

Research report

# Perception of dyadic relationship and emotional states in patients with affective disorder

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## Abstract

**Background:** Previous research has shown that interpersonal processes play a significant role in the development and maintenance of affective disorders. In this study, this claim was further investigated by comparing the perception of the dyadic relationship and judgment of other's emotions in affective disorder patients. **Method:** The sample included 39 couples ( $n = 39$  couples) with one of the partners suffering from an affective disorder and currently either in an acute or remitted depressive state. All participants completed four instruments, measuring the perceived quality of the dyadic relationship and the perception of other's emotions as reflected by judgments of facial expressions line drawings. **Results:** While the level of marital satisfaction was found to be lower in the acute than in the remitted group both for ill partners and their spouses, spouses in both the acute and remitted group tended to be more critical of their ill partners. Patients who were depressed judged facial expressions significantly less positively than did remitted patients. Judgments of negative emotions were highly correlated between partners in the acute group, but uncorrelated in the remitted group. Acutely depressed patients were less sensitive to invitation than remitted patients, while their spouses displayed the opposite pattern. **Conclusion:** The present results shed further light on the interpersonal dynamics between depressed patients and their spouses by underscoring differences between couples with a remitted vs. acutely depressed partner in their perception of the dyadic unit and their judgments of facial emotions. **Limitations:** Longitudinal research is needed, in which the same patients are tested during periods of remission and acute episodes, as well as research investigating the role of patient gender in the perception of facial expressions of emotions.

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**Keywords:** Affective disorder; Dyadic relationship; Facial emotions; Interpersonal; Perception

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## 1. Background

Social maladjustment in patients with depression has been richly documented (Briscoe and Smith,

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1973; Bothwell and Weissman, 1997; Ruestow et al., 1978; Merikangas, 1984). According to the interpersonal theories of depression, social maladjustment plays a crucial role in the development and maintenance of depression. Coyne et al. (1991) proposed that maladjusted social behaviors in depressed patients could underlie depressogenic processes by eliciting negative reactions in others, which may result in withdrawal by family and friends (see also Coyne, 1976; Gotlib and Hammen, 1992; Lewinsohn, 1974; Segrin and Abramson, 1994).

In investigating the social context of depressed patients, special attention has been given to the interaction with the spouse. Interactions between depressed patients and their spouses have been consistently found to be negative and conflict-ridden (e.g., Weissman, 1987) and the absence of a confiding relationship with the partner is considered as an important vulnerability factor for depression (Brown et al., 1994). Marital satisfaction is highly correlated with the severity of the depressive symptoms and the quality of the dyadic relation also plays a prominent role in relapse, as patients with higher marital satisfaction scores are less likely to suffer a clinically significant return of symptoms (Hooley and Teasdale, 1989). These findings suggest that the negative dyadic relationship may interact with other factors of the affective disorder to increase and perpetuate the depressive symptoms. In this interpersonal context, the way the partner interacts with the depressed patient provides crucial information on the dynamics of the relationship in which the depressed patient is immersed. Investigators have recently sought to learn how spouses of depressed patients differ from controls, and how they react and contribute to their partners' illness. In general, spouses of depressed patients have been found to experience special difficulties, as they reported more stress, more health problems, less family support and less marital satisfaction than did spouses of well controls (e.g. Krantz and Moos, 1987; Mitchell et al., 1983). Moreover, just as difficulties in the close relationships and social functioning of recovered depressed persons persist long after the depressive symptoms remit (Weissman et al., 1974; Bothwell and Weissman, 1997), so do the difficulties reported by their spouses. Although Coyne et al. (1987) found partners of patients in an acute depressive episode to experience higher degrees of burden and psychologi-

cal distress than partners of remitted patients, other evidence suggests that the latter group still experience more problems than controls. Levkovitz et al. (1999) found that well spouses of affective patients in remission reported of receiving less support from their partners, displayed lower levels of marital adjustment and ranked their spouses lower on positive qualities and higher on negative qualities than did controls. Krantz and Moos (1987) showed that spouses of depressed patients had enduring problems in the social and family context even after their ill partners' remission, while life functioning in other domains improved. These findings are consistent with the idea that well-established interpersonal patterns are likely to continue even after the depressive symptoms of the ill partner diminish, which may have a negative impact on the remitted patient by increasing the risks of relapse. The spouses' attitudes towards the patients also appear to contribute to their depressed partners' illness. Hooley and Teasdale (1989) found that patients whose spouses reported higher levels of marital satisfaction were more likely to remain well than were patients whose spouses reported less marital satisfaction. Based on spouses' interviews and reports, they also found spouses of patients who remained well to be significantly less critical of their ill partner than spouses of patients who relapsed. Interestingly, perceived criticism from a spouse by the ill patient was an even better predictor of relapse, suggesting that the perceptions of depressed patients in an interpersonal context play an important role in relapse.

