



A prospective study of PTSD following recovery from first-episode psychosis: The threat from persecutors, voices, and patienthood

Kat Brunet*, Max Birchwood, Rachel Uptegrove, Maria Michail and Kerry Ross

University of Birmingham, UK

Objectives. Approximately one third of people with early psychosis report post-traumatic symptoms, some of which are thought to arise from traumatic experiences associated with psychosis itself. This prospective study tested hypotheses based on retrospective findings that threat appraisals of voices, persecutors, or the new label of 'mental health patient' predict symptoms of post-traumatic stress disorder (PTSD).

Methods. Appraisals of power and threat from voices and other persecutors and appraisals of the threat posed to identity by the diagnosis were assessed during the first acute phase of psychosis. Eighteen months later, PTSD symptom levels and diagnosis were established.

Design. Prospective.

Results. Of 39 participants who completed the follow-up phase, 12 (31%) met criteria for PTSD diagnosis. Nineteen (49%) of the participants were still distressed by memories of their psychosis or the associated treatment. During the acute phase of psychosis, appraisals of threat from voices and persecutors were strongly associated with distress. With the exception of the perceived ability to cope with threat, none of these appraisals were predictive of subsequent post-traumatic stress however. Similarly, only one appraisal of the diagnosis (loss of control) was predictive of PTSD.

Conclusion. It may be that retrospective studies have overestimated the influence of candidate appraisals in predicting PTSD. It might also be that assessments made during the acute phase of psychosis preceded a key phase of psychological processing that takes place during the immediate aftermath of the psychotic episode. A staged prospective design is required to uncover the true impact of psychosis on PTSD.

There is a growing consensus that PTSD is a significant co-morbidity in psychosis (Morrison, Frame, & Larkin, 2003) with around one third of first-episode patients meeting diagnostic criteria for PTSD (Jackson, Knott, Skeate, & Birchwood, 2004; Tarrier, Khan, Cater, & Picken, 2007). A diagnosis of PTSD in the context of a serious mental illness

*Correspondence should be addressed to Kat Brunet, Department Psychology, University of Birmingham, Edgbaston, Birmingham B15 2TT, UK (e-mail: k.brunet@bham.ac.uk).

predicts more severe mental health outcomes, greater use of health and psychiatric services, lower satisfaction with services, and poorer life-satisfaction (Buckley, Miller, Lehrer, & Castle, 2009; Mueser, Essock, Haines, Wolfe, & Xie, 2004; Switzer *et al.*, 1999). Unrecognized PTSD may lead to re-traumatization through repeated exposure to progenitor traumas such as compulsory admission, restraint, and lack of personal choice (Mueser *et al.*, 1998) and unrecognized symptoms might be mistaken for impending psychotic relapse or negative symptoms, preventing access to appropriate treatment. There is emerging evidence that PTSD can be treated in this population (Bernard, Jackson, & Jones, 2006; Calcott, Standart, & Turkington, 2004; Frueh *et al.*, 2004; Jackson *et al.*, 2009; Mueser *et al.*, 2008). The value of recognizing and understanding PTSD in those experiencing psychosis is therefore clear; nonetheless, it remains a 'frequently neglected comorbid diagnosis' (Mueser, Rosenberg, Goodman, & Trumbetta, 2002) and the nature of the relationship between PTSD and psychosis remains unknown (Morrison *et al.*, 2003). Three possibilities are considered next.

Symptoms of psychosis misclassified as PTSD

One possibility is that symptoms of psychosis are misclassified as PTSD. It may be difficult to distinguish between hallucinations and flashbacks, both of which might contribute to ideas of reference and anomalous behaviour such as talking to oneself (Muenzenmaier *et al.*, 2005; Rosenberg *et al.*, 2001; Shaner & Eth, 1989). Negative symptoms, such as emotional blunting and social withdrawal, might be difficult to distinguish from trauma-related avoidance (Muenzenmaier *et al.*, 2005; Rosenberg *et al.*, 2001; Shaner & Eth, 1989). Poor concentration, irritability, or hypervigilance may be interpreted as symptoms of either hyperarousal or psychosis (Shaner & Eth, 1989). Nevertheless, there is evidence that the two disorders have distinguishable trajectories (Buckley *et al.*, 2009; Lundy, 1992; McGorry *et al.*, 1991; Shaner & Eth, 1989; Strakowski *et al.*, 1998) and that PTSD can be reliably assessed in people with severe mental illness (Mueser *et al.*, 2001).

Psychotic and PTSD symptoms arise from shared social risk factors

There is considerable evidence that traumatic events, such as childhood abuse or parental loss, can increase the risk of psychosis in those with an underlying vulnerability (Janssen *et al.*, 2004; Morgan *et al.*, 2007; Read, van Os, Morrison, & Ross, 2005). These same events can also increase the risk of developing PTSD in response to further events later in life (Brewin, Andrews, & Valentine, 2000). It is possible therefore that those who experience traumatic events early in life are more likely to develop both psychosis and PTSD later in life, and that the co-occurrence of the two symptom-sets is a result of overlapping processes set in motion by the same childhood events.

PTSD as a response to the psychotic episode and circumstances of treatment

A psychotic episode might itself be viewed as a life event sufficiently traumatic to trigger PTSD symptoms. There is some debate as to whether a psychotic episode is a valid PTSD-triggering event (Jackson *et al.*, 2004) within the context of a wider debate regarding the construct of PTSD itself (Gold, Marx, Soler-Baillo, & Sloan, 2005). According to criterion A of the DSM-IV description of PTSD, the diagnosis requires that the individual 'experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or

others' (American Psychiatric Association or APA, 1994, pp. 427–428). Criterion A therefore requires a real threat to physical integrity and does not acknowledge the traumatic sequelae of either *perceived* threat to physical integrity, or of perceived or real threats to *psychological* integrity such as the fear of losing one's mind (Jackson *et al.*, 2004; Morrison *et al.*, 2003). It might be argued that some experiences of voices, delusional beliefs, and the diagnosis itself can be sufficiently traumatic to initiate a process culminating in PTSD symptoms.

Psychological models of PTSD suggest that the *subjective* perception of threat is more important than the *objective* features of a traumatic event (Brewin & Holmes, 2003). Rather than focusing on the objective nature of the threat to well-being the Ehlers and Clark (2000) model of PTSD gives greater valence to a person's *appraisals* of the event, of their feelings and behaviours during the event, and of sequelae such as others' reactions and anticipated consequences.

