

The Role of Unhelpful Appraisals and Behaviours in Vulnerability to Psychotic-like Phenomena

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Abstract. Numerous research studies have found evidence of psychotic-like experiences in the general population which are unrelated to psychopathology. Recent cognitive models of psychosis have considered these findings and have taken a normalizing approach to psychosis. It is suggested that hallucinations and delusions are essentially “normal” but are interpreted and responded to in an unhelpful way by individuals who come into contact with services. A web-based cross-sectional survey was conducted in which 544 students completed measures of predisposition to psychotic phenomena, appraisals of hallucinations and delusions, the use of safety behaviours and thought control strategies and a measure of general health. Positive appraisals of psychotic-like phenomena were found to be associated with the frequency of such phenomena but no more so than negative beliefs. Negative appraisals were more strongly associated with distress than positive appraisals but when the frequency of psychotic-like phenomena was controlled for negative appraisals made only a small contribution to distress. Avoidant safety behaviours and punishment-based thought control strategies were found to be associated with both distress and the frequency of psychotic-like phenomena. These findings provide some support for recent cognitive conceptualizations of psychosis, but essentially they emphasize the multi-faceted nature of vulnerability to psychosis.

Keywords: Continuum, psychosis, hallucinations, delusions, safety behaviours, thought-control.

Introduction

The notion that there is some continuity between “normality” and psychosis (Claridge, 1990; Strauss, 1969) is becoming increasingly accepted by mental health professionals (Claridge, 1997a; van Os et al., 1999) and current research suggests that a dimensional approach to psychotic phenomena is most appropriate. A significant number of individuals from the general population have unusual experiences or beliefs (Johns et al., 2004) and whilst these traits are considered to mark a cognitive vulnerability to psychosis (Claridge, 1997a, 2002), these people may never come into contact with psychiatric services and this susceptibility will lay dormant. However, if environmental circumstances are sufficiently adverse (this is inevitably idiosyncratic) then a person may cross over into the clinical domain and experience frank psychotic phenomena. This approach to psychosis is known as the fully-dimensional model

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and conceives of unusual experiences and beliefs as generally neutral but in some circumstances indicative of future distress.

Krabbendam, Myin-Germeys, Bak and van Os (2005) have explored some of the psychological mechanisms that may be involved in transition over the psychosis continuum and they found that emotional, cognitive and behavioural responses to the initial psychotic-like phenomena are central. Individuals who experience negative emotional states and employ symptomatic coping styles are at increased risk of developing psychosis. A separate body of research has focused on those experiences that may indicate future distress and construes them as attenuated clinical symptoms within a prodrome. Yung et al. (1998) were able to identify individuals at high risk of psychosis by using a combination of state and trait indicators, the most common of which is the presence of sub-clinical psychotic phenomena. These authors focus more narrowly upon proneness to psychosis, whereas the current study examines psychotic-like phenomena in the larger context of natural personality variation with the possibility of clinical distress for some individuals in the future.

Morrison (2001) presents a comprehensive model of psychosis that focuses on the interpretation of intrusions into awareness; he argues that positive psychotic symptoms can be conceptualized as intrusions into awareness (e.g. auditory hallucinations) or culturally unacceptable interpretations of such intrusions (e.g. delusional beliefs). From this standpoint, it is the interpretation, or catastrophic misinterpretation, of these intrusions that causes the associated distress and disability observed in those diagnosed with psychosis. Garety, Kuipers, Fowler, Freeman and Bebbington (2001) have also outlined a cognitive model of positive psychotic symptoms that encompasses hallucinations and delusions in one framework, and they too suggest a central role for appraisal. They propose that pre-existing negative schemas, affective states and biases in cognitive processes result in and maintain positive symptoms. Such dysfunctional negative schemas are thought to be the result of traumatic or negative social experiences, and by their very nature are inevitably associated with emotional distress. It is this affective state that is seen to maintain the psychotic appraisal.

There is a substantial amount of evidence in the literature to suggest that the interpretation of intrusions is central to the understanding of psychotic symptoms and distress and it is thought that appraisals may also be important in understanding non-clinical instances of such experiences. Negative beliefs about psychotic phenomena have been found to significantly predict levels of distress associated with both voices (Escher, Romme, Buiks, Delespaul and van Os, 2002; Morrison and Baker, 2000; Morrison, Wells and Nothard, 2002; Soppitt and Birchwood, 1997; van der Gaag, Hageman and Birchwood, 2003) and paranoia (Morrison, Gumley et al., 2005). However, few studies control for the frequency with which people experience such phenomena. This is important because the frequency of hallucinations and delusions may co-vary with negative beliefs about such phenomena.

