



DELUSIONAL PHENOMENOLOGY—DIMENSIONS OF CHANGE

HELEN M. SHARP¹*, CHRISTOPHER F. FEAR², J. MARK G. WILLIAMS³,
DAVID HEALY¹, C. FERGUS LOWE³, HILARY YEADON⁴
and ROBIN HOLDEN⁴

¹Department of Psychological Medicine, Hergest Unit, Ysbyty Gwynedd, Bangor, Gwynedd, LL57 2PW, United Kingdom, ²Department of Psychiatry, Queen Elizabeth Hospital, Birmingham, United Kingdom,

³University College of North Wales, Bangor, United Kingdom and ⁴Aberconwy Community Mental Health Team, Llandudno, United Kingdom

(Received 9 July 1995; in revised form 6 September 1995)

Summary—Although the application of cognitive techniques to both the measurement and modification of delusional beliefs has recently been developed in more theoretical detail (e.g. Chadwick & Lowe, 1994, *Behaviour Research and Therapy*, 32, 355–367) there has not been an effort to examine the variability of delusional phenomenology across time. In the present study we report on the treatment of 6 individuals who fulfilled DSM-III-R (American Psychiatric Association, 1987) criteria for Delusional Disorder and who received cognitive therapy targeted specifically on the single symptom of their delusional belief(s). Single-case time-series methodology was used to examine the associations between different aspects of delusional phenomenology through baseline and intervention study phases. Belief maintenance factors were found to be significantly associated with conviction in all 3 individuals who responded to the intervention. Negative behaviours, affect associated with the belief, preparedness to talk to others about the belief and insight were associated with conviction in some individuals but not others. Preoccupation and acting on the belief were aspects of delusional phenomenology that were found to systematically vary independent of belief conviction. The results support a multidimensional view of delusional phenomenology and the process of change during cognitive intervention.

INTRODUCTION

In 1973, Watts, Powell and Austin reported a study which aimed to develop a systematic, replicable procedure for the modification of abnormal beliefs. The techniques recommended have been adopted in subsequent attempts at belief modification (e.g. Chadwick & Lowe, 1990; Chadwick, Lowe, Horne & Higson, 1994). Other studies have developed psychotherapeutic approaches to schizophrenia using packages of techniques to address a range of problem areas (e.g. Fowler & Morley, 1989; Kingdon & Turkington, 1991; Tarrier, Beckett, Harwood, Baker, Yusupoff & Ugarteburu, 1993; Garety, Kuipers, Fowler, Chamberlain & Dunn, 1994; Kingdon, Turkington & John, 1994) and research taking a cognitive therapy of single symptoms approach has moved on to the treatment of auditory hallucinations (Haddock, Bentall & Slade, 1993; Chadwick & Birchwood, 1994; Morrison, 1994). Although the application of cognitive techniques to both the measurement and modification of delusional beliefs has been developed in more theoretical detail (Chadwick & Lowe, 1994; Alford & Beck, 1994) there has not been an effort to examine the variability of delusional phenomenology across time.

The present study focuses on the single symptom of delusions. We report in detail the treatment of 6 patients, 3 of whom responded to treatment and 3 of whom did not; response to treatment being defined here in the traditional manner as a drop in belief conviction. The study was designed as a partial replication and extension of the verbal challenge procedure of Chadwick and Lowe (1990). However, unlike Chadwick and Lowe (1990) whose patients fulfilled diagnostic criteria for schizophrenia this study was confined to patients who satisfied DSM-III-R (American Psychiatric Association: APA, 1987) criteria for delusional disorder, the principal aim of the study being to explore some unanswered questions concerning the interaction of delusional beliefs with other 'delusional' symptomatology over the course of treatment.

*Author for correspondence.

First, we explored the interaction of abnormal beliefs with affect associated with that belief. Chadwick and Lowe (1990) remarked upon the inter-relationships between ratings of conviction, preoccupation and levels of anxiety for each of their *Ss*. Conviction referred to the degree to which the individual believed their belief to be true at the moment of asking, preoccupation referred to how frequently the person had thought about their belief during the past week, and anxiety referred to how anxious the person had felt whilst thinking about their belief during the past week. The authors found considerable variability between individuals in the nature of these relationships with some individuals who were highly preoccupied during the baseline phase being highly anxious and some showing low levels of anxiety. A similar picture was observed during their verbal challenge treatment phase, one example being a *S* who showed considerable reductions in both conviction and anxiety during intervention but whose preoccupation levels remained high. They concluded that the relation between these 3 characteristics is highly dependent on the individual concerned. However, it is also possible that such individual differences arose from the use of a standard mood rating (anxiety) for all participants. In the present study we took account of the fact that people label their affect differently. In addition to a standard mood rating of anxiety we assessed idiosyncratic affective responses using adjectives generated by the person concerned (e.g. terror, fed-upness) to describe how they felt when thinking about their delusional belief. The level of all these affective dimensions were monitored on a sessional basis.

Chadwick and Lowe (1990) principally assessed outcome of therapy using measures of belief conviction, preoccupation, anxiety and accommodation. Accommodation refers to the individual's ability to notice and respond to disconfirmatory evidence pertinent to their belief occurring in their everyday life. They did not formally assess any other aspects of delusional phenomenology such as behavioural change (e.g. action on beliefs) or belief maintenance factors (e.g. the active search for evidence to support or refute their belief). In the present study cognitive, affective and behavioural components of delusional phenomenology were assessed throughout the study so that we might examine their relations with belief conviction over time and also have a more complete range of delusional dimensions on which to assess the potentially idiosyncratic responses to intervention. For example, although conviction in the delusional belief has most commonly been used as the primary index of treatment outcome, it may be that some individuals respond to therapy with a behavioural change in the absence of a corresponding change in reported conviction level.

In order to explore the dimensions of change during the course of treatment more thoroughly we assessed a wide range of delusional phenomena and monitored their variability over time throughout baseline and therapy phases of the study using the Maudsley Assessment of Delusions Schedule (MADS; Wessely, Buchanan, Reed, Cutting, Everitt, Garety & Taylor, 1993; Buchanan, Reed, Wessely, Garety, Taylor, Grubin & Dunn, 1993; Taylor, Garety, Buchanan, Reed, Wessely, Ray, Dunn & Grubin, 1994). Designed as a cross-sectional assessment tool the MADS has previously been used to investigate how prevalent action on beliefs actually is in floridly psychotic individuals and to determine whether belief types (e.g. persecutory or grandiose), which vary between *Ss*, are linked to differing classes of action (e.g. violent vs defensive). The assessment of a wide range of delusional symptomatology, like other aspects of emotion, cognition or behaviour brings with it difficulties because the stability or variability of such characteristics within the individual over time is not known in advance. It is possible that many aspects of delusional symptomatology measured by the scale are state-like as opposed to trait-like. If the former is true of a particular characteristic then it would be potentially misleading to measure it in a cross-sectional manner. Knowledge of the variability of symptoms over time is important because certain aspects of delusional phenomenology have been identified as possible prognostic indicators. For example, it has been suggested that a deluded person's ability to countenance hypothetical contradictory evidence may be a potential predictor of response to cognitive behavioural intervention for that belief (Chadwick & Lowe, 1990). The stability of this characteristic is as yet unknown. If this aspect of delusional phenomenology was found to vary from week to week within the same individual, a single cross-sectional assessment would be unrepresentative and its use as a prognostic indicator potentially misleading. The present study uses a single case study, repeated measures design to examine further the interrelationships between belief conviction and different aspects of delusional phenomenology over time.

In summary, we investigated the relationship between individual's self-expressed affect associated with their delusional belief and other delusional criteria, such as conviction and preoccupation. Second, using a version of the MADS modified for repeated use we tested which particular features were stable or fluctuated within individuals over time, and investigated the relations between the traditional outcome criterion of belief conviction and other delusional symptoms.

METHOD

Subjects

Referrals were sought from Consultant Psychiatrists in North Wales for patients whose primary symptomatology was that of holding delusional beliefs. Individuals were accepted on to the study if they satisfied the following inclusion criteria. First, participants were required to fulfil criteria for a diagnosis of Delusional Disorder according to the Revised Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; APA, 1987). The diagnosis was made by a consultant psychiatrist (DH). Second, they had to have been regarded as clinically deluded for at least 6 months prior to entry on to the study and the content of their delusions must have been stable throughout that period. Third, at the time of entry to the study no patient was to be on more than 250 mg of Chlorpromazine per day or its equivalent. Fourth, each participant had to be willing to talk to a researcher who wished to discuss their beliefs. Patients were told that they would have the opportunity to talk to a person about their strongly held beliefs in greater detail than they had probably done so before. They were informed that it would involve seeing this person on a roughly weekly basis for about an hour at a time. Finally, participants and their psychiatrists had to be willing to keep medication levels constant as far as was possible throughout the course of the study period.* At the time of study all the participants were outpatients supported in the local community. Ethical approval was granted from the Gwynedd Health Authority Ethics Committee for the present study.

Following the inclusion criteria 7 male patients were admitted into the study. However, one of these patients was later excluded on advice from his consultant psychiatrist, when after completion of 3 baseline sessions the patient discovered a lump, strongly suggestive of a possible carcinoma. The remaining 6 patients completed the study.

Case histories

Subject 1 (S1) was a 43 yr old single man who believed that he had been taken over by a good spirit (belief 1; B1) and he spoke as if he was the spirit, referring to S1 in the third person. He also believed that there was an evil spirit trying to persecute him (belief 2; B2). At the time of the study he was living with his parents. He had held the same delusional belief for 4 yr.

