

Current Paranoid Thinking in Patients With Delusions: The Presence of Cognitive-Affective Biases

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Background: There has been renewed interest in the influence of affect on psychosis. Psychological research on persecutory delusions ascribes a prominent role to cognitive processes related to negative affect: anxiety leads to the anticipation of threat within paranoia; depressive negative ideas about the self create a sense of vulnerability in which paranoid thoughts flourish; and self-consciousness enhances feelings of the self as a target. The objective of this study was to examine such affective processes in relation to state paranoia in patients with delusions. **Methods:** 130 patients with delusions in the context of a nonaffective psychosis diagnosis (predominantly schizophrenia) were assessed for contemporaneous levels of persecutory ideation on 5 visual analog scales. Measures were taken of anxiety, depression, threat anticipation, interpretation of ambiguity, self-focus, and negative ideas about the self. **Results:** Of the patients, 85% report paranoid thinking at testing. Symptoms of anxiety and depression were highly prevalent. Current paranoid thinking was associated with anxiety, depression, greater anticipation of threat events, negative interpretations of ambiguous events, a self-focused cognitive style, and negative ideas about the self. **Conclusions:** The study provides a clear demonstration that a range of emotion-related cognitive biases, each of which could plausibly maintain delusions, are associated with current paranoid thinking in patients with psychosis. We identified biases both in the contents of cognition and in the processing of information. Links between affect and psychosis are central to the understanding of schizophrenia. We conclude that treatment of emotional dysfunction should lead to reductions in current psychotic experiences.

Key words: delusions/paranoia/cognition/anxiety/depression/schizophrenia

Introduction

Both the conceptualization of schizophrenia and the understanding of its causes are undergoing significant change. Evidence is accumulating that there are multiple distinct experiences, including paranoia, grandiosity, hallucinations, anhedonia, and thought disorder^{1–3}; each experience is on a continuum in the general population,^{4,5} and patients with schizophrenia seen in clinical settings are the rare individuals at the severe end of a number of these dimensions.^{6,7} Although classification systems have maintained a core divide between emotional disorders and psychotic conditions, it is increasingly recognized that affect is actually key to understanding schizophrenia.^{8–10} In this study, we take one salient psychotic experience, paranoia, and examine the presence of cognitive-affective processing biases likely to maintain the problem.

In our model of the formation and maintenance of persecutory delusions, anxiety and depression are given prominent roles.¹¹ For example, anxiety is considered to cause the threat theme of paranoid thoughts and to lead to negative interpretations of ambiguous events; the effects will be enhanced by self-consciousness, an attentional focus on the self, increasing the sense of the self as a target. More recently we have highlighted how worry can lead to more implausible and distressing paranoid experience.¹² It is not only processing styles that are important but also content related to emotional concerns matters. Paranoia is considered an extension of



Fig. 1. The paranoia hierarchy.³³

negative ideas about the self as vulnerable (see figure 1). The importance of depressive ideas about the self, negative self representations, is also central to another prominent account of persecutory delusions.¹³ Broadly these models are consistent with empirically established links of psychotic symptoms to emotional reactivity, trauma, and adversity.^{14–17} Anxiety and depression are separate basic emotions, both likely contributing to persecutory delusions, but there is a high degree of correlation and considerable genetic overlap, indicating a shared negative affectivity factor and shared psychological processes.^{18,19}

These theoretical ideas concerning delusion and emotion, typically derived from clinical observation, have received empirical support. A large number of studies have found that anxiety and depression are associated with clinical and nonclinical paranoid thinking.^{20,21} For example, in a national epidemiological survey, participants reporting plots against them had 10 times the odds of reporting anxiety and 7 times the odds of reporting depression compared with people not reporting such paranoid thoughts.⁵ Innovative experience sampling studies with patients have found that increases in anxiety predict the occurrence of paranoia.^{22,23} Experimental studies have shown that anxiety and depression predict the occurrence of paranoid thinking²⁴ and that inducing anxiety results in an increased likelihood of paranoid thoughts.²⁵ Convergent with these findings, psychotic-like experiences are more common in individuals with anxiety and depressive disorders.²⁶ Thus, emotional disorder and paranoia are likely to be causally linked.