Positive appraisals of psychotic phenomena have also been implicated in the occurrence of hallucinations and delusions; Morrison (2001) postulates that they may be involved in increasing the frequency of such phenomena. This assertion is derived from the self regulatory executive function model (SREF) outlined by Wells and Matthews (1994). This work outlines a general theory of vulnerability to psychopathology, and when applied to psychosis it is thought that positive beliefs (about the function of voices or delusions) lead to a plan that is likely to result in the increase of such phenomena. For instance, if someone believes that their voices provide companionship, the consequent plan for processing may involve directing attention towards the voices, and therefore becoming more aware of their occurrence. The individual

may also carry out responses that are known to increase the phenomena; for instance, sitting in a quiet room or taking particular substances. There are a number of studies that support this prediction (Laroi and Van der Linden, 2005; Morrison, Gumley et al., 2005; Morrison, Nothard, Bowe and Wells, 2005; Morrison, Wells and Nothard, 2000; Morrison et al., 2002) but none have tested the specificity of the relationship i.e. controlled for the contribution of negative appraisals.

It is clear that the way in which people respond to psychotic-phenomena may be important in the development and maintenance of such phenomena. There is much empirical evidence to suggest that patients intuitively use coping strategies in order to deal with their psychotic symptoms (Falloon and Talbot, 1981; McCandless-Glimcher et al., 1986; Romme, Honig, Noorthoorn and Escher, 1992). Unfortunately, not all of these prove to be helpful. In fact, the use of maladaptive coping strategies may be involved in the transition to psychosis (Krabbendam et al., 2005). People may attempt to control their experiences through behavioural and cognitive strategies; there are a variety of such strategies but safety behaviours (Salkovskis, 1991) and thought control strategies will be discussed specifically.

Individuals use safety behaviours in order to prevent unwanted consequences from occurring, and in the short term this may alleviate their distress. However, in the long term, performing such behaviours is thought to be counterproductive as it prevents the receipt of disconfirmatory evidence about both the psychotic appraisal and the feared outcome. Thus, safety behaviours serve to maintain the negative belief and the distress associated with it. Moreover, distress results in increased arousal and therefore hypervigilance for further experiences that will enhance the incidence of psychotic phenomena. Freeman, Garety and Kuipers (2001) gathered data from delusional patients diagnosed with a schizophrenia spectrum disorder and found that individuals who used more safety behaviours experienced higher levels of anxiety.

A cognitive strategy that may be used to cope with psychotic phenomena is thought control. The control of unwanted or distressing thoughts has been examined in relation to psychosis. A study by Morrison and Wells (2000) compared thought control strategies used by patients with a diagnosis of schizophrenia and non-patients. It was found that patients used significantly more punishment and worry-based control strategies and less distraction-based techniques than non-patients. Worry and punishment-based thought control strategies are considered to be strongly linked to distress but they may also be associated with the frequency of psychotic phenomena because they involve paying attention to the problematic phenomena.

Aims of the study

The present study aims to examine the role of interpretation and behavioural responses in the occurrence of psychotic-like phenomena and distress. First, it is hypothesized that positive appraisals of hallucinations and delusions will be associated with the frequency of such phenomena and this association will remain even when controlling for negative beliefs. Second, it is expected that negative beliefs will be associated with distress and this will be the case even when controlling for the frequency of psychotic-like phenomena and positive beliefs. Third, it is hypothesized that unhelpful responses will be associated with both the frequency of psychotic-like phenomena and distress in relation to such phenomena. In addition, such responses will continue to predict distress even when controlling for the frequency of psychotic-like phenomena.

Method

Participants

Five hundred and forty-four participants took part in study, all of whom were students from the University of Manchester. The male to female ratio of the sample was 175:369 respectively. The age of the participants ranged from 18 to 55, the mean age of the group was 21.4 (standard deviation = 4.4). Forty-five participants were postgraduate students and the remaining 499 were undergraduate students. The sample was not screened for mental health problems but it was explained in the e-mail invitation that only people without any psychiatric history should respond.