Subject 2 (S2) was a 39 yr old man who believed that he had been monitored by the Ministry of Defence (M.o.D.) in the past (belief 1; B1) and that he was being lined up for a top job in the future (belief 2; B2). He wasn't sure of the exact nature of the job but he thought it would be in MI6 or the foreign office or similar. He felt that the 'illness' was an endurance test that he had to survive to prove his worthiness for the job. At the time of the study he was living with his fiancée and her daughter. His beliefs began whilst working for the Ministry of Defence in his early twenties.

Subject 3 (S3) was a 36 yr old married man living with his second wife at the time of the study. He believed that his next door neighbours were persecuting him and had reported them to the police. He also believed that strangers he met in the street called him names and were part of the conspiracy. He had held his beliefs for 2 yr since he worked in a factory where he first felt that people were against him. The onset of the paranoia coincided with S3 having taken appetite suppressant medication in excess of the recommended dosage in a bid to lose weight quickly.

*Despite this requirement for entry on to the study, during the study 2 participants stopped taking their medication. Both were retained in the study since the main focus of the study was not to evaluate the effectiveness of psychological treatment but to examine the correlates of change in % conviction. S3 ceased his medication between baseline and therapy phases of the study as he could no longer afford the prescriptions. S6 ceased his medication mid-way through baseline believing them to be placebo pills. Unfortunately poor compliance with neuroleptic medication is a true reflection of the situation in clinical practice.

Subject 4 (S4) was a 48 yr old man. He lived alone at the time of the study. He believed that ministers of the church were persecuting him from their homes. He had held these beliefs for some 13 yr and had also been hearing their voices talking to him over this time.

Subject 5 (S5) was a 60 yr old man living in sheltered accommodation at the time of the study. He had been separated from his wife for a number of years although they were still in contact once a month. He believed that he was the devil or "The Omen" and had done so for 12 yr. He claimed he could influence world events and felt that he was responsible for all the disasters in the world although he wasn't sure how he managed it.

Subject 6 (S6) was a 45 yr old single man who lived alone. He believed that the police were observing him, and had been for many years, following a misdemeanour some time previously. He had held the beliefs for 13 yr and he felt the police had bugged his house and that they followed him when he went into hospital.

Assessments

Following Chadwick and Lowe (1990) participants were asked to make a rating of degree of conviction in their belief, firstly in the form of a percentage rating (% conviction) and subsequently following Brett-Jones, Garety and Hemsley (1987), both degree of belief conviction and pre-occupation with the belief were assessed using Phillips' (1977) modified form of Shapiro's (1961) Personal Questionnaire (PQ). This technique assesses changes in symptom intensity specific to an individual subject and was also adopted to measure the amount of anxiety experienced by the participant whilst thinking about the belief. Unlike previous studies, participants were also invited to suggest up to 3 other adjectives that best described how they felt whilst thinking about their beliefs and these adjectives, whether describing positive feelings (e.g. hopefulness about the future) or negative ones (e.g. terror). These were also measured using the PQ method. The conviction measure was concerned with how the *S* was feeling at the time of testing but the measures of preoccupation, anxiety and other self-generated adjectives referred to the level of symptom intensity experienced during the preceding week.

The Maudsley Assessment of Delusions Schedule (MADS; Wessely, Buchanan, Reed, Cutting, Everitt, Garety & Taylor, 1993) is a standardised interview covering the phenomenology of abnormal beliefs (e.g. conviction, preoccupation, systematisation), the associated affect, the reasons given by the *S* for possessing those beliefs, the behaviour that has resulted and the insight the patient might have as to the problem. During its development inter-rater reliabilities for the items in the measure were calculated. All items retained in the final version of the MADS achieved a value of κ , a chance converted agreement index, that exceeded 0.6. The mean value of κ was 0.82 (Taylor *et al.*, 1994). The test-retest reliability of the schedule was assessed with ratings at time 2 being completed 3–5 days after time 1. The mean value of κ for the test items at test-retest was 0.63. These comparatively modest test-retest agreement levels were thought to most likely reflect true changes in patients' mental status from time 1 to time 2, as opposed to being due to unreliability of the measure.

At the beginning of the present study the belief to be modified was identified and this became the focus for the MADS on each administration. The original version of the MADS measures delusional characteristics either since the belief was formed or (on most items) within a time period of a month prior to the interview. A modified version of the MADS (mMADS) was developed for use in the present study which contained the same questions but answers were assessed over a time frame of the week prior to interview.

Design

The study followed a multiple baseline design with *Ss* being allocated to receive either 5, 6, 7 or 8 baseline sessions serially according to the order that they were referred for entry on to the study. As 7 patients were referred this resulted in 2 patients being allocated to have 5 baseline sessions, 2 to have 6 sessions, 2 patients to have 7 (including the patient who had to withdraw from the study during baseline) and 1 patient to have 8 such sessions. The intervention phase of the study commenced after the successful completion of the allocated baseline sessions. The different baselines served as control conditions to evaluate the change that would have been expected had the treatment not been introduced (Kazdin, 1982). Participants were seen by one of three possible

therapists (HS, psychologist; HY, a social worker; RH, a community psychiatric nurse) throughout the study.

Patients were assessed by a psychiatrist (CF) who was blind to treatment progress. They were assessed once before the start of the baseline, once in between the baseline and intervention and once at the end of the intervention phase. The measures were the same as those normally completed on a sessional basis between the client and therapist during the course of the study.

Procedure

Sessions lasting approximately 60–90 min were conducted once a week, where possible, and in three phases. Sessions were held either in the outpatient clinic or in the participant's home.

Phase 1: preliminary interview(s). Following Chadwick and Lowe (1990), one and in some cases two interviews were conducted. These served the dual function of defining the belief to be modified and of establishing a rapport with the participant. Formal assessment measures were not completed at these interviews.

Phase 2: baseline. During the baseline sessions the participant was encouraged to discuss the genesis of his belief system in fine detail. Evidence was collected concerning past and present phenomena that had served to establish the belief and maintain it through time.

Phase 3: cognitive therapy intervention. Therapists followed the manual developed by Chadwick and Lowe in previous research in North Wales incorporating some more recent techniques from the normalising rationale of Kingdon and Turkington (1991).

Timing of within-session assessments

Percentage conviction ratings and all personal questionnaires (PQ conviction, preoccupation, affect consequent upon the belief) were completed at the end of every baseline and therapy session and at each follow-up assessment. The original version of the MADS was administered only at the end of the first baseline session and by the independent assessor at the pre-baseline assessment phase. The modified version (mMADS) was employed at the end of all subsequent baseline and therapy sessions and at each of the follow-up assessments.

RESULTS

Primary response to therapeutic intervention

Three measures of conviction were used in the study, percentage conviction (% conviction), an ordinal measure assessed by the PQ method (PQ conviction), and an ordinal assessment of conviction included in the MADS. Due to the lower degree of flexibility within the second and third measure (fewer categories) the % conviction rating is used as the primary index of response to therapy as in Chadwick and Lowe (1990).

In order to confirm or reject the presence of a downward trend in individual time series for % conviction ratings, the raw data were subjected to a simple smoothing operation (Morley & Adams, 1991). Moving averages were calculated for each successive pair of sessional ratings made by the individual concerned. Smoothed % conviction ratings for all 6 individuals are displayed graphically in Fig. 1. Also included in Fig. 1 are the ratings of % conviction that each participant made at their pre-baseline, pre-therapy and end of therapy assessments with the psychiatrist who was blind to their within-session ratings. It is clear from this that 3 of the Ss (S1, S2 and S5) showed a reduction in the degree of conviction with which they held their beliefs during the intervention phase of the study. Ratings of belief conviction made at the psychiatrist's assessments during the course of the study were broadly consistent with the within-session ratings for all except one individual (S5). In his case, ratings made within-sessions oscillated to a large degree from one week to the next throughout the study and as such it was not surprising that the ratings completed with the psychiatrist did not correspond closely to these.

It is important to note that S1 held two delusional beliefs. The first of these was that he was possessed by a good spirit and the second was that an evil spirit was around and was trying to take over control. Only the second of these was targeted during intervention and only the targeted belief showed any change. This is evidence in support of the intervention being the specific agent of change. S2 held two beliefs and these were challenged in tandem as they were intrinsically linked.

