

Predicting husbands' and wives' retirement satisfaction from the emotional qualities of marital interaction

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ABSTRACT

Retirement satisfaction was predicted from the emotional qualities of pre-retirement marital interaction in 49 male ($M_{\text{age}} = 63$) and 31 female ($M_{\text{age}} = 61$) retirees. In 1989, we measured physiological, behavioral, and subjective aspects of emotion while spouses discussed a conflict in their marriage. Five years later, we assessed retirement satisfaction for spouses who had retired in the intervening period. Husbands who were physiologically relaxed and affectively positive during marital interaction were happier in their subsequent retirements. Wives' retirement satisfaction was not predicted by the emotional qualities of marital interaction.

KEY WORDS: emotion • long-term marriage • marital interaction • retirement satisfaction

Over the course of a long-term marriage, couples will navigate a number of life transitions. Transitions that occur relatively early in marriage include moving in together, becoming a parent, children reaching adolescence, relocations, and job changes. Examples of life transitions later in marriage include becoming grandparents, changing health, death of parents, retirement, and widowhood. A common feature of these transitions is that they bring about changes in roles, identities, expectations, attitudes, and relationships both with one's spouse and with other family members. In

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navigating life transitions, resources derived from the marital relationship are critical (Cowan & Cowan, 1992).

A number of studies have investigated common early marital transitions. Most commonly studied has been the birth of the first child, which is typically associated with sharp declines in marital satisfaction (e.g., Johnson, Amoloza, & Booth, 1992; Rollins & Cannon, 1974). Cowan and Cowan (1992) found that a preventative intervention that encouraged marital communication reduced the severity of the initial drop in marital satisfaction after the birth of the first child, thus underscoring the importance of communication between spouses for navigating this difficult transition.

Marriage and the transition to retirement

The transition to retirement typically occurs after the marriage is well-established and has not generated as much research as have early-marriage transitions. Existing work on marriage and retirement has primarily addressed two issues: (a) the impact of retirement on marriage, and (b) the impact of marriage on retirement.

Impact of retirement on marriage. Research on the impact of retirement on marriage has produced decidedly mixed results. Some authors have proposed that retirement has a positive effect on marriage. Atchley (1976) described a 'honeymoon stage' following retirement in which spouses could enjoy each other, the financial fruits of their life's work, increased leisure time, and pleasurable interactions with grown children. Gilford (1984) reported that couples between the ages of 63 and 69 (many of whom had retired) reported more 'positive interaction' and less 'negative sentiment' than somewhat younger couples (far fewer of whom had retired). Compared with a matched sample of working men, male retirees reported higher levels of marital satisfaction (Kulik, 1999). In contrast, other scholars have concluded that retirement has negative effects on marriage. Johnston (1990) found that changes in roles and identities following retirement were significant stressors and that spouses became more aware of their partners' faults. Lee and Shehan (1989) found decreases in marital satisfaction when husbands had been retired between four and eight years. More recently, marital satisfaction has been shown to decline immediately following the retirement transition, but to be elevated at least two years after couples have settled into the retirement stage of life (Moen, Kim, & Hofmeister, 2001). Finally, a number of studies found retirement to have little effect on marriage. Bishop, Epstein, Baldwin, Miller, and Keitner (1988) found retirement to be less important to spouses' morale than health, socioeconomic, and family functioning variables. Ekerdt and Vinick (1991) found no differences in marital complaints or marital satisfaction between retired couples and controls, strongly endorsing the continuity in marital qualities from before to after retirement.

Impact of marriage on retirement. In contrast to the mixed findings on the impact of retirement on marriage, research on the impact of marriage on retirement has been much more consistent, supporting a positive association between marriage (satisfied marriages in particular) and satisfaction with retirement. For example, married retirees have been shown to adjust better to and be happier in retirement than unmarried retirees (e.g., Atchley, 1992; Seccombe & Lee, 1986). Among married retirees, those in satisfied marriages adjust to the changes associated with retirement better than those in dissatisfied marriages (Myers & Booth, 1996). And, finally, self-reported satisfaction with marriage and family relationships has been associated with higher levels of retirement satisfaction (Fouquereau, Fernandez, & Mullet, 1999).

Two unique characteristics of the retirement transition may amplify the impact of marriage on retirement satisfaction. First, as people move out of the workplace and back into the home full-time, the amount of time spent alone with one's spouse increases markedly. In fact, because retirement commonly occurs when children are no longer living at home, the extent of time spouses spend together is likely greater than in any other stage of marriage (Bernard & Phillipson, 1995). Second, retirement occurs at a time in the lifespan when social networks shrink, the number of social ties decreases, and the importance of close relationships, such as the marital relationship, increases (Carstensen, 1992, 1993). Thus retirement occurs during a period when people spend more time interacting with spouses and significant others (Carstensen, Graff, Levenson, & Gottman, 1996). As a result of the increased time spouses spend together and the greater salience of close relationships, qualities of marital interaction are increasingly important predictors of retirement satisfaction.

Why use the emotional qualities of marital interaction to predict retirement satisfaction?