Materials

Peters Delusions Inventory (briefform) (PDI; Peters, Joseph, Day and Garety, 2004). This is a 21-item self-report scale designed to measure delusional ideation in the general population (i.e. a measure of psychosis-proneness). It assesses three dimensions of delusions (distress, preoccupation, and conviction) in addition to presence or absence. The PDI has demonstrated excellent internal consistency (healthy sample $\alpha = 0.82$; deluded sample $\alpha = 0.90$) and test-retest reliability ($r = 0.78$ to $r = 0.81$). Criterion validity has been established by deluded clients who gain higher scores on the PDI compared to a “healthy” group.

Launay-Slade Hallucination Scale-revised (LSHS-R). This is a 24-item questionnaire based upon the Launay-Slade hallucinations scale (Launay and Slade, 1981) that has been revised by Morrison et al. (2002). The LSHS-R is a measure of predisposition to hallucinations; the items are endorsed using a 4-point scale to measure frequency. The questionnaire has three subscales, including vividness of imagery, visual hallucinations, and auditory hallucinations, but only the visual and auditory hallucinatory subscales were employed here. The scales have demonstrated acceptable internal consistency ($\alpha = 0.62$ to $\alpha = 0.88$) and scores remained relatively stable ($r = 0.62$ to $r = 0.75$) over a period of 6 weeks (Morrison et al., 2002).

Beliefs about Paranoia Scale (BAPS; Morrison, Gumley et al., 2005). This is a 34-item questionnaire that examines individuals’ beliefs about paranoia. Responses are endorsed on a 4-point scale measuring extent of belief. The measure has four subscales: negative beliefs about paranoia, beliefs regarding paranoia as a survival strategy, positive beliefs about paranoia, and normalizing beliefs about paranoia. This scale has demonstrated acceptable internal consistency ($\alpha = 0.49$ to $\alpha = 0.83$) and good predictive validity has been established using the PDI.

Interpretations of Voices Inventory (IVI; Morrison et al., 2000). This is a 26-item questionnaire developed to measure interpretations of voices. The questionnaire is worded hypothetically (“If I were to hear voices I would believe that. . .”) and items were scored on a 4-point scale to measure conviction. The scale has three subscales: positive interpretations, metaphysical interpretations, and interpretations about loss of control. All of the subscales have demonstrated good internal consistency ($\alpha = 0.80$ to $\alpha = 0.94$) and test-retest reliability ($r = 0.73$ to $r = 0.84$). Predictive validity has been established using the LSHS-R.

Safety Behaviours Scale (SBS; Author Devised Measure). This is a 31-item questionnaire designed to measure the behaviours people use to avoid potentially threatening situations.

Responses are endorsed on a 4-point scale. The scale comprises three subscales including: avoidant and safety seeking behaviours, internally influencing safety behaviours, and help-seeking behaviours. Only the first two subscales are used in the present study as these represent unhelpful responses. The scale is in the preliminary stages of development but has demonstrated reasonable internal consistency ($\alpha = 0.54$ to $\alpha = 0.81$) and test-retest reliability ($r = 0.31$ to $r = 0.82$) (Campbell, 2006).

Thought Control Questionnaire (TCQ; Wells and Davies, 1994). This is a scale designed to measure strategies that are used to control unpleasant or unwanted thoughts. It consists of 30 items that are endorsed on a 4-point scale. The scale comprises five subscales, namely distraction, social control, punishment, worry, and reappraisal. Only the punishment and worry-based subscales are used in the present study as these represent unhelpful responses. Scores were found to be stable across a period of 6 weeks ($r = 0.67$ to $r = 0.83$) and all of the subscales have demonstrated good internal consistency ($\alpha = 0.64$ to $\alpha = 0.79$).

General Health Questionnaire (GHQ; Goldberg and Hillier, 1979). The 28-item version of the GHQ is used to assess general at-risk mental state in the general population, using a cut-off score of five or more to define psychiatric caseness. Two variables were calculated in the present study; one dichotomous variable that indicates caseness and one continuous variable that represents the total score on the scale. The validity and reliability of this scale has been established in a number of cross cultural studies (Aderibighe and Guerje, 1992; Romans-Clarkson, Walton, Herbison and Mullen, 1989) and those involving specific patient populations (Benjamin, Lennon and Gardner, 1991).