Recently, some investigators have suggested that the poor social and interpersonal relations that are characteristic of depression could be linked to an impairment in the depressed patients' ability to judge, recognize and discriminate emotions in others (Morrison et al., 1988). Specifically, negative interactions would be mediated by depressed patients' negative interpretations of other's facial expressions (Bouhuys et al., 1997). The studies that put this idea to empirical test have usually used line drawings of faces displaying feelings of anger, disgust, fear, happiness, sadness, invitation and rejection. The former five emotions (anger, disgust, fear, happiness and sadness) are typically recognized in a similar fashion across a large array of different cultures (Ekman, 1992, Hale et al., 1998). The latter two

(invitation and rejection) play an important role in interpersonal theories of depression (Coyne, 1976), and previous research has shown that depressed patients report more feelings of rejection by others than do controls (Hoehn-Hyde et al., 1982). These studies have yielded conflicting findings. Some authors reported that patients with depression show a negative bias in discriminating facial expressions of emotion, and that patients with a higher negative affect display more impaired sensitivity to sad faces (Gur et al., 1992; Mandel and Palchoudhury, 1985; Rubinow and Post, 1992). For instance, in a recent longitudinal study Bouhuys et al. (1999) reported that acute patients perceive more expressions of negative emotions in ambiguous faces than do remitted patients, but found no such differences with respect to positive emotions. Others reported no such bias in depressed patients' judgments of facial expressions (Archer et al., 1992; Bouhuys et al., 1996; Gaebel and Wolwer, 1992). Hale et al. (1998) observed no significant difference between acutely depressed patients and controls on their judgments of negative facial expressions, but found the former to score lower on their judgments of positive emotions than did the latter. Hale et al. (1998) investigated how spouses of depressed patients interpret the emotional valence of facial expressions. They found the same patterns of differences between spouses of depressed patients and controls as they did between the patients and controls. Most interestingly, patients' and partners' judgments on both negative and positive facial expressions did not differ.

To summarize, a large array of studies converge to indicate that many similarities can be observed between depressed patients and their spouses. These similarities have been found on measures of marital satisfaction, with both depressed patients and their spouses reporting enduring marital distress. Similarities have also been noted in the bias of acutely depressed patients and their spouses in discriminating facial emotional expressions. Such similarities appear to support the idea that negative interpersonal dynamics in the close relationship are linked to depression, in line with interpersonal theories. It is not entirely clear, however, whether these findings indeed indicate that depressed patients influence their partners and vice-versa. While both depressed patients and their spouses have been shown to display the same pattern of differences when compared to

controls, the two groups were not directly contrasted. One notable exception is the aforementioned study by Hale et al. (1998), who found no differences in the way depressed patients and their spouses judged facial emotional expressions. It is important to realize however, that comparing averages between groups (depressed patients vs. spouses), as did Hale et al. (1998), does not allow one to draw any conclusion concerning what happens within the dyadic unit (the patient and his or her spouse), which is the crux of the interpersonal view on depression. Indeed, it is theoretically possible that depressed patients and spouses may display similar characteristics as groups, while each depressed patient might be dissimilar from his or her own spouse. Assessing the strength of the correlation between spouses on the studied measures would thus provide a better way for testing the interpersonal view than do the observed similar averages of depressed patients' and their partners' scores. Furthermore, the differences in these correlations between couples with a remitted vs. acutely depressed patient could provide significant insights into the dynamics of the relationship and indicate whether the negative tendency observed in judgments of facial expressions represents an enduring bias in depressed-prone individuals and their partners or a mood-related symptom.

Therefore, the present study included four groups, remitted depressed outpatients, their spouses, depressed outpatients showing acute symptoms, and their spouses. We studied the perceived quality of the dyadic relationship and judgments of facial emotional expressions in these groups. We then assessed the strength of the correlation between spouses for couples with a remitted depressed partner (henceforth, remitted couples or remitted group) and for couples with a depressed partner displaying acute symptoms (henceforth, acute couples or acute group).

## 2. Methods

### 2.1. Subjects

The study sample included 39 married patients with major depression ( $n = 39$ ; DSM-IV; American Psychiatric Association, 1994), randomly selected from our out-patient clinic population.

Patients were included in the present study if they fulfilled the following criteria: (1) They were diagnosed by two board-certified psychiatrists as suffering from chronic, unipolar or bipolar affective disorder without psychotic features. (2) Their age was above 18 and below 65. (3) They did not receive neuroleptic medication. (4) They were involved with a spouse or partner in a relationship of at least 1-year duration. (5) They had no history of alcohol or drug abuse. (6) They did not suffer from a severe physical illness. Beyond the above exclusion criteria, there was no control concerning the patients' psychotherapeutic or pharmacological treatments.