Appraisals of hospitalization and treatment during first-episode psychosis are reported to predict PTSD (Jackson *et al.*, 2004); first admission is most commonly reported as the most distressing (Beattie, Shannon, Kavanagh, & Mulholland, 2009). In one study, 24% of PTSD symptoms following psychosis were related to recurrent intrusive experiences of hospitalization (Meyer, Taiminen, Vuori, Aijala, & Helenius, 1999).

People with psychosis commonly believe that they are in great danger from voices or other persecutors who hold extraordinary power and may intend to kill, harm, or shame them. Indeed, persecutory delusions are more common in those meeting diagnostic criteria for PTSD (Shaw, McFarlane, Bookless, & Air, 2002). Commanding voices are common and hearers often feel trapped between the negative consequences of compliance and fear of extreme retribution for resistance of voices' commands (Chadwick & Birchwood, 1994; Freeman & Garety, 2004).

Those who appraise their voices as being intent on harming them (malevolent) and having great power to carry out these threats (omnipotent) experience greater levels of distress (Soppitt & Birchwood, 1997; Vaughan & Fowler, 2004), and plausibly might experience greater levels of PTSD. Andrew and colleagues reported a cross-sectional relationship between higher levels of post-traumatic stress in relation to childhood trauma and greater perceived malevolence and omnipotence in voices, suggesting that a traumatic history might contribute to voices being appraised negatively (Andrew, Gray, & Snowden, 2008). It remains unclear whether the threat from voices themselves can lead to post-traumatic stress.

In another cross-sectional study, those experiencing PTSD after a psychotic episode appraised their persecutory threat retrospectively as having been more powerful, awful, and deserved and felt less able to cope with or control the situation than their non-PTSD counterparts (Chisholm, Freeman, & Cooke, 2006). It may be however that the experience of PTSD led participants to appraise their persecutors more negatively in retrospect. A prospective study is needed to determine whether persecutory threats during acute psychosis predict PTSD on recovery.

A third potential factor in the development of PTSD following first-episode psychosis might be the fear of 'going crazy'. It has been suggested that psychiatric diagnosis leads to a dramatic shattering of self-identity, and desperate attempts to avoid being labelled as 'mad' and thus rejected by society (Jeffries, 1977; Shaw *et al.*, 2002). It has been suggested that this experience may be sufficiently traumatic to precipitate subsequent PTSD in some individuals (Jeffries, 1977; Shaw *et al.*, 2002). It might also be that this factor interacts with the distress arising from symptoms and hospitalization to create

a traumatic response; indeed, it is difficult to disentangle the contribution of various features of an episode to post-psychotic traumatic stress (Chisholm *et al.*, 2006).

Ehlers and Clark (2000) highlight the influence of a number of appraisals of threat on the development of PTSD. Among others they discuss: shame in relation to the traumatic event, a sense of continued threat, a threat to life goals, the fear of losing control, and the threat of being unacceptable to others. These are appraisals that have been documented among young people adapting to a diagnosis of psychosis (Birchwood *et al.*, 2006).

Tarrier and colleagues reported that young people experiencing PTSD in relation to their recent first-episode appraised their psychosis as causing a greater loss of hope and aspirations and demonstrated greater suicidality; however, a prospective study is required to elucidate the direction of this relationship (Tarrier *et al.*, 2007).

There have been relatively few prospective studies in the PTSD literature (Neria, Nandi, & Galea, 2008) and none that we are aware of in the study of PTSD following psychosis. Here, we utilize a prospective design to clarify the nature of the relationship between appraisals of threat from psychotic symptoms and beliefs and subsequent PTSD.

Hypotheses

- (1) Greater perceived threat of harm from persecutors and voices will be associated with higher levels of distress during the acute phase of first-episode psychosis.
- (2) Greater perceived threat from persecutors and voices, and higher levels of accompanying distress will predict greater risk of and severity of post-traumatic stress symptoms over time.
- (3) Greater levels of perceived threat to identity and status in relation to the diagnosis of psychosis will be associated with greater risk for and severity of post-traumatic stress symptoms over time.

Method

Design

In this prospective study, patients in the acute phase of a first psychotic episode were assessed for appraisals of threat from voices, other persecutors, and the diagnosis. Assessments were completed while participants were still experiencing acute symptoms in order to capture the nature and extent of the perceived threat while the experience was still active. These patients were followed up 18 months after the acute phase of psychosis to ascertain the rate of PTSD diagnosis at a time when associated post-traumatic symptoms might be apparent.

Sampling and inclusion criteria

Sequential referrals to the West Birmingham Early Intervention in psychosis Service (EIS) were identified during the baseline phase of the study. Home treatment and admission wards were contacted weekly to ensure prompt referral during the acute period. Inclusion criteria required individuals to be aged between 16 and 35 and experiencing a first episode of psychosis conforming to broad criteria (F20, F22, F23, F25; or F30, F31, F32 with psychotic symptoms) of the Tenth Revision of the International Classification of Diseases and Related Health Problems (ICD-10; World Health Organisation, 1992b).

Measures

Acute phase of first-episode psychosis

Operational ICD-10 diagnosis. The Schedules for Clinical Assessment in Neuropsychiatry (SCAN; World Health Organization, 1992a) was administered by R.U. who has received training to required levels of reliability. The SCAN is widely used in psychosis research (Rijinders *et al.*, 2000).

Threat from persecutors. The Details of Threat Questionnaire (DoT; Freeman, Garety, & Kuipers, 2001) is a semi-structured interview designed to assess the nature of the threat from persecutors. Participants are asked to think about their persecutors and use scales from 0 to 10 to rate: the power of the persecutor, delusional distress, awfulness of threat, and expected ability to cope in the event of the harm occurring. Strength of belief conviction is rated from 0 to 100%, and imminence of the threat on a scale from 1 (*it has been happening recently*) to 5 (*in 6 months or more*). Concurrent validity of these measures has been established through clear links with distress, self-esteem, and depression (Freeman *et al.*, 2001).

