

DAILY RECIPIENT MOOD AND SOCIAL SUPPORT PROVISION FOR WOMEN WITH
BREAST CANCER

Sara E. Boeding

A thesis submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Master of Arts in the Department of Psychology (Clinical Psychology).

Chapel Hill
2010

Approved by:

Donald Baucom, Ph.D.

Andrea Hussong, Ph.D.

Jonathan Abramowitz, Ph.D.

ABSTRACT

SARA E. BOEDING: Effects of Daily Recipient Mood on Social Support Provision for Women with Breast Cancer
(Under the direction of Donald Baucom, Ph.D.)

Women who are diagnosed with breast cancer can experience an array of psychosocial difficulties; however, social support, particularly from a spouse, has been shown to serve a protective function. This study examined the ways in which a woman's mood and her spouse's marital satisfaction influence a male partner's decision to provide such support. Pre-test data (including a baseline measure and a 30 day daily diary) from a larger intervention study and Multilevel Modeling (MLM) were used. Results show that on days in which women reported higher levels of negative or positive mood, they received more support. Also, women who were overall more positive tended to receive more support than those who were less positive, but overall levels of negativity had no effect. Finally, men who were more satisfied in their marriages provided more support to their wives, but remained responsive to women's mood. Implications of these findings are discussed.

TABLE OF CONTENTS

LIST OF TABLES.....	iv
ABBREVIATIONS.....	v
DAILY RECIPIENT MOOD AND SOCIAL SUPPORT PROVISION.....	1
<i>Method</i>	8
<i>Participants</i>	8
<i>Materials</i>	8
<i>Daily Diary Measures</i>	8
<i>Baseline Measure</i>	10
<i>Procedure</i>	10
<i>Results</i>	11
<i>Discussion</i>	15
REFERENCES.....	27

LIST OF TABLES

Table

1. Correlations, Means, and Standard Deviations of Primary
Study Variables.....24
2. Fixed Effects (Top) and Variance-Covariance Estimates (bottom)
for Models Predicting Social Support Provision.....25

ABBREVIATIONS

BFI	Brief Fatigue Inventory
BPI	Brief Pain Inventory
DAS	Dyadic Adjustment Scale
ICC	Intraclass Correlation
IVR	Interactive Voice Response System
MLM	Multilevel Modeling
NA	Negative Affect
PA	Positive Affect
PANAS	Positive and Negative Affect Schedule
QMI	Quality of Marriage Index
RSAT	Relationship Satisfaction Questionnaire
SPS	Source Specific Social Provisions Scale

DAILY RECIPIENT MOOD AND SOCIAL SUPPORT PROVISION FOR WOMEN WITH BREAST CANCER

Women who are diagnosed with breast cancer can experience an array of psychosocial difficulties, including depression, anxiety, body image concerns, and sexual dysfunction (Baucom, Porter, Kirby, Gremore, & Keefe, 2005; O'Mahoney & Carroll, 1997). During such challenging times, social support has been shown to have a protective function (e.g. Bloom, Stewart, Johnston, Banks, & Fobair, 2001; Helgeson & Cohen, 1996; Holland & Holahan, 2003) with the most profound source of support being from one's spouse (Figueiredo, Fries, & Ingram, 2004; Neuling & Winefield, 1988). However, spouses might find it difficult to provide support due to their own levels of distress or the strain the breast cancer can place on the relationship (e.g., sexual difficulties, negotiating new roles and responsibilities; Wagner, Bigatti, & Storniolo, 2006). Therefore, only some spouses continue to provide the much needed social support to their wives. To better aid couples facing breast cancer, it becomes necessary to understand the factors which contribute to the level of social support a partner can and will provide to the female with breast cancer.

Social Support has frequently been conceptualized in one of two ways (House, Kahn, McLeod, & Williams, 1985). Structural Support (AKA "social integration" or "network support") refers to the quantity of social contacts (such as friends, family, and neighbors) an individual has. In contrast, Functional Support refers to the type or quality of support behaviors provided to the individual. This can include advice or knowledge (informational support); tangible resources or assistance (instrumental support); or empathy, reassurance,

and expression of love and affection (emotional support). Although structural social support promotes overall well-being, only functional social support serves a protective function during times of stress (Cohen & Wills, 1985). Thus, this study evaluated provision of functional social support only.

Social support is generally thought of as a transactional process, dependant on the dynamics between the support recipient and the support provider (e.g., Pearlin & McCall, 1990). Thus, a number of factors might influence whether support is requested or provided. There are likely to be characteristics of the woman herself that influence whether she receives support, and her own mood is likely to be one of those factors. Previous research has focused on the effects of psychopathology (e.g., depression) or personality traits (particularly neuroticism and extraversion) on the provision of social support, rather than mood per se. These lines of research suggest that while positive recipient characteristics (like extraversion) may increase levels of support provision, negative recipient characteristics (such as distress or neuroticism) may be associated with decreased social support provision.

While low to moderate levels of psychological distress often lead to the mobilization of social support, severe and persistent levels of distress diminish levels of support and amplify levels of negative responses (Dunkel-Schetter & Skokan, 1990; Gurung, Taylor, & Seeman 2003; Segrin, 2001). This can occur in a variety of contexts, including that of breast cancer (Bolger, Foster, Vinokur, & Ng, 1996; Moyer & Salovey 1999). In addition, a depressed care receiver can lead to feelings of caregiver stress and burden (Coyne et al., 1987; Jeglic et al., 2005). In general, research indicates that people often avoid or respond negatively to others who demonstrate depressed mood, perhaps at the time the depressed person most needs support (Finch, 1998; Gurtman, 1986; Pasch, Bradbury, & Davila 1997;

Wade & Kendler, 2000). The rejection of depressed persons occurs even if the depression seems justified, although justification attenuates the effect (Gurtman, 1986).

In addition to distress and depressed mood, a patients' overall level of neuroticism or negative affectivity may lead to lower levels of social support receipt. Neuroticism, a personality trait characterized by negative affect (Clark, Watson, & Mineka, 1994; Costa & McCrae, 1980), successfully predicts marital discord and dissolution more than any other personality trait (Karney & Bradbury, 1995). In addition, women high in neuroticism both receive less support and perceive that less support is available to them, irrespective of their satisfaction with the level of support (Kendler, Gardner, & Prescott, 2003; Kitamura et al., 2002; Pasch, Bradbury, & Sullivan, 1997).