The following exclusion criteria were implemented for spouses: (1) They were not diagnosed as suffering from any mental health problem on Axis 1 of DSM-4. (2) Their Positive Symptom Total (PST) score on the Brief Symptom Inventory (B.S.I.; Derogatis and Spenser, 1982) was less than 20.

The sample was divided into four groups. (1) *Acute patients*. Affective disorder patients judged to be in an acute depressive episode according to the following criteria. (a) They had a Beck Depression Inventory score (BDI; Beck et al., 1961) of more than 11. (b) Both their partners and treating psychiatrists reported the patients to have been in an acute depressive episode for at least 4 weeks. (2) *Spouses of acute patients*. (3) *Remitted patients*. Affective disorder patients judged to be in partial or complete remission according to two criteria. (a) They had a Beck Depression Inventory Score of less than 7. (b) Both their partners and treating psychiatrists reported the patients to have been in remission for at least 4 weeks. (4) *Spouses of remitted patients*.

The acute patients group included six men and 13 women (the spouses of acute patients group thus included 13 men and six women). The remitted patients group included nine men and seven women (the spouses of remitted patients group thus included seven men and nine women).

## 2.2. Demographic data

The mean age of affective disorder onset was 32 (STD = 14). Eight patients (23%) had a history of psychiatric hospitalization, four patients (11%) had a history of suicide attempts and 20 patients (57%) were currently on psychotropic medication. The

average length of relationship was 21 years (STD = 12; range: 1–46). Three of the patients (9%) and four of the partners (11%) had been previously divorced. The average number of children-per-couple was 2.06 (STD = 1.02; range: 0–4). A total of 21 of the patients (60%) and 23 of the partners (66%) were working at the time of the study.

## 3. Materials

### 3.1. Perception of the spouse and dyadic relationship

The patients and spouses were asked to complete four questionnaires.

*The Brief Symptom Inventory* (B.S.I., Derogatis and Spenser, 1982) is a shortened version of the Symptom Check List 90 (Derogatis and Clearly, 1977).

*The Marital and Dyadic Adjustment Scale* (Spanier, 1976) is a 32-item measure of adjustment to marriage, marital satisfaction and present quality of the marriage.

*The Characteristics Attributed to spouse questionnaire*, was developed for the purpose of this study. The subject was asked to score the presence of each of 25 character traits in his/her partner on a 5-point scale. The traits covered a wide range of personality characteristics with emphasis on those traits that have been traditionally identified as being related to depression (Eysenck et al., 1976; Levkovitz et al., 1999). The trait list included both positively (e.g. emotionally strong, stable, patient, calm) and negatively (e.g. pessimistic, cowardly, critical, unsatisfied) connoted characteristics.

*The questionnaire for assessment of non-formal social support* consists of 11 items selected from the Social Support Questionnaire (Sarason and Sarason, 1982; Sarason et al., 1985; Vaux, 1985; Vaux and Harrison, 1985).

### 3.2. Judgment of facial expressions

A total of 12 facial expression line drawings were used in this study. They were composed as previously described (Hale et al., 1998; Bouhuys et al., 1995,

1996) (Fig. 1). All patients were requested to respond to each facial expression line drawing as follows. A list of adjectives, each of which described a different emotion, was printed under each facial expression line drawing. Patients were instructed to judge, based on their first impression, how strongly each facial expression line drawing displayed each of the emotions described by the adjectives, on a 5-point scale ranging from 1 (this emotion is not expressed by the line drawing) to 5 (this emotion is very strongly expressed by the line drawing). The emotion adjectives used in this study were fear, happiness, anger, sadness, disgust, rejection and invitation. The seven emotions were divided into two groups. Negative emotions included anger, disgust, fear, rejection and sadness, while positive emotion

included happiness and invitation (e.g. Warson and Tellegen, 1985; Hale et al., 1998).

#### 4. Procedure

Patients and spouses who met the inclusion criteria were invited to participate in the study. All of them completed the questionnaires described above within 7 days after selection.