The Safety Behaviours Questionnaire (SBQ; Freeman *et al.*, 2001, 2007) is a semi-structured interview designed to assess behaviours that clients use to mitigate persecutory threat, for example, by avoiding certain situations or by remaining highly vigilant for signs of threat. This measure has demonstrated high inter-rater reliability ($r = 1.0$; 95% CI 0.99-1) and acceptable test-retest reliability ($r = 0.74$; 95% CI 0.28-0.93; Freeman *et al.*, 2001). It was used here to assess participants' perceived level of control over the threat and the perceived effectiveness of safety behaviours on a scale from 0 to 10. These evaluations are proposed to reflect participants' perceived ability to cope with or control the situation.

Voice-related threat. The Beliefs About Voices Questionnaire-Revised (BAVQ-R; Chadwick, Lees, & Birchwood, 2000) is a widely used self-report measure assessing beliefs, emotions, and behaviours associated with voices. It is widely used in cognitive studies of voices and the scales have Cronbach's alpha and retest reliability values greater than .8. Chadwick *et al.* (2000) have reported high levels of internal consistency and construct validity in relation to anxiety and depression. The measure was used here to assess perceived malevolence, benevolence, and omnipotence of clients' most dominant voice.

The distress scale of the Voice Topography Scale (Hustig & Hafner, 1990) was administered, asking participants to rate the distress linked to their voices using a scale between 1 (*very distressing*) and 5 (*very comforting*). This scale has been used extensively in research on the cognitive model of voices (Birchwood, Meaden, Trower, Gilbert, & Plaistow, 2000; Soppitt & Birchwood, 1997).

Threat from the diagnosis of psychosis. The Personal Beliefs about Illness Questionnaire-Revised (PBIQ-R) was originally developed by Birchwood, Mason, MacMillan, and Healy (1993) to evaluate clients' own appraisals of their psychosis. Each item is rated between 1 (*strongly disagree*) and 4 (*strongly agree*) to assess individuals' appraisals of: loss of social goals, roles, and status; entrapment by their illness; shame

regarding their illness; control over their illness; and their perceived 'social fit' or social marginalization. The PBIQ scales have been used extensively in studies of post-psychotic depression (e.g., Birchwood, Iqbal, Chadwick, & Trower, 2000) and social anxiety (Birchwood *et al.*, 2006). The PBIQ-R demonstrates good internal consistency, with Cronbach's alpha ranging from .72 to .81.

Eighteen-month follow-up

PTSD symptomatology. The PTSD Symptom Scale-Interview (PSS-I; Foa, Riggs, Dancu, & Rothbaum, 1993) is a structured interview used to provide categorical data indicating whether or not participants meet criteria for PTSD diagnosis according to DSM-IV criteria (APA, 1994), focussing on participants' most traumatic event. The three symptom groups of PTSD: re-experiencing, avoidance, and hyperarousal are each assessed and rated on likert scales. Foa *et al.* (1993) reported high levels of internal consistency, test-retest reliability, and concurrent validity in relation to measures of intrusion, avoidance, depression, and anxiety. Convergence with diagnoses based on the Structured Clinical Interview for DSM-III-R (APA, 1987) was high (Foa *et al.*, 1993).

The Impact of Event Scale-Revised (IES-R; Weiss, 2004) provides continuous data measuring the level of overall post-traumatic stress as well as levels within the three symptom groups of PTSD. It comprises 22 items that were asked in relation to the same traumatic event identified in the PSS-I. The IES-R demonstrates adequate internal consistency and subscale validity and has been widely used in psychosis research (Weiss, 2004).

Procedure

Baseline interviews were conducted by R.U. and K.R. and took place at participants' homes, respite hostels, or acute wards. Interviews lasted approximately 2 hr and were conducted over one, two, or three sessions as appropriate. Follow-up appointments were conducted by K.B. and M.M. as the baseline interviewers were not available at this time point.

Data analysis

Data analyses were performed using SPSS version 16 for Windows (SPSS Inc.). Each analysis was conducted using subsamples of participants who had experienced symptoms relevant to the analysis; some analyses were therefore low in power. For hypothesis one, relationships between appraisals of threat and levels of distress were evaluated using correlational and stepwise regression analyses in line with the exploratory nature of the analyses. For hypotheses two and three, analysis of variance (ANOVA) and chi-square analyses were used to compare PTSD and non-PTSD groups in terms of appraisals of threat and distress levels. Additionally, correlational analyses were used to ascertain any relationship between threat and distress factors and levels of traumatic stress according to total IES-R scores. The statistical assumptions required for regression analysis were confirmed in line with recommendations (Binder, 1984; Field, 2000; Zumbo & Zimmerman, 1993).

Results

The sample

A total of 94 potential participants were screened. Of these, 9 were not in their first-episode of psychosis, 5 were not in the acute phase, 8 did not meet diagnostic criteria, and 22 declined to participate. This left a total of 50 participants who provided consent. No significant difference in age, sex, or ethnicity was found between those who consented and those who declined consent.

Participants were mostly male (66%) and were from a range of cultural backgrounds including African-Caribbean (42%), Pakistani (24%), Indian (12%), White British (10%), other White (4%), African (4%), and dual White and Black African-Caribbean heritage (4%). Age at baseline ranged from 17 to 33 years with a mean of 22.4 years. The SCAN diagnoses included schizophrenia (74%), mania with psychosis (6%), delusional disorder (2%), schizoaffective disorder (4%), acute schizophrenia such as psychotic disorder (10%) and other non-organic psychotic disorder (4%).

The follow-up phase took place on average 18 months after initial assessment. Of the 50 baseline participants, 39 (78%) completed the follow-up phase of the study. The remaining 11: declined to complete assessments at follow-up (6), had disengaged from services (2), had been discharged from services and had no risk assessment available (2), or were in prison (1). Those available to follow-up did not differ significantly from non-participants in terms of age, diagnosis, sex, or ethnicity.