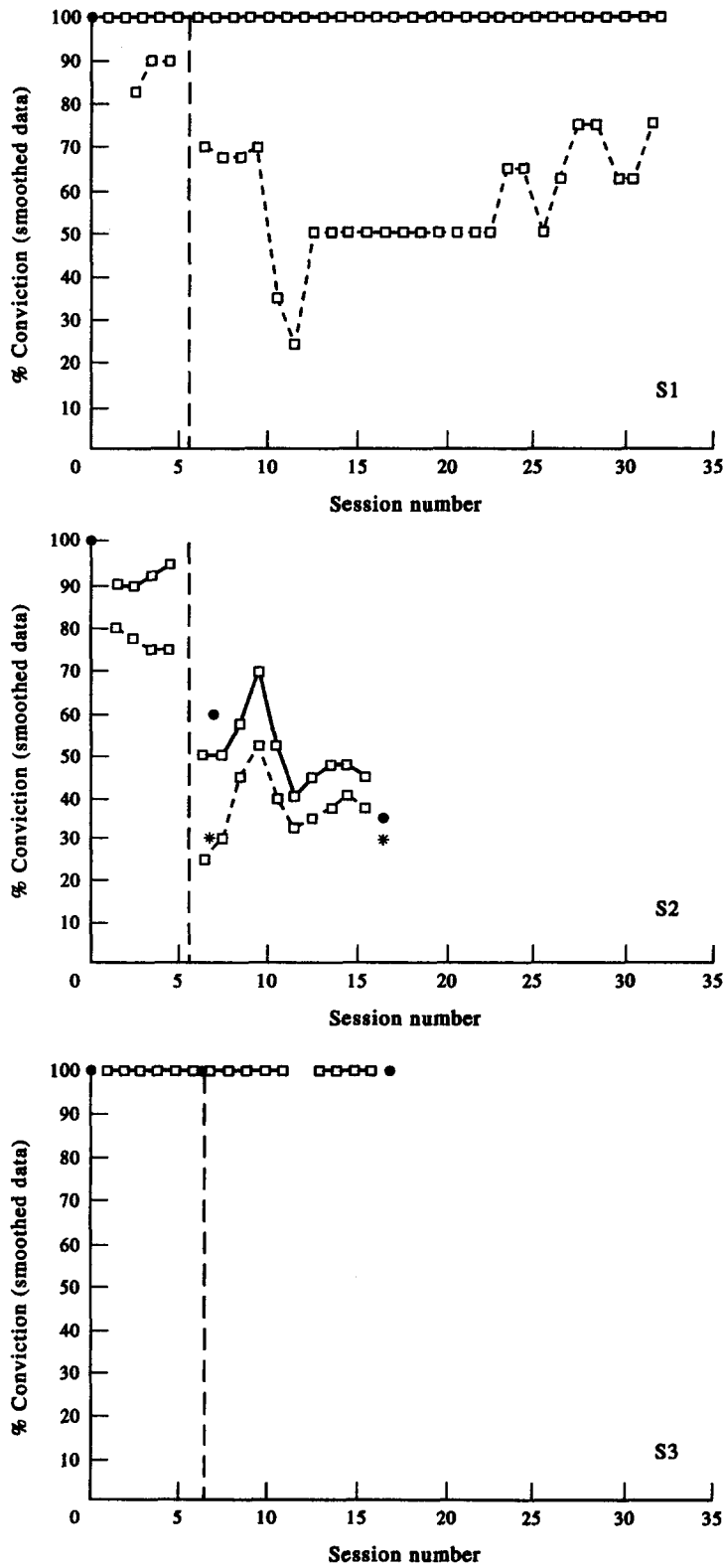


Fig. 1—caption on facing page.

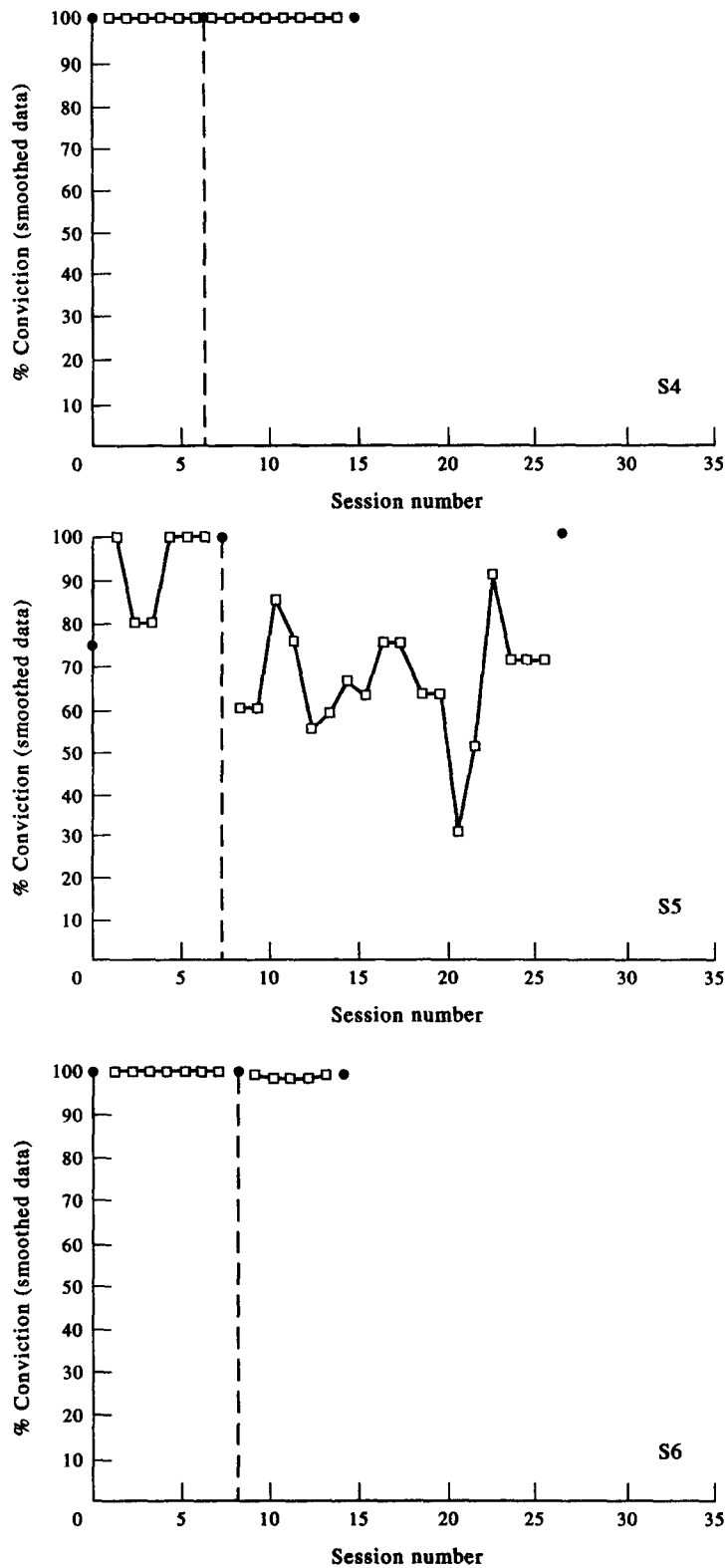


Fig. 1. Smoothed sessional ratings of belief conviction (%) throughout baseline and intervention for each study participant. For S1 and S2 smoothed sessional conviction ratings for the second belief are joined by a dotted line. Study phases are separated by a vertical dotted line. ● denotes independent assessment for belief 1; * denotes independent assessment for belief 2 where appropriate. Independent assessments were not available for S1 in between baseline and therapy phases of the study or at the end of therapy.

Both beliefs responded to cognitive intervention. S5 held one belief and this was the target of treatment. The treatment progress of all 3 responders and the 3 non-responders (S3, S4 and S6) shall now be considered in fine detail and in relation to all other aspects of delusional phenomenology that were assessed.

Secondary responses to therapeutic intervention

All 6 individuals spontaneously generated different adjectives to describe their feelings whilst thinking about their respective delusional beliefs. These were variously being: fed-up (S1), concerned (S1), depressed (S2), hopeful (S2), tense (S3), scared (S4), angry (S4), sad (S5), anxious (S5), terrified (S6), and confused (S6). This finding supports our rationale that people label their affect differently. Only one participant spontaneously chose the standard rating, anxious, to describe how he felt whilst thinking about his belief. Allowing people to define the emotional consequences of a belief is therefore likely to provide more accurate information about the relation between such affect and other delusional dimensions, such as conviction or preoccupation.

Data analysis followed the principles of single case time series analyses. First, for each individual case, the statistical independence of the data was examined (Morley & Adams, 1989; Everitt, 1989). Autocorrelations of lag 1 were calculated for each of the following within-subject variables recorded on a session by session basis (% conviction, PQ conviction, PQ preoccupation, PQ affect consequent upon the belief). For each variable the data were corrected for the regression of each score on the preceding score. In subsequent statistical analyses the corrected data, that is, the residuals, for these variables were used in preference to the raw data which were to varying degrees serially dependent (autocorrelations ranging in magnitude from ± 0.01 to 0.72).

Spearman rank order correlations were calculated between the residuals of each variable to examine the relationships between belief conviction, preoccupation and affect consequent upon the belief for each individual and each phase (baseline and therapy) separately. Where scores were constant throughout phase the correlations with other variables were indeterminable. For S3 and S4 complete correlation matrices were indeterminable as their measures of % conviction, PQ anxiety and all but one measure of PQ affect (own words) were constant throughout the course of the study. Their data will therefore not be discussed below. Tables 1–4 display the determinable inter-dimensional correlation coefficients for S1, S2, S5 and S6 respectively. In the calculation of correlations, missing data were excluded in a pairwise fashion with the correlation coefficient

Table 1. Spearman rank-order correlation matrix displaying the strength of associations between specific aspects of S1's delusional experience measured across baseline ($n = 5$ sessions) and therapy separately ($n = 27$ sessions)

| Variables | %C B1 | %C B2 | PQ C B1 | PQ C B2 | Preoccupation | Anxiety | Concern | Fed-up |
|---------------|-------|----------------|---------|---------|---------------|---------|---------|--------|
| %C B1 | — | • | • | • | • | • | • | • |
| %C B2 | • | — | • | • | • | 0.52 | • | 0.55 |
| PQ C B1 | • | • | — | • | • | • | • | • |
| PQ C B2 | • | 0.80*** | • | — | • | • | • | • |
| Preoccupation | • | −0.08 | • | −0.00 | — | • | • | • |
| Anxiety | • | −0.00 | • | −0.11 | 0.21 | — | • | 0.96** |
| Concern | • | −0.20 | • | −0.40* | −0.05 | 0.23 | — | • |
| Fed-up | • | −0.20 | • | −0.16 | −0.03 | 0.37* | 0.31 | — |

Note. Data from the baseline phase is presented in *italics* and data from the therapy phase is displayed in **bold type**. • = correlation not determinable as either variable was constant throughout phase. B1 = belief 1; B2 = belief 2. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; † $P < 0.06$.