Procedure

All students on the University of Manchester's mailing list were sent an e-mail about the study and were invited to take part. Included in this e-mail was a link to the questionnaire web page. When the participants clicked on this link they were first shown the participant information sheet, which included information about what they would be asked to do and how long the study would take. If participants wished to proceed and take part they were asked to indicate their consent by clicking the continue button. The next page to be displayed included all the questionnaires. Participants were first asked to enter personal information such as age, gender and occupation. They were also asked to provide their e-mail addresses to enable the researcher to identify them. Participants completed the questionnaires at their own pace but with an estimated completion time of 35 minutes. Once completed, participants were asked to click a button to submit their responses.

Data analysis

The data were examined for normality using analysis of Skewness and Kurtosis and visual inspection. Several of the variables measured were not normally distributed, but most were found to be normalizable using logorhythmic transformations (IVI control subscale, BAPS paranoia as a survival strategy, TCQ punishment subscale) or square root transformations (PDI Distress). However, a number of variables remained non-transformable (IVI positive interpretations of voices, and IVI metaphysical interpretations of voices, BAPS positive beliefs

Table 1. Descriptive statistics for each of the subscales

Subscale	<i>N</i>	Mean (<i>SD</i>)	Min score	Max score
GHQ total	538	33.8 (5.7)	26	53
PDI no. of beliefs total	544	7.2 (3.6)	0	20
PDI distress	544	19.7 (12.5)	1	75
LSHS-R total	541	42.3 (10.9)	6	84
BAPS negative	539	22.1 (8.4)	12	51
BAPS paranoia as a survival strategy	539	17.1 (5.8)	10	44
BAPS positive	539	4.8 (1.5)	3	13
BAPS normalizing	539	7.9 (2.7)	3	12
IVI metaphysical	537	15.9 (3.7)	13	39
IVI positive	537	10.2 (3.3)	7	25
IVI loss of control	537	7.0 (2.8)	4	17
TCQ punishment	538	10.1 (2.8)	6	23
TCQ worry	538	10 (3.1)	5	21
SBS avoidance/safety seeking behaviours	538	31.6 (6.9)	19	58
SBS anti-social behaviours	538	12.6 (3.1)	3	16

about paranoia subscale); therefore, non-parametric statistics were employed when analysing these variables.

Results

The mean, standard deviation and the range of scores for the subscales of each of questionnaires are displayed in Table 1.

Positive appraisals and frequency

In order to test the first hypothesis, Spearman's correlation coefficients were performed between the subscales measuring the frequency of psychotic-like phenomena (PDI total number of beliefs) and those subscales measuring appraisals of psychotic-like phenomena (All IVI and BAPS subscales). From Table 2 it can be seen that there are both positive and negative appraisals that are significantly associated with the frequency of psychotic-like phenomena.

To explore this hypothesis further, two hierarchical multiple regressions were performed. In the first the total number of hallucinatory experiences endorsed (LSHS-R Total) was entered as the dependent variable. The independent variables included in the analysis were negative beliefs about voices (IVIM and IVIC) and age and gender in step 1, and positive beliefs about voices in step 2. The multiple *R* was .198 and significant ($F_{(5,531)} = 26.187, p < .0001$). The adjusted R^2 was .190, indicating that a small amount of the variance was accounted for by these predictor variables. An examination of the tolerances of the individual variables found them to be acceptably high, indicating that colinearity was not a problem. On step 1, with negative beliefs about voices and age and gender entered, the multiple *R* was .139 and significant ($F_{(4,532)} = 107.947, p < .0005$). On the final step when the positive beliefs about voices were entered the increment in R^2 was .058 and significant ($F = 38.688, p < .0005$).

Table 2. Spearman's correlation coefficients between the frequency of psychotic-like phenomena and unhelpful appraisals and responses

Subscale	Number of hallucinatory experiences	Number of delusional beliefs endorsed
Metaphysical beliefs about voices	.324**	.371**
Controlling beliefs about voices	.165**	.197**
Positive beliefs about voices	.408**	.357**
Negative beliefs about paranoia	.489**	.471**
Survival beliefs about paranoia	.371**	.398**
Positive beliefs about paranoia	.361**	.380**
Normalizing beliefs about paranoia	.227**	.180**
Avoidant safety behaviours	.521**	.422**
Internally influencing safety behaviours	.278**	.286**
Punishment-based thought control strategies	.359**	.314**
Worry-based thought control strategies	.327**	.246**

Note: * at the 0.05 level and ** at the 0.01 level (2-tailed).