Intrusive memories

On being asked if they experienced memories of past events that continued to intrude into their consciousness and distress them, 26 (67%) of the 39 follow-up participants affirmed that they did. Table 1 illustrates the nature of these memories: 11 (42%) related

Table 1. Primary distressing intrusive memories reported by participants ($N = 26$)

Category of event	Description of memory	Number of cases
Admission related	Being admitted to hospital	7
	Being taken to hospital by squad car	1
	Being arrested, the police using CS gas and restraint	1
	Police involvement during admission	1
	Being locked up for attacking a nurse	1
Symptom related	'The devil putting things in me'	1
	Delusions surrounding a physical complaint	1
	Intense feelings of fear related to persecutory delusions	2
	Voices	2
	Thinking that doctors were going to burn her	1
	Smashing up his own home	1
Prior to illness	Unnamed event during childhood	1
	Childhood abuse	1
	Rape	1
	Nightmare involving sexual abuse	1
	Experience of arrest and court appearance	1
	Attacked while sleeping	1
	Being stabbed	1

to events surrounding admission, 8 (31%) to psychotic symptoms, and 7 (27%) to events prior to the psychosis. Events surrounding admission were therefore the predominant intrusive memory.

PTSD

According to PSS-I assessment, 12 (30.8%) of the 39 follow-up participants demonstrated symptoms that conformed to DSM-IV diagnosis for PTSD. The traumatic events associated with PTSD diagnosis included events surrounding admission (5/12), events related to past psychotic symptoms (2/12), and events that had occurred prior to the first episode of psychosis (5/12).

The IES-R was completed by 25 of the 26 participants who reported distressing memories; one was unable to complete this measure. Mean scores for overall post-traumatic stress were 45.75 ($SD = 18.59$) for those 12 participants meeting PTSD diagnosis and 15.77 ($SD = 16.75$) for the 13 who did not meet PTSD criteria. Overall IES-R scores for the PTSD group were comparable to those of adolescents involved in the Jupiter shipping disaster (mean = 43, $SD = 16.5$; Udwin, Boyle, Yule, Bolton, & O'Ryan, 2000). Total IES-R scores were unrelated to the period of time elapsed since the acute phase ($r = -.06$, $N = 25$).

Appraisals

The distribution of participants' appraisals of voices, persecutors, and of the diagnosis can be seen in Table 2. Examination of variability in the key predictive variables shows that the full range of each was reported with considerable variance.

Table 2. Descriptive statistics for appraisal scores

		N	Possible range	Actual range	Mean	Standard deviation	Variance
Voice-related appraisals	Distress	27	1–5	1–5	2.96	1.22	1.5
	Malevolence	28	0–18	0–17	6.36	4.8	23.05
	Benevolence	28	0–18	0–18	5.96	5.07	25.74
	Omnipotence	28	0–18	0–17	7.07	3.72	13.85
Persecutor-related appraisals	Distress	25	0–10	0–10	6.28	3.41	11.63
	Power of the persecutor	25	0–10	0–10	6.08	3.4	11.56
	Strength of conviction	25	0–100	5–100	70	33.32	1110.42
	Awfulness of threat	25	0–10	0–10	6.48	3.53	12.43
	Control over the situation	25	0–10	0–10	4.67	4.09	16.73
	Imminence of harm	25	1–5	1–3	1.76	0.83	0.69
	Ability to cope	25	0–10	0–10	4.32	3.13	9.81
	Effectiveness of safety behaviours	25	0–10	0–10	4	5.29	28
Appraisals of the diagnosis	Shame	36	4–16	4–16	9	2.84	8.06
	Entrapment	36	4–16	4–15	9.11	2.96	8.79
	Group fit	36	4–16	4–14	8.53	2.6	6.77
	Loss	36	4–16	4–16	9.08	3.3	10.88
	Control	36	4–16	4–16	8.69	2.78	7.7

The hypotheses

Hypothesis 1: Greater perceived threat of harm from persecutors and voices will be associated with higher levels of distress during the acute phase of first-episode psychosis.

Voices

Twenty-eight (72%) of the 39 follow-up participants heard voices during the baseline phase. One of these participants did not complete the topography of voices questionnaire; analyses involving voice-related distress were therefore completed for 27 participants.

Higher levels of voice-related distress were associated with greater perceived malevolence ($r = -.4, p = .039$) and lower perceived benevolence ($r = .4, p = .047$) but were unrelated to omnipotence ($r = -.08, p = .71$). Appraisals of malevolence and benevolence were entered as predictors of voice-related distress in a stepwise multiple regression. The regression model selected malevolence as the sole predictor of distress, and accounted for 13% of variance ($R^2 = .16, R^2_{\text{adj}} = .13, F_{(1,25)} = 4.75, p = .039$). Each additional point scored for malevolence resulted in an increase of .1 in distress ($\beta = .1, t = 2.18, p = .039$).

Persecutors

Twenty-five (64%) follow-up participants experienced feelings of persecution during the baseline phase; analyses involving persecutor-related distress were thus completed for 25 participants.

Greater distress was associated with: the persecutor having greater power ($r = .7, p < .001$), higher levels of conviction ($r = .54, p < .001$), the expected harm being more awful ($r = .7, p < .001$), lower perceived control ($r = -.48, p = .009$), greater imminence of harm ($r = -.37, p = .038$), and lower expected ability to cope when the harm occurs ($r = -.5, p = .003$). Distress was unrelated to the perceived effectiveness of safety behaviours ($r = .09, p = .626$).

These variables were entered into a stepwise multiple regression with persecutor-related distress as the outcome variable. The resulting model accounted for 51% of variance ($R^2 = .55, R^2_{\text{adj}} = .51, F_{(2,22)} = 13.53, p < .001$). Selected predictors included perceived awfulness of threat ($\beta = .43, t = 3.47, p = .002$) and strength of conviction in the threat ($\beta = .03, t = 2.38, p = .026$); β values indicated moderate effects on distress score.

Hypothesis 2: Greater perceived threat from persecutors and voices, and higher levels of accompanying distress will predict greater risk of and severity of post-traumatic stress symptoms over time.

Voices

A chi-square analysis revealed no difference between PTSD and non-PTSD groups in presence or absence of voices during the acute phase ($\chi^2 = 1.1, p = .446, N = 39$). Among the subsample of voice-hearers, ANOVA comparing those with and those without PTSD revealed no differences in levels of voice-related distress (PTSD mean = 3.33, $SD = 1.41$; non-PTSD mean = 2.78, $SD = 1.11$; $F = 1.25, p = .275, N = 27$), nor in appraisals of voices' malevolence (PTSD mean = 7.4, $SD = 5.54$; non-PTSD mean = 5.78,

$SD = 4.4$; $F = .73$, $p = .402$, $N = 28$), benevolence (PTSD mean = 5.1, $SD = 4.91$; non-PTSD mean = 6.44, $SD = 5.24$; $F = .44$, $p = .512$, $N = 28$), or omnipotence (PTSD mean = 8.1, $SD = 4.63$; non-PTSD mean = 6.5, $SD = 3.11$; $F = 1.2$, $p = .284$, $N = 28$).