Researchers exploring links between marriage and retirement have not directly observed marital interaction, but rather have relied on self-report measures of marital qualities (e.g., marital satisfaction) and self-report measures of retirement (e.g., retirement satisfaction). Although this approach has revealed important information about the relationship between marriage and retirement, it also raises concerns that common method variance might account for observed associations. An alternative to depending entirely on self-report measures is to directly observe marital interactions and to expand measures into the behavioral and physiological domains. This approach could provide additional information about the nature of the relationship between marriage and retirement and avoid some of the pitfalls inherent in relying solely on self-report measures.

The current focus on the emotional qualities of marital interaction stems from previous theory and research on (a) basic emotional processes and (b) predicting marital satisfaction and stability from emotion during marital conversations. Emotions are a ubiquitous aspect of everyday life and serve important intrapersonal and interpersonal functions. The emotion system

is comprised of hard-wired and learned components that work together to effectively respond to basic problems related to survival and reproduction as well as to navigate complex social situations.

Marital interaction is a particularly appropriate context in which to study emotional phenomena because of the wide range of emotional responding that occurs in this critical social relationship. Emotional responding (indicated by subjective experience, nonverbal behaviors, and physiology) measured in the context of marital interaction reflects qualities of marriage that cannot be directly measured or easily reported on a questionnaire. More specifically, emotional responding during marital interaction, as reflected in physiological, behavioral, and subjective domains, has been found to be associated with current and future marital satisfaction and stability. In the domain of physiology, low levels of physiological arousal while discussing a marital conflict were associated with concurrent levels of marital satisfaction (Levenson & Gottman, 1983) and predicted subsequent improvement in marital satisfaction (Levenson & Gottman, 1985). Compared with wives in satisfied marriages, those who reported high levels of marital distress had heightened blood pressure responses during a discussion of marital conflict (Carels, Szczepanski, Blumenthal, & Sherwood, 1998) and heightened ambulatory blood pressure when at home (Carels, Sherwood, Szczepanski, & Blumenthal, 2000). In the domain of behavior, lower levels of fondness for their partners, lower levels of 'wenness,' and higher levels of negativity during an interview about their marriage predicted divorce three years later (Buehlman, Gottman, & Katz, 1992). Demand and withdrawal behaviors in marital dyads predicted changes in marital satisfaction one year later (Heavey, Layne, & Christensen, 1993). In the domain of subjective experience, less positive affect and more negative affect during marital interaction were associated with lower levels of marital satisfaction (Levenson, Carstensen, & Gottman, 1994; Levenson & Gottman, 1983) and predicted decreases in marital satisfaction three years later (Levenson & Gottman, 1985). Taken together, research from multiple investigators suggests that marital satisfaction is positively associated with an emotional climate of marital interaction that is high in positive affect, low in negative affect, and physiologically calm. Because these emotional qualities of marital interaction have been found to account for substantial variance in marital satisfaction and stability (e.g., Gottman & Levenson, 1992), we hypothesized that these same factors would also predict satisfaction with retired life.

Age and emotional responding. Given that the participants in this study are at retirement age, might there be any general age-related changes in emotional responding that would account for associations between emotional qualities of marital interaction and retirement satisfaction? This question raises two issues. The first pertains to age-related stability in emotional responding. Although early writings on emotion in late life depicted old age as a time of increasingly dampened, rigid, and flat emotionality (e.g., Banham, 1951), recent empirical work supports a

different view. Across a variety of emotional tasks, the emotional experiences of older participants are quite similar to the emotional experiences of younger participants (Levenson, Carstensen, Friesen, & Ekman, 1991; Malatesta & Izard, 1984; Malatesta, Izard, Culver, & Nicolich, 1987). Studies of spontaneous emotional behavior in older and younger participants also suggest that emotional expressivity is maintained as individuals age (e.g., Levenson et al., 1991; Malatesta & Izard, 1984; Tsai, Levenson, & Carstensen, 2000). The only domain in which age differences have been found consistently is in the domain of physiological responding to emotional tasks (e.g., emotional conversations, Levenson et al., 1994; relieved emotion task, Levenson et al., 1991). However, there is some evidence to suggest that age-related diminution of physiological responding to emotional stimuli is primarily accounted for by age-related diminution in physiological responding to a wider range of emotional and nonemotional stimuli (Kupperbusch, Kunzmann, & Levenson, 2001). Although we cannot say definitively that there are no changes in emotionality with increased age, there is considerably more evidence for maintenance than loss in the domains of emotionality that are the focus of the present study.

The second issue pertains to the ability of the emotional qualities of marital interaction to predict marital satisfaction similarly for older couples and young couples. Although few studies have examined this issue, evidence from two samples of older couples supports this assumption. Specifically, the same affective qualities that distinguished dissatisfied couples from satisfied couples in younger marriages (i.e., less positivity, greater negativity, and greater affect reciprocity) were also found to typify dissatisfied marriages in later life (Levenson et al., 1994). Consistent with data from newlywed couples, Kiecolt-Glaser and her colleagues found that the amount of negative behavior during marital conflict was related to (a) differences across couples in marital satisfaction and (b) the degree of physiological responding in older (aged 55 to 75) married couples (Kiecolt-Glaser, Glaser, Cacioppo, & MacCallum, 1997). Based on evidence for age-related stability of emotional responding and age-related continuity in the connections between marital interaction and marital satisfaction, it appears unlikely that age will be a confound in the current study.