#### 5. Results

To examine the differences in average scores between depressed patients and their spouses in the

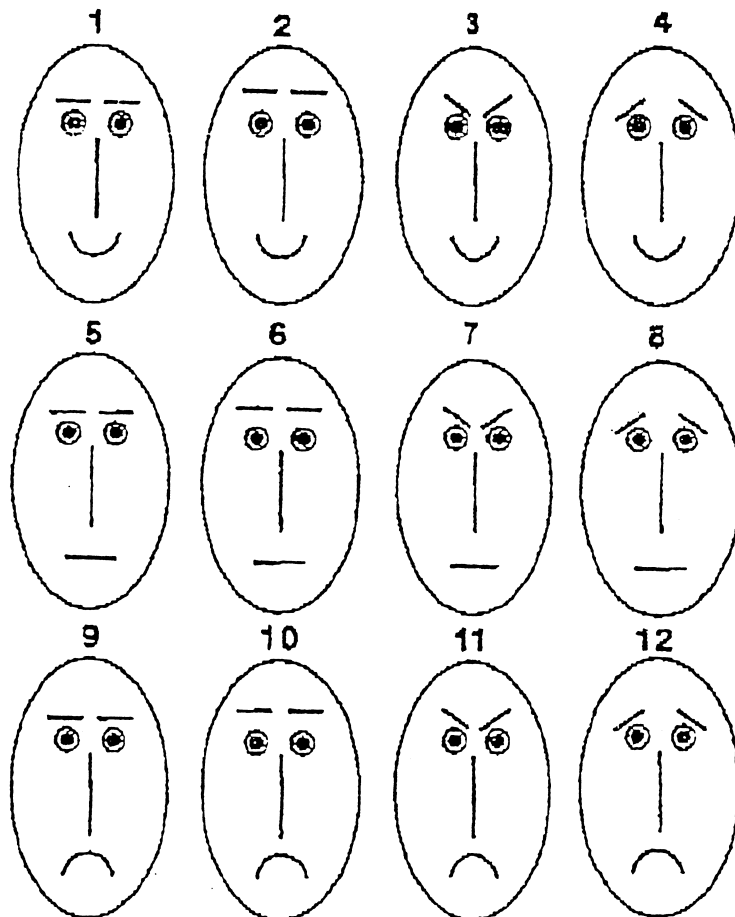


Fig. 1. Faces judged by patients and spouses.

remitted vs. acute group, analyses of variance (ANOVAs) were conducted on each study measure with patient vs. spouse and remitted vs. acute as between-subject factors. Mean scores for each group are presented in Table 1. Four couples (two in the acute group and 2 in the remitted group) were excluded from the analyses because one of the partners judged that none of the facial expression line drawings displayed any of the seven possible emotions. That is, these participants rated all facial expressions with score 1. Such data strongly suggest that these participants did not comply with the instructions. Thus, the following analyses concern 35 couples.

### 5.1. Perception of the spouse and dyadic relationship

Spouses were significantly more critical of their partners than were patients, as revealed by lower scores on Positive Traits attributed to partner,  $F(1,66) = 5.24$ ,  $P < 0.03$ , and a tendency to score higher on Negative Traits attributed to their partner,  $F(1,66) = 2.90$ ,  $P < 0.1$ . Remitted couples reported a higher level of marital satisfaction compared with

acute couples, as measured by the Dyadic Adjustment Scale,  $F(1,66) = 6.91$ ,  $P = 0.01$ , and perceived level of support received from spouse,  $F(1,33) = 4.13$ ,  $P < 0.05$ .

### 5.2. Judgment of facial expressions

#### 5.2.1. Negative expressions

There was no statistically significant difference between patients and their spouses on their judgment of Negative Expressions ( $F < 1$ ). Acute couples tended to judge Negative Expressions more negatively than did remitted couples ( $F(1,33) = 3.17$ ,  $P < 0.08$ ). This trend approached significance for Anger ( $F(1,33) = 2.77$ ,  $P < 0.1$ ), Sadness ( $F(1,33) = 3.68$ ,  $P < 0.06$ ) and Disgust ( $F(1,33) = 3.31$ ,  $P < 0.08$ ). There was no significant difference between remitted and acute patients on their judgments of negative facial expressions ( $F(1,33) = 2.73$ ,  $P > 0.1$ ) but a trend towards more negative judgments by acute patients was found to approach significance on judgments of Sadness,  $F(1,33) = 3.75$ ,  $P < 0.07$  and Disgust  $F(1,33) = 3.40$ ,  $P < 0.08$ . There was no significant difference between patients and spouses

Table 1  
Mean scores test measures in remitted patients, acutely depressed patients, spouses of remitted patients and spouses of acutely depressed patients