Table 2. Spearman rank-order correlation matrix displaying the strength of associations between specific aspects of S2's delusional experience measured across baseline ($n = 5$ sessions) and therapy separately ($n = 10$ sessions)

| Variables | %C B1 | %C B2 | PQ C B1 | PQ C B2 | Preoccupation | Anxiety | Depression | Hopeful |
|---------------|---------------|---------------|---------------|-------------|---------------|-------------|------------|----------|
| %C B1 | — | <i>0.96**</i> | <i>0.98**</i> | <i>0.71</i> | −0.13 | −0.14 | 0.40 | 0.11 |
| %C B2 | 0.86** | — | <i>0.89*</i> | 0.72 | −0.07 | −0.19 | 0.24 | 0.16 |
| PQ C B1 | 0.48 | 0.47 | — | 0.67 | −0.22 | −0.09 | 0.54 | 0.05 |
| PQ C B2 | 0.30 | 0.45 | 0.73** | — | −0.46 | −0.79† | −0.13 | 0.77† |
| Preoccupation | 0.55* | 0.75** | 0.33 | 0.38 | — | 0.56 | −0.31 | −0.55 |
| Anxiety | 0.14 | 0.14 | 0.00 | 0.18 | 0.33 | — | 0.52 | −0.99*** |
| Depression | 0.23 | 0.48 | −0.14 | 0.36 | 0.70* | 0.50 | — | −0.54 |
| Hopeful | 0.17 | 0.04 | 0.14 | −0.45 | 0.08 | −0.50 | −0.43 | — |

Note. Data from the baseline phase is presented in *italics* and data from the therapy phase is displayed in **bold type**. • = correlation not determinable as either variable was constant throughout phase. B1 = belief 1; B2 = belief 2. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; † $P < 0.06$.

Table 3. Spearman rank-order correlation matrix displaying the strength of associations between specific aspects of S5's delusional experience measured across baseline ($n = 7$ sessions) and therapy separately ($n = 19$ sessions)

| Variables | %C B1 | PQ C B1 | Preoccupation | Anxiety | Sadness |
|---------------|---------------|-------------|---------------|---------------|--------------|
| %C B1 | — | <i>0.39</i> | • | <i>0.56</i> | <i>-0.11</i> |
| PQ C B1 | 0.70** | — | • | 0.85** | <i>-0.09</i> |
| Preoccupation | 0.08 | 0.36 | — | • | • |
| Anxiety | <i>-0.31</i> | 0.05 | 0.54* | — | <i>0.14</i> |
| Sadness | 0.34 | 0.31 | 0.18 | <i>-0.31</i> | — |

Note. Data from the baseline phase is presented in italics and data from the therapy phase is displayed in bold type. • = correlation not determinable as either variable was constant throughout phase. B1 = belief 1; B2 = belief 2. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; † $P < 0.06$.

Table 4. Spearman rank-order correlation matrix displaying the strength of associations between specific aspects of S6's delusional experience measured across baseline ($n = 8$ sessions) and therapy separately ($n = 6$ sessions)

| Variables | %C B1 | PQ C B1 | Preoccupation | Anxiety | Confusion |
|---------------|--------------|--------------|---------------|--------------|--------------|
| %C B1 | — | • | • | • | • |
| PQ C B1 | 0.71 | — | • | • | • |
| Preoccupation | 0.58 | 0.23 | — | <i>0.60†</i> | <i>0.25</i> |
| Anxiety | 0.29 | <i>-0.23</i> | 0.86* | — | <i>-0.26</i> |
| Sadness | 0.79† | 0.26 | 0.89* | 0.82* | — |

Note. Data from the baseline phase is presented in italics and data from the therapy phase is displayed in bold type. • = correlation not determinable as either variable was constant throughout phase. B1 = belief 1; B2 = belief 2. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; † $P < 0.06$.

relying on the remaining valid data within each study phase. Ratings of 'terror' for S6 are not reported as data was not consistently collected.

Relationship between belief conviction (%) and anxiety

No significant associations were found between belief conviction and anxiety for any of the participants (r ranging in magnitude between ± 0.00 and 0.56) during either study phase. The magnitude of the correlations exceeded 0.50 for S1 and S5 during baseline and given more sessions may have achieved significance.

Relationship between belief conviction (%) and self-generated mood variables

No significant associations were found between belief conviction and self-generated mood variables for any of the participants (r ranging in magnitude between ± 0.04 and 0.79). However, again, for fed-upness in S1 during baseline and for confusion in S6 during therapy the magnitude of the associations exceeded 0.50 and given a larger number of sessions may well have exceeded significance.

Anxiety vs self-generated mood variables in relation to alternative outcome criterion

Overall, during baseline, or 'resting state', the relationship between the alternative measure of belief conviction (PQ conviction) and mood can be summarised as follows. PQ conviction was highly correlated with anxiety in 2 out of 4 individuals. S2's belief 2 was grandiose in nature and the conviction with which it was held was negatively associated with anxiety ($r = -0.79$, $df = 4$, $P = 0.055$). S5's belief was persecutory in nature and was positively associated with anxiety during this phase ($r = 0.85$, $df = 6$, $P < 0.01$). In addition, for S2 conviction in his grandiose belief was positively associated with hope for the future ($r = 0.77$, $df = 4$, $P = 0.06$) although the magnitude of the correlation just failed to achieve statistical significance. Belief conviction and affect were not found to be significantly associated in either individual during therapy. For one participant (S1) belief conviction was found to be significantly associated with affect during the intervention period. For him a reduction in belief conviction was associated with a rise in concern ($r = -0.40$, $df = 19$, $P < 0.05$). This adverse reaction to the loss of belief conviction may explain why towards the end of the study his level of conviction rose to just under pre-intervention levels. Loss of conviction was perhaps proving to be uncomfortable.

Further to these results, for 3 (S2, S5 and S6) out of the 4 individuals preoccupation was found to be significantly and positively associated with adverse affective responses during intervention. For all 3 the affective dimensions were those that were self-generated; depression (S2; $r = 0.70$, $df = 9$, $P < 0.01$), anxiety (S5; $r = 0.54$, $df = 17$, $P < 0.05$) and confusion (S6; $r = 0.89$, $df = 4$,