For those who identified a traumatic memory, there was no significant correlation between levels of post-traumatic stress (IES-R) and either voice-related distress ($r = .01$, $p = .979$, $N = 19$), malevolence ($r = -.02$, $p = .947$, $N = 20$), benevolence ($r = .26$, $p = .261$, $N = 20$), or omnipotence ($r = .09$, $p = .708$, $N = 20$).

Persecutors

PTSD and non-PTSD groups did not differ in the presence of persecutory delusions during acute psychosis ($\chi^2 = 1.5$, $p = .287$, $N = 39$). Among those experiencing persecutory delusions, there was no difference between clients with or without PTSD in terms of levels of persecutor-related distress (PTSD mean = 6, $SD = 3.95$; non-PTSD mean = 6.37, $SD = 3.34$; $F = .05$, $p = .823$, $N = 25$). Groups also did not differ in terms of persecutory power (PTSD mean = 7.5, $SD = 1.98$; non-PTSD mean = 5.61, $SD = 3.68$; $F = 1.41$, $p = .247$, $N = 25$), strength of conviction (PTSD mean = 65.83, $SD = 37.47$; non-PTSD mean = 71.32, $SD = 32.91$; $F = .12$, $p = .73$, $N = 25$), awfulness of threat (PTSD mean = 8.17, $SD = 2.86$; non-PTSD mean = 5.95, $SD = 3.61$; $F = 1.87$, $p = .184$, $N = 25$), perceived control (PTSD mean = 2.4, $SD = 3.29$; non-PTSD mean = 5.38, $SD = 4.15$; $F = 1.67$, $p = .212$, $N = 25$), imminence of harm (PTSD mean = 1.67, $SD = 1.03$; non-PTSD mean = 1.79, $SD = 0.79$; $F = .1$, $p = .76$, $N = 25$), and perceived effectiveness of safety behaviours (PTSD mean = 0; non-PTSD mean = 6, $SD = 5.66$; $F = 0$, $p = .988$, $N = 25$). Only one persecutor-related appraisal differed: perceived ability to cope was higher in those who did not develop PTSD (mean = 5.05, $SD = 2.93$) than in those who did (mean = 2, $SD = 2.76$; $F = 5.07$, $p = .034$, $N = 25$).

Using IES-R scores as a continuous variable representing levels of traumatic stress symptoms among those reporting a traumatic memory, we found no significant correlation between levels of post-traumatic stress and either persecutor-related distress ($r = .2$, $p = .456$, $N = 16$), persecutory power ($r = .13$, $p = .654$, $N = 15$), strength of conviction ($r = -.1$, $p = .726$, $N = 16$), awfulness of threat ($r = .17$, $p = .525$, $N = 16$), perceived control ($r = -.07$, $p = .814$, $N = 14$), imminence of harm ($r = -.04$, $p = .891$, $N = 16$), perceived effectiveness of safety behaviours ($r = -.5$, $p = .072$, $N = 14$), or perceived ability to cope ($r = -.08$, $p = .768$, $N = 16$).

Hypothesis 3: Greater levels of perceived threat to identity and status in relation to the diagnosis of psychosis will be associated with greater risk for and severity of post-traumatic stress symptoms over time.

Thirty-six of the follow-up participants had completed the PBIQ during the baseline assessment. PTSD groups did not differ in appraisals of shame (PTSD mean = 9.18, $SD = 2.27$; non-PTSD mean = 8.92, $SD = 3.09$; $F = .06$, $p = .803$, $N = 36$), entrapment (PTSD mean = 10.27, $SD = 2.97$; non-PTSD mean = 8.6, $SD = 2.87$; $F = 2.54$, $p = .12$, $N = 36$), group fit (PTSD mean = 9.64, $SD = 1.75$; non-PTSD mean = 8.04, $SD = 2.79$; $F = 3.04$, $p = .09$, $N = 36$), or loss of role or status (PTSD mean = 10.18, $SD = 2.96$; non-PTSD mean = 8.6, $SD = 3.38$; $F = 1.8$, $p = .189$, $N = 36$) in relation to receiving a diagnosis of psychosis. Those who developed PTSD reported lower levels of control over their illness (mean = 10.09, $SD = 2.77$) than those who did not develop PTSD (mean = 8.08, $SD = 2.6$; $F = 4.4$, $p = .043$, $N = 36$). Among those who reported a traumatic memory, IES-R correlated significantly with the sense of group fit ($r = .44$, $p = .042$, $N = 22$).

Discussion

This study is the first prospective investigation that we are aware of that has assessed appraisals of potentially traumatic experiences at the time of a first episode of psychosis and plotted their impact on levels of post-traumatic stress symptoms during subsequent recovery from psychosis. Findings support previous reports that a substantial minority (31%) of the sample meet DSM-IV criteria for PTSD. Overall IES-R scores for the PTSD group were comparable with those of adolescents involved in the Jupiter shipping disaster (Udwin *et al.*, 2000). An additional 36% reported distressing memories that were subthreshold for PTSD; thus, two thirds of the follow-up sample experienced distressing intrusive memories at some level.

A substantial proportion (73%) of individuals' most distressing memories were related to events surrounding their psychosis, including 42% related to admission events and 31% related to psychotic symptoms. This is consistent with our hypothesis that experiences surrounding a psychosis are potential candidates to trigger subsequent PTSD. Indeed, intrusive memories of symptoms and admission continued to distress participants 18 months after their first acute episode.

As anticipated, voices that were more malevolent and less benevolent were associated with higher levels of distress during the acute phase. Similarly, persecutors that were appraised as being less controllable, the threat more awful, imminent, or less possible to cope with were also appraised as more distressing. Although the intrusive memories mainly focused on admission and acute psychotic symptoms, the appraisals of threat or harm arising from these experiences and the accompanying distress did *not* predict PTSD status or PTSD severity at 18-month follow-up. These results stand in contrast with a cross-sectional study in which people demonstrating PTSD in response to a range of life events concurrently appraised their voices as more omnipotent, more malevolent, and less benevolent (Andrew *et al.*, 2008), and the study of Chisholm *et al.* (2006) in which those with PTSD retrospectively appraised their persecutors as more powerful, awful, deserved, and felt less in control or able to cope.