Significant predictors of the frequency of hallucinations were positive beliefs about voices ($\beta = 1.017$, Partial $r = .242$, $t = 6.220$, $p < .0005$); metaphysical beliefs about voices ($\beta = .458$, Partial $r = .116$, $t = 2.691$, $p < .01$) and female gender ($\beta = 2.173$, Partial $r = .104$, $t = 2.403$, $p < .05$).

In the second regression the total number of delusional beliefs endorsed (PDI Total No.) was entered as the dependent variable. The independent variables included in the analysis were negative beliefs about paranoia (BAPS Negative) and age and gender in step 1, and positive beliefs about paranoia (BAPS positive, survival and normalizing) in step 2. The multiple R was .290 and significant ($F_{(6, 532)} = 36.259$, $p < .0001$). The adjusted R^2 was .282 indicating that a small amount of the variance was accounted for by these predictor variables. An examination of the tolerances of the individual variables found them to be acceptably high, indicating that collinearity was not a problem. On step 1, with negative beliefs about paranoia and age and gender entered, the multiple R was .224 and significant ($F_{(3, 535)} = 51.472$, $p < .0005$). On the final step, when the positive beliefs about paranoia subscale were entered, the increment in R^2 was .066 and significant ($F = 16.556$, $p < .0005$). Significant predictors of the frequency of delusional beliefs were positive beliefs about paranoia ($\beta = .377$, Partial $r = .147$, $t = 3.427$, $p < 0.005$); survival beliefs about paranoia ($\beta = .107$, Partial $r = .151$, $t = 3.529$, $p < .0005$) and negative beliefs about paranoia ($\beta = .144$, Partial $r = .337$, $t = 8.249$, $p < .0005$).

Negative appraisals and distress

In order to test the second hypothesis, Spearman's correlation coefficients were performed between the subscales measuring distress (PDI Distress and GHQ) and those subscales measuring appraisals of psychotic-like phenomena (All IVI and BAPS subscales). From Table 3 it can be seen that both positive and negative appraisals of voices and delusions are associated with general distress. In addition, both positive and negative beliefs about paranoia are significantly associated with delusional distress. However, negative beliefs about paranoia were more strongly associated with delusional distress than any of the positive beliefs.

Table 3. Spearman's correlation coefficients between distress and unhelpful appraisals and responses

Subscale	Delusional distress	General distress
Metaphysical beliefs about voices	N/A	.260**
Controlling beliefs about voices	N/A	.238**
Positive beliefs about voices	N/A	.270**
Negative beliefs about paranoia	.512**	.471**
Survival beliefs about paranoia	.292**	.252**
Positive beliefs about paranoia	.187**	.135**
Normalizing beliefs about paranoia	.124**	.175**
Avoidant safety behaviours	.386**	.428**
Internally influencing safety behaviours	.184**	.232**
Punishment-based thought control strategies	.310**	.348**
Worry-based thought control strategies	.218**	.322**

Note: * at the 0.05 level and ** at the 0.01 level (2-tailed).

To explore this relationship further, a hierarchical multiple regression was performed using delusional distress (PDI Distress) as the dependent variable. The independent variables included in the analysis were positive beliefs about paranoia (BAPS positive, survival and normalizing), the number of delusional beliefs endorsed, and age and gender in step 1, and negative beliefs about paranoia in step 2. The multiple R was .808 and significant ($F_{(7, 531)} = 318.690, p < .0001$). The adjusted R^2 was .805 indicating that a large amount of the variance was accounted for by these predictor variables. An examination of the tolerances of the individual variables found them to be acceptably high, indicating that collinearity was not a problem. On step 1, with positive beliefs about paranoia, the number of delusional beliefs endorsed and age and gender entered, the multiple R was .757 and significant ($F_{(6, 532)} = 276.490, p < .0005$). On the final step when the negative beliefs about paranoia subscale was entered the increment in R^2 was .051 and significant ($F = 139.622, p < .0005$). Significant predictors of delusional distress were negative beliefs about paranoia ($\beta = .404$, Partial $r = .456, t = 11.816, p < .0005$) and the number of delusional beliefs endorsed ($\beta = 2.594$, Partial $r = .816, t = 32.546, p < .0005$).