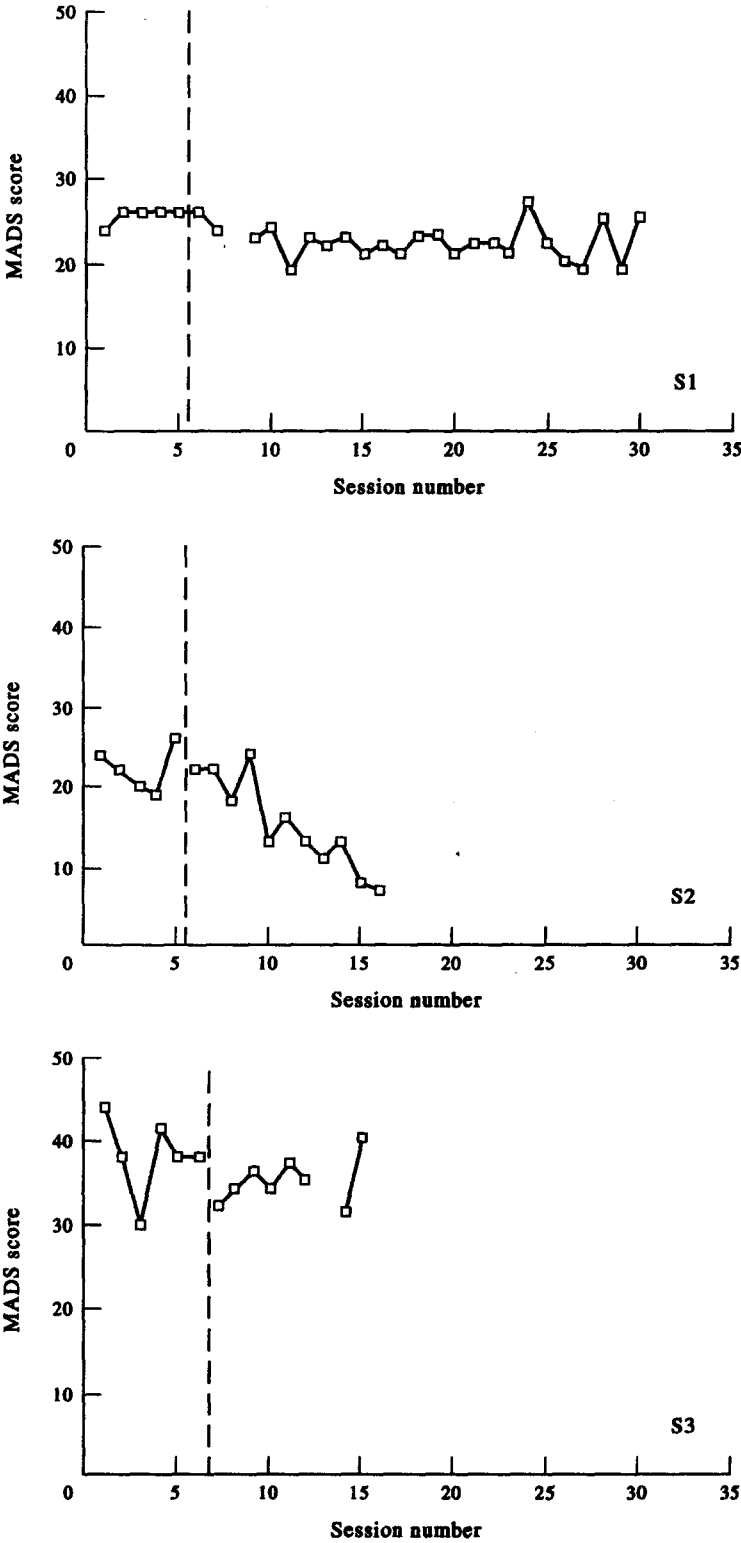


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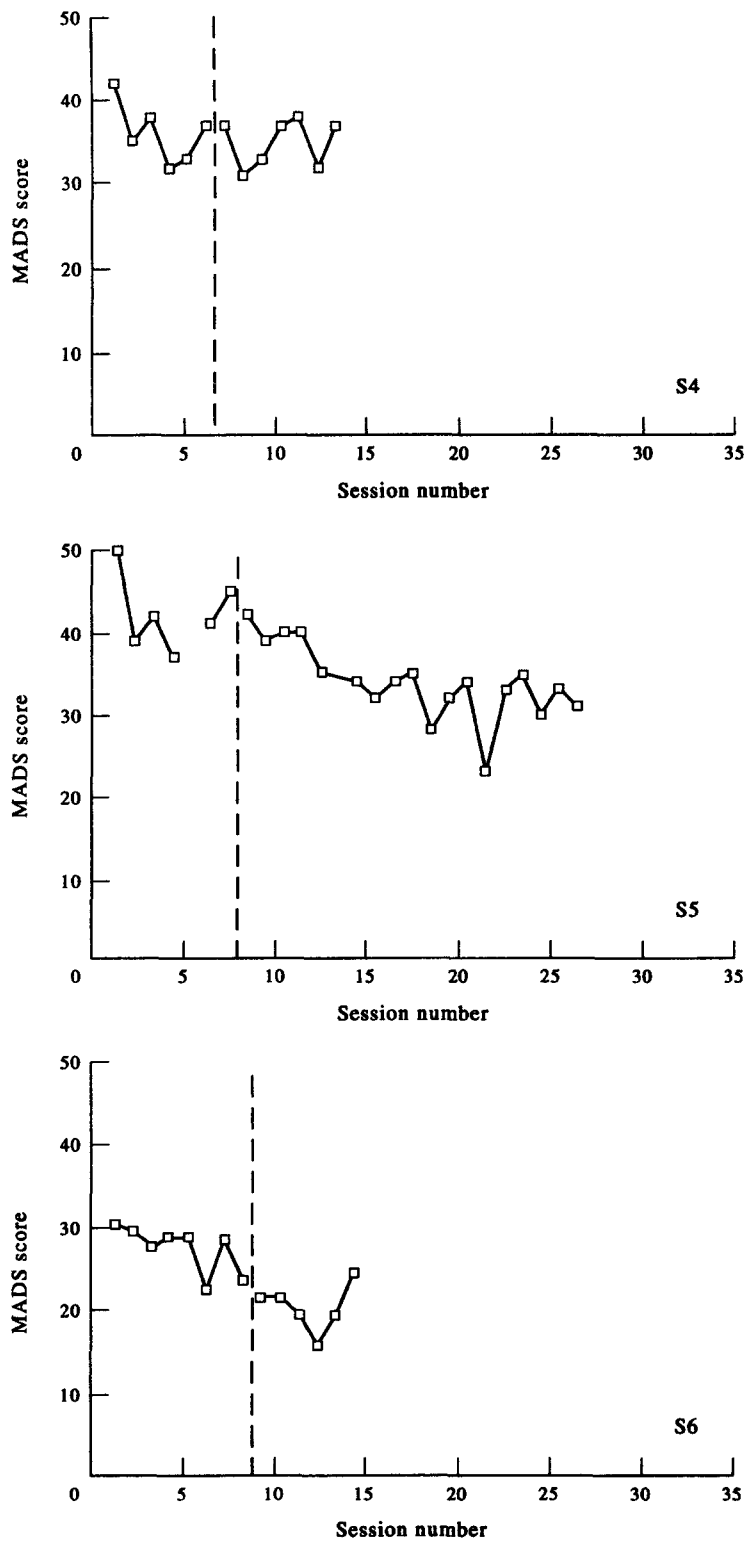


Fig. 2. Sessional scores on the mMADS representing overall delusional phenomenology throughout baseline and intervention study phases for each study participant. Study phases are separated by a vertical dotted line.