Gender and retirement satisfaction

The transition to retirement can be a qualitatively different experience for male and female retirees due to differences in career paths, meaning of work, economic conditions, and gender role expectations (Kim & Moen, 2001; Moen, 1996). Reasons for retirement and the outcomes associated with retirement differ considerably for men and women (George, Fillenbaum, & Palmore, 1984). When examining the association of a number of factors with retirement quality, Moen and her colleagues (2001) found that while some factors are important for men's retirement satisfaction (e.g., reasons for retirement and how much they liked their pre-retirement job), other factors are important for women's retirement satisfaction (e.g.,

income, early retirement). Thus, we were interested in examining whether the emotional qualities of marital interaction would predict retirement satisfaction differently or the same for the men and women in our sample.

Other correlates of retirement satisfaction

Of course, marital quality is only one of many factors found to impact retirement satisfaction. These have included financial status (e.g., Dorfman, Kohout, & Heckert, 1985; Quick & Moen, 1998; Richardson & Kilty, 1991; Seccombe & Lee, 1986), health (Quick & Moen, 1998; Seccombe & Lee, 1986), involvement in organizations (Dorfman, 1995), pre-retirement planning (Quick & Moen, 1998), and satisfaction with specific aspects of retirement (e.g., free time and activities with friends; Kremer, 1984–85). Because these factors could influence any documented relationships between marital satisfaction and retirement (e.g., Fouquereau et al., 1999), a measure of marital satisfaction was included. The intention behind this approach was to determine whether the emotional qualities of marital interaction predict retirement satisfaction over and above the ability of self-report measures of marital satisfaction to predict retirement satisfaction.

Overview and hypotheses

Previous studies that found relationships between marital satisfaction and retirement satisfaction measured both sets of variables concurrently (e.g., Fouquereau et al., 1999). In the present study, we adopted a longitudinal strategy, assessing the emotional qualities of marital interaction a number of years prior to retirement and subsequently using these measures to predict satisfaction with retirement. The goal of this study was to determine whether retirement satisfaction can be predicted from the emotional qualities of marital interaction. It was expected that the emotional climate of marital interaction, measured in the domains of physiology, behavior, and subjective experience would predict satisfaction with life in retirement five years later. Specifically, we hypothesized that low levels of physiological activation, greater amounts of positive affective behavior, lesser amounts of negative affect behavior, and higher levels of self-reported positive experience would be associated with higher levels of retirement satisfaction. The predictive validity of emotional qualities of marital interaction were evaluated relative to other known predictors of retirement satisfaction (i.e., health, income, and marital satisfaction). Based on prior findings of sex differences in the antecedents and consequences of retirement, we examined the predictors of retirement satisfaction separately for husbands and wives.

Method

Participants

Participants were 80 individual retirees (49 married men, 31 married women). The present sample is a subset of spouses in couples who were recruited to

participate in a longitudinal study of emotion in long-term marriage. A sample that would be representative of middle-aged and older long-term married couples living in the areas surrounding Berkeley, California was recruited using a three-stage sampling procedure. First, characteristics of the target couples in terms of marital satisfaction, ethnicity, and socioeconomic status were established using a telephone survey; recruitment goals were then set based on the telephone survey. Second, a large sample was recruited using newspaper, bulletin boards, radio and placards on city buses, and screened on the basis of their responses to questionnaires over the telephone. Third, screened participants were selected on the basis of recruitment goals with respect to marital satisfaction and demographics for participation in the laboratory session (Levenson, Carstensen, & Gottman, 1993). For inclusion in the present study, we chose individual spouses who had retired during the five-year period following the assessment of their marital interaction. Spouses were considered retired if they were working no more than part-time at Time 2 after having worked full-time at Time 1 or not working at Time 2 after having worked full-time or part-time at Time 1. The mean age for husbands at the time of the initial assessment was 62.8 years ($SD = 4.2$; range = 48–70 years), and the mean age for wives was 60.9 years ($SD = 3.8$; range = 49–69 years). All spouses were in first marriages (mean duration = 39.5 years; $SD = 4.0$; range = 23–46 years). Seventy-four participants were Caucasian, 2 were Asian, 2 were Hispanic, and 1 was Black. One male participant did not indicate his ethnicity. Although some of the husbands and wives in the present sample were married to each other, husbands and wives were analyzed separately to maximize the amount of usable data. This strategy enabled us to use data from couples in which only one spouse provided retirement satisfaction data (36 couples) and couples in which both spouses provided retirement satisfaction data (22 couples).

Procedure

Overview. To predict satisfaction with life in retirement longitudinally, we assessed physiological, behavioral, and subjective indicators of emotion during marital interaction as well as marital satisfaction at Time 1 and assessed retirement satisfaction five years later (Time 2). Health and income variables were also assessed at Time 2 to reflect the person's post-retirement status.