Understanding the link between negative emotion and delusions has led to an emerging literature on

cognitive-affective processing. A form of anticipation of threat has been examined by Bentall and colleagues.^{27–29} They found that patients with persecutory delusions, in comparison to nonclinical controls, are more likely to anticipate socially negative events that have a paranoid aspect occurring to them (eg, “Someone reads your mail without your permission,” “Someone stares at you menacingly”). A self-focused cognitive style, as assessed by the Self-Consciousness Scale,³⁰ has been associated with levels of paranoia in patients with schizophrenia³¹ and in students.^{32,33} Fowler and colleagues³⁴ have tested the role of negative ideas about the self in persecutory delusions. A cohort of 300 patients with psychosis was assessed at 3 time points over 1 year. Statistical modeling indicated that depressed mood and negative ideas about the self predicted the strength of persecutory delusions over time, with only a weak effect in the opposite direction. However, as with all these psychological factors, a reciprocal relationship between affect, cognitive processing, and paranoid thinking remains plausible.

None of these studies have examined the affective cognitive processes in relation to levels of *state* paranoia in patients. However, it is important in developing new interventions to target them by identifying processing biases associated with current symptomatic experiences. In this study, our aim was to take a large group of patients with delusional beliefs in the context of what are traditionally considered nonaffective psychotic disorders (schizophrenia, schizo-affective psychosis, and delusional disorder) and to examine for the first time the association of a number of affective cognitive processes in relation to state paranoid thinking. There were 3 hypotheses: current

paranoid thinking would be related to recent levels of anxiety and depression; current paranoid thinking would be associated with specific cognitive-affective biases (anticipation of mild negative events happening to the person, negative interpretations of ambiguous events being taken, a self-focused cognitive style, and negative ideas about the self); and these biases in individuals with delusions would be accounted for by the levels of anxiety and depression. We thus proposed to establish the presence of emotion-related cognitive biases in individuals with delusions and link these to current paranoid thinking.

Method

Participants

One hundred and thirty patients with delusions from clinical services took part. The inclusion criteria were the following: age, 18–65; International Statistical Classification of Diseases-10 diagnosis of nonaffective psychosis (F20–F29); and a current delusion (rated ≥ 2 on the Schedules for Clinical Assessment in Neuropsychiatry),³⁵ present for at least the last 3 months and held with at least 50% conviction. The exclusion criteria were a primary diagnosis of alcohol or drug dependency, organic brain disorder, diagnosed learning disability, or a command of English insufficient to complete assessments. The patients were recruited from 6 different National Health Service (NHS) sites in United Kingdom: South London and Maudsley NHS Foundation Trust, Norfolk and Waveney Mental Health NHS Foundation Trust, Camden and Islington NHS Foundation Trust, North East London NHS Foundation Trust, Barnet, Enfield and Haringey Mental Health NHS Trust, and Central and North West London NHS Foundation Trust.

Symptom Measures

State Paranoia. Five visual analog scales were used to assess state paranoia: (1) I am being deliberately harmed or upset; (2) I am being followed; (3) There is a conspiracy against me; (4) I am being persecuted; (5) I am being laughed at behind my back. For each item, participants rated how they were feeling “right now” from 0 (not at all) to 100 (totally). A total score was used. The internal reliability of this scale was high (Cronbach alpha = 0.86).

Scale for the Assessment of Positive Symptoms (SAPS).³⁶ The SAPS is a 35-item, 6-point (0–5) rating instrument for the assessment of the positive symptoms of psychosis. Symptoms over the last month were rated. Higher scores indicate the presence of greater levels of positive symptoms.

Beck Anxiety Inventory.³⁷ The Beck Anxiety Inventory (BAI) is a self-report 21-item, 4-point (0–3) scale for the assessment of anxiety over the past week. Higher scores

indicate higher levels of anxiety. The cut-offs for the scale are non-anxious (0–9), mild (10–18), moderate (19–29), and severe range (30+).