Whereas negative affect will likely reduce levels of social support provision, positive affect might increase levels of support provision. Support for this notion comes from the Broaden-and-Build theory (Fredrickson, 1998, 2001). According to this model, negative emotions narrow, and positive emotions broaden an individual's thought-action repertoire. An individual's perception of a threat will result in negative emotions, which in turn elicits specific thoughts and behaviors (e.g., fear elicits the escape response). In contrast, positive emotions promote more flexible, creative thinking and the consideration of an array of behaviors (see Isen, 1993 for a review). This expanded thought-behavior repertoire serves to promote the accumulation of personal and social resources, which can later be utilized in threatening situations. For example, joy promotes play, which is an important component of forming and maintaining social relationships (Frijda, 1986). Other positive emotions also promote behaviors that strengthen relationship functioning; in turn, these relationships serve as resources during times of adversity (Fredrickson, 1998). Thus, women who experience

more positive emotions may engage in more positive relationship behaviors, strengthening their romantic bonds; this may in turn prompt more positive behaviors, such as support, from their partner.

Empirical evidence has begun to accumulate that supports the Broaden-and-Build theory. Traditionally, research regarding positive emotions has focused on the ways in which the *experience* of positive emotions promotes well-being (Papa & Bonnao, 2008). For example, positive affect influences well-being by increasing perceptions of social support (Finch, 1998). More recent studies have examined the ways in which behavioral expressions of emotions influence an individual's social network. For instance, laughter and smiling during times of adversity enhance social relations and network size (Keltner & Bonnano, 1997; Papa & Bonnao, 2008). In addition, recipient extraversion (which is highly correlated with positive affect) is associated with higher levels of social support perception and provision (Swickert, Rosentreter, Hittner, & Mushrush, 2002; Van Dras & Siegler, 1997). Thus, recipient positivity should heighten the chances that a partner will provide social support when it is needed.

The research discussed thus far coincides with a reciprocity model in which the level of social support provided is directly related to the level of positive affect and inversely related to the level of negative affect of the support recipient. However, a more complete model would not only encompass situational and recipient characteristics, but factors regarding the support provider and/or the relationship between the recipient and provider as well (Dunkel-Schetter & Skokan, 1990). One potentially important factor related to both the provider and the relationship is marital satisfaction. For men, perceptions of social support received during a given interaction are often based on distal factors, such as marital

satisfaction, rather than what occurs during that specific interaction (Carels & Baucom, 1999). It is possible that males also utilize marital satisfaction in their decision to provide support.

Several studies have found that marital satisfaction does influence the level of support provided to wives (Cutrona & Suhr, 1994; Verhofstadt, Buysse, Devoldre, & De Corte, 2007). Marital satisfaction can influence appraisals of, and behaviors towards, spouses (Pasch et al., 1997; Waldinger & Schulz 2006). Thus, husbands highly satisfied with their marriages may continue to think and behave positively towards their spouses despite high levels of negative affectivity from their wives. This is consistent with long term models of relationship functioning (e.g., Gottman, 1998) which propose that if a couple experiences long term good will and satisfaction in their relationship, then when one person is struggling, needs assistance, or is more negative, the other partner will respond positively due to this long term “bank account” of good will.

Marital satisfaction represents a good approximation of a positive “bank account” in this model. Therefore, marital satisfaction should moderate the relationship between recipient mood and the provision of support provision, such that the effects of mood will be partially or fully ameliorated when the husband is satisfied in his marriage. That is, men who are highly satisfied in their relationship should provide high levels of social support, irrespective of their wives’ mood, but men who are less satisfied in their marriage should be more reactive to their wives’ mood. There is some evidence that marital satisfaction can moderate the relationship between recipient characteristics and the experiences or responses of a support provider. For instance, one investigation of patients undergoing coronary artery bypass found that levels of patient depression, optimism, and neuroticism were all associated

with higher levels of caregiver burden or distress; however, the effects of patient neuroticism on caregivers' experience of burden were particularly detrimental for those caregivers who were less satisfied in their marriage (Ruiz, Matthews, Scheier, & Schulz, 2006). Another study found that the more a patient's cancer restricted their caregiver's time and interfered with their activities, the more the caregiver responded negatively to the patient (e.g., criticized or avoided), but only for those caregivers who were less satisfied in their marriages (Manne, Alfieri, Taylor, & Dougherty, 1999). Thus, individuals who possess more positive and less negative characteristics may receive more support than those who are more negative and less positive, but this may only be the case for those who have dissatisfied spouses.

Although a substantial body of literature now seems to indicate that positive recipient characters (such as extraversion) are associated with more support and negative recipient characteristics (such as neuroticism) are associated with less support across persons, it remains unclear to what extent the same pattern might hold with regards to "within person fluctuations" in mood over time. That is, on days in which a given woman experiences more negative and less positive mood, does her spouse provide less support? And to what extent might that relationship vary based on his level of marital satisfaction? Given breast cancer patients may experience more negative and variable moods, it is important to understand the effect this has on their ability to obtain the support they need. This study seeks to build on previous research by examining both within and between person effects of mood on social support provision, and by including positive affect, which is often omitted or is examined in terms of network support rather than functional support.

Research in this area has typically relied on cross-sectional designs, although some studies have instead utilized a two-wave design in which follow-up data is collected several

months after baseline data. These methods have yielded illuminating results on how between-person differences in mood-related variables are associated with support, but they cannot adequately assess within person differences over time. The influence of mood on social support provision is likely to occur during the same day; therefore it is important to assess mood on a daily basis. In addition, to fully understand how changes in mood are associated with changes in support over time, multiple assessment points are needed. Therefore, this study utilized daily diary methodology to assess mood and social support provision for a period of thirty days.