Measures at Time 1: Questionnaires. Each spouse individually completed a packet of questionnaires at home. The packet assessed general demographic information, physical health, psychological health, and marital satisfaction.

Measures at Time 1: Marital interaction session. This experimental procedure was based on Levenson and Gottman's (1983) observational method for studying couple interactions. The goal of this method is to replicate a naturalistic situation in which couples would have a private conversation (such as while riding in the car together or when arriving at home after a day of work). Each couple was scheduled to arrive for the laboratory session when they would not have interacted with each other for approximately eight hours to ensure that an adequate amount of interaction would occur. Physiological sensors were placed on each spouse to record a number of aspects of autonomic and somatic nervous system activity (see later). Couples were then instructed to relax for

five minutes after which time they were signaled to begin a 15-minute conversation about the events of the day. Prior to the second conversation (conflict discussion), which was the focus of the present study, each spouse completed the Couple's Problem Inventory (Gottman, Markman, & Notarius, 1977), in which they rated the severity of 10 marital issues on a 1–100 scale. The experimenter viewed the inventories and helped the couple find an area of disagreement. A five-minute rest period was followed by a 15-minute discussion of the area of disagreement. The third conversation was about a mutually agreed upon pleasant topic.

Approximately one week later, spouses returned to the laboratory and viewed the three previously recorded interactions, using a rating dial to report how they had been feeling during the conversations. The rating dial consists of a rotary knob with a pointer that traverses a 180-degree path with anchors ranging from 1 (*extremely negative*) to 5 (*neutral*) to 9 (*extremely positive*). Spouses were instructed to use the rating dial to indicate how they were feeling during the original interaction. This procedure has been validated previously as a means for obtaining continuous self-report of an individual's emotional state (see Gottman & Levenson, 1985).

Measures at Time 2: Questionnaires. Retired spouses completed questionnaires that assessed general demographic information, physical health, psychological health, and marital satisfaction using the same questionnaires and procedures as the Time 1 assessment. Additionally, spouses completed a questionnaire that assessed retirement satisfaction and perceptions of retirement experiences (Retirement Satisfaction Inventory [RSI]; Floyd et al., 1992). Each couple received \$150 for completing the Time 1 questionnaires and participating in the Time 1 laboratory session; each couple was paid \$20 for completing the Time 2 questionnaires.

Apparatus and measures

Physiological. Continuous recordings of seven aspects of each spouse's autonomic and somatic activity during Time 1 marital interaction were collected using a system consisting of a Grass Model 7 12-channel polygraph and a DEC LSI 11/73 microcomputer: (a) cardiac interbeat interval (IBI) – Beckman miniature electrodes with Redux paste were placed in a bipolar configuration on opposite sides of the participant's chest and the interval between successive R-waves of the electrocardiogram (EKG) was measured in milliseconds; (b) finger pulse amplitude – a UFI photoplethysmograph attached to the second finger of the nondominant hand recorded the volume of blood in the finger. The trough-to-peak amplitude of the finger pulse was measured, providing an index of the amount of blood in the periphery; (c) pulse transmission time to the finger – the time interval was measured between the R-wave of the EKG and the upstroke of the peripheral pulse at the finger; (d) pulse transmission time to the ear – a UFI photoplethysmograph attached to the right earlobe recorded the volume of blood in the ear. The time interval was measured between the R-wave of the EKG and the upstroke of the peripheral pulse at the ear; (e) finger temperature – a Yellow Springs Instruments thermistor was attached to the palmar surface of the first phalange of the middle finger of the dominant hand with surgical tape; (f) skin conductance level – a constant voltage device passed a small voltage between

Beckman regular electrodes attached to the palmar surface of the middle phalanges of the first and third fingers of the nondominant hand using sodium chloride in Unibase as the electrolyte; and (g) general somatic activity – an electromechanical transducer attached to a platform under the participant's chair generated an electrical signal proportional to the amount of body movement in any direction.

A computer program was used to calculate second-by-second averages for each physiological measure for each spouse. The physiological measures were selected to sample broadly from major organ systems (cardiac, vascular, thermoregulatory, electrodermal, and somatic muscle) to allow for continuous measurement, and to include measures used in previous studies of marriage (e.g., Levenson & Gottman, 1983, 1985). Additionally, these measures were selected to be as unobtrusive as possible. In all cases, sensor placement was painless and the location of sensors was inconspicuous (i.e., there were no sensors placed on the face) so that spouses would not be distracted during their conversations. Because the focus of the experiment was on the marital discussion itself, and not on the measurement of physiology, spouses typically acclimated quickly to the sensors.

Nonphysiological. Two remotely controlled high-resolution video cameras, which were partially concealed behind darkened glass, were used to obtain frontal views of each spouse's face and upper-torso. These images were combined into a single split-screen image using a video special effects generator and were recorded on a VHS videocassette recorder. Two lavalier microphones were used to record the couples' conversations. The computer was programmed to enable synchronization between video and physiological data by controlling the operation of a device that superimposed the elapsed time on the video recording and a second device that recorded a synchronization tone on one of the audio channels of the videotape recording. This system was also used to synchronize the data obtained in the recall session with the data obtained in the interaction session.