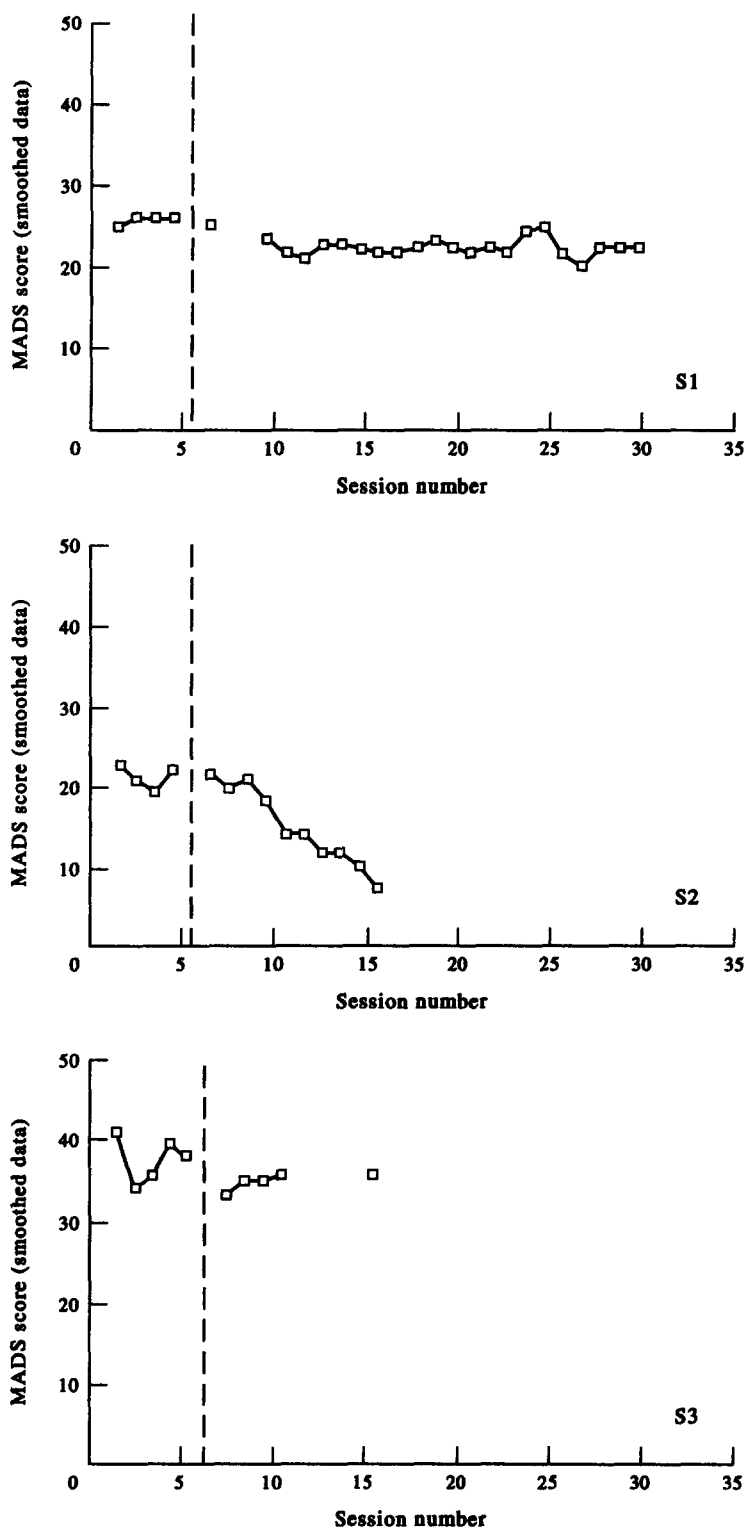


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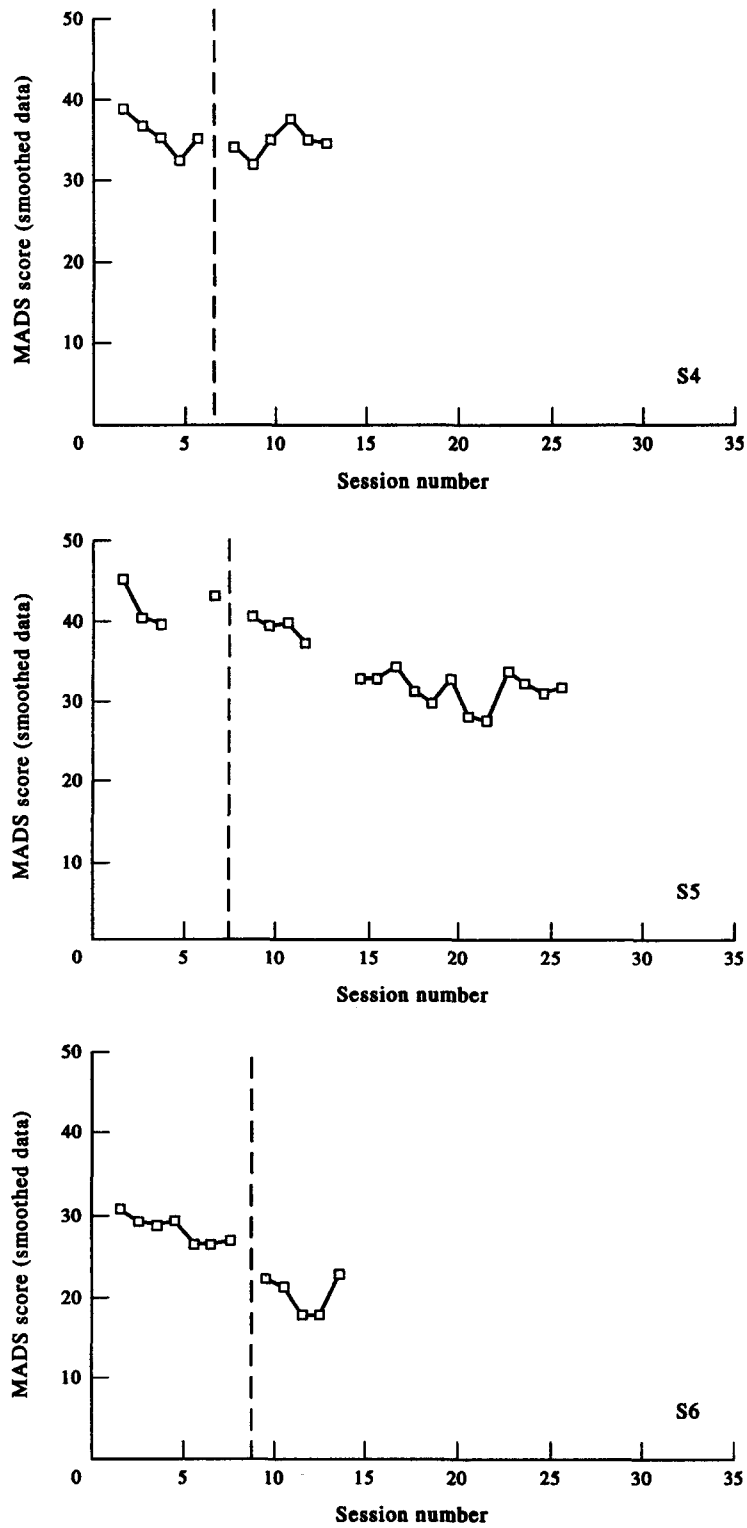


Fig. 3. Smoothed sessional scores on the mMADS representing overall delusional phenomenology throughout baseline and intervention study phases for each study participant. Study phases are separated by a vertical dotted line.

$P < 0.05$). The last of these individuals showed a corresponding association between preoccupation and the standard mood rating of anxiety ($r = 0.86$, $df = 4$, $P < 0.05$). Though for him anxiety and his self-generated affective response, 'confusion', were themselves significantly correlated ($r = 0.82$, $df = 4$, $P < 0.05$).

Delusional phenomenology and the wider process of change

From the Maudsley Assessment of Delusions Scale (MADS and mMADS) a total score can be derived which provides a crude index of total delusional phenomenology. This total score was calculated for each individual for each session throughout the study. One item was omitted from this calculation, "reaction to hypothetical contradiction", as this was not completed at every session.

In order to examine state-like variation in overall delusional phenomenology over time within individuals, mMADS total score ratings were plotted against assessment time throughout the study. It should be noted that the administration of the original MADS on baseline session 1 concentrated on a longer time frame (1 month prior to interview) as opposed to the 1 week time frame measured on all subsequent administrations of the modified version (mMADS). One would therefore expect the scores for overall delusional phenomenology to be slightly higher when the longer time frame was being sampled. This expectation was upheld for 5 out of the 6 participants. MADS and mMADS total score ratings for all 6 individuals throughout the course of the study are displayed graphically in Fig. 2.

From Fig. 2 it is clear that for each individual on the study there was considerable variability from session to session in the mMADS total scores during both baseline and therapy phases. The mMADS does seem sensitive to fluctuations in delusional phenomenology. However, because of this variation it remains difficult to interpret response to therapy and to deduce the presence of a true downward trend in the data as a result of intervention. Despite these reservations we attempted to examine response to therapy further. In order to help confirm or reject the presence of a downward trend in individual time series for mMADS total score ratings, the raw data were subjected to a simple smoothing operation (Morley & Adams, 1991). Moving averages were calculated for each successive pair of sessional ratings made by the individual concerned. The data from the first administration of the MADS on baseline session 1 was not included. Smoothed mMADS total score ratings for all 6 individuals are displayed graphically in Fig. 3.

From Fig. 3, 3 individuals (S2, S5 and S6) showed a clearer downward direction in their scores during therapy. Two of these (S2 and S5) were those who responded to therapy with a substantial drop in belief conviction (% conviction) and the third had responded with a 1% drop (S6). S6's mMADS scores perhaps reflected change during therapy that registered on other dimensions of delusional phenomenology rather than conviction. S1, S3 and S4 showed no clear evidence of an overall downward trend on the broad range of delusional phenomenology assessed by the mMADS, equally they showed no rise as a result of intervention.

One of the major aims of the present study was to examine the dimensions of change in delusional phenomenology for those individuals who responded to therapeutic intervention with a marked drop in belief conviction (% conviction). Given that the use of a total score on the mMADS may have obscured underlying changes in different directions on the individual composite subscales, the subscale scores for these 3 index individuals were examined more carefully.

Relationship of the mMADS subscales to belief conviction (%)

In order to examine the relationship between broader indices of delusional phenomenology as assessed by the mMADS and the primary index of outcome from cognitive intervention, % conviction, we examined the strength of associations between them for each individual separately during baseline and therapy phases of the study.

First, following the principles of single case time series analysis autocorrelations of lag 1 (Morley & Adams, 1989; Everitt, 1989) were performed on each variable separately. In each case data from baseline session 1 was excluded. For each variable the data were corrected for the regression of each score on the preceding score. In subsequent statistical analyses the corrected data, that is, the residuals, for these variables were used in preference to the raw data which were to some extent serially dependent (autocorrelations ranging in magnitude from ± 0.02 to 0.91).

Table 5. Correlations between residualised scores for % conviction and other delusion related phenomena over baseline sessions in Ss who responded to belief modification

| Subject | Conviction | Belief maintenance factors | | | Action | Negative behaviour | Preparedness to talk to others | Systematisation | Insight | mMADS total |
|---------|------------|----------------------------|----------------|------------|-----------|--------------------|--------------------------------|-----------------|-----------|-------------|
| | | Preoccupation | Belief factors | Affect | | | | | | |
| S1 | 0.93* (4) | • | 0.93* (4) | 0.65 (4) | • | -0.97* (4) | • | • | 0.65 (4) | • |
| S2 B1 | 0.89* (4) | • | -0.99** (4) | 0.39 (4) | -0.07 (4) | -0.33 (4) | -0.99** (4) | • | -0.32 (4) | 0.57 (4) |
| B2 | 0.92* (4) | • | -0.99** (4) | 0.40 (4) | -0.02 (4) | -0.29 (4) | -0.99** (4) | • | 0.25 (4) | 0.60 (4) |
| S5 | -0.70 (6) | • | 0.85** (6) | 0.85** (6) | -0.06 (4) | • | -0.63 (3) | • | — | — |

Note. The number of valid observations used to obtain each correlation coefficient is given in parentheses. • = correlation not determinable as either variable was constant throughout phase. — = correlation not determined due to missing data. B1 = belief 1; B2 = belief 2. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Table 6. Correlations between residualised scores for % conviction and other delusion related phenomena over therapy sessions in Ss who responded to belief modification

| Subject | Conviction | Belief maintenance factors | | | Action | Negative behaviour | Preparedness to talk to others | Systematisation | Insight | mMADS total |
|---------|-------------|----------------------------|----------------|-----------|------------|--------------------|--------------------------------|-----------------|------------|--------------|
| | | Preoccupation | Belief factors | Affect | | | | | | |
| S1 | 0.54** (21) | 0.05 (21) | -0.11 (21) | 0.17 (21) | 0.11 (19) | 0.31 (19) | -0.17 (21) | 0.22 (21) | -0.09 (21) | 0.45* (19) |
| S2 B1 | 0.50 (10) | -0.12 (10) | 0.70* (10) | 0.11 (10) | 0.07 (10) | 0.58* (10) | 0.35 (10) | 0.42 (10) | 0.36 (10) | 0.25 (10) |
| B2 | 0.30 (10) | -0.05 (10) | 0.68* (10) | 0.23 (10) | -0.08 (10) | 0.53 (10) | 0.39 (10) | 0.07 (10) | 0.54* (10) | 0.33 (10) |
| S5 | 0.30 (18) | 0.32 (16) | 0.46* (16) | 0.25 (16) | 0.14 (16) | -0.01 (16) | 0.60** (16) | 0.10 (16) | 0.49* (16) | 0.72*** (16) |

Note. The number of valid observations used to obtain each correlation coefficient is given in parentheses. • = correlation not determinable as either variable was constant throughout phase. — = correlation not determined due to missing data. B1 = belief 1; B2 = belief 2. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

Spearman rank-order correlations were calculated between the residualised mMADS subscale scores and the residualised % conviction ratings. The resulting correlations are displayed in Table 5 for the baseline phase and Table 6 for the therapy phase of the study.

Clearly, belief maintenance factors were most consistently associated with % conviction ratings throughout baseline and intervention. The only non-significant association was for S1 during the intervention. The belief maintenance subscale assessed whether an individual could identify internal (e.g. mood, abnormal experiences) influences and/or external events that continued to make him sure of his belief and whether or not that individual actively sought out evidence to confirm or disconfirm his belief. Affirmative responses to these questions yielded a higher score. Higher scores were found to be consistently associated with higher conviction ratings.