	Patients (Remitted)		Patients (Acute)		Spouses (Remitted)		Spouses (Acute)	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
<i>(A) Perception of the spouse and dyadic relationship</i>								
Dyadic adjustment	3.00	0.62	2.52	0.60	2.93	0.93	2.52	0.65
Support	3.64	0.79	2.99	0.85	3.45	1.19	3.09	1.20
Positive traits	3.92	0.61	3.98	0.73	3.40	0.94	3.62	0.87
Negative traits	2.74	0.67	2.88	0.58	2.96	0.55	3.14	0.55
<i>(B) Judgment of facial expressions</i>								
Negative expressions	1.73	0.54	2.14	0.88	1.77	0.77	1.96	0.59
Fear	1.70	0.69	1.86	0.81	1.66	0.94	1.87	0.65
Anger	1.81	0.66	2.11	0.93	1.71	0.81	2.04	0.74
Sadness	2.07	0.82	2.70	1.07	2.16	1.15	2.39	0.70
Disgust	1.45	0.48	1.98	1.06	1.58	0.76	1.74	0.67
Rejection	1.60	0.58	2.07	1.00	1.78	0.92	1.76	0.72
Positive expressions	1.59	0.48	1.29	0.31	1.34	0.49	1.53	0.42
Happiness	1.59	0.39	1.32	0.41	1.60	0.98	1.66	0.54
Invitation	1.59	0.67	1.26	0.33	1.07	0.15	1.40	0.45

on this measure in either the remitted or acute groups,  $F_s < 1$ .

### 5.2.2. Positive expressions

The interaction between patients vs. spouses and remitted vs. acute on judgments of Positive Expressions was significant,  $F(1,66) = 5.74$ ,  $P < 0.02$ . Paired comparisons revealed that acute patients tended to judge facial expressions of Invitation less positively than did remitted patients,  $F(1,33) = 3.56$ ,  $P < 0.07$ , and also tended to score lower on Happiness,  $F(1,33) = 4.01$ ,  $P < 0.06$ . In contrast, spouses of acute patients scored higher than spouses of remitted patients on Invitation,  $F(1,33) = 7.72$ ,  $P < 0.009$ . Partners in the two groups did not differ in their judgments of Happiness,  $F < 1$ . Moreover, while spouses scored significantly lower on Invitation than did patients in the remitted group,  $F(1,30) = 9.11$ ,  $P < 0.006$ , they displayed the opposite trend in the acute group, but this difference did not reach significance.

### 5.3. Correlation between spouses

In order to assess whether the degree of similarity between partners within the dyadic unit in their perception of marital satisfaction and facial expressions showed a different pattern in remitted vs. acute couples, the correlation between patients and their spouses was calculated for each study measure. Between-spouses correlation coefficients for each study measure are shown in Table 2.

### 5.4. Perception of the spouse and dyadic relationship

Patients and their spouses showed no correlation in how they rated each other on Positive as well as on Negative Traits, in both the remitted and acute groups. Reports of marital satisfaction as measured by the Dyadic Adjustment Scale were highly correlated between partners in both the remitted,  $r = 0.60$ ,  $P < 0.05$ , and acute groups,  $r = 0.52$ ,  $P < 0.05$ . The correlation between partners on their report of perceived support from spouse revealed a high degree of reciprocity in the remitted group,  $r = 0.82$ ,  $P < 0.01$ , but not in the acute group, where this correlation was significantly lower and non-significant.

Table 2

Correlation coefficient ( $r$ ) on test measures between spouses in the Remitted vs. Acute groups

	Remitted	Acute	Remitted vs. Acute
<i>(A) Perception of the spouse and dyadic relationship</i>			
Dyadic adjustment	0.60*	0.52*	
Support	0.82**	0.12	$P < 0.05$
Positive traits	0.22	0.04	
Negative traits	0.14	-0.15	
<i>(B) Judgment of facial expressions</i>			
Negative expressions	0.15	0.66**	$P < 0.05$
Fear	0.05	0.69**	$P < 0.01$
Anger	0.01	0.54*	$P < 0.05$
Sadness	0.05	0.54*	$P < 0.05$
Disgust	0.24	0.52*	$P < 0.05$
Rejection	0.33	0.42	
Positive expressions	0.38	-0.14	
Happiness	0.17	-0.25	
Invitation	-0.48	-0.07	

\* $P < 0.05$ , \*\* $P < 0.01$ .

### 5.5. Judgment of facial expressions

The correlation between partners on judgments of negative facial expressions revealed a striking pattern, which was consistent across individual emotions except for rejection. Whereas spouses' judgments were highly correlated in the acute group,  $r = 0.66$ ,  $P < 0.01$ , it was not the case in the remitted group. No significant correlations between spouses were observed on judgments of positive facial expressions.