Questionnaires. The Retirement Satisfaction Inventory (RSI; Floyd et al., 1992) was used to assess satisfaction with retirement. The RSI is a 51-item questionnaire that addresses three broad domains related to the retirement experience: (a) reasons for retirement, (b) sources of enjoyment in retirement, and (c) satisfaction with life in retirement.

Health and income were assessed from the Time 2 questionnaire follow-up. Health variables were measured in two ways. First, participants responded to a single-item measure of subjective health ('How would you rate your overall health?') on a scale that ranges from 1 (*very poor*) to 10 (*very good*). Second, participants completed the Cornell Medical Index (CMI; Brodman, Erdmann, & Wolff, 1974), which consists of 195 items (e.g., 'Are you troubled by constant coughing?'). For each CMI item, the respondent indicates whether the symptom is present or not and, if present, how much it interferes with usual activities (5-point scale). Income was assessed from a single-item on which spouses indicated their annual pre-tax household income for 1993. Marital satisfaction was assessed from the questionnaire packet administered prior to retirement (at Time 1) using the Marital Relationship Inventory (Burgess, Locke, & Thomes, 1971) and the Marital Adjustment Test (Locke & Wallace, 1959). Cronbach's alphas were .83 and .45, respectively.

Data reduction

Physiology. Means and standard deviations for each physiological measure were computed from the second-by-second data for each spouse during the 15-minute conflict conversation. Because we were interested in assessing general physiological activation, we composed an aggregate measure of physiological activation during the conflict conversation by summing the standardized values for: (a) cardiac interbeat interval, (b) somatic activity, (c) skin conductance level, and (d) finger pulse amplitude. Values for cardiac interbeat interval and finger pulse amplitude were reversed before summing so that higher values on the physiological aggregate indicate higher levels of physiological activation. We selected these four indicators to compose our aggregate in order to broadly and equally represent activity in four somatic and autonomic systems – musculoskeletal (somatic activity), cardiac (cardiac interbeat interval), vascular (finger pulse amplitude), and electrodermal (skin conductance) – and to reduce the potential for Type I error that would result from repeating analyses for each individual physiological measure.

Affective behavior. Trained coders assessed affective behavior using the Specific Affect Coding System (SPAFF; Gottman, 1996). SPAFF is a cultural informant system in which coders consider a gestalt consisting of verbal content, voice tone, context, facial expression, gestures, and body movement. SPAFF treats the stream of behavior as continuous (rather than segmenting it into time blocks or turns of speech), and, thus, codes can be given at any time. The code best describing the affect of a spouse is indicated on a computer-monitored dial. A code remains in effect until a change in behavior occurs such that another code better reflects the affective state of the spouse. For the speaker, positive codes are: (a) interest, (b) affection, (c) humor, (d) validation, and (e) joy. The negative affect codes are: (a) anger, (b) contempt, (c) disgust, (d) belligerence, (e) domineering, (f) defensiveness, (g) fear/tension/worry, (h) sadness, and (i) whining. There is also a neutral speaker code. For the listener, the codes are: (a) positive, (b) negative, (c) neutral, and (d) stonewalling (indicating listener disengagement).

Reliability was calculated using Cohen's kappa (Bakeman & Gottman, 1986). The overall mean kappa for all of the SPAFF codes was .64. Because our hypotheses concerned positive and negative affective behaviors rather than specific SPAFF codes (and to control for Type I error), we computed two summary scores that indicated: (a) positive speaker behaviors and (b) negative speaker behaviors during the conflict conversation. To control for differences among couples in the total number of codes assigned, these scores were expressed as the proportion of the total number of emotional codes given for that couple.

Subjective experience. Subjective experience during the conflict conversation was calculated as the mean rating dial position across the 15-minute conversation. Higher scores on this measure of subjective experience indicate higher levels of positive emotional experience.

Retirement satisfaction. A single measure of satisfaction with life in retirement was computed from the 12 items on the RSI that indicated degree of satisfaction

with (a) health, (b) services, (c) marriage and family, and (d) retired life in general. Higher scores on this scale indicate greater levels of satisfaction. Alpha for the 12-item scale was .79. Means and standard deviations for retirement satisfaction were 5.03 ($SD = .57$) for husbands and 4.94 ($SD = .75$) for wives. For the 22 couples in which both husbands and wives had retired, spouses' retirement satisfaction scores did not differ significantly between spouses ($M_{\text{Husband}} = 5.01$, $M_{\text{Wife}} = 5.07$).

Health, income, and marital satisfaction. The CMI was scored for symptom severity by summing across all of the items. Because it is a symptom checklist, lower scores on the CMI indicate higher levels of physical health. Income was a continuous variable, with higher values indicating greater pre-tax income for 1993. Because the two measures of marital satisfaction were highly correlated (r for husbands = .83; r for wives = .88), we computed a single measure of marital satisfaction by averaging the two scores (both inventories use the same scale) for each spouse. Higher scores on this measure indicate higher levels of marital satisfaction.