The current investigation employed the long term bank account model to investigate if and how a support recipient's mood influenced a male partner's provision of social support in the context of breast cancer. It was hypothesized that men who were more satisfied in their marriage would provide more support to their wives than men who were less satisfied in their marriage, and that women who were more positive and less negative would receive more support (between person comparisons). However, an interaction was also hypothesized; that is, it was predicted that men who were highly satisfied in their marriage would provide support irrespective of their wives' mood, but men who were less satisfied in their marriage would provide more support to women who were more positive and less negative. Likewise, it was hypothesized that on days in which women experienced more positive and less negative mood, they would receive more support (within person comparison), but this relationship would be moderated by men's marital satisfaction such that men who were more satisfied in their marriages would provide support regardless of their wives' daily fluctuations in mood.

Method

Participants

Participants were 161 heterosexual couples confronting early-stage breast cancer. Couples were recruited from the University of North Carolina (UNC) Hospital and Duke University Medical Center in the context of a larger treatment-outcome study (see Baucom et al., 2005 for details). Recruiters reviewed medical recorders to determine eligibility; inclusion criteria included (a) a recent diagnosis of Stage I, II, or IIIa breast cancer, no history of other breast cancer, and no history of cancer within the last five years (skin cancer excluded); (b) currently being married or living with a male partner in a committed relationship for at least one year; and (c) both partners being willing to participate and able to speak English. Eligible couples then received letters describing the study and stating that a recruiter would contact them to discuss their possible participation in the study.

Of the 161 women in this study, 85% were white, 10% were black, 2.5% were Hispanic, and 2.5% were Asian or Pacific Islander. They tended to be middle aged; ages ranged from 25 to 82, with a median of 52.5 years old. The median level of education was 16 years (i.e., college-educated), and the range was 11 to 26 years. Participants' household income ranged from (a) \$10,000 to \$14,999 to (b) over \$250,000, with the median income range being \$100,000 to \$249,999. Women had been married or living together in a committed, heterosexual relationship for 1 to 56 years, with the median being 22 years.

Materials

Daily Diary Measures

Women were asked to complete several daily diary measures by phone everyday for 30 days following the couple's initial assessment. The following daily diary measures were utilized in this investigation:

Source Specific Social Provisions Scale (SPS, Cutrona, 1989). The amount of daily partner support, and satisfaction with that support, were assessed with the SPS, adapted for use on a daily basis. The current investigation utilized the three questions regarding the amount of daily support. These include (a) "How much did your partner help out with chores or routine tasks today?" (b) "How much did your partner support you emotionally today?" and (c) "How much did your partner help you make decisions or give you useful advice today?" Responses range from 0 (not at all) to 5 (a great deal). A summary score was created for each day by summing the items. The reliability of the scale within this study was high ($\alpha = .80$).

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). An adapted version of the PANAS was used to assess daily levels of positive affect (PA) and negative affect (NA). Participants rated the extent to which they experienced various mood states that day from 0 (not at all) to 5 (extremely). The scale included five PA items ("happy", "joyful", "calm", "enjoyment or fun" and "pleased") and six NA items ("depressed", "unhappy", "worried or anxious", "angry or hostile", "guilty" and "frustrated"). Ratings were summed to form two subscales (PA and NA). Other daily diary studies have used similar scales, and report high reliability (for PA, $\alpha = .88$; for NA, $\alpha = .89$; Gil et al., 2004). In the present study, reliabilities were similar ($\alpha = .90$ for PA; $\alpha = .86$ for NA).

Brief Pain Inventory (BPI; Cleeland & Ryan, 1994) and Brief Fatigue Inventory (BFI; Mendoza et al., 1999). Daily pain levels were assessed with one question from the

BPI, “What was your average amount of cancer-related pain during the past 24 hours?”

Daily fatigue was assessed using one question from the BFI, “What was your average amount of fatigue, weariness, or tiredness during the past 24 hours?” Participants rated these items from 0 (“no pain or fatigue”) to 9 (“as bad as you can imagine”).

Baseline Measure

Quality of Marriage Index (QMI; Norton, 1983). The QMI is a 6-item self-report measure of marital satisfaction. Participants rate five items on a scale from 1 (“very strong disagreement”) to 7 (“very strong agreement”). The sixth item (“Circle the number that best describes the degree of happiness, everything considered, in your marriage or relationship”) is rated on a 10-point scale from 1 (“very unhappy”) to 10 (“very happy”). Thus, higher scores indicate greater quality of marriage. The QMI has well established psychometric properties, with high reliability ($\alpha = .97$) and excellent convergent validity (Heyman, Sayers & Bellach, 1994). The QMI strongly correlates with other measures of marital satisfaction, including the Dyadic Adjustment Scale (DAS) and with the Relationship Satisfaction Questionnaire (RSAT). Correlations range from .85 and .94.

Procedure

Following recruitment, couples completed an initial assessment session. In this session, a research staff member obtained informed consent and couples completed a number of baseline questionnaires and video-taped interaction tasks. The couples were then assigned to one of three treatment conditions: Relationship Enhancement (a couple-based cognitive behavioral therapy), couple-based Cancer Education, or Treatment-as-Usual (in which

couples receive written materials about breast cancer and a list of community resources). The couples were paid \$40 for the initial assessment session. The current investigation utilized data from one of these baseline questionnaires, as indicated in the measures section.

In addition to the baseline questionnaires, women completed a daily diary. Women were instructed to choose a timeslot after 5 p.m. and they called at this time everyday for thirty days beginning the day after their initial assessment. A recorded voice asked for their ID number, provided instructions regarding the phone system, and read the items. After the recording asked each item, participants responded using the telephone key pad. The VoiceGuide Interactive Voice Response (IVR) system automatically entered the data into a computerized database. The database was monitored to ensure compliance with these procedures. Weekly phone calls were utilized to reinforce calling and to address any deviations from the protocol that occurred.

In total, there were 3777 observations across 161 women. Women called between 2 and 30 days, with the mean amount of days being 25.2 (out of a total of 30). This corresponds to a compliance rate of 84%.

