho, whereas dissatisfied spouses showed a mean SC change of -0.4 μmho. This group difference in SC reactivity was statistically significant [$F(1,24) = 6.4, p = .02$] and appears in Table IV.

The second most predictive variable was patients’ MAT scores, which accounted for an additional 18% of the variance in SC change. The more dissatisfied the patients, the more aroused the spouses became during the pain-listen condition; the more satisfied the patients, the less aroused the spouses became during the pain-listen condition.
The third most predictive variable was spouse age, which accounted for an additional 12% of the variance in SC change. The older the spouses, the more aroused they became during the pain-listen condition; the younger the spouses, the less aroused they became during the pain-listen condition.

Spouses’ SOL, PUN, or DIS levels were not predictive of spouses’ SC reactivity during the pain-listen condition. Also, patient pain severity, symptom distress, and/or pain duration were not predictive of spouses’ SC reactivity during the pain-listen condition.

*Pain-Respond Condition. The stepwise regression for spouses’ SC reactivity under the “pain-respond” condition appears in Table V. The most predictive variable of spouses’ SC reactivity during the pain-respond condition was spouses’ MAT scores, which accounted for 20% of the variance in SC change. The more satisfied the spouses, the less aroused they became during the pain-respond condition; the more dissatisfied the spouses, the more aroused they became during the pain-respond condition. Satisfied spouses showed a mean SC change of +0.1 µmho, whereas dissatisfied spouses showed a mean SC change of +0.5 µmho (see Table IV). This group difference in SC reactivity was statistically significant \( F(1,24) = 4.25, p < .05 \).

The second most predictive variable was patients’ MAT scores, which accounted for an additional 13% of the variance in SC change. The more dissatisfied the patients, the less aroused the spouses became during the pain-respond condition; the more satisfied the patients, the more aroused the spouses became during the pain-respond condition.

The third most predictive variable was spouse symptom distress (as measured by the GSI score from the SCL-90R), which accounted for an additional 9% of
Table V. Stepwise Regression Model for Spouses' Skin Conductance During the 
Pain-Respond Condition

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>Partial $R^2$</th>
<th>Model $R^2$</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spouse marital satisfaction</td>
<td>.20</td>
<td>.20</td>
<td>5.85</td>
<td>.03</td>
</tr>
<tr>
<td>2</td>
<td>Patient marital satisfaction</td>
<td>.13</td>
<td>.33</td>
<td>4.63</td>
<td>.05</td>
</tr>
<tr>
<td>3</td>
<td>Spouse symptom distress</td>
<td>.09</td>
<td>.42</td>
<td>3.44</td>
<td>.08</td>
</tr>
</tbody>
</table>

the variance in SC change. The more symptomatic the spouses, the less aroused they became during the pain-respond condition; the less symptomatic the spouses, the more aroused they became during the pain-respond condition.

Spouses' levels of SOL, PUN, or DIS were not predictive of spouses' SC reactivity during the pain-respond condition. None of the other variables were significantly predictive of spouses' SC reactivity during the pain-respond condition.

Predicting Spouses' Heart Rate

_Pain-Listen Condition_. The most predictive variable of spouses' HR reactivity during the pain-listen condition was the patients' MAT scores, $[F(1, 24) = 6.24, p < .05]$ which accounted for 21% of the variance in HR change. The more satisfied the patients, the less aroused the spouses became during the pain-listen condition; the more dissatisfied the patients, the more aroused the spouses became during the pain-listen condition. Spouses of satisfied patients showed a mean HR change of –0.9 beat/min (bpm) while spouses of dissatisfied patients showed a mean HR change of +4.1 bpm. This group difference in HR reactivity approached statistical significance $[F(1,24) = 2.95, p < .10]$ and appears in Table VI. Spouses' SOL, PUN, or DIS levels were not predictive of spouses' HR reactivity during the pain-listen condition. None of the other variables were significantly predictive of spouse HR reactivity during the pain-listen condition.