## 6. Discussion

The objective of this study was to explore the interpersonal dynamics within the dyadic unit in couples with one partner suffering from an affective disorder. We examined: (a) the degree of dyadic adjustment, measured as the degree of marital satisfaction, perceived support from spouse and perceived spouse's traits; and (b) the perception of facial expressions of negative and positive emotions, in four groups of participants: (1) acutely depressed patients; and (2) their spouses; (3) depressed patients in remission; (4) their spouses. As in previous

reports, mean scores on the study measures were used to compare patients vs. their spouses, and acute episodes vs. remission. In order to investigate the interpersonal view of depression and get a better understanding of how spouses within the dyadic unit influence each other at different stages of the illness, we also examined the correlation between spouses on each study measure during remission and during an acute episode.

Before we proceed to discuss our results, it should be noted that one important limitation of the present study concerns the composition of the sample groups along the gender variable<sup>1</sup>. In the remitted group, nine patients were men and seven were women, whereas in the acute group, six patients were men and 13 were women. This imbalance introduces an ambiguity as to whether the differences observed between the remitted vs. acute groups may in fact reflect differences between men vs. women or at least interact with gender. Post-hoc comparisons were therefore performed in order to examine this possibility. Effects involving gender were found only on judgments of negative facial expressions, not in any of the other measures. Such effects will be discussed below, where relevant.

### *6.1. Perception of the spouse and dyadic relationship*

The pattern of dyadic adjustment levels obtained here is in line with the existing literature on this topic. However, the present study provided additional insights into the dynamics of the relationship between spouses during acute episodes vs. during remission. We replicated earlier findings showing that the level of marital satisfaction is lower during acute episodes than during remission for depressed patients (e.g. Beach et al., 1986) as well as for their spouses (Coyne et al., 1987). We extended the previous studies by showing that spouses within the dyad are highly correlated in their ratings of the marital relationship in both groups (remitted and acute), suggesting a positive interaction between spouses unit during remission and a negative inter-

action during acute episodes. This finding is in line with the interpersonal view of depression.

We also replicated a similar trend on perceived support from spouse (e.g. Coyne et al., 1987), with patients and spouses experiencing higher levels of support in the remitted than in the acute group. However, we also found that partners within the dyadic unit are highly correlated on this measure in the remitted group, but not in the acute group. This finding indicates that the reciprocity within the dyadic unit in providing support to each other (or how it is perceived) may break down during acute episodes. Note that this fact is obscured by the similarity in the average level of support reported by acute patients and their spouses.

Finally, this study provided converging evidence for the existence of a link between depression and spouses' critical attitude towards their ill partners (e.g. Hooley and Teasdale, 1989). We found spouses to be more critical of their ill partners than ill partners are of their well spouses. Moreover, spouses' critical attitude was similar in the remitted group and in the acute group. As Hooley and Teasdale suggested, the enduring negative attitude of spouses towards their ill partners after the symptoms have diminished may play a role in relapse. However, how one partner within the dyadic unit perceives the other does not appear to induce reciprocity, as the low correlations between spouses indicate.

### *6.2. Judgment of facial expressions*

The pattern of results obtained for judgments of facial expressions yielded three main findings. Firstly, we found that, overall, acute patients judged expressions of emotion more negatively than did remitted patients. This trend was significant for positive emotions but approached significance only for selected negative expressions of emotion. Such results reveal stronger effects of depressed state on judgment of facial expressions than were found in earlier literature. Indeed, Bouhuys et al. (1999) reported effects only for negative emotions, while Hale et al. (1998) reported effects only for positive emotions. However, closer scrutiny of our data revealed that the trend towards a negative bias in judging negative emotions was significant only when the depressed patient was a woman. In contrast, male

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<sup>1</sup>We thank an anonymous referee for this suggestion.



patients displayed a non-significant trend in the opposite direction. No differences related to gender were obtained in judgments of positive emotions. The unexpected gender-related differences obtained here suggest that systematic investigation of gender effects in the perception of facial expressions of emotion might provide valuable insights and possibly resolve existing discrepancies in the literature.

Secondly, the additional measures used in the present study cast a new light on reported dissociations between positive and negative expressions of emotions. We found spouses within the dyadic unit to be highly correlated in their perception of negative facial emotions in the acute group, not in the remitted group. In contrast, no correlation was found in either group on judgments of positive expressions. Thus, spouses within the dyadic unit become matched on their judgments of negative facial expressions during acute depressive episodes, suggesting that they influence each other to a higher degree at that time, but only on negative emotions. Because of the small and unbalanced sample sizes with respect to gender, no meaningful comparison could be made on such correlation measures between couples in which the depressed partner was a woman vs. a man.

The third main set of findings concerns the Invitation–Rejection compound. It is of particular interest, in view of the interpersonal theory of depression, that ratings on Invitation and Rejection were found to behave in a singular fashion when compared to ratings on other emotions. Indeed, it may be noteworthy that rejection was the only negative emotion on which the correlation between partners was non-significant, and on which spouses of depressed patients did not score higher in the acute than in the remitted group. More strikingly, whereas depressed patients were less sensitive to expressions of invitation in the acute than in the remitted group, spouses displayed the opposite pattern, i.e. they scored higher on Invitation in the acute than in the remitted group.