Results

Multilevel modeling (MLM) was utilized following the guidelines put forth by Raudenbush and Bryk (2002) in order to evaluate the effects of women's mood and men's marital satisfaction on the amount of social support provided to women with breast cancer over a span of thirty days. This technique allowed examination of the ways in which *both* within and between person factors predicted changes in social support over time. Previous research has focused primarily on how between person differences, such as depression, predict social support provision, but do not explicate the ways in which daily mood may

influence support *within* a given dyad. This statistical technique not only permits examination of this important question but has the advantages of incorporating full case data and allowing unequal spacing of assessments over time (in contrast to more traditional repeated measures tools, such as ANOVA). Thus, even if a woman missed some of her daily assessments, her data could still be utilized. This is important because, as stated previously, women on average completed 25.2 of their 30 calls.

On average, the sample was highly satisfied and displayed moderate levels of positive affect, and relatively low levels of negative affect (See Table 1 for means, standard deviations, and correlations among study variables). Given these distributions were not normally distributed, the variables were log transformed, and the distributions were reexamined. The log transformation did not result in normally distributed variables; thus, the original variables were utilized in the analyses. Diagnostics indicated that there were no outliers and that the data did not violate model assumptions, with the exception that very slight heteroscedasticity was evidenced in the residuals on the QMI (such that greater variability occurred at higher levels of QMI scores). As a result, the final model was re-analyzed modeling heteroscedastic errors with the following equation: $\sigma^2 = \sigma^2 \wedge e^{\alpha_{qmi_grndmc}}$. Written another way, this is $\log(\sigma^2) = \log(\sigma_0^2) + \alpha_{qmi_grndmc}$. This model was not significant; thus, the more parsimonious homoscedastic error structure was retained.

Correlations indicated that positive mood was associated with higher levels of support, as was marital satisfaction; negative mood was associated with lower support. Prior to formally testing these associations using multilevel modeling, all within person variables were person-centered, and all between person variables were grand mean centered. Thus, all interpretations are for a woman of the average age, whose husband is at the average level of

marital satisfaction, and who is at her average level of pain, fatigue, positive mood, and negative mood.

Prior to testing predictors of support, an empty random-effects ANOVA with a serial correlation structure was conducted to decompose the within and between person variability in support. The serial correlation structure was utilized, because it was believed that the error structure of support would not be independent; rather, it was thought that errors would be correlated across days. Given the largest correlation was small, $r = .02$, and the overall error structure was non-significant, it was removed, and the more parsimonious model of independent errors was utilized in all further models.

The random-effects ANOVA was recalculated after removing the serial correlation structure. An ICC of .49 indicates that 49% of the variance in support provision was accounted for by between-person differences (also, this indicates a moderate correlation of within person differences). Thus, there was a moderate amount of dependence in the data, and approximately half of the variance was accounted for by within person differences.

Table 2 presents the fixed and random effects.

Several control variables were added to the model; these included both time-invariant (women's age) and time-variant (pain and fatigue) covariates. Daily values of pain and fatigue represent the within person (i.e., across days) effect, whereas mean levels of pain and fatigue represent the between person effect. None of the control variables were significant, and changes in ICC were negligible; thus the models presented below exclude these variables.

Next, women's' positive and negative moods, the main variables of interest, were included in the model. Thus, support was predicted from women's daily negative and

positive mood and women's aggregated positive and negative mood. Table 2 presents the fixed and random effects of this model. The effects of daily positive mood and daily negative mood were both significant and indicate that higher levels of daily positive and negative mood predicted higher levels of support provision. Of the within person variance in support unaccounted for in the empty model, 15% was accounted for by positive mood and negative mood.

In addition, mean levels of positive mood were significantly associated with support, but mean levels of negative mood were not. This indicates that women who were overall more positive tended to receive more support, but women who were overall more negative did not receive more or less support than women who were less negative. Of the between person variance unaccounted for in the empty model, 28% was accounted for by mean levels of positive and negative mood. Taken together, results indicate that the inclusion of mood variables significantly accounted for both within and between person variability in support. More specifically, results show that women who were generally more positive received more support than those women who were less positive, but all women received more support on days in which they displayed more affect.

Finally, men's marital satisfaction and the interactions of men's marital satisfaction and women's mood were added to the model. Thus, support provision was predicted from women's daily positive and negative mood, women's mean levels of positive and negative mood, men's marital satisfaction, the interactions between daily mood and men's marital satisfaction, and the interactions between mean mood levels and men's marital satisfaction. The fixed effect for men's marital satisfaction was significant (see Table 2) and indicates that men who were more highly satisfied provided more support than those who were less

satisfied. However, the interaction effects were not significant, indicating that the effects of mood did not depend on how satisfied men were in their marriages. Of the within person variance in support unaccounted for in the previous model, 2% was accounted for by men's marital satisfaction. Also, of the between person variance unaccounted for in the previous model, 10% was accounted for by men's marital satisfaction. Thus, the inclusion of men's marital satisfaction variables significantly accounted for both within and between person variability in support, but mostly accounted for between person variability.

Although compliance rates were high (as previously reported), there was concern that those individuals who completed very few of the daily diaries might have skewed the results. Therefore, a sensitivity analysis was conducted by re-examining the final model, excluding cases for which there were fewer than 20 data points. Results were consistent with those under complete case data; therefore, results are reported using full case data.

Taken together, results indicate that on days in which women experience more affect, they receive more support. In addition, women who are generally more positive tend to receive more support, and men who are more satisfied in their marriages tend to provide more support.

Discussion

Although the benefits of social support in the context of breast cancer are well-established, less is known about the predictors of social support. Several lines of research have suggested that those who are more depressed, distressed, or neurotic may receive less support, and those who are more extraverted may receive more support. However, little is known about the processes which occur day-to-day, within a dyad, and how a breast cancer patient's mood may influence her spouse's support provision. This study built on previous

literature but using daily diary methodology and multilevel modeling to better understand this important issue. Taken together, the results support the hypotheses that higher levels of marital satisfaction and positive mood correspond with increases in support provision; however, an interaction effect was not supported, and the effect of negative affect was not as anticipated. Overall levels of women's negativity did not have an effect on support provision across women, but on days that women experienced more negative mood, they received *more* support (that is, within person variation in negative mood predicted spouses' support, but overall negativity between women did not). Note that correlational analyses revealed the opposite effect; that is, a simple correlation between negative mood and support indicated that more negativity was associated with less support. Thus, including positive mood in addition to negative mood, and decomposing the within versus between person effects, was warranted and highly valuable in discerning the relationship between mood and support.