One explanation for these predominantly negative findings might be that many analyses involved low numbers because only subsets of the overall sample heard voices, experienced persecutory delusions, or reported traumatic memories. While the resulting lack of statistical power in these analyses may have led to type II errors, this is considered unlikely as no trends were evident in the data.

It might also be that relationships between symptom appraisals, distress, and PTSD were not evident in this group where some PTSD-related memories were of events other than psychotic symptoms. Those citing hospitalization as their most traumatic memory commonly recalled their entire psychotic episode as traumatic but chose to define their experience as treatment related upon further questioning; psychotic symptoms are perhaps more shameful or threatening to disclose and are commonly downplayed (Shaw *et al.*, 2002). For those citing events unrelated to the psychotic episode, it was difficult to ascertain whether or not psychotic experiences were indeed traumatic but superseded by other more distressing events. It is therefore difficult to disentangle the contribution of events to post-traumatic symptoms in this group, and participant numbers were not sufficient to allow differential analyses.

It might be argued that the findings from this prospective study suggest that previous cross-sectional reports may have overestimated the relationship between these appraisals and PTSD due to their reliance on retrospective assessments and perhaps the need to 'search for meaning' in current symptoms. Those participants experiencing PTSD

might indeed appraise their past voices or persecutors as being more threatening in retrospect. Evidence suggests that there is poor agreement between data collected in prospective assessments and subsequent retrospective reports, particularly in the case of psychosocial variables (Henry, Moffitt, Caspi, Langley, & Silva, 1994). More pertinently, longitudinal studies of PTSD indicate that current PTSD symptomatology influences perceptions of prior traumatic events (Roemer, Litz, Orsillo, Ehlich, & Friedman, 1998). Further studies have noted that 2 years after a period of war-zone exposure, those demonstrating higher levels of PTSD symptomatology increased their reports of traumatic exposure in comparison with earlier assessments (King *et al.*, 2000). Similarly, retrospective recall of psychological experiences, such as symptoms of acute stress disorder (Harvey & Bryant, 2000) or peri-traumatic dissociation (Marshall & Schell, 2002), is thought to be influenced by current psychological state.

There is one other explanation for these negative findings. It might be that our contemporaneous assessments of candidate traumas may have *preceded* the later psychological processing of trauma, that is believed to be the core process responsible for the development of PTSD, and that would have been captured in the assessments conducted by retrospective studies. In other words, we assessed appraisals *during* the candidate event; perhaps analogous to assessing appraisals during rather than soon after a car crash or sexual assault. Elsewhere, it has been noted that the events and psychological processing that take place *after* a trauma have consistently been shown to have 'the biggest impact on whether a person develops PTSD' (Brewin, 2003, p. 56). It may be that the key time to assess appraisals is during the immediate aftermath of the psychotic episode, once insight has returned and the individual has begun processing the implications of their experiences and survival.

Our findings concerning the content of intrusive memories in PTSD yield important indicators as to the key factors involved in the development of PTSD following psychosis; a revised methodology is needed in order to permit the development of post-event processing. Ideally, this would involve a staged prospective study assessing psychotic experiences during the acute phase of psychosis, assessing appraisals, and affect during the psychological adjustment phase of the following 3–6 months, and observing the link between this and PTSD status at a subsequent follow-up point. The study might also benefit from baseline assessment of traumatic history and PTSD symptoms for use as covariates in the longitudinal analyses.

Acknowledgement

Professor Birchwood is part-funded by the National Institute for Health Research (NIHR) through the Collaborations for Leadership in Applied Health Research and Care for Birmingham and Black Country (CLAHRC-BBC). The views expressed in this publication are not necessarily those of the NIHR, the Department of Health, the University of Birmingham or the CLAHRC-BBC theme 3 management group.

References

- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders-III-R*. Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders-IV*. Washington, DC: Author.

- Andrew, E., Gray, N., & Snowden, R. (2008). The relationship between trauma and beliefs about hearing voices: A study of psychiatric and non-psychiatric voice hearers. *Psychological Medicine*, *38*, 1409–1417. doi:10.1017/S003329170700253X
- Beattie, N., Shannon, C., Kavanagh, M., & Mulholland, C. (2009). Predictors of PTSD symptoms in response to psychosis and psychiatric admission. *Journal of Nervous and Mental Disease*, *197*, 56–60. doi:10.1097/NMD.0b013e31819273a8
- Bernard, M., Jackson, C., & Jones, C. (2006). Written emotional disclosure following first-episode psychosis: Effects on symptoms of post-traumatic stress disorder. *British Journal of Clinical Psychology*, *45*, 403–415. doi:10.1348/014466505X68933
- Binder, A. (1984). Restrictions on statistics imposed by method of measurement: Some reality, some myth. *Journal of Criminal Justice*, *12*, 467–481. doi:10.1016/0047-2352(84)90094-1
- Birchwood, M., Iqbal, Z., Chadwick, P., & Trower, P. (2000) Cognitive approach to depression and suicidal thinking in psychosis 1: Ontogeny of post-psychotic depression. *British Journal of Psychiatry*, *177*, 516–521. doi:10.1192/bjp.177.6.516
- Birchwood, M., Mason, R., MacMillan, F., & Healy, J. (1993). Depression, demoralization and control over psychotic illness: A comparison of depressed and non-depressed patients with a chronic psychosis. *Psychological Medicine*, *23*, 387–395. doi:10.1017/S0033291700028488
- Birchwood, M., Meaden, A., Trower, P., Gilbert, P., & Plaistow, J. (2000). The power and omnipotence of voices: Subordination and entrapment by voices and significant others. *Psychological Medicine*, *30*, 337–344. doi:10.1017/S0033291799001828
- Birchwood, M., Trower, P., Brunet, K., Gilbert, P., Iqbal, Z., & Jackson, C. (2006). Social anxiety and the shame of psychosis: A study in first episode psychosis. *Behaviour Research and Therapy*, *45*, 1025–1037. doi:10.1016/j.brat.2006.07.011
- Brewin, C. (2003). *Post-traumatic stress disorder: Malady or myth?*: New Haven: Yale University Press.
- Brewin, C., & Holmes, E. (2003). Psychological theories of posttraumatic stress disorder. *Clinical Psychology Review*, *23*, 339–376. doi:10.1016/S0272-7358(03)00033-3
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology*, *68*, 748–766. doi:10.1037/0022-006X.68.5.748
- Buckley, P., Miller, B., Lehrer, D., & Castle, D. (2009). Psychiatric comorbidities and schizophrenia. *Schizophrenia Bulletin*, *35*, 383–402. doi:10.1093/schbul/sbn135
- Calcott, P., Standart, S., & Turkington, D. (2004). Trauma within psychosis: Using a CBT model for PTSD in psychosis. *Behavioural and Cognitive Psychotherapy*, *32*, 239–244. doi:10.1017/S1352465804001249
- Chadwick, P., & Birchwood, M. (1994). The omnipotence of voices: A cognitive approach to auditory hallucinations. *British Journal of Psychiatry*, *164*, 190–201. doi:10.1192/bjp.164.2.190
- Chadwick, P., Lees, S., & Birchwood, M. (2000). The revised beliefs about voices questionnaire (BAVQ-R). *British Journal of Psychiatry*, *177*, 229–232. doi:10.1192/bjp.177.3.229
- Chisholm, B., Freeman, D., & Cooke, A. (2006). Identifying potential predictors of traumatic reactions to psychotic episodes. *British Journal of Clinical Psychology*, *45*, 545–559. doi:10.1348/014466505X90136
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*, 319–345. doi:10.1016/S0005-7967(99)00123-0
- Field, A. (2000). *Discovering statistics: Using SPSS for windows*. London: Sage Publications.
- Foa, E. B., Riggs, D. S., Dancu, C. V., & Rothbaum, B. O. (1993). Reliability and validity of a brief instrument for assessing posttraumatic stress disorder. *Journal of Traumatic Stress*, *6*, 459–473. doi:10.1002/jts.2490060405
- Freeman, D., & Garety, P. A. (2004). Delusion content and emotional distress. In D. Freeman & P. A. Garety (Eds.), *Paranoia: The psychology of persecutory delusions* (pp. 60–93). New York: Psychology Press.