Unhelpful responses

In order to test the third hypothesis, Spearman's correlation coefficients were performed between the subscales measuring unhelpful responses to psychotic-like phenomena (punishment-based and worry-based strategies of thought control and avoidant and internally influencing safety-behaviours) and those subscales measuring the frequency of psychotic-like phenomena (LSHS-R Total and PDI Total No.) and emotional distress (PDI Distress and GHQ Total). From Table 2 and 3 it can be seen that avoidant safety behaviours are more strongly associated with distress and the frequency of psychotic-like phenomena than internally influencing safety behaviours. Punishment and worry-based thought control strategies were significantly associated with both general and delusional distress.

To explore this relationship further, a hierarchical multiple regression was performed using general distress (GHQ Total) as the dependent variable. The independent variables included in the analysis were the frequency of psychotic-like phenomena (LSHS-R Total and PDI

Total No.) and age and gender in step 1, and unhelpful responses (SBS avoidance, TCQ punishment and TCQ Worry) in step 2. The multiple R was .308 and significant ($F_{(7, 529)} = 33.656, p < .0001$). The adjusted R^2 was .299, indicating that a large amount of the variance was accounted for by these predictor variables. An examination of the tolerances of the individual variables found them to be acceptably high, indicating that colinearity was not a problem. On step 1, with the frequency of psychotic-like phenomena and age and gender entered, the multiple R was .235 and significant ($F_{(4, 532)} = 40.855, p < .0005$). On the final step, when the unhelpful responses were entered the increment in R^2 was .073 and significant ($F = 18.638, p < .0005$). Significant predictors of general distress were the frequency of hallucinations ($\beta = .079$, Partial $r = .129, t = 3.001, p < .005$), the number of delusional beliefs endorsed ($\beta = .287$, Partial $r = .164, t = 3.385, p < .0005$), older age ($\beta = .109$, Partial $r = .101, t = 2.343, p < .05$), avoidant safety behaviours ($\beta = .144$, Partial $r = .168, t = 3.919, p < .0005$), punishment-based thought control strategies ($\beta = .244$, Partial $r = .127, t = 2.946, p < .005$) and worry-based thought-control strategies ($\beta = .218$, Partial $r = .123, t = 2.854, p < .005$).

Discussion

The current findings are partially consistent with the hypotheses and suggest that both unhelpful responses and dysfunctional appraisals play a small but significant role in predicting the frequency of non-psychotic phenomena and distress. It is clear that there are multiple factors involved in vulnerability to psychosis. The appraisals and unhelpful responses measured here are just some of many. These results do, however, support the continuum of psychosis (Claridge, 1997b) and the recent cognitive conceptualizations of psychotic experiences (Garety et al., 2001; Morrison, 2001).

It was predicted that positive beliefs about psychotic-like phenomena would be associated with the frequency of such phenomena. This aspect of our hypothesis was supported but the specific relationship between positive beliefs and frequency was not observed. Negative beliefs were also found to be significantly associated with frequency and when negative beliefs were controlled for positive beliefs predicted only a small (but significant) percentage of the variance in frequency. The present findings suggest that positive beliefs about psychotic phenomena, in a non-clinical sample, explain very little additional variance in the frequency of psychotic phenomena once negative beliefs have been taken into account. Therefore, our results fail to support those authors who emphasize the importance of positive beliefs in the development of unusual experiences and beliefs (Chadwick and Birchwood, 1994; Morrison, 2001). However, this sample endorsed only a small number of positive beliefs and this is likely to have biased our results.

The fact that negative beliefs about voices were associated with general distress supports the robust relationship observed between these variables in clinical groups (Escher et al., 2002; Soppitt and Birchwood, 1997; van der Gaag et al., 2003). Overall, the present data suggest that paranoia (Freeman et al., 2005a, b) and voice hearing exists on a continuum (Johns et al., 2004). Negative metacognitive beliefs about paranoia showed significant relationships with both general and delusional distress and the specificity of the hypothesized relationship in this instance was largely supported. The associations between negative beliefs and distress were greater than those for positive beliefs and this supports the work of Morrison, Gumley et al.

(2005) who found a relationship between negative beliefs about paranoia and distress in a non-clinical sample.