_Pain-Respond Condition_. The most predictive variable of spouses' HR reactivity during the pain-respond condition was patients' MAT scores ($p = .02$), which accounted for 23% of the variance in HR change. The more satisfied the patients, the more aroused the spouses were during the pain-respond condition; the more dissatisfied the patients, the less aroused the spouses were during the pain-respond condition. Spouses of satisfied patients showed a mean HR change of +0.5 bpm, whereas spouses of dissatisfied patients showed a mean HR change of –2.9 bpm. This group difference in HR reactivity approached statistical significance $[F(1,24) = 3.36, p = .08]$ and appears in Table VI. Spouses' SOL, PUN, or DIS levels were not predictive of spouses' HR reactivity during the pain-respond condition. None of the other variables were significantly predictive of spouse HR reactivity to responding to and discussing the pain reports.
Table VI. Spouse Heart Rate Reactivity by Level of Patient Marital Satisfaction

<table>
<thead>
<tr>
<th>Level of patient marital satisfaction</th>
<th>Beats per minute</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Listen*</td>
<td>Respond**</td>
<td></td>
</tr>
<tr>
<td>Satisfied</td>
<td>-0.9 (3.6)</td>
<td>0.5 (3.3)</td>
<td></td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>4.1 (11.4)</td>
<td>-2.9 (6.3)</td>
<td></td>
</tr>
</tbody>
</table>

*p = .10.
**p = .08.

Summary

To summarize briefly the spouses' SC data, the primary variable mediating their reactivity during the pain-listen condition was their level of marital satisfaction. Maritally satisfied spouses demonstrated greater increases in SC than dissatisfied spouses when listening to the patients' pain reports. Patients' marital satisfaction was also a significant predictor. When the patients felt dissatisfied with their marriage, spouses' SC levels became accentuated; when the patients felt satisfied, spousal SC levels became attenuated.

The primary variable mediating spouses' SC reactivity during the pain-respond condition again was their level of marital satisfaction. In this condition, however, maritally dissatisfied spouses demonstrated greater increases in SC than satisfied spouses. Patients' marital satisfaction was a significant predictor of spouses' reactivity in this condition as well. When the patients felt dissatisfied, spouses' SC levels became attenuated; when the patients felt satisfied, spouses' SC levels became accentuated.

To summarize briefly spouses’ HR data, the primary variable mediating the spouses’ HR reactivity during the pain-listen condition was the patients' level of marital satisfaction. The more satisfied the patients, the less change that occurred in HR when listening to the pain reports. The more dissatisfied the patient, the greater the increases in HR when listening to the pain reports.

The primary variable mediating the spouses' HR reactivity during the pain-respond condition was, again, the patients' level of marital satisfaction. The more satisfied the patients, the greater the increases in HR when responding to the pain reports. The more dissatisfied the patients, the more likely HR actually decreased when responding to the pain reports. The other variables, including spouses' marital satisfaction, did not mediate HR reactivity under either the pain-listen or the pain-respond condition.

Spouses' level of solicitousness as measured by the relevant subscales of the MPI was not a significant predictor of autonomic reactivity during any condition. Ratings of the quality of the marital interactions were on six point Likert scales. Both patients and spouses rated the interactions as natural and typical of their usual interactions about the pain. These data appear in Table VII.
Table VII. Mean Ratings for the Quality of Marital Interactions

<table>
<thead>
<tr>
<th>Rating</th>
<th>Patient</th>
<th>Spouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral interactions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>5.7</td>
<td>5.2</td>
</tr>
<tr>
<td>Natural</td>
<td>5.2</td>
<td>5.0</td>
</tr>
<tr>
<td>Pain presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical</td>
<td>5.2</td>
<td>5.3</td>
</tr>
<tr>
<td>Pain interactions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural</td>
<td>5.1</td>
<td>5.2</td>
</tr>
<tr>
<td>Typical</td>
<td>5.2</td>
<td>5.3</td>
</tr>
</tbody>
</table>

Note: 1-6 rating scale.