The results support the notion that women's daily mood influences the amount of support they receive; that is, on days in which women experience more affect, they also receive more support. There are several possible explanations for this effect. One possibility is that women who are experiencing higher levels of affect on a given day may engage in more support elicitation strategies, and husbands respond to these strategies rather than mood per se. Second, women's mood in and of itself may provide an important cueing function to men. Whereas both positive and negative mood might cue men to respond with support, the motivation to provide support could be different in the two mood states. That is, when husbands perceive their wives to be more highly distressed (as evidenced by more negative affect on a given day), they may recognize their wives' increased need for support. And, on days in which women are more positive, men may perceive their spouses as being more

approachable, and they may choose to provide positive support in light of the patient's "good day." Although both types of mood might cue a supportive response from a male partner, the two moods would be operating in different ways. A third and final possibility is women's mood may serve as a more diffuse primer, making patients more salient to their spouses. That is, higher levels of affectivity may lead to increases in partners' awareness of their spouse on a given day, which then promotes further behavioral engagement.

To further elucidate the nature of why both women's positive and negative mood are associated with increased men's support, it is important for research to examine not only mood and social support but motivations for support as well. More specifically, to what extent does a woman's mood motivate her to engage in more frequent or more successful support elicitation strategies? Likewise, to what extent and in what ways do women's positive mood and negative mood motivate husbands to provide support to their wives in similar or different ways? Also, the current investigation examined the manner in which women's mood influenced their spouses' behaviors (i.e., support) but not the women's own behavior. It is therefore unclear if men are responding to the expression of emotions or to changes in women's behaviors; thus, it is important to include measures of women's behaviors that are associated with their mood, in addition to assessing men's behavioral responses. Only when mood, motivations, and behaviors are all assessed can a full transactional model be examined.

Although the effect of negative mood on support was unanticipated (that is, higher levels of negative affect were associated with higher levels of support), these results are consistent with a growing body of literature which indicates that higher levels of support can be associated with *higher* levels of distress. Several models have emerged to explain these

results. One of these is the triage model, which holds that when individuals are more distressed, they receive more support as a result of need (Lepore, Glaser, & Roberts, 2008); in this model, distress leads to support. An alternative model is the self esteem threat model, which postulates that high levels of support can decrease one's sense of self esteem, which in turn results in higher levels of distress; thus, increased support leads to greater distress. Given that in this study women experienced higher levels of negative *and* positive affect on days in which they received more support, it is unlikely that support decreased women's self-esteem and increased both positive and negative mood. It is more plausible that men increased their levels of support in response to wives' higher levels of negative mood or distress (consistent with the triage model). However, to fully understand which model may best explain how support and mood influence one another within a given dyad over time, future research should include measures of self-esteem in addition to mood and support. In addition, it is important to examine effects over a larger time span, as changes in self-esteem likely occur over larger time periods.

Although our results highlight the importance of daily mood on support provision within a given dyad, the findings suggest that only overall positive mood (between persons), not negative mood, is associated with support. Women who generally are more positive tend to receive more support than those who are less positive. This may be because women who are more positive are easier to approach and to support. In addition, men may experience support interactions with positive women as being more rewarding than interactions with women who are less positive. This is consistent with the broaden-and-build theory of emotions, which holds that one effect of positive emotions is to gather and maintain social resources that can be used in times of need.

The lack of effect for overall negativity is notable, especially given that previous research has suggested that levels of distress, depression, and neuroticism are all associated with lower levels of support across persons. One possibility is that overall levels of negative affect found in this study are not representative of these women's mood more broadly; that is, their level of negativity may be somewhat transient, characteristic of this particularly difficult time period only. Men may therefore attribute women's negativity to a justified situational factor, breast cancer, and therefore continue to provide support. However, given that previous research has found that depressed mood can lead to rejection, *even when* there is justification (Gurtman, 1986), this explanation may not hold. These results are consistent with the Lepore, Glaser, and Roberts (2008) study, which found only a trend towards significance for negative affect on support provision. Thus, as elaborated upon below, it is plausible that overall levels of negativity truly have little effect on support provision.

The lack of effect for overall negative mood suggests that spouses may accommodate or extinguish to their partners' level of negativity over time, and as a result, they become less reactive to it. That is, women who are more negative may be more likely to elicit negative responses early in their relationships. Over time, however, men may begin to recognize that their female partners' negativity is simply part of who their partner is, and is not an indicator of the health of the relationship or status of their partner's distress. Men may therefore ignore their female partners' overall, typical level of negativity, and base their behaviors towards their female partners on other factors, such as when their partner becomes more negative than usual. Thus, if a male partner has a wife who generally expresses a high level of negative mood, he may only provide support on days in which she is more negative than usual.

Unresponsiveness to a partner's overall, global levels of negative affect can be adaptive because being highly responsive to negative spousal characteristics would likely lead to both heightened individual distress on a regular basis, as well as decreased marital satisfaction. It is notable that on average, couples in our study had been married for many years (the median length of marriage was 22 years) and were fairly highly satisfied in their marriages. Thus, it is unclear if younger spouses do tend to be more responsive to negative affect than older spouses (suggesting accommodation) or whether all spouses tend not to respond to negative affect. In addition, it may be that only distressed couples respond to negative affect. To better understand if and how the process of accommodation to negative affectivity may occur, it is therefore important to study younger couples, who have not had as much of an opportunity to accommodate to their partners yet, and to see to what extent this finding would hold in a more distressed population. Unfortunately, the current sample includes few young and distressed couples.

All explanations thus far detail the ways in which mood may be influencing levels of support provision; however, given the correlational nature of this study, it is possible that it support which is influencing mood rather than the reverse. For instance, the level of support a woman receives on a given day may alter her cognition about her relationship and her health, and her mood may then shift based on these appraisals. That is, on days in which a given woman receives more support from her spouse, she may hold more favorable views of her spouse and relationship, and therefore may experience higher levels of positive affect. At the same time, receiving more support may cue her into the fact that her current health status necessitates this level of support, which in turn may lead to increased feelings of negative affect. Thus, support may cue her into both positive aspects of her relationship and negative

aspects of her health, and she may therefore experience higher levels of either or both positive and negative affect.

