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The effects of emotional salience on thought disorder in patients with bipolar affective disorder

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ABSTRACT

Background. This study aimed to explore the effects of emotionally salient material on thought disorder in patients with bipolar affective disorder.

Method. Seventy-one participants (20 manic, 15 depressed, 16 currently well patients and 20 non-psychiatric-controls) were interviewed in two conditions: an emotionally salient interview and a non-salient interview. Speech samples were rated using the Scale for the Assessment of Thought, Language and Communication.

Results. Manic patients presented with significantly more thought disorder than any other group in both conditions and exhibited the greatest reaction to emotionally salient material.

Conclusion. The effects of emotional salience on thought, language and communication are not unique to schizophrenic patients. The speech of manic patients is more affectively responsive than the speech of remitted, bipolar depressed and normal participants. The implications of these findings are discussed.

INTRODUCTION

For some time thought disorder was considered the primary feature of schizophrenia. However, clinical studies have revealed that it is often part of the presentation of other psychiatric disorders, especially depression and mania (Andreasen, 1979*a*). Loosening of associations, clanging, repetitive and concrete speech, and poverty of speech are some of the forms of thought disorder that have been observed in manic and depressed patients (Grossman & Harrow, 1991). Wilcox (1992) found that the quality of formal thought disorder was a strong predictor of relapse in manic patients. However, there has been relatively little research on the degree to which thought disorder occurs in other phases of the illness. This information may be pertinent to revealing the type of pathophysiological and psychological processes that occur at various stages of the illness.

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Schizophrenia researchers have long recognized that positive symptoms can be exacerbated by emotional stress and life events (Brown & Birley, 1968; Ventura *et al*. 1989). The relationship between thought disorder and emotional arousal was demonstrated by Shimkunas (1972) who found that patients were more thought disordered when disclosing information about emotional events. These findings were replicated more recently by Haddock *et al*. (1995) who looked at schizophrenic patients with and without thought disorder. When talking about emotionally salient material, those who were already thought disordered presented with more exacerbation of thought disorder than did those who were not initially thought disordered. Similar results have also been obtained in a series of studies by Docherty *et al*. (1994*a*, *b*, 1998).

Docherty *et al*. (1994*a*) assessed 30 patients with acute schizophrenia and found they produced significantly more thought disorder and communication disturbances when talking about negative affective topics when compared

to positive topics. The degree of 'affective reactivity' was positively correlated with the severity of positive symptoms. In a further study of schizophrenic patients and their relatives, Docherty *et al.* (1994*b*) found that speech disturbance was similar for both groups but affective reactivity of speech only occurred in the schizophrenic patients. Docherty (1996) and Docherty *et al.* (1998) report that in schizophrenia, some patients are more vulnerable to affective reactivity of symptoms than others. Furthermore, some types of communication disturbance may be more reactive than others and this may reflect different underlying processes.

These findings raise the question of whether thought disorder in bipolar patients is similarly influenced by emotional arousal. In the present study, we attempted to examine thought disorder at the different stages of bipolar illness when patients were discussing emotionally challenging and non-challenging topics.

METHOD

Participants

Participants were 51 patients who met the DSM-IV (American Psychiatric Association, 1994) criteria for bipolar affective disorder, referred to the study by community mental health teams and 20 healthy controls recruited by advertisement from non-professional hospital staff and the civil service. Of the bipolar patients, 20 were manic, 15 were depressed and 16 were currently in remission. All manic participants, seven of the depressed participants and none of the remitted participants were in-patients. Diagnosis was initially made by the clinical teams but was verified by the first author on the basis of discussion with the teams, examination of the medical notes and clinical assessments administered to the patients, which consisted of two interview-based scales – the Bech–Rafaelson Mania Scale (BRMS) (Bech *et al.* 1978) and the Hamilton Rating Scale for Depression (HRSD) (Hamilton, 1960) – and two self-report scales – the Altman Self-Rating Mania Scale (ASRM) (Altman *et al.* 1997) and the Beck Depression Inventory (BDI) (Beck *et al.* 1996) (three manic patients and one depressed patient failed to complete the BDI).

These assessments of current symptoms were also used to assign the patients to manic, depressed and remitted groups. In accordance with DSM criteria, the remitted patients were required to have not had clinically significant depressive or manic symptoms within the 8 weeks preceding the assessments. Scores for each of the groups are given in Table 1. Because the data were not normally distributed, groups were compared using the Kruskal–Wallis test, followed by multiple comparisons using the Mann–Whitney test. For the BDI, all groups scored differently from each other ($P<0{\cdot}01$), and the same was true for HRSD scores ($P<0{\cdot}001$). For the BRMS all groups differed ($P<0{\cdot}05$) but for the ASRM the manic group scored higher than the remaining three groups ($P<0{\cdot}001$), which did not differ from each other.