Results

Data analysis strategy

Data analysis was conducted in two stages. First, we employed correlational analyses to test whether indicators (physiological, behavioral, and subjective) of the emotional qualities of Time 1 marital interaction predicted Time 2 retirement satisfaction. Second, we employed a hierarchical multiple regression approach to assess: (a) whether indicators of the emotional quality of Time 1 marital interaction could predict Time 2 retirement satisfaction over and above other known correlates of retirement satisfaction (i.e., Time 2 health and income); and (b) the relative contribution of the emotional qualities of Time 1 marital interaction and Time 1 marital satisfaction in predicting Time 2 retirement satisfaction. All analyses were conducted separately for husbands and wives. An alpha level of .05 was used for all statistical tests.

Do the emotional qualities of marital interaction predict subsequent retirement satisfaction?

Table 1 presents correlations of retirement satisfaction with (a) mean physiological arousal, (b) proportion of positive emotional behaviors, (c) proportion of negative emotional behaviors, and (d) subjective experience for husbands and wives. For husbands, greater self-reported retirement satisfaction was predicted by (a) lower levels of physiological activation, (b) higher proportions of positive emotional behaviors, and (c) more positive scores on the rating dial during the conflict conversation. The proportion of negative emotional behaviors was not significantly associated with retirement satisfaction for husbands. There were no significant correlations between retirement satisfaction and physiological, behavioral, and subjective variables for retired wives. Consistent with our hypothesis, these analyses indicate that husbands who were physiologically relaxed and affectively positive during a conversation with their spouse prior to retirement were happier in their retirements five years later. The hypothesis was not supported for wives.

Do the emotional qualities of marital interaction predict subsequent retirement satisfaction controlling for health and income?

We employed a hierarchical multiple regression approach to test whether indicators of emotion during marital interaction would predict retirement satisfaction even after controlling for health and income, both shown in previous research to be important correlates of retirement satisfaction. First, we investigated the bivariate correlations of health and income variables with retirement satisfaction to assess whether they made good candidates for control variables. The correlations (presented in Table 2) indicate that self-reported health and income showed moderate to weak correlations with retirement satisfaction in the predicted direction. For husbands, the correlation with health reached significance, while the correlations with income approached significance.

Three separate hierarchical regression analyses were conducted. In each analysis, self-reported health, symptom severity on the CMI, and income were entered as a group on the first step. One of the three indicators of the emotional quality of marital interaction that had been found to predict retirement

TABLE 1
Correlations of indicators of emotion during marital interaction with husbands' and wives' retirement satisfaction

Indicators of emotion during marital interaction	Husbands' retirement satisfaction ($N = 49$)	Wives' retirement satisfaction ($N = 31$)
Physiological arousal	-.36**	.08
% total positive behaviors	.36**	.15
% total negative behaviors	-.08	.02
Subjective experience	.27*	.20

* $p < .05$ (one-tailed); ** $p < .01$ (one-tailed).

TABLE 2
Correlations of self-reported health, Cornell Medical Index symptom severity, income, and marital satisfaction with husbands' and wives' retirement satisfaction

	Husbands' retirement satisfaction ($N = 49^a$)	Wives' retirement satisfaction ($N = 31^b$)
Single-item health	.49**	.62**
CMI severity	-.27*	-.27†
Income	.22†	.19
Marital satisfaction	.47**	.42**

^aHusbands $N_{income} = 46$. ^bWives $N_{income} = 30$.

† $p < .10$; * $p < .05$ (one-tailed); ** $p < .01$ (one-tailed).

satisfaction (i.e., mean physiological activation, proportion of positive behaviors, and self-reported affect) was entered on the second step.

For husbands, health and income together were significantly associated with retirement satisfaction, $F(3,43) = 5.98, p < .01$. Controlling for these health and income variables, we found that the incremental variance explained by mean physiological arousal was significant $F(1,41) = 5.12, p < .05$. The incremental variance explained by proportion of positive behaviors was also significant $F(1,42) = 6.82, p < .05$, as was the incremental variance explained by self-reported affect $F(1,41) = 4.21, p < .05$.

For wives, the effect of health and income together on retirement satisfaction was significant, $F(3,27) = 6.98, p < .01$. No additional analyses were conducted as there were no significant indicators of retirement satisfaction among the emotional variables.

These findings replicate previous work suggesting that health and financial status are important correlates of satisfaction with life in retirement for both husbands and wives. However, these analyses revealed that, for husbands, physiological, behavioral, and subjective indicators of the emotional quality of marital interaction assessed prior to retirement predicted subsequent satisfaction with life in retirement above and beyond more traditional demographic variables such as health and financial status.