Whether judgments of facial expressions are indicative of how people perceive others' emotions or reveal their own (Ekman et al., 1980), the observed pattern supports several aspects of the interpersonal view. Firstly, it may explain depressed patients' withdrawal during acute episodes. According to the present results, they feel more rejected and less

invited, as well as signaling less invitation and more rejection to their well spouse. Secondly, we may speculate that the tendency for partners within the dyadic unit to undergo changes in opposite directions between the remitted vs. acute state in their perception of invitation/rejection may constitute a factor that contributes to the development of the acute episode. During remission, highly inviting patients encounter expressions of rejection in their spouses which they might find difficulties in dealing with. During acute episodes, the situation reverses, and the well spouses now signal high levels of invitation that are met by expressions of rejection in the ill partner. This mismatch between spouses in their perception of invitation/rejection may create a negative interactional process. Whether such a process is a result or a factor of the affective disorder is beyond the scope of our study. Further research using a within-subject design, i.e. a longitudinal study in which the same patients are tested during periods of remission and acute episodes, similarly to Bouhuys et al.'s study, would be better suited to answer this question.

## References

- American Psychiatric Association, 1994. *Diagnostic and Statistical Manual of Mental Disorders*, 4th Edition. American Psychiatric Association, Washington DC.
- Archer, J., Hay, D.C., Young, A.W., 1992. Face processing in psychiatric conditions. *Br. J. Clin. Psychol.* 31, 45–51.
- Beck, A.T., Ward, C.H., Mendelsohn, M., Mock, J., Erbaugh, J., 1961. An inventory for measuring depression. *Arch. Gen. Psychiatry* 4, 561–571.
- Bothwell, S., Weissman, M.M., 1997. Social impairments 4 years after an acute depressive episode. *Am. J. Orthopsychiatry* 47 (2), 231–237.
- Bouhuys, A.L., Bloem, G.M., Groothuis, T.G.G., 1995. Induction of depressed and elated mood by music influences the perception of facial emotional expressions in healthy subjects. *J. Affect. Disord.* 33, 215–226.
- Bouhuys, A.L., Bloem, G.M., Groothuis, T.G.G., 1999. Depressed patients' perception of facial emotions in depressed and remitted state is associated with relapse: a longitudinal study. *J. Nerv. Ment. Dis.* 187, 595–602.
- Bouhuys, A.L., Greet, E., Mersch, P.P.A., Jenner, J.A., 1996. Non-verbal interpersonal sensitivity and persistence of depression: Perception of emotions in schematic faces. *Psychiatry Res.* 64, 193–203.
- Bouhuys, A.L., Greet, E., Mersch, P.P.A., 1997. Relationship between perception of facial emotions and anxiety in clinical depression: does related-related perception predict persistence of depression? *J. Affective Dis.* 43, 213–223.