Table 1. *Data on age, sex, years in full time education and age of onset*

	Manic ($N=20$)	Depressed ($N=15$)	Remitted ($N=16$)	Control ($N=20$)
Age, mean (S.D.)	42·7 (8·25)	44·4 (9·38)	45·5 (11·27)	33·9 (9·51)
Sex, *N* (%)				
Male	6 (30%)	5 (33·3%)	9 (56·3%)	7 (35%)
Female	14 (70%)	10 (66·7%)	7 (43·8%)	13 (65%)
Education (years), mean (S.D.)	12·8 (2·34)	13·4 (2·87)	15·2 (3·08)	14·9 (3·08)
Age of onset, mean (S.D.)	22·5 (8·6)	22·5 (9·1)	24·6 (8·7)	

Four manic patients were in receipt of lithium carbonate, 11 were in receipt of another mood stabilizer, 18 were in receipt of a neuroleptic and one was prescribed an antidepressant. Ten depressed patients were receiving lithium, four were receiving another mood stabilizer, eight were in receipt of a neuroleptic and eight were taking an antidepressant. In the case of the remitted patients, 11 were in receipt of lithium, one was receiving another mood stabilizer, five were prescribed a neuroleptic and six were taking antidepressants.

Data on age, gender, years in full time education, duration of illness and time since last episode, are also given in Table 1. A significant difference in age between the groups was accounted for by the lower age of the controls compared with each of patient groups ($F(3,67)=5{\cdot}67$, $P<0{\cdot}05$, Tukey $P<0{\cdot}5$ for each *post hoc* comparison). A significant difference between groups was found for years in education ($F(3,67)=2{\cdot}99$, $P<0{\cdot}05$), although none

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of the *post hoc* comparisons between groups was significant.

Development of the interviews

The interview questions were developed from work by Haddock *et al.* (1995), who devised 80 short statements designed to represent a range of emotional salience relevant to patients with schizophrenia. These were revised to include topics thought more likely to be pertinent to patients with bipolar affective disorder, such as items about embarrassment or regret. A panel of 15 judges rated the revised statements on a 1–6 scale of emotional salience. This panel included bipolar disorder sufferers, community nurses, a psychiatrist and psychologists. Those rated as most emotionally salient were used as the basis for the personal interview and those rated least emotionally salient were used for the impersonal interview. Emotionally salient questions included statements such as 'Could you tell me about the things you regret most in your life?' and 'Could you tell me about any big arguments you had in your family?' Questions for the non-salient interview included 'Could you tell me about any hobbies you have?' and 'Could you tell me about your favourite foods?'

Procedure

The interviews were carried out in counterbalanced order by the first author. Taped 10-min speech samples were obtained for each interview with a 10-min break in between interviews.

In each interview, participants were asked the same set of 10 questions; however, in the event that this did not elicit 10 min of speech the remaining five questions were asked. Participants were instructed to answer according to their interpretation of the questions and standard prompts were given to encourage individuals to talk. They were allowed to speak at their own pace, without interference by the interviewer. The tape recorder was turned off at the end of each interview.

Participants' symptoms were rated using the BRMS and the HRSD on the basis of a semi-structured interview. Demographic information including age, occupation and education was also obtained through both patient reports and case-notes. Participants also completed the ASRM and the BDI. The procedure took between 45 min and 1 h, excluding breaks.

The 10 min speech samples for both the emotionally salient (ES) and non-emotionally salient (NES) interviews were rated using the Scale for the Assessment of Thought, Language and Communication (TLC) (Andreasen, 1979*b*). The ratings were made by four independent raters, who were psychology graduate research assistants, specifically trained to use the TLC by the first author, and who were paid to make the ratings. The ratings were made from tapes of the interviews, which the raters could slow down and replay as required. They were instructed to make transcriptions of particular speech samples as they proceeded in order to facilitate their ratings. They were blind to the allocation of the participants to groups and the hypotheses of the study were not discussed with them.

The TLC assesses twenty different types of thought disorder as defined by Andreasen (1979*a*). It incorporates different speech and language behaviours such as pressure of speech, illogicality and incoherence, measuring the presence and severity of each on a scale of 0 (not present) to 4 (present in extreme form). An overall global measure of thought disorder is also given on a scale of 0 to 4, and a summed score, computed by weighting for the more pathological types of thought disorder. Inter-rater reliability calculated from ten interviews rated by all raters, was excellent for the TLC global score (intraclass $r = 0{\cdot}93$), and good for TLC summed scores (interclass $r = 0{\cdot}79$).