When considering effects across women, women who, on average, receive more support experience more positive mood overall, but do not experience more or less negative mood, as noted above. Although the stress-buffering model would suggest that higher levels of support would ameliorate levels of negative mood (Cohen & Wills, 1985), higher levels of support are not associated with differential levels of negative mood across women in this study. This suggests that if it is truly support which is influencing mood, that the mechanism is not aiding women cope with negatives, but rather increasing levels of levels of hope, optimism, and positive mood. Given this finding is largely discrepant with the large body of research suggesting support serves to ameliorate stress and negative affect, it is more likely that mood is influencing support in this study, or that the effects are bidirectional in nature.

Finally, men who are more satisfied in their marriages do tend to provide more support to their wives, but men remain responsive to affectivity regardless of their level of satisfaction. That is, contrary to our hypothesis, an interaction between marital satisfaction and affect was not supported, at either the within person or between person level. This suggests that even men who are highly satisfied in their marriages will change their levels of support based on their female partners' negative and positive mood, even though on the whole they provide more support to their wives. Thus, men take into account both their own overall levels of satisfaction in their marriage and characteristics of the support recipient when deciding whether or not to provide support.

This study highlights the importance of using daily diary methodology and multilevel modeling techniques to better understand within and between person effects. Although

previous research has indicted a general rejection of individuals higher in distress and depression, this study found that men responded to daily fluctuations in mood rather than overall levels of negative affectivity. Furthermore, when women experienced more negative mood, they received *more* support, consistent with the triage model (that is, men provide support on days in which it is most needed). Further research should examine effects over larger spans of time and in other populations (i.e., couples who have not been together as long, and who are not currently confronting a major illness) to better elucidate these effects. In addition, possible mechanisms should be explored, including but not limited to both spouses' motivations in response to positive and negative mood. Finally, research should examine gender effects; it is unclear if women would respond to men's affect in the same way as men respond to women.

These findings also highlight the importance of assessing not only negative affect, which tends to be emphasized, but positive affect as well. Although theories such as the broad-and-build theory postulate that positive emotions enhance social relations, few studies actually assess the associations between positive affect and support, and those that do often examine how positive affect influences overall network size, rather than the dynamics within a support relationship (functional support). However, in this study only overall positivity, not negativity, predicted support, which lends credence to the broad-and-build theory of positive emotions.

This investigation provides promising findings with regard to clinical practice. The results suggest that either enhancing women's expression of emotions or men's relationship satisfaction could lead to increases in women's social support receipt. Having said that, this study is correlational in nature, and it is therefore unclear whether changes in mood and

marital satisfaction would lead to changes in support, if the reverse is true, or if another variable is responsible for this relationship. At the minimum, it is important for women to recognize that negative affect is not a prerequisite to receiving support when confronting cancer.

Several limitations of this investigation should be noted. First, we measured support with women's self-reports, but women's perceptions of support receipt may have been influenced by their mood, which was assessed at the same time and in the same way as support received. However, women reported higher levels of support when in a negative mood, and it is unlikely that negative mood caused women to underreport the amount of support they received. Still, future research should incorporate observational data or partner reports of support provision. In addition, our sample was predominately white, highly educated, and upper-middle class, and it is therefore unclear to what extent these results may generalize to other populations.

Social support provides an invaluable protective function in the context of breast cancer, particularly if it comes from spouses. To aid patients, it is therefore imperative that we examine not only the effects of support, but the potential factors which influence support. This study highlights the fact that not only situational and provider characteristics should be considered, but recipient characteristics as well. In addition, this investigation shows that consideration of between person effects is valuable, but incomplete; more research regarding within person differences is clearly warranted. Still, this study strongly suggests that mood may be an essential component of the support process, and it is therefore important for researchers and clinicians alike to consider this when working with breast cancer patients.

Table 1

Correlations, Means, and Standard Deviations of Primary Study Variables

Variable	Positive Mood	Negative Mood	Men's Marital Satisfaction	Support
1. Positive Mood	—			
2. Negative Mood	-.60**	—		
3. Men's Marital Satisfaction	.25**	-.16*	—	
4. Support	.52**	-.28**	.41**	—
Mean	14.66	5.94	38.70	9.74
Standard Deviation	3.66	3.93	7.05	2.65

Note: $N = 161$ women for positive mood, negative mood, and support; $N = 159$ men for marital satisfaction. Means, standard deviations, and correlations were calculated using average levels of women's positive mood, negative mood, and support. Astericks (*) denote significance, where * is $p < .05$ and ** is $p < .01$.

Table 2

Fixed Effects (Top) and Variance-Covariance Estimates (Bottom) for Models Predicting Social Support Provision

Parameter	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)
Fixed Effects			
Intercept	9.75 (.21)**	9.75(.18)**	9.70(.18)**
Daily Positive Mood		.20(.02)**	.20(.02)**
Daily Negative Mood		.05(.02)**	.05(.02)**
Agg. Positive Mood		.42(.06)**	.38(.06)**
Agg. Negative Mood		.06(.06)	.06(.06)
Men's Marital Satisfaction			.11(.03)**
Daily Pos. Mood x Satisfaction			-.003(.003)
Daily Neg. Mood x Satisfaction			.002(.002)
Agg. Pos. Mood x Satisfaction			.000(.01)
Agg. Neg. Mood x Satisfaction			-.01(.01)
Random Effects			
Intercept/Intercept	6.45 (.79)**	4.66 (.57)**	4.18(.52)**
Pos. Mood/Intercept		-.08 (.05)	-.06(.05)
Pos. Mood/Pos. Mood		.03 (.01)**	.03(.01)**
Neg. Mood/Intercept		.01(.03)	-.002(.03)

Neg. Mood/Pos. Mood	-.008 (.003)	.000(.01)
Neg. Mood/Neg. Mood	.01(.003)*	.01(.004)**

Note: Astericks (*) denote significance, where * is $p < .05$ and ** is $p < .01$. Agg =

aggregated across days (i.e., overall mood levels); Pos = Positive; Neg = Negative.