Beck Depression Inventory-II.³⁸ The Beck Depression Inventory-II (BDI-II) is a self-report 21-item, 4-point scale (0–3) for the assessment of depression over the past fortnight. Higher scores indicate higher depression. Birchwood et al³⁹ report a high correlation ($r = .91$) between the BDI and the interview-based Calgary Depression Scale for Schizophrenia.⁴⁰ The cut-offs for the scale are minimal (0–13), mild (14–19), moderate (20–29), and severe (29+).

Affective Processing Measures

Threat Anticipation.²⁹ The format was derived from previous studies.^{27–29} Participants had to write how likely a list of negative, neutral, and positive events were to happen over the next 2 years to themselves and also to other people. Each event was rated separately for the likelihood that it would happen to the self and to another person on a 7-point scale (“not at all likely” to “very likely”). We used 5 mild negative events that were not obviously paranoia-related (“Your physical health deteriorates,” “You will find it hard to express yourself with others,” “You have too many responsibilities to manage,” “You have an accident,” “You cannot manage your finances”), 5 neutral events (eg, “You receive a dental appointment in the mail,” “Someone asks you if the seat next to you is taken”), and 5 positive events (eg, “You win a competition,” “You manage to save for something you want to buy”). This provided 6 likelihood summary scores: threat anticipation-self, neutral anticipation-self, positive anticipation-self, threat anticipation-other, neutral anticipation-other, and positive anticipation-other. Higher scores indicate higher estimates of likelihood.

Interpretation of Ambiguity.⁴¹ In this task 10 ambiguous scenarios are presented to participants, and respondents answer yes or no to a possible explanation. For example, *You go to a party at a club. While dancing, you spot an old friend not far away and call out. They do not reply, and after a moment, turn and leave the dance floor, heading for the bar. You don't call out again because it is too noisy. Was your friend ignoring you in the club? (Yes/No).* Other scenarios concern, eg, giving a presentation, doing a DIY project, and first impressions. Higher scores indicate greater endorsement of negative interpretations of the ambiguous events.

Self-Consciousness Scale.³⁰ The Self-Consciousness Scale has 2 subscales. Private self-consciousness is assessed with 10 items (eg, “I’m always trying to figure myself out”), and public self-consciousness is assessed with 7 items (eg, “I’m self-conscious about the way I look”). Each item is

rated on a 5-point scale (0 = extremely uncharacteristic, 5 = extremely characteristic). Higher scores indicate a greater degree of self-focus. We also included 3 visual analog measures of current attention (“Right now my attention is focused on my inner thoughts and feelings,” “Right now my attention is focused on how I appear to others,” and “Right now my attention is focussed on my surroundings”).

*Brief Core Schema Scales (BCSS).*⁴² The BCSS, developed with nonclinical and psychosis groups, has 24 items assessing negative and positive beliefs about the self and others each rated on a 5-point scale (0–4). Higher scores reflect greater endorsement of items. The subscale of interest in this study was negative beliefs about self, which contains 6 items (eg, “I am unloved,” “I am worthless,” and “I am weak”).

Analysis

Analyses were carried out using Stata Version 11.⁴³ The first and second hypotheses were tested by calculating Pearson correlations between paranoia, anxiety, depression, and the cognitive processes. The third hypothesis was tested by carrying out partial correlations between paranoia and the cognitive processes, allowing for anxiety and depression. A mediation analysis was not conducted because the study was cross-sectional. All tests were two tailed.

Results

Basic Demographic and Clinical Information

The mean age of the sample ($N = 130$) was 41.1 years ($SD = 11.6$), with 82 men and 48 women. The ethnicities of the sample were white ($n = 79$), black Caribbean ($n = 15$), black African ($N = 12$), black Other ($n = 4$), Asian ($n = 6$), and other ($n = 14$). Common factors for this patient group were the majority were single ($n = 92$) and not currently working ($n = 119$).

The diagnoses by the clinical teams of the participants were schizophrenia ($n = 111$), delusional disorder ($n = 7$), schizo-affective disorder ($n = 9$), and psychotic disorder ($n = 1$). Almost all participants ($n = 121$) were currently taking antipsychotic medication. The mean length of illness was 14.2 years ($SD = 10.3$). From the SAPS ratings, 119 were experiencing persecutory delusions, 87 were experiencing auditory hallucinations, and 20 were experiencing grandiose delusions. The mean score for state paranoia was 163.9 ($SD = 147.0$). The full range of scores from 0 to 500 were reported for state paranoia, with 19 individuals scoring zero and 3 individuals reporting 500. The state paranoia score positively correlated with the SAPS persecutory delusions item, $r = .38$, $P < .001$.