RESULTS

Participants spoke a mean of 1465 words (S.D. = 680) in 10 min during the emotional salient condition and a mean of 1109 (S.D. = 434) words in the non-emotional condition; this difference was significant ($F(1,67) = 33{\cdot}94$, $P < 0{\cdot}001$) but there were no group differences in the number of words spoken and the interaction between condition and group was non-significant for this measure.

Global and summed scores on the TLC for the four groups are shown in Table 2. Individual subscale scores were not analysed to avoid the risk of type-1 error proliferation.

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Table 2. *Mean scores (and standard deviations) obtained by each group on TLC global and summed scores for emotionally salient (ES) and non-emotionally salient (NES) conditions*

	Manic ($N=20$)		Depressed ($N=15$)		Well ($N=16$)		Control ($N=20$)		Total ($N=71$)	
TLC subscales	ES	NES	ES	NES	ES	NES	ES	NES	ES	NES
Global score Mean (S.D.)	1·75 (1·02)	0·10 (0·79)	0·47 (0·92)	0·27 (0·59)	0·50 (0·73)	0·19 (0·40)	0·30 (0·57)	0·15 (0·37)	0·79 (1·01)	0·45 (0·69)
Summed Mean (S.D.)	7·4 (3·91)	5·85 (3·94)	1·87 (2·64)	1·87 (2·47)	2·75 (2·76)	1·63 (2·25)	1·85 (2·01)	0·95 (1·43)	3·62 (3·75)	2·68 (3·35)

Table 3. *Pearson correlations between severity of mania as assessed by the Bech–Rafaelson and Altman scales and severity of thought disorder as assessed by both TLC global and summed scores*

	All participants ($N=71$)				Patient groups only ($N=51$)			
	TLC global		TLC summed		TLC global		TLC summed	
	ES	NES	ES	NES	ES	NES	ES	NES
Bech–Rafaelson Mania Scale	0·54***	0·57***	0·56***	0·55***	0·50***	0·54***	0·53****	0·50****
Altman Self-Rating Mania Scale	0·35**	0·29*	0·35**	0·30*	0·32*	0·26	0·33*	0·26

* $P<0·05$; ** $P<0·01$; *** $P<0·001$; **** $P<0·0001$.

Table 3 shows Pearson correlations between severity of mania as assessed by the Bech–Rafaelson and Altman scales and severity of thought disorder as assessed by both TLC global and summed scores, which were all significant. When data from the patient groups only were included in the analyses, the correlations remained significant with the exception of those between the Altman Self-Rating Mania Scale scores and the two TLC scores for the non-emotional condition.

The TLC scores were subjected to two-way (groups × conditions) mixed-model ANOVAs. Both global and summed scores were positively skewed. However, there was no suitable way of transforming the data to make it more symmetrical, and there is no existing non-parametric test that would permit a comparison of condition and group effects simultaneously. Therefore initial analyses were on untransformed data, enabling the means to be interpreted, but these were followed up by an analysis of differences between the conditions in the summed scores, which were near-normally distributed. For the summed scores a significant main effect for group was revealed ($F(3,67)=13·65$, $P<0·0001$), accounted for by the higher levels of thought and communication disorder in the manic patients compared to all other groups (Tukey HSD, $P<0·001$ for each comparison). There was also a significant effect for condition ($F(1,67)=27·21$, $P<0·0001$) accounted for by higher levels of thought and communication disorder in the emotionally salient condition. The interaction was also significant ($F(3,67)=4·19$, $P<0·01$). Tests of simple main effects revealed that the manic patients showed much higher levels of thought and communication disorder in the emotionally salient condition compared to the non-emotional condition ($P<0·001$). The lesser differences observed in the remitted ($P<0·05$) and normal participants ($P<0·05$) were nonetheless statistically significant. However, no evidence of an exacerbation of thought and communication disorder in the emotional condition was observed in the case of the depressed patients ($P=0·69$).

In the case of the global TLC scores, a two-way ANOVA on these data revealed a significant main effect for group ($F(3,67)=14·33$ $P<0·001$). This was accounted for by the higher levels of thought, language and communication disorder in the manic patients in comparison to all other groups ($P<0·001$ for each comparison). A significant effect was found for condition ($F(1,67)=24·01$, $P<0·001$) indicating

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higher levels of thought, language and communication disorder in the emotionally salient condition. The interaction was also significant ($F(3,67) = 3{\cdot}15$, $P < 0{\cdot}05$). Tests of simple main effects revealed that the manic patients showed the greatest increase in thought, language and communication disorder in the emotionally salient condition when compared to the non-emotionally salient condition ($P < 0{\cdot}001$). The remitted patients also showed a statistically significant difference in the emotionally salient condition but to a lesser degree ($P < 0{\cdot}05$). No significant increase in thought, language and communication disorder was observed in the depressed patients ($P = 0{\cdot}17$) or the non-psychiatric control group ($P = 0{\cdot}23$).