REFERENCES

- Baucom, D. H., Porter, L. S., Kirby, J. S., Gremore, T. M., & Keefe, F. J. (2005). Psychosocial issues confronting young women with breast cancer. *Breast Disease*, 23, 103-113. Retrieved from <http://www.iospress.nl/loadtop/load.php?isbn=08886008>
- Bloom, J. R., Stewart, S. L., Johnston, M., Banks, P., & Fobair, P. (2001). Sources of support and the physical and mental well-being of young women with breast cancer. *Social Science & Medicine*, 53(11), 1513-1524. doi:10.1016/S0277-9536(00)00440-8
- Bolger, N., Foster, M., Vinokur, A. D., & Ng, R. (1996). Close relationships and adjustments to a life crisis: The case of breast cancer. *Journal of Personality and Social Psychology*, 70(2), 283-294. doi:10.1037/0022-3514.70.2.283
- Carels, R. A., & Baucom, D. H. (1999). Support in marriage: Factors associated with on-line perceptions of support helpfulness. *Journal of Family Psychology*, 13(2), 131-144. doi:10.1037/0893-3200.13.2.131
- Clark, L. A., Watson, D., & Mineka, S. (1994). Temperament, personality, and the mood and anxiety disorders. *Journal of Abnormal Psychology*, 103(1), 103-116. doi:10.1037/0021-843X.103.1.103
- Cleeland, C. S. & Ryan, K. M. (1994). Pain assessment: Global use of the Brief Pain Inventory. *Annals of the Academy of Medicine, Singapore*, 23(2), 129-138. Retrieved from <http://www.annals.edu.sg/>
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98(2), 310-357. doi:10.1037/0033-2909.98.2.310
- Costa, P. T., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology*, 38(4), 668-678. doi:10.1037/0022-3514.38.4.668
- Coyne, J. C., Kessler, R. C., Tal, M., Turnbull, J., Wortman, C. B., & Greden, J. F. (1987). Living with a depressed person. *Journal of Consulting and Clinical Psychology*, 55(3), 347-352. doi:10.1037/0022-006X.55.3.347
- Cutrona, C. E. (1989). Ratings of social support by adolescents and adult informants: Degree of correspondence and prediction of depressive symptoms. *Journal of Personality and Social Psychology*, 57, 723-730. doi:10.1037/0022-3514.57.4.723
- Cutrona, C., & Suhr, J. (1994). Social support communication in the context of marriage: An analysis of couples' supportive interactions. *Communication of social support: Messages, interactions, relationships, and community* (pp. 113-135). Thousand Oaks, CA US: Sage Publications, Inc.

- Dunkel-Schetter, C., & Skokan, L. A. (1990). Determinants of social support provision in personal relationships. *Journal of Social and Personal Relationships*, 7(4), 437-450. doi:10.1177/0265407590074002
- Figueiredo, M. I., Fries, E., & Ingram, K. M. (2004). The role of disclosure patterns and unsupportive social interactions in the well-being of breast cancer patients. *Psycho-Oncology*, 13(2), 96-105. doi:10.1002/pon.717
- Finch, J. F. (1998). Social undermining, support satisfaction, and affect: A domain-specific lagged effects model. *Journal of Personality*, 66(3), 315-334. doi:10.1111/1467-6494.00014
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2(3), 300-319. doi:10.1037/1089-2680.2.3.300
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218-226. doi:10.1037/0003-066X.56.3.218
- Frijda, N. H. (1986). *The emotions*. New York, NY, US & Paris, France: Cambridge University Press.
- Gil, K. M., Carson, J. W., Porter, L. S., Scipio, C., Bediako, S. M., & Orringer, E. (2004). Daily mood and stress predict pain, health care use, and work activity in African American adults with sickle-cell disease. *Health Psychology*, 23(3), 267-274. doi:10.1037/0278-6133.23.3.267
- Gottman, J. M. (1998). Psychology and the study of the marital processes. *Annual Review of Psychology*, 49, 169-197. doi:10.1146/annurev.psych.49.1.169
- Gurtman, M. B. (1986). Depression and the response of others: Reevaluating the reevaluation. *Journal of Abnormal Psychology*, 95(1), 99-101. doi:10.1037/0021-843X.95.1.99
- Gurtman, M. B. (1986). Negative reactions to depressive displays: Does justification help? *Journal of Social & Clinical Psychology*, 4(4), 497-502. Retrieved from <http://www.atypon-link.com/GPI/loi/jscp?cookieSet=1>
- Gurung, R. A. R., Taylor, S. E., & Seeman, T. E. (2003). Accounting for changes in social support among married older adults: Insights from the MacArthur studies of successful aging. *Psychology and Aging*, 18(3), 487-496. doi:10.1037/0882-7974.18.3.487
- Helgeson, V., & Cohen, S. (1996). Social support and adjustment to cancer: Reconciling descriptive, correlational, and intervention research. *Health Psychology*, 15(2), 135-148. doi:10.1037/0278-6133.15.2.135