However, when the frequency of delusional beliefs was taken into account negative beliefs about paranoia predicted a significant but small percentage of the variance in delusional distress. This analysis suggests that negative beliefs about paranoia were better predictors of distress than positive beliefs about paranoia but not delusional frequency. In fact, little variance remained to be explained once the number of delusional ideas had been taken into account. Nevertheless, our results suggest that in non-patients negative beliefs about psychotic-like phenomena still play a modest role in delusional distress, and this provides some support for the cognitive models of psychosis recently outlined (Garety et al., 2001; Morrison, 2001). However, it is important to note that negative metacognitive beliefs may actually be a result of positive psychotic phenomena rather than a cause. Similarly, distress may be a cause of psychotic-like phenomena rather than a consequence. Due to the cross-sectional nature of the study the sequence of these relationships cannot be elucidated.

When turning to unhelpful responses it was found that the use of both avoidant safety behaviours and punishment-based thought control strategies were associated with both the frequency of psychotic-like phenomena and distress. This bolsters the work of Krabbendam et al. (2005) and is supportive of certain theoretical postulations (Morrison, 2001) and empirical evidence (Freeman et al., 2001) regarding the role of safety behaviours in psychosis. The notion that punishment and worry-based thought control strategies are associated with distress (Morrison and Wells, 2000) is also supported. However, it must be acknowledged that the measures of unhelpful responses were not specifically tied to psychotic-like phenomena; therefore, these strategies may have been used by some individuals in the sample but not necessarily in response to their psychotic-like phenomena. These results may therefore indicate that such unhelpful responses merely co-occur in individuals who have psychotic-like experiences.

When a regression analysis was performed it was discovered that the contribution of unhelpful responses to distress was small when controlling for the frequency of psychotic-like phenomena. This small contribution may be explained by the notion that these unhelpful responses are unrelated to psychotic-like phenomena. Alternatively, the fact safety-behaviours have a complicated relationship with distress may also explain such a small contribution. Initially, safety behaviours serve to reduce distress levels but in the long term they are expected to increase distress (Salkovskis, 1991). It is also equally feasible that these unhelpful responses are less involved in distress in non-patients compared with patients. In order to examine these issues more effectively, unhelpful responses to psychotic-like phenomena should be measured explicitly.

These findings have several clinical implications but before these are considered it is important that the limitations of the study are fully appreciated. The present study is exploratory in nature and this restricts the conclusions that can be drawn. It is a central limitation of the study that the sequence of the relationships examined cannot be elucidated. As such these relationships may exist in the opposite direction to that predicted (e.g. beliefs are the result of psychotic-like phenomena and not the cause). In addition, the generalizability of this work is severely limited because the sample is not representative of the general population. First, it involved only students from one university in Manchester, and second, the sample was entirely self-selected. This problem is exacerbated by the fact that limited information about the participants was gathered and as such no estimation can be made about the biases at play.

Furthermore, no information regarding the use of illicit drugs was gathered in relation to the experiences and beliefs measured. Certain illicit substances are known to influence psychotic experiences in individuals without a history of psychopathology. However, it is unlikely that the current results are entirely an artifact of this confounding variable; previous evidence of psychotic-like experiences in a non-clinical sample when controlling for drug use has been gathered (van Os, Hanssen, Bijl and Ravelli, 2000). Bearing these limitations in mind, the following implications should be interpreted cautiously.

In light of the present findings and previous literature it is reasonable to suggest that punishment-based thought control strategies and avoidant safety behaviours should be targeted when working with individuals who have been diagnosed with a psychotic disorder or who have been identified as being at high risk of developing psychosis (Yung et al., 1998). For example, clients could be encouraged to carry out behavioural experiments that involve them dropping their avoidant safety behaviours in situ. This would be expected to decrease their levels of distress in the long-term and reduce their conviction in the feared outcome. However, such an intervention must be approached with caution as it is likely to increase distress in the short-term. As such, a secure therapeutic alliance is essential and fully informed consent should be obtained. The use of punishment-based strategies to control unwanted thoughts could also be targeted for treatment in psychotic or high-risk groups. The aim of such treatment would be to replace these unhelpful control strategies with more functional ones by assisting the client to use distraction-based techniques and reappraisal. Such an intervention would be enhanced by the provision of information based on normalizing intrusive thoughts. It is also suggested that negative beliefs about paranoia and voices are explored with clients because these may be