Emotional qualities of marital interaction and marital satisfaction as predictors of retirement satisfaction

As would be expected from the existing literature, marital satisfaction was correlated with retirement satisfaction in our sample (husbands: $r(49) = .47$; wives: $r(31) = .42$). To understand our finding that for husbands the physiological, behavioral, and subjective indicators of the emotional quality of marital interaction also predicted retirement satisfaction, we conducted additional hierarchical analyses to assess the relative contribution of these emotional predictors and a measure of marital satisfaction. Specifically, we examined the question of whether indicators of emotion during marital interaction would predict retirement satisfaction even after controlling for the effect of marital satisfaction on retirement satisfaction. We ran three hierarchical multiple regression analyses, entering variables as follows: (1) self-reported marital satisfaction at Time 1 was entered on the first step; (2) indicators of the emotional quality of Time 1 marital interaction found to be significantly related to retirement satisfaction after controlling for health and income variables (i.e., mean physiological arousal, proportion of positive behaviors, and subjective affect) were entered on the second step. These analyses revealed that self-reported marital satisfaction was significantly associated with retirement satisfaction, $F(1,47) = 13.59, p < .01$; $r = .47$. The incremental variance explained by mean physiological arousal, controlling for self-reported marital satisfaction, was significant $F(1,46) = 4.30, p < .05$. However, the incremental variance explained by proportion of positive behaviors was not significant, nor was the effect of self-reported affect. Thus, these analyses reveal that physiological arousal during a conversation with one's wife, but not proportion of positive behaviors or self-reported emotion, predicts husbands' subsequent satisfaction with life in retirement above and beyond a global measure of marital satisfaction.

The reduction in the magnitude of the relation between the proportion of positive behaviors and positive emotional experience and retirement satisfaction when controlling for self-reported marital satisfaction suggests that

marital satisfaction may be mediating the effect of these aspects of the emotional qualities of marital interaction on subsequent retirement satisfaction. We investigated this idea using the Baron and Kenny (1986) approach to testing mediation, testing whether: (a) marital satisfaction mediated the effect of positive behaviors on retirement satisfaction; and (b) marital satisfaction mediated the effect of positive emotional experience on retirement satisfaction. For the first analysis, we initially determined that Baron and Kenny's (1986) conditions for establishing mediation were met in that: (a) positive behaviors were significantly related to marital satisfaction ($r = .49, p < .05$) and (b) marital satisfaction was significantly related to retirement satisfaction ($r = .47, p < .05$). We then tested whether the direct relationship between positive behaviors and retirement satisfaction was reduced to nonsignificance after controlling for these two relationships. We found this to be the case ($r = .33, p < .05$; $r_{\text{controlling for marital satisfaction}} = .16, ns$). We then applied the same procedures for testing mediation to the relationship between positive emotional experience and retirement satisfaction. This relationship was also reduced to nonsignificance when controlling for the effect of marital satisfaction on retirement satisfaction ($r = .27, p < .05$; $r_{\text{controlling for marital satisfaction}} = .12, ns$).

These findings support the idea that husbands' marital satisfaction mediates the effect of positive affective behaviors and affective experience on retirement satisfaction. Husbands who were more affectively positive (in both behavior and experience) during interactions with their spouses were also happier in their marriages and therefore happier with their lives in retirement.

Discussion

In examining whether the emotional qualities of marital interaction could predict satisfaction with life in retirement, we found that physiological, behavioral, and subjective indicators of emotion during marital interaction assessed prior to retirement significantly predicted subsequent retirement satisfaction for husbands, but not for wives. These findings indicated that husbands who were physiologically relaxed and affectively positive in behavior and in subjective experience when they discussed an area of marital conflict were more likely to be satisfied with their retirement five years later. Moreover, we found that the capacity of these emotional qualities of marital interaction to predict retirement satisfaction held even after controlling for health and income variables, both of which are known correlates of retirement satisfaction.

We also investigated the relative efficacy of emotional qualities of marital interaction and marital satisfaction to predict retirement satisfaction. Results indicate that marital satisfaction mediated the prediction of retirement satisfaction by positive emotional behaviors and positive subjective experience. This finding emphasizes the importance of marital quality at this stage of life and its intimate connection with retirement satisfaction. Interestingly, the prediction of retirement satisfaction by physiological relaxation during marital interaction held even after controlling for marital satisfaction. Thus, it appears that the ability of the husband to remain physiologically 'relaxed' while discussing a marital conflict has special status in

terms of contributing to retirement satisfaction above and beyond its contribution to marital satisfaction. In earlier work, we have written about the difficulty men have with physiological arousal when they are engaged in marital conflict (Gottman & Levenson, 1988). During a discussion of marital conflict, husbands reported feeling more negative when they were physiologically aroused; affect and physiological arousal were not correlated for wives (Levenson et al., 1994). These new findings further underscore the pervasive implications of this difficulty for men.

In contrast to husbands, none of the measured emotional qualities of marital interaction predicted retirement satisfaction for wives. Most notably for wives, physiological relaxation, the only measured emotional quality of marital interaction that predicted retirement satisfaction independent of marital satisfaction for husbands, was not a critical ingredient for being satisfied with retired life. This finding is consistent with our earlier observations (Gottman & Levenson, 1988) that wives do not experience the physiological arousal associated with marital conflict to be as toxic as do men. In keeping with this observation, it is reasonable to conclude that physiological arousal would be unlikely to spill over into other areas of life satisfaction for wives such as satisfaction with retirement.