Hypothesis 1: Association of Paranoia With Anxiety and Depression

The mean BAI score was 21.9 ($SD = 13.1$), with 24 patients in the nonanxious range, 33 in the mild anxiety range, 38 in the moderate range, and 33 in the severe anxiety range. The mean BDI score was 25.7 ($SD = 13.7$), with 29 patients in the minimal depression range, 20 in the mild range, 30 in the moderate range, and 51 in the severe depression range. State paranoia positively correlated with levels of anxiety, $r = .38$, $P < .001$, and depression, $r = .37$, $P < .001$. Levels of anxiety and depression were significantly associated, $P = .62$, $P < .001$.

Hypothesis 2: Associations of Paranoia With Affective Processes

The associations of paranoia with the cognitive-affective processes are shown in [table 1](#). It can be seen that higher levels of state paranoia were associated with higher ratings of anticipation of threat to the self, negative interpretations of ambiguous events, private and public self-consciousness, and negative ideas about the self. Paranoia was unrelated to anticipating positive or neutral events occurring to the self or to any type of event happening to another person, ie, there was a specific association of paranoia with anticipating negative events occurring to the self. The self-focus visual analog scales supported the association of self-consciousness with state paranoia, but there was also an association of paranoia with being focused upon the surroundings.

Hypothesis 3: Links Between Paranoia and Affective Processing Are Explained by Affect

In [table 1](#), it can be seen that anxiety and depression were also associated with the cognitive-affective processes. The associations of state paranoia with the cognitive-affective processes were tested when controlling for the levels of anxiety and depression. It can be seen that the associations with threat anticipation, negative interpretations, private self-consciousness, attention on inner thoughts, attention on surroundings, and negative ideas about the self, no longer remained significant. Only the associations of state paranoia with public self-consciousness and attention on appearance to others remain significant when controlling for affect.

Discussion

Anxiety, depression, and related cognitive processing were examined in a large sample of patients with delusions in the context of schizophrenia. A straightforward finding should not be overlooked; significant levels of anxiety and depression were very common in patients with delusions, with greater than two-thirds of the sample reporting moderate to severe anxiety and/or depression. It reinforces

Table 1. Correlations Between Paranoia, Anxiety, Depression, and the Cognitive Processes

Variable	State Paranoia	Anxiety	Depression	State Paranoia (Partial Correlation, Allowing for Anxiety and Depression)
Threat anticipation—self	.21* <i>P</i> = .020	.43*** <i>P</i> < .001	.49*** <i>P</i> < .001	.02 <i>P</i> = .815
Neutral anticipation—self	.10 <i>P</i> = .280	.19* <i>P</i> = .040	.04 <i>P</i> = .640	.06 <i>P</i> = .537
Positive anticipation—self	-.00 <i>P</i> = .960	-.11 <i>P</i> = .243	-.27** <i>P</i> = .003	.09 <i>P</i> = .328
Threat anticipation—other	.06 <i>P</i> = .545	.27** <i>P</i> = .003	.17 <i>P</i> = .068	-.039 <i>P</i> = .673
Neutral anticipation—other	.02 <i>P</i> = .821	.13 <i>P</i> = .172	.01 <i>P</i> = .897	-.01 <i>P</i> = .939
Positive anticipation—other	.01 <i>P</i> = .946	.14 <i>P</i> = .120	.11 <i>P</i> = .229	-.06 <i>P</i> = .549
Negative interpretation	.19* <i>P</i> = .028	.38*** <i>P</i> < .001	.45*** <i>P</i> < .001	-.00 <i>P</i> = .978
Private self-consciousness	.21* <i>P</i> = .021	.14 <i>P</i> = .118	.18* <i>P</i> = .047	.15 <i>P</i> = .089
Public self-consciousness	.23** <i>P</i> = .009	.15 <i>P</i> = .094	.09 <i>P</i> = .317	.20* <i>P</i> = .029
My attention is focused on my inner thoughts and feelings	.24** <i>P</i> = .007	.33*** <i>P</i> < .001	.24** <i>P</i> = .006	.12 <i>P</i> = .170
My attention is focused on how I appear to others	.31*** <i>P</i> < .001	.16 <i>P</i> = .066	.14 <i>P</i> = .107	.26** <i>P</i> = .003
My attention is focused on my surroundings	.19* <i>P</i> = .027	.15 <i>P</i> = .083	.10 <i>P</i> = .265	.15 <i>P</i> = .090
Negative ideas about the self	.25** <i>P</i> = .004	.46*** <i>P</i> < .001	.65*** <i>P</i> < .001	.01 <i>P</i> = .882