- Heyman, R. E., Sayers, S. L., & Bellack, A. S. (1994). Global marital satisfaction versus marital adjustment: An empirical comparison of three measures. *Journal of Family Psychology*, 8(4), 432-446. doi:10.1037/0893-3200.8.4.432
- Holland, K. D., & Holahan, C. K. (2003). The relation of social support and coping to positive adaptation to breast cancer. *Psychology & Health*, 18(1), 15-29. doi:10.1080/0887044031000080656
- House, J. S., Kahn, R. L., McLeod, J. D., & Williams, D. (Eds.). (1985). *Measures and concepts of social support*. San Diego, CA, US: Academic Press.
- Isen, A. M. (Ed.). (1993). *Positive affect and decision making*. New York, NY, US: Guilford Press.
- Jeglic, E. L., Pepper, C. M., Ryabchenko, K. A., Griffith, J. W., Miller, A. B., & Johnson, M. D. (2005). A Caregiving Model of Coping with a Partner's Depression. *Family Relations*, 54(1), 37-45. doi:10.1111/j.0197-6664.2005.00004.x
- Karney, B. R., & Bradbury, T. N. (1995). The longitudinal course of marital quality and stability: A review of theory, methods, and research. *Psychological Bulletin*, 118(1), 3-34. doi:10.1037/0033-2909.118.1.3
- Keltner, D., & Bonanno, G. A. (1997). A study of laughter and dissociation: Distinct correlates of laughter and smiling during bereavement. *Journal of Personality and Social Psychology*, 73(4), 687-702. doi:10.1037/0022-3514.73.4.687
- Kendler, K. S., Gardner, C. O., & Prescott, C. A. (2003). Personality and the experience of environmental adversity. *Psychological Medicine*, 33(7), 1193-1202. doi:10.1017/S0033291703008298
- Kitamura, T., Watanabe, K., Takara, N., Hiyama, K., Yasumiya, R., & Fujihara, S. (2002). Precedents of perceived social support: Personality, early life experiences and gender. *Psychiatry and Clinical Neurosciences*, 56(2), 169-176. doi:10.1046/j.1440-1819.2002.00951.x
- Lepore, S. J., Glaser, D. B., & Roberts, K. J. (2008). On the positive relation between received social support and negative affect: A test of the triage and self-esteem threat models in women with breast cancer. *Psycho-Oncology*, 17(12), 1210-1215. doi:10.1002/pon.1347
- Manne, S. L., Alfieri, T., Taylor, K. L., & Dougherty, J. (1999). Spousal negative responses to cancer patients: The role of social restriction, spouse mood, and relationship satisfaction. *Journal of Consulting and Clinical Psychology*, 67(3), 352-361. doi:10.1037/0022-006X.67.3.352

- Mendoza, T. R., Wang, X. S., Cleeland, C. S., Morrissey, M., Johnson, B. A., Wendt, J. K., et al. (1999). The rapid assessment of fatigue severity in cancer patients: Use of the Brief Fatigue Inventory. *Cancer*, 85(5), 1186-1196. doi:10.1002/(SICI)1097-0142(19990301)85:5<1186::AID-CNCR24>3.0.CO;2-N
- Moyer, A., & Salovey, P. (1999). Predictors of social support and psychological distress in women with breast cancer. *Journal of Health Psychology*, 4(2), 177-191. doi:10.1177/135910539900400212
- Neuling, S. J., & Winefield, H. R. (1988). Social support and recovery after surgery for breast cancer: Frequency and correlates of supportive behaviors by family, friends and surgeon. *Social Science & Medicine*, 27(4), 385-392. doi:10.1016/0277-9536(88)90273-0
- Norton, R. (1983). Measuring marital quality: A critical look at the dependent variable. *Journal of Marriage & the Family*, 45(1), 141-151. doi:10.2307/351302
- O'Mahoney, J. M., & Carroll, R. A. (1997). The impact of breast cancer and its treatment on marital functioning. *Journal of Clinical Psychology in Medical Settings*, 4(4), 397-415. doi:10.1023/A:1026205502614
- Papa, A., & Bonanno, G. A. (2008). Smiling in the face of adversity: The interpersonal and intrapersonal functions of smiling. *Emotion*, 8(1), 1-12. doi:10.1037/1528-3542.8.1.1
- Pasch, L. A., Bradbury, T. N., & Davila, J. (1997). Gender, negative affectivity, and observed social support behavior in marital interaction. *Personal Relationships*, 4(4), 361-378. doi:10.1111/j.1475-6811.1997.tb00151.x
- Pasch, L., Bradbury, T., & Sullivan, K. (1997). Social support in marriage: An analysis of intraindividual and interpersonal components. *Sourcebook of social support and personality* (pp. 229-256). New York, NY US: Plenum Press.
- Pearlin, L. I., & McCall, M. E. (Eds.). (1990). *Occupational stress and marital support: A description of microprocesses*. New York, NY, US: Plenum Press.
- Raudenbush, S. W. & Bryk, A. S. (2002). *Hierarchical Linear Models: Applications and Data Analysis Methods* (2nd ed.). Thousand Oaks, CA: Sage Publications Inc.
- Ruiz, J. M., Matthews, K. A., Scheier, M. F., & Schulz, R. (2006). Does who you marry matter for your health? Influence of patients' and spouses' personality on their partners' psychological well-being following coronary artery bypass surgery. *Journal of Personality and Social Psychology*, 91(2), 255-267. doi:10.1037/0022-3514.91.2.255
- Segrin, C. (2001). *Interpersonal processes in psychological problems*. New York, NY, US: Guilford Press.

- Swickert, R. J., Rosentreter, C. J., Hittner, J. B., & Mushrush, J. E. (2002). Extraversion, social support processes, and stress. *Personality and Individual Differences*, 32(5), 877-891. doi:10.1016/S0191-8869(01)00093-9
- Verhofstadt, L. L., Buysse, A., Devoldre, I., & De Corte, K. (2007). The influence of personal characteristics and relationship properties on marital support. *Psychologica Belgica*, 47(3), 195-217. Retrieved from <http://www.baps.be/publications.html#psybel>
- Von Dras, D. D., & Siegler, I. C. (1997). Stability in extraversion and aspects of social support at midlife. *Journal of Personality and Social Psychology*, 72(1), 233-241. doi:10.1037/0022-3514.72.1.233
- Wade, T. D., & Kendler, K. S. (2000). The relationship between social support and major depression: Cross-sectional, longitudinal, and genetic perspectives. *Journal of Nervous and Mental Disease*, 188(5), 251-258. doi:10.1097/00005053-200005000-00001
- Wagner, C. D., Bigatti, S. M., & Storniolo, A. M. (2006). Quality of life of husbands of women with breast cancer. *Psycho-Oncology*, 15(2), 109-120. doi:10.1002/pon.928
- Waldinger, R. J., & Schulz, M. S. (2006). Linking Hearts and Minds in Couple Interactions: Intentions, Attributions, and Overriding Sentiments. *Journal of Family Psychology*, 20(3), 494-504. doi:10.1037/0893-3200.20.3.494
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063-1070. doi:10.1037/0022-3514.54.6.1063