Five other subscales of the mMADS conviction, affect, negative behaviour, idiosyncrasy and insight related to the belief, showed a less consistent pattern of relationships with % belief conviction across Ss. Associations were significant for some Ss but not others. Each of these subscales will be considered in turn. Conviction on the mMADS was highly correlated with % conviction during baseline, but in all cases the magnitude of the correlations was diminished during intervention. All 3 individuals had responded to therapy with substantial variation in their % conviction scores. Because the degree of variation is greater during this phase compared to baseline and the mMADS conviction rating is a semantic ordinal rating and is therefore less flexible than the percentage scoring system then perhaps one explanation for the lower correlations between the two measures of conviction could be the difference in their relative sensitivity to change. For instance one could be either 90% or 10% sure of one's belief but in either case 'have some doubts' about one's belief.

The mMADS affect subscale comprises 5 yes/no items sampling whether thinking about the delusional belief made them feel elated, unhappy, frightened, anxious and/or angry during the previous week. The magnitude of the correlations between % conviction and the total score on the affect subscale were in all cases higher during baseline than during therapy.

Negative behaviours refer to those behaviours which indicate decreased functioning (e.g. my belief stops me from watching television, or, my belief stops me from meeting friends). During baseline, % conviction was negatively associated with negative behaviours to varying degrees. The more unsure the individual was about his belief, the more it interfered with behavioural functioning. However, during intervention the polarity of these associations changed. During this phase the more unsure the individual was about his belief, the less the belief interfered with behavioural functioning, functioning was improved.

A similar pattern could be observed for the associations between % conviction and the subscale labelled "idiosyncrasy" in the mMADS. The subscale actually assesses the extent to which the individual believes other people share his beliefs or is alone in his beliefs and the frequency with which he has discussed the beliefs or argued about the beliefs with others during the past week. This subscale may be better thought of as measuring the individual's preparedness to talk to others about the beliefs. During baseline, conviction was negatively associated with preparedness to talk to others. A decrease in conviction being associated with an increase in preparedness to talk to others. In contrast, during the intervention phase, conviction was most commonly positively associated with preparedness to talk to others, that is, the individual was more likely to believe they were alone in their belief, not talk to others and/or argue with others about their belief less frequently.

Scores on the insight subscale had an inconsistent relationship with % conviction. For 2 individuals (S2 and S5), during the intervention phase, % conviction was positively and significantly related to insight. Reduction in conviction was thus associated with an increase in insight in these individuals.

For 3 of the mMADS subscales, preoccupation, action on the belief (e.g. writing to someone, hitting someone) and belief systematisation, scores were consistently found to be unrelated to % conviction during each study phase. We examined these data further. If a significant correlation is derived between 2 particular variables then one assumes that they covary. However, if a variable does not correlate with the other then it could be a truly independent aspect of delusional phenomenology or it could be an unreliable measure. The cautious interpretation would be that it was an unreliable construct. To distinguish between these two possibilities we used the information from autocorrelations calculated for each subscale score over time. The hypothesis was that if the

Table 7. Autocorrelations indicating the degree of serial dependency for each of the mMADS subscales for each individual throughout the study

| Subject | Preoccupation | Action | Systematisation |
|---------|---------------|--------------|-----------------|
| S1 | 0.84*** (26) | 0.68*** (24) | 0.91*** (26) |
| S2 | 0.84*** (14) | 0.53* (14) | 0.86*** (14) |
| S5 | 0.90*** (20) | -0.05 (20) | -0.05 (20) |

Note. The number of valid observations used to obtain each correlation coefficient is given in parentheses. * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

autocorrelation was significant then this is indicative of systematic variation across data points, it is a measure of relatedness of successive data points. A non-significant autocorrelation would be expected if the fluctuation was unrelated from week to week and is more likely to be indicative of an unreliable construct with changes over time being due to error variance. To summarise, if a given subscale of the mMADS were found not to correlate with % conviction then autocorrelation was used to indicate whether this construct was likely to be a truly independent systematically varying aspect of delusional phenomenology or an unreliable construct whose variation over time was random.

Table 7 displays the lag 1 autocorrelations for each of the 3 mMADS subscales, preoccupation, action and systematisation for each individual separately. Time series data for preoccupation in all 3 Ss yielded significant autocorrelations and those for action and systematisation were significant for 2 out of 3 Ss. These results suggest that the subscales are detecting true and systematically varying aspects of delusional phenomenology rather than detecting error variance. Preoccupation, action on beliefs and belief systematisation were therefore deemed to be reliable dimensions of delusional phenomenology which did not covary with percentage belief conviction.

Finally, data was only available for 1 S during baseline to compute a correlation between % conviction and mMADS total score. However, during therapy, S1 and S5's % conviction ratings were significantly and positively associated with mMADS total score. Lower conviction being associated with lower overall levels of delusional phenomenology.

DISCUSSION

In the present study 3 out of 6 individuals responded to cognitive behavioural belief modification with a reduction in belief conviction. The reductions in % conviction in our study were not as clear cut as those reported by Chadwick and Lowe (1990). One explanation for the lack of a marked response to intervention in the present study could perhaps rest on the nature of the individuals participating. Chadwick and Lowe (1990) studied schizophrenic individuals whereas we focused on those fulfilling DSM-III-R criteria for delusional disorder. Patients who fulfil diagnostic criteria for delusional disorder display the prominent feature of delusions whereas in schizophrenia other psychotic features may be dominant. The delusions or loss of them may not be as crucial a component to the person's psychological integrity in the schizophrenic group and may consequently be more easily modified.

The first aim of the present study was to explore the interaction between abnormal beliefs and affect within individuals. We proposed that the relationship between an individual's belief conviction or preoccupation and related affect may be more accurately examined when idiosyncratic affective dimensions are assessed as opposed to the previous practice (Chadwick & Lowe, 1990) of using a standard mood rating across individuals. This proposal was most clearly supported in relation to belief preoccupation. During therapy, increased preoccupation was associated with adverse affective responses when measured using self-generated descriptors in 3 out of 4 individuals. The standard mood rating of anxiety was associated with preoccupation in only 1 of the 4. Although preferable to the use of a standard mood rating across all participants the practice could also run the risk of being too idiosyncratic resulting in the measurement of affective responses that are on the surface mild (e.g. concern) and may be healthy responses. Care needs to be taken to address the subtleties involved in understanding individual expression of affect and such mild expressions should not be dismissed lightly. However, given this cautionary note one could argue that for the purposes of measuring response to intervention, the individual should be shaped towards choosing a more extreme reaction.

The results with regard to belief conviction were more equivocal. Belief conviction assessed by percentage rating was found not to be significantly associated with either the standard mood rating of anxiety or with any of the individual's self-generated affective descriptors. The results with respect to belief conviction assessed by personal questionnaire were equivocal during baseline with conviction being associated with anxiety in 1 out of 3 cases as it also was with a measure of self-generated affect. There were no significant associations between PQ conviction and affect during intervention.

The cognitive model predicts that belief conviction should be associated with measures of affect during baseline. Significant associations were found between PQ conviction and PQ mood ratings during this phase but not between % conviction and PQ mood ratings. We suggest that the lack of associations in the latter case may be due to differences in scaling between the two measures and the number of observations within phase being small. The use of a standard scaling technique across all outcome measures may increase the likelihood of true associations being detected especially when the number of observations is small.

The lack of significant associations between either measure of conviction and any measure of affect during the intervention phase of the study suggests that the associations that were significant during baseline were broken down as a result of therapy. During baseline 7 out of 32 intercorrelations between measures of belief conviction and affect, whether self-generated or otherwise, were greater than 0.50 in magnitude. During intervention only 1, out of the 32 possible, was greater than 0.50. In addition, the magnitude of correlations found between % conviction and the affect subscale on the mMADS were also diminished during the intervention phase in comparison to the baseline phase in those individuals who responded to therapy. One explanation of how cognitive therapy causes changes in the treatment of depression is that it breaks the reciprocal links between mood and cognition (Teasdale, 1985; Williams, 1992). In the present study cognitive techniques were used to demonstrate how thoughts can have emotional consequences and also to reduce the extent to which mood was used as information in support of the delusional belief (e.g. "I feel so bad it must be true"). A possible interpretation of the latter set of results would be that the therapist's attempts to loosen the links between mood and conviction during intervention were successful.

The second aim of the study was to investigate response to therapy on a wider range of phenomenological dimensions than previous work and relatedly to examine whether such dimensions as assessed using the modified version of the MADS (Wessely *et al.*, 1993) systematically covaried with belief conviction over time or whether they operated as reliable independent constructs systematically varying over time. It has been reported elsewhere (Chadwick & Lowe, 1990; Brett-Jones *et al.*, 1987) that Ss often can report reductions in belief conviction without a corresponding reduction in preoccupation and Chadwick and Lowe contended that the relationships between such dimensions are highly idiosyncratic. Our data supports a multidimensional view of delusions whereby some aspects of delusional phenomenology may covary with belief conviction within an individual over time (affect, negative behaviours, preparedness to talk to others and insight) in a highly idiosyncratic manner whereas other dimensions such as preoccupation, systematisation and action on beliefs are independent of conviction level.

Unlike previous studies our data permitted an examination of the source of variation in variables found to be independent of belief conviction. Examination of these variables (preoccupation, action on beliefs and systematisation) assessed by the mMADS repeatedly over time using autocorrelations suggested that such variation was systematic and not purely due to error variation. Previous studies have examined the correlations between different dimensions of delusional phenomenology (e.g. Brett-Jones *et al.*, 1987) but have not controlled for the effects of serial dependency in individual time series. Our results also confirm that the mMADS is a reliable measure of state-like variation in delusional phenomenology over time, with its subscales being sensitive to shifts in belief conviction throughout the study.