Because the data for both global and summed scores was positively skewed, a one-way ANCOVA was carried out on differences in the summed scores between the conditions, calculated by subtracting the summed TLC scores in the non-salient condition from those in the salient condition; these scores were near-normally distributed. As we included scores in the non-salient condition as a covariate, this analysis controlled for overall group differences in thought disorder. There was a significant effect for group in this analysis ($F(3,66) = 3{\cdot}117$, $P < 0{\cdot}05$). This was accounted for by the greater difference scores in the manic group compared to both the normal controls (LSD, $P < 0{\cdot}05$) and the depressed participants ($P < 0{\cdot}005$).

DISCUSSION

Consistent with previous research (Docherty *et al*. 1994*a*, *b*, 1998; Haddock *et al*. 1995), the manic patients in the present study showed higher levels of thought, language and communication disorder than the comparison groups. As predicted, these patients showed a marked exacerbation of their thought, language and communication disorder when discussing emotionally salient topics. The remitted patients similarly showed increased disorder in the emotionally salient condition, although to a lesser degree. In contrast, the normal participants showed evidence of emotional reactivity on only one of the two speech measures, and the depressed patients showed no evidence on either measure. This study did not have sufficient power to investigate which types of thought, language and communication disturbances were more reactive. However, as the most significant results were obtained for the summed rather than the global scores, it seems likely that those types of disorder that are most heavily weighted when calculating summed scores – pressure of speech, illogicality and incoherence – are implicated. Further studies are required to test this hypothesis.

There has been a persisting debate about the similarities and differences between the thought, language and communication disorders found in manic and schizophrenia patients (Holzman *et al*. 1986). However, with respect to the effects of emotional salience, the present findings point to an important similarity, as the results obtained from the manic patients in the present study mirror those obtained from schizophrenia patients in previous research (Docherty *et al*. 1994*a*, 1998; Haddock *et al*. 1995). The findings from this study also suggest that this effect may not be restricted to psychotic patients, as we found some evidence of it in the normal controls. Docherty has argued that emotional reactivity may be a feature specific to only some psychotic patients. Although we think it likely that the extent to which communication is disrupted by emotional arousal may exist on a continuum, the present findings confirm that patients in some affective states are more reactive to emotional stimuli than patients in other states. In this respect, the depressed patients in the present study may be regarded as particularly abnormal, as there was no evidence that their speech was affected in this way. There are several possible explanations for the lack of reactivity in the depressed patients. It is possible that this finding is an artefact of the procedure employed: as depressed patients process information in a consistently negative way, negatively emotionally salient material may fail to induce a significant change in affectivity. Alternatively, the underlying psychological processes responsible for bipolar depression (for example, the behavioural inhibition system; Depue *et al*. 1987) may be less responsive to emotional stimuli than those involved in mania.

In order to clarify these group differences further, it will be necessary to study the mechanisms responsible for this effect. Although it is usually assumed that emotional arousal

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disrupts the psychological processes involved in the construction and self-monitoring of speech acts, studies so far have failed to measure the actual extent of emotional arousal during different conditions, or the processes such as working memory (Barch & Berenbaum, 1994) or reality monitoring (Harvey, 1985), which are hypothesized to be compromised in thought disordered patients. These will be important lines of future research. A limitation of this study is that emotional arousal during the two conditions and psychological mechanisms implicated in thought, language and communication disorder were not measured. It is therefore not possible to identify which mechanisms may cause emotionally salient material to increase thought disorder.

An important clinical implication from this study is that it is necessary for the role of the emotional content of speech to be taken into account during assessments of patients for thought, language and communication disorder. It is likely that they could be misleading unless consideration is given to the effects that the emotional content of the assessment may have on patients' presentation.

One further important clinical implication of the present findings is that remitted bipolar patients remain highly vulnerable to communication difficulties when required to discuss emotional topics. This finding is consistent with recent evidence of considerable subsyndromal mood disorder in remitted patients (Gitlin *et al*. 1995), accompanied by evidence of a cognitive vulnerability to emotional disorder (Scott *et al*. 2000). It is possible that psychosocial interventions, designed to improve patients' abilities to cope with emotional challenges, may reduce this kind of vulnerability to symptom-exacerbation. Recent findings indicating that cognitive-behavioural interventions can reduce vulnerability to manic relapse are consistent with this suggestion (Lam *et al*. 2000).

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