- Freeman, D., Garety, P. A., & Kuipers, E. (2001). Persecutory delusions: Developing the understanding of belief maintenance and emotional distress. *Psychological Medicine*, *31*, 1293–1306. doi:10.1017/S003329170100455X
- Freeman, D., Garety, P. A., Kuipers, E., Fowler, D., Bebbington, P., & Dunn, G. (2007). Acting on persecutory delusions: The importance of safety seeking. *Behaviour Research and Therapy*, *45*, 89–99. doi:10.1016/j.brat.2006.01.014
- Frueh, C., Buckley, T., Cusack, K., Kimble, M., Grubaugh, A., Turner, S., & Keane, T. (2004). Cognitive-behavioural treatment for PTSD among people with severe mental illness: A proposed treatment model. *Journal of Psychiatric Practice*, *10*, 26–38.
- Gold, S., Marx, B., Soler-Baillo, J., & Sloan, D. (2005). Is life stress more traumatic than traumatic stress? *Anxiety Disorders*, *19*, 687–698. doi:10.1016/j.janxdis.2004.06.002
- Harvey, A., & Bryant, R. (2000). Memory for acute stress disorder symptoms: A two-year prospective study. *Journal of Nervous and Mental Disease*, *188*, 602–607.
- Henry, B., Moffitt, T., Caspi, A., Langley, J., & Silva, P. (1994). On the “Remembrance of things past”: A longitudinal evaluation of the retrospective method. *Psychological Assessment*, *6*, 92–101. doi:10.1037/1040-3590.6.2.92
- Hustig, H., & Hafner, R. (1990). Persistent auditory hallucinations and their relationship to delusions and mood. *Journal of Nervous and Mental Disease*, *178*, 264–267.
- Jackson, C., Knott, C., Skeate, A., & Birchwood, M. (2004). The trauma of first-episode psychosis: The role of cognitive mediation. *Australian and New Zealand Journal of Psychiatry*, *38*, 327–333. doi:10.1080/j.1440-1614.2004.01359
- Jackson, C., Trower, P., Reid, I., Smith, J., Hall, M., Townend, M., . . . Birchwood, M. (2009). Improving psychological adjustment following a first episode of psychosis: A randomized controlled trial of cognitive therapy to reduce post psychotic trauma symptoms. *Behaviour Research and Therapy*, *47*, 454–462. doi:10.1016/j.brat.2009.02.009
- Janssen, I., Krabbendam, L., Bak, M., Hanssen, M., Vollebergh, W., de Graaf, R., & van Os, J. (2004). Childhood abuse as a risk factor for psychotic experiences. *Acta Psychiatrica Scandinavica*, *109*, 38–45. doi:10.1046/j.0001-690X.2003.00217.x
- Jeffries, J. J. (1977). The trauma of being psychotic: A neglected element in the management of chronic schizophrenia. *Canadian Psychiatric Association Journal*, *22*, 199–206.
- King, D., King, L., Erickson, D., Huang, M., Sharkansky, E., & Wolfe, J. (2000). Posttraumatic stress disorder and retrospectively reported stressor exposure: A longitudinal prediction model. *Journal of Abnormal Psychology*, *109*, 684–633. doi:10.1037/0021-843X.109.4.624
- Lundy, M. S. (1992). Psychosis-induced posttraumatic stress disorder. *American Journal of Psychotherapy*, *46*, 485–491.
- Marshall, G., & Schell, T. (2002). Reappraising the link between peritraumatic dissociation and PTSD symptom severity: Evidence from a longitudinal study of community violence survivors. *Journal of Abnormal Psychology*, *4*, 626–636. doi:10.1037//0021-843X.111.4.626
- McGorry, P. D., Chanen, A., McCarthy, E., Vanriel, R., McKenzie, D., & Singh, B. S. (1991). Posttraumatic stress disorder following recent-onset psychosis: An unrecognized postpsychotic syndrome. *Journal of Nervous and Mental Disease*, *179*, 253–258.
- Meyer, H., Taiminen, T., Vuori, T., Aijala, A., & Helenius, H. (1999). Posttraumatic stress disorder symptoms related to psychosis and acute involuntary hospitalisation in schizophrenic and delusional patients. *Journal of Nervous and Mental Disease*, *187*, 343–352.
- Morrison, A. P., Frame, L., & Larkin, W. (2003). Relationships between trauma and psychosis: A review and integration. *British Journal of Clinical Psychology*, *42*, 331–353.
- Muenzenmaier, K., Castille, D. M., Shelley, A. M., Jamison, A., Battaglia, J., Opler, L. A., & Alexander, M. J. (2005). Comorbid posttraumatic stress disorder and schizophrenia. *Psychiatric Annals*, *35*, 50–56.
- Mueser, K., Essock, S., Haines, M., Wolfe, M., & Xie, H. (2004). Posttraumatic stress disorder, supported employment and outcomes in people with severe mental illness. *CNS Spectrums*, *9*, 913–925.