It is important to note that other measured factors such as health, income, and marital satisfaction were correlated with retirement satisfaction for both husbands and wives. Thus, having an adequate income, good health, and being satisfied with the marriage are ingredients of retirement satisfaction that are common to both spouses. The emotional quality of marital interaction, however, was an ingredient of retirement satisfaction for husbands only. Husbands who can negotiate marital conflict while maintaining low arousal, positive behaviors, and positive feelings seem to be happier in their marriages, and, thus, are more satisfied with life in retirement.

Why might the emotional qualities of marital interaction forecast husbands' retirement satisfaction?

An interesting finding from this study was that husbands and wives differed in what predicted their satisfaction with retirement. Differences between men and women in predictors of retirement satisfaction have been reported previously (e.g., Quick & Moen, 1998; Seccombe & Lee, 1986), but not in terms of the emotional qualities of marital interaction.

We believe that husbands' ability to maintain physiological calmness and emotional positivity when discussing an area of marital conflict suggests facility, comfort, and competence in marital communication. It likely reflects a sense of trust, confidence, and respect between spouses. As marriage comes to occupy an increasingly significant role in retired life and as couples spend increasing amounts of time together, we believe that the ability to maintain positive and comfortable communication, even when dealing with the stress of marital problems, becomes a very important contributor to the quality of and satisfaction with retired life. Our findings that this relationship only held for husbands may derive from the

particular characteristics of the cohort we studied. For couples married in and around the 1950s, wives who worked full-time outside of the home throughout the marriage were still somewhat rare, and thus the role definition for working men was more clear-cut. Husbands in our sample may have experienced a greater shift in self-identity during the transition to retirement than did working wives. Husbands in this cohort who defined themselves primarily in terms of their work could find themselves somewhat adrift after retirement. In contrast, wives who always derived a large part of their identity from the home may not have experienced such a drastic change in their self-identity when work was no longer part of their lives.

Another factor playing a role in these spousal differences could be the pronounced narrowing of social networks that occurs more for men than for women in late life. For example, Altergott (1988) found that women over 65 spend a considerable amount of time with friends, relatives, and neighbors, whereas men over 65 spend most of their time with their spouses. When men and women were asked to name their primary confidant, 49% of men identified their wife; only 20% of women identified their husband as their primary confidant (Umberson, Chen, House, Hopkins, & Slaten, 1996). With the transition to retirement engendering greater investment in home life for men and more reliance on wives as their primary social contact, it is not surprising that the quality of marital interaction prior to retirement would become very important in determining the husbands' satisfaction with their retired life.

Limitations, strengths, and remaining questions

Our findings are limited by the size and homogeneity of the present sample. In particular, we are concerned that the small sample size for the wives ($N = 31$) may not have allowed us enough power to detect possible effects of emotional variables. The power for detecting a medium-sized effect ($r = .30$) at $\alpha = .05$ with $N = 31$ is .38 (Cohen & Cohen, 1983). This is considerably lower than the power for detecting a medium-sized effect for the sample of husbands (power = .55). Moreover, our sample was mostly Caucasian and upper-middle class, raising questions of generalizability to other ethnic and economic groups.

There are a number of questions related to the precise timing of retirement that we were not able to address. For example, there was not sufficient sample size to determine if it made a difference whether husbands or wives retired first in dual-career couples. Moreover, we assessed retirement satisfaction only once, thus we could not analyze predictors of the trajectory of retirement satisfaction over time.

The ability to measure qualities of marital interaction before retirement gave this study an advantage in exploring the direction of causality over earlier studies that obtained all measures at the same point in time. Although the present findings for husbands are consistent with the notion that the emotional quality of marital interaction predicts retirement satisfaction, these

data are still correlational in nature and thus the direction of causality cannot be determined with certainty.

The primary goal of this study was to predict retirement satisfaction from the qualities of marital interaction that were in effect prior to retirement. Recently, Szinovacz and Schaffer (2000) showed that marital conflict tactics change from pre-retirement to post-retirement. This suggests that a study using our methods for examining the emotional qualities of marital interaction before and after retirement and linking changes in these qualities to retirement satisfaction could be highly informative.

The present study measured emotional responding only in the context of marital interaction. Thus, we cannot rule out the possibility that husbands' arousal in the conflict situation might reflect a more general response tendency. For example, husbands' emotional state while interacting with another family member or a stranger might predict satisfaction with life in retirement. Alternatively, husbands' general responding to a wide range of emotional and nonemotional situations might forecast satisfaction with life in retirement. It may be that by measuring physiological, behavioral, and subjective responding to a social situation we are assessing some general index of imperturbability. Future studies should include measures of emotional responding with other interaction partners and in other emotional and nonemotional situations to address this question.

The use of a longitudinal design and a multi-method approach to the study of marital factors that affect satisfaction with life in retirement are strengths of the current study. Findings for predictors of retirement satisfaction from the emotional qualities of marital interaction indicate a promising avenue for future research that identifies predictors of retirement satisfaction from marital variables. Owing to recent demographic changes, such as increased longevity, and social and historical changes, such as greater numbers of women in the workforce and more workers taking early retirement, increasingly greater numbers of people will spend considerable amounts of time in retirement. Thus, an optimal goal is to ensure high levels of satisfaction with life in retirement for all retirees.

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