DISCUSSION

Researchers have suggested that witnessing another person in distress produces aversive emotional arousal (e.g., empathy) in the potential helper, who then acts to reduce this arousal through being helpful (Batson and Coke, 1983). Block (1981) and others (Kremer et al., 1985) have suggested that such a mechanism could account for solicitousness in spouses of patients with chronic pain. The data provided no direct support for this contention. The principal variables that mediated spouses’ emotional reactivity during pain-related interactions were the spouses’ and patients’ marital satisfaction, and not spouses’ levels of solicitousness. Data on skin conductance did evidence some interesting patterns. Although satisfied spouses felt more aroused (i.e., empathic) as passive observers of pain than did dissatisfied spouses, satisfied spouses were less reactive as active participants in pain-related interactions. Because SOL, PUN, or DIS was not predictive of these changes in arousal, perhaps responding to the pain in any fashion may, in itself, lessen the magnitude of arousal in satisfied spouses. In contrast, dissatisfied spouses felt unaroused (i.e., unempathic) as passive observers of pain, yet they were vulnerable to emotional reactivity when required to respond to the pain by discussing its impact on daily living. For dissatisfied spouses, interacting with the patient on the topic of pain created the arousal.

One could speculate that satisfied spouses would be prone to engage the patient about the pain due to their empathic reactivity as listeners and tempered reactivity as responders, whereas dissatisfied spouses would be prone to disengage from the patient due to their lack of empathic reactivity as listeners and more intense reactivity as responders. Specific fine-grained research on the sequential nature of pain-related marital interactions could bear upon this question. For instance, Levenson and Gottman (1983) found that there is negative affect reciprocity and psychophysiological linkage between dissatisfied marital partners during conflictual interactions. Similar results may occur for dissatisfied (or disjointly satisfied) couples during discussions about chronic pain. The pain-related discussions of maritally satisfied couples might not be as marked by the reciprocal exchange of negative affect
or the temporal linkage of aversive arousal as may be the case with dissatisfied couples.

In the present study, the magnitude of SC and HR arousal in spouses related to the level of spouse satisfaction in the marriage. Thus, satisfied spouses were more empathic than were dissatisfied spouses when listening to their partners describe the pain's impact on their daily lives (i.e., showed SC arousal). In contrast, dissatisfied spouses were unempathic toward their partners' pain (i.e., showed SC deactivation). Whether satisfied spouses were more empathic than dissatisfied spouses because they felt more maritally satisfied or whether satisfied spouses perceived themselves as satisfied because they respond empathically to their partners remains unclear. In addition to SC reactivity, empathic spouses showed HR deceleration to patient pain reports when the patient also felt satisfied in the marriage. Cardiac deceleration may reflect “empathetic listening” and receptiveness to the external stimuli, whereas cardiac acceleration may relate to “mental rejection” of external stimuli (Lacey and Lacey, 1974). Thus, relative to maritally dissatisfied patients, maritally satisfied patients had more attentive spouses (i.e., showed HR deceleration) when describing the pain's impact on daily living. In contrast, dissatisfied patients had less attentive spouses (i.e., showed HR acceleration) than did satisfied patients under these conditions. Once again, the issue remains whether satisfied spouses were attentive because patients felt maritally satisfied or whether maritally satisfied patients felt satisfied because their spouses were attentive to their problems.

When considering the autonomic measures of SC and HR together, spouses in conjointly satisfied marriages were more empathic and attentive to the patient's pain whereas spouses in conjointly dissatisfied marriages were less empathic and attentive to the pain. In disjunctly satisfied marriages comprised of satisfied patients and dissatisfied spouses (the most common asymmetric pattern), spouses were attentive though unempathic to the pain. Indeed, the more satisfied the patient, the less empathic the dissatisfied spouse.

One limitation of the study was that we used questionnaire methods to quantify spouses' level of solicitousness rather than actual coding of the interactions themselves. A second limitation is that spouses' observation of patients' verbal pain behavior may produce different patterns of solicitousness and/or physiological arousal than would occur in response to nonverbal pain behavior. Future research needs to examine the equivalence of verbal and nonverbal pain behavior in producing solicitous responses in spouses. Future research also needs to examine spouses' behavior in naturalistic settings during a variety of interactions to establish the generality of the findings.

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