In addition to the examination of the links between cognitive factors (belief conviction) and affect, two measures of behaviour were also examined, negative behaviours and action on beliefs. Negative behaviours that were consequent upon the belief (e.g. my belief stops me from meeting friends) were found to be associated with belief conviction in 2 of the 3 individuals but in different study phases. However, for both the individuals the polarity of the associations changed from baseline to therapy in the same way. The more unsure the individual was about his belief during

baseline the more it interfered with behavioural functioning. During therapy a reduction in belief conviction was associated with an improvement in behavioural functioning. Action on beliefs did not covary with belief conviction in any individual but was found to be a systematically varying independent aspect of delusional phenomenology.

Also of note was that during baseline, belief conviction was negatively associated with preparedness to talk to others. A decrease in conviction was associated with an increase in preparedness to talk to others. One tentative explanation of these data is that a drop in conviction for whatever reason leads to a degree of reactivity being triggered in the belief system. The individual faced with doubts about his belief and feeling threatened searches out commonality with other individuals wanting to believe others share the same views. As a consequence talking and almost inevitably arguing about the beliefs becomes more frequent. In contrast, during the intervention phase belief conviction was most commonly positively associated with preparedness to talk to others, that is, the individual was more likely to believe they were alone in their belief, not talk to others and/or argue with others about their belief less frequently. These findings would suggest that the measurement of behavioural change may be an important additional index in evaluating the success of intervention.

Finally, in relation to dimensions of change during cognitive intervention, belief maintenance factors were found to be the most consistent secondary dimension of change. If belief maintenance factors were truly maintaining the belief directly then one would expect the score on this subscale of the mMADS to covary significantly with degree of belief conviction. This was indeed found to be the case providing a useful external validity check for this subscale of the mMADS. However, the relationship was not unidirectional in nature. A reduction in conviction was not necessarily associated with a decreased number of maintenance events being reported. Such a situation is illustrated by the case of S2 during baseline, where perhaps doubts concerning the belief led to active search for more evidence in support of the belief rather than the situation during therapy whereby the response to reduction in belief conviction was associated with a corresponding drop in such interpretative exploits. During intervention, satisfactory alternative explanations for events are sought and if successful would negate the need for continued active search for evidence which supports the belief.

These data provide validation for the focus of belief modification strategies being directed at the evaluation and reattribution of evidence cited by an individual as being supportive of their delusional belief (Watts *et al.*, 1973; Chadwick & Lowe, 1990). A graded approach is taken in challenging the least important piece of 'supportive' evidence first, moving gradually on to challenge the core belief last. A reduction in belief conviction should ultimately be accompanied by a reduction in the score on the mMADS belief maintenance subscale if the individual is truly interpreting internal and external phenomena in a non-delusional fashion. Future intervention studies may find such a measure a useful secondary assessment of treatment progress. Future therapeutic interventions should also focus not only on the modification of delusional beliefs using belief conviction as the primary index of outcome but also on other aspects of delusional phenomenology, such as preoccupation, which operate independently but which in our study were themselves related to adverse affective responses.

The study of self-generated mood variables and other dimensions of delusional phenomenology (e.g. conviction, preoccupation, maintenance factors) enables a more accurate understanding of how the individual's belief system is intertwined with his/her emotional life and can help elucidate particular protective/defensive functions that the belief may hold. Such functions are not necessarily apparent from belief content. For example, S1 showed a reduction in his conviction that an evil spirit was trying to take possession of him and he showed a corresponding rise in 'concern'. Given the persecutory nature of the belief one would have perhaps expected the opposite affective response. Through careful discussion of alternatives to the belief it became clear that believing an evil spirit was trying to take over was more preferable to the feared alternative, being mentally ill. Paradoxically this fear of madness served to perpetuate the illness. Continuous assessment of self-generated mood variables facilitated the objective determination of a 'reactivity' in the belief system for this individual, signalling that therapy should either be continued with due caution concerning the need to deal with the underlying fear before removal of the belief, or alternatively that the belief was still actively serving a function and would perhaps be best left unchallenged. If the belief is still providing a vital function for the individual then the question should be whether

or not one can reliably generate a valid alternative to it that will enable the individual to gain long term benefit from the intervention process and not just a short term replacement.

Our approach to the examination of abnormal beliefs like that advocated by Chadwick and Birchwood (1994), stresses the interaction of the person and the disorder which evolves over time. We used an idiographic approach to objectively assess the inter-associations between different delusional dimensions. This complements the subjective picture which arises during therapy and aids the clear understanding of both the 'resting state' of the belief system during baseline and subsequently the process of change during intervention.

Acknowledgements—We wish to extend our thanks to all those who took part in this study. This research was supported by a grant from the Welsh Scheme for the Development of Health and Social Research to David Healy, Fergus Lowe and Mark Williams.

REFERENCES

- Alford, B. A. & Beck, A. T. (1994). Cognitive therapy of delusional beliefs. *Behaviour Research and Therapy*, 32, 369–380.
- American Psychiatric Association: APA (1987). *Diagnostic and Statistical Manual of Mental Disorders* (3rd edn, rev.). Washington, DC.
- Brehm, J. W. (1966). *A Theory of Psychological Reactance*. New York: Academic Press.
- Brett-Jones, J., Garety, P. & Hemsley, D. (1987). Measuring delusional experiences: a method and its application. *British Journal of Clinical Psychology*, 26, 257–265.
- Buchanan, A., Reed, A., Wessely, S., Garety, P., Taylor, P., Grubin, D. & Dunn, G. (1993). Acting on delusions. II: the phenomenological correlates of acting on delusions. *British Journal of Psychiatry*, 163, 77–81.
- Chadwick, P. & Birchwood, M. (1994). The omnipotence of voices: a cognitive approach to auditory hallucinations. *British Journal of Psychiatry*, 164, 190–201.
- Chadwick, P. D. J. & Lowe, C. F. (1990). Measurement and modification of delusional beliefs. *Journal of Consulting and Clinical Psychology*, 58, 225–232.
- Chadwick, P. D. J. & Lowe, C. F. (1994). A cognitive approach to measuring and modifying delusions. *Behaviour Research and Therapy*, 32, 355–367.
- Chadwick, P. D. J., Lowe, C. F., Horne, P. J. & Higson, P. J. (1994). Modifying delusions: the role of empirical testing. *Behaviour Therapy*, 25, 35–49.
- Everitt, B. S. (1989). *Statistical methods for medical investigations*. New York: Oxford University Press.
- Fowler, D. & Morley, S. (1989). The cognitive-behavioural treatment of hallucinations and delusions: a preliminary study. *Behavioural Psychotherapy*, 17, 267–282.
- Garety, P. A., Kuipers, L., Fowler, D., Chamberlain, F. & Dunn, G. (1994). Cognitive behavioural therapy for drug-resistant psychosis. *British Journal of Medical Psychology*, 67, 259–271.
- Haddock, G., Bentall, R. P. & Slade, P. D. (1993). Psychological treatment of chronic auditory hallucinations: two case studies. *Behavioural and Cognitive Psychotherapy*, 21, 335–346.
- Kazdin, A. E. (1982). *Single case research designs*. New York: Oxford University Press.
- Kingdon, D. G. & Turkington, D. (1991). The use of cognitive behaviour therapy with a normalising rationale in schizophrenia. *The Journal of Nervous and Mental Disease*, 179, 207–211.
- Kingdon, D. G., Turkington, D. & John, C. (1994). Cognitive behaviour therapy of schizophrenia: the amenability of delusions and hallucinations to reasoning. *British Journal of Psychiatry*, 164, 581–587.
- Lowe, C. F. & Chadwick, P. D. J. (1990). Verbal control of delusions. *Behaviour Therapy*, 21, 461–479.
- Morley, S. & Adams, M. (1989). Some simple statistical tests for exploring single-case time-series data. *British Journal of Clinical Psychology*, 28, 1–18.
- Morley, S. & Adams, M. (1991). Graphical analysis of single-case time series data. *British Journal of Clinical Psychology*, 30, 97–115.
- Morrison, A. P. (1994). Cognitive behaviour therapy for auditory hallucinations without concurrent medication: a single case. *Behavioural and Cognitive Psychotherapy*, 22, 259–264.
- Phillips, J. P. N. (1977). Generalised personal questionnaire techniques. In Slater, P. (Ed.), *Dimensions of intrapersonal space* (Vol. 2, pp. 195–246). New York: Wiley.
- Shapiro, M. B. (1961). A method of measuring psychological changes specific to the individual psychiatric patient. *British Journal of Medical Psychology*, 34, 151–155.
- Tarrier, N., Beckett, R., Harwood, S., Baker, A., Yusupoff, L. & Ugarteburu, I. (1993). A trial of two cognitive-behavioural methods of treating drug-resistant residual psychotic symptoms in schizophrenic patients: I. Outcome. *British Journal of Psychiatry*, 162, 524–532.
- Taylor, P. J., Garety, P., Buchanan, A., Reed, A., Wessely, S., Ray, K., Dunn, G. & Grubin, D. (1994). Delusions and violence. In Monahan, J. & Steadman, H. J. (Eds), *Violence and mental disorder: Developments in risk assessment*. University of Chicago.
- Teasdale, J. D. (1985). Psychological treatment of depression: how do they work? *Behaviour Research and Therapy*, 23, 157–165.
- Watts, F. N., Powell, G. E. & Austin, S. V. (1973). The modification of abnormal beliefs. *British Journal of Medical Psychology*, 46, 359–363.
- Wessely, S., Buchanan, A., Reed, J., Cutting, J., Everitt, B., Garety, P. & Taylor, P. J. (1993). Acting on delusions. I: Prevalence. *British Journal of Psychiatry*, 163, 69–76.
- Williams, J. M. G. (1992). *The psychological treatment of depression: A guide to the theory and practice of cognitive behaviour therapy* (2nd edn). London: Routledge.