- Mueser, K. T., Goodman, L. B., Trumbetta, S. L., Rosenberg, S. D., Osher, F. C., Vidaver, R., . . . Foy, D. W. (1998). Trauma and posttraumatic stress disorder in severe mental illness. *Journal of Consulting and Clinical Psychology, 66*, 493–499. doi:10.1037/0022-006X.66.3.493
- Mueser, K., Rosenberg, S., Fox, L., Salyers, M., Ford, J., & Carty, P. (2001). Psychometric evaluation of trauma and posttraumatic stress disorder assessments in persons with severe mental illness. *Psychological Assessment, 13*, 110–117. doi:10.1037/1040-3590.13.1.110
- Mueser, K. T., Rosenberg, S. D., Goodman, L. A., & Trumbetta, S. L. (2002). Trauma, PTSD, and the course of severe mental illness: An interactive model. *Schizophrenia Research, 53*, 123–143. doi:10.1016/S0920-9964(01)00173-6
- Mueser, K., Rosenberg, S., Xie, H., Jankowski, M., Bolton, E., Lu, W., . . . Wolfe, R. (2008). A randomized controlled trial of cognitive-behavioral treatment for posttraumatic stress disorder in severe mental illness. *Journal of Consulting and Clinical Psychology, 76*, 259–271. doi:10.1037/0022-006X.76.2.259
- Neria, Y., Nandi, A., & Galea, S. (2008). Post-traumatic stress disorder following disasters: A systematic review. *Psychological Medicine, 38*, 467–480. doi:10.1017/S0033291707001353
- Read, J., van Os, J., Morrison, A. P., & Ross, C. A. (2005). Childhood trauma, psychosis and schizophrenia: A literature review with theoretical and clinical implications. *Acta Psychiatrica Scandinavica, 112*, 330–350. doi:10.1111/j.1600-0447.2005.00634.x
- Rijinders, C., van den Berg, J., Hodiamont, P., Nienhuis, F., Furer, J., Mulder, J., & Giel, R. (2000). Psychometric properties of the schedules for clinical assessment in neuropsychiatry. *Social Psychiatry and Psychiatric Epidemiology, 35*, 348–352. doi:10.1007/s001270050249
- Roemer, L., Litz, B. T., Orsillo, S. M., Ehlich, P. J., & Friedman, M. J. (1998). Increases in retrospective accounts of war-zone exposure over time: The role of PTSD symptom severity. *Journal of Traumatic Stress, 11*, 597–605. doi:10.1023/A:1024469116047
- Rosenberg, S., Mueser, K., Friedman, M., Gorman, P., Drake, R., Vidaver, R., . . . Jankowski, M. (2001). Developing effective treatments for posttraumatic disorders among people with severe mental illness. *Psychiatric Services, 52*, 1453–1461. doi:10.1176/appi.ps.52.11.1453
- Shaner, A., & Eth, S. (1989). Can schizophrenia cause posttraumatic stress disorder? *American Journal of Psychotherapy, 43*, 588–597.
- Shaw, K., McFarlane, A. C., Bookless, C., & Air, T. (2002). The aetiology of postpsychotic posttraumatic stress disorder following a psychotic episode. *Journal of Traumatic Stress, 15*, 39–47. doi:10.1023/A:1014331211311
- Soppitt, R. W., & Birchwood, M. (1997). Depression, beliefs, voice content and topography: A cross-sectional study of schizophrenic patients with auditory verbal hallucinations. *Journal of Mental Health, 6*, 525–532. doi:10.1080/09638239718617
- Strakowski, S. M., Sax, K. W., McElroy, S. L., Keck, P. E., Hawkins, J. M., & West, S. A. (1998). Course of psychiatric and substance abuse syndromes co-occurring with bipolar disorder after a first psychiatric hospitalisation. *Journal of Clinical Psychiatry, 59*, 465–471.
- Switzer, G., Dew, M., Thompson, K., Goycoolea, J., Derricott, T., & Mullins, S. (1999). Posttraumatic stress disorder and service utilization among urban mental health center clients. *Journal of Traumatic Stress, 12*, 25–39. doi:10.1023/A:1024738114428
- Tarrier, N., Khan, S., Cater, J., & Picken, A. (2007). The subjective consequences of suffering a first episode psychosis: Trauma and suicide behaviour. *Social Psychiatry and Psychiatric Epidemiology, 42*, 29–35. doi:10.1007/s00127-006-0127-2
- Udwin, O., Boyle, S., Yule, W., Bolton, D., & O’Ryan, D. (2000). Risk factors for long-term psychological effects of a disaster experienced in adolescence: Predictors of post traumatic stress disorder. *Journal of Child Psychology and Psychiatry, 41*, 969–979. doi:10.1111/1469-7610.00685
- Vaughan, S., & Fowler, D. (2004). The distress experienced by voice hearers is associated with the perceived relationship between the voice hearer and the voice. *British Journal of Clinical Psychology, 43*, 143–153. doi:10.1348/014466504323088024
- Weiss, D. S. (2004). The impact of events scale – revised. In J. P. Wilson & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 168–189). New York: The Guilford Press.

- World Health Organization. (1992a). *Schedules for clinical assessment in neuropsychiatry*. Geneva.
- World Health Organization. (1992b). *The ICD-10 classification of mental and behavioural disorders*. Geneva.
- Zumbo, B., & Zimmerman, W. (1993). Is the selection of statistical methods governed by level of measurement? *Canadian Psychology*, 34, 390-399.

Received 11 August 2010; revised version received 2 March 2012