- Briscoe, C.W., Smith, J.B., 1973. Depression and marital turmoil. *Arch. Gen. Psychiatry* 29 (6), 811–817.
- Brown, G.W., Harris, T.O., Hepworth, C., Robinson, R., 1994. Clinical and psychosocial origins of chronic depressive episodes II: a patient enquiry. *Br. J. Psychiatry* 165, 457–465.
- Coyne, J.C., 1976. Depression and the response of others. *J. Abnorm. Psychol.* 85, 186–193.
- Coyne, J.C., Kessler, R.C., Tal, M. et al., 1987. Living with a depressed person. *J. Consult. Clin. Psychol.* 55 (3), 347–352.
- Coyne, J.C., Burchill, S.A.L., Stiles, W.B., 1991. An interactional perspective on depression. In: Snyder, C.R., Forsyth, D.O. (Eds.), *Handbook of Social and Clinical Psychology*. Pergamon, New York, pp. 327–349.
- Derogatis, L.R., Clearly, P., 1977. A confirmation of the dimensional structure of the SCL-90: A study in construct validity. *J. Clin. Psychol.* 33, 981–989.
- Derogatis, L.R., Spenser, P.M., 1982. *The Brief Symptom Inventory (BSI): Administration, Scoring and Procedures Manual*. Johns Hopkins University School Medicine, Baltimore, MD.
- Ekman, P., 1992. Are there basic emotions? *Psychol. Rev.* 99, 550–553.
- Ekman, P., Friesen, W.Y., O'Sullivan, M., Scherer, K., 1980. Relative importance of face, body and speech in judgments of personality and affect. *J. Pers. Soc. Psychol.* 38, 270–277.
- Eysenck, S.B., White, O., Eysenck, H.J., 1976. Personality and mental illness. *Psychol. Rep.* 39 (3), 1011–1022.
- Gaebel, W., Wolwer, W., 1992. Facial expression and emotional face recognition in schizophrenia and depression. *Eur. Arch. Psychiatry Clin. Neurosci.* 242, 46–52.
- Gotlib, I.H., Hammen, C.L., 1992. *Psychological Aspects of Depression: Toward a Cognitive–Interpersonal Integration*. Wiley, Chichester.
- Gur, R.C., Erwin, R.J., Gur, R.E., Zwil, A.S., Heinberg, C., Kraemer, H.C., 1992. Facial emotion discrimination: Behavior finding in depression. *Psychiatry Res.* 41, 241–251.
- Hale, W.W., Jansen, J.H.C., Bouhuys, A.L. et al., 1998. The judgment of facial expressions by depressed patients, their partners and controls. *J. Affect. Dis.* 47, 63–70.
- Hoehn-Hyde, D., Schlottmann, R.S., Rush, A.J., 1982. Perception of social interactions in depressed patients. *J. Consult. Clin. Psychol.* 50, 209–212.
- Hooley, J.M., Teasdale, J.D., 1989. Predictors of relapse in unipolar depressives: expressed emotion, marital distress, and perceived criticism. *J. Abnorm. Psychol.* 98 (3), 229–235.
- Krantz, S.E., Moos, R.H., 1987. Functioning and life context among spouses of remitted and non-remitted depressed patients. *J. Consult. Clin. Psychol.* 55 (3), 353–360.
- Levkovitz, Y., Fennig, S., Horesh, N., Barak, Y., Treves, I., 1999. Perception of ill spouse and dyadic relationship in couples with affective disorder and those without. *J. Affect. Dis.* 58 (3), 237–240.
- Lewinsohn, P.M., 1974. Clinical and theoretical aspects of depression. In: K.S. Calhoun, H.E. Adams and K.M. Mitchell (Eds.). *Innovative treatment methods in psychopathology*, Wiley, New York, pp. 63–102.
- Mandel, M.K., Palchoudhury, S., 1985. Responses to facial expression of emotion in depression. *Psychol. Rep.* 56, 653–654.
- Merikangas, K.R., 1984. Divorce and assortative mating among depressed patients. *Am. J. Psychiatry* 141 (1), 74–76.
- Mitchell, R.E., Cronkite, R.C., Moos, R.H., 1983. Stress, coping and depression among married couples. *J. Abnorm. Psychol.* 92 (4), 433–448.
- Morrison, R.L., Bellack, A.S., Mueser, K.T., 1988. Deficits in facial-affect recognition and schizophrenia. *Schizophr. Bull.* 14 (1), 67–83.
- Rubinow, D.R., Post, R.M., 1992. Impaired recognition of affect in facial expression in depressed patients. *Biol. Psychiatry* 31 (9), 947–953.
- Ruestow, P., Dunner, D.L., Bleecker, B., Fieve, R.R., 1978. Marital adjustment in primary affective disorder. *Compr. Psychiatry* 19 (6), 565–571.
- Sarason, I.G., Sarason, B.R., 1982. Concomitants of social support: attitudes, personality characteristics, and life experiences. *J. Pers.* 50 (3), 331–344.
- Sarason, I.G., Sarason, B.R., Potter, 3rd E.H., Antoni, M.H., 1985. Life events, social support and illness. *Psychosom. Med.* 47 (2), 156–163.
- Segrin, C., Abramson, L.Y., 1994. Negative reactions to depressive behaviors. A communication theories analysis. *J. Abn. Psychol.* 103, 655–668.
- Spanier, G.B., 1976. Measuring dyadic adjustment. New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family* 38, 15–28.
- Vaux, A., 1985. Factor structure of the network orientation scale. *Psychol. Rep.* 57 (3 pt 2), 1181–1182.
- Vaux, A., Harrison, D., 1985. Support network characteristics associated with support satisfaction and perceived support. *Am. J. Community Psychol.* 13 (3), 245–268.
- Warson, D., Tellegen, A., 1985. Toward a consensual structure of mood. *Psychol. Bull.* 98, 219–235.
- Weissman, M.M., Klerman, G.L., Paykel, E.S., Prusoff, B., Hanson, B., 1974. Treatment effects on the social adjustment of depressed patients. *Arch. Gen. Psychiatry* 30 (6), 771–778.
- Weissman, M.M., 1987. Advances in psychiatric epidemiology: rates and risks for major depression. *Am. J. Public Health.* 77 (4), 445–451.