P* < .05, *P* < .01, ****P* < .001.

the view that emotional disorder is a clinical problem in its own right for patients with psychosis. However, our main aim was to test links of negative affect and affective processes to current paranoia. We replicate other studies in finding that the most anxious and depressed individuals also have the highest levels of paranoid thinking.^{5,20} That is, negative affect and paranoid thinking appear to be linked. Perhaps, this is simply a consequence of the paranoid thinking, but longitudinal studies do not support such a view.^{12,22,23,34} The issue then shifts to explaining how affect influences delusional thinking.

The particular addition to the literature provided by this study is in showing that a range of cognitive-affective processing biases are active in people with current paranoid thinking, each of which is likely to exacerbate the problems. Greater anticipation of threatening events was clearly apparent, including negative interpretations of ambiguity. These biases will maintain a sense of current threat, defeat, and vulnerability. These are the sorts of biases addressed in traditional cognitive behavioral approaches in the generation of alternative explanations for events and testing out of paranoid ideas. There was also evidence of a hyperalertness, toward internal thoughts, how one was coming across, and the external environment. This attentional style will mean greater sensitivity to signs of potential threat and hence

many more false alarms. The patients' goal in any given situation is the detection of danger, rather than to focus on other aspects of activities or the environment. In short, danger will always be in mind. Shifting attentional focus is likely to be a crucial target of successful clinical interventions, linked to the observation that patients feel much less paranoid when engaged in meaningful activity. Behavioral tests of the differences between maintaining an internal focus of attention compared with an external focus of attention are very useful in cognitive therapy. We also confirmed the association of negative ideas about the self with paranoia.^{34,44} Individuals who feel the least confident of themselves will see themselves as vulnerable and hence potential targets of hostility. It is not difficult to envisage how these processing biases may arise from the adverse social factors associated with psychosis.^{16,17,45} Our view is that reducing negative ideas about the self and encouraging more positive views will lead to improvements in levels of paranoia.

The strengths of this study are the size of the clinical group, the range of biases studied, and the links made with the *current* experience of persecutory thinking. Testing the patients on 4 affective processes (threat anticipation, interpretation of ambiguity, self-focus, negative ideas about self) meant there was no reliance on a single task. However, the key limitation is the cross-sectional

nature of the link made between affect and paranoia. It could not be determined whether the affective biases contribute to the future occurrence of paranoia, however plausible this might seem. It was also not possible to examine whether the cognitive processes are mediators of the links between negative affect and paranoia. Longitudinal study of these processes would be especially helpful. We did not alter significance levels for multiple testing, ascribing to the view that “simply describing what tests of significance have been performed, and why, is generally the best method of dealing with multiple comparisons.”⁴⁶ It was shown that a bias in anticipation of events only occurred for threatening and not for positive or neutral events; it would be helpful in future studies to examine different types of threatening events (eg, social and nonsocial situations) in order to assess the generalization of threat anticipation. It would also be valuable to examine the influence of affective processes in relation to delusional subtypes.⁴⁷ Other affective processes, for instance, worry,¹² emotion regulation,⁴⁸ and interpersonal sensitivity³³ have recently been investigated in relation to paranoid thinking, and future work needs to identify those that are key to understanding and therefore important to target in treatment. Our view is that treating emotional dysfunction in patients should lead to reductions in psychotic experiences, and this requires clinical evaluation.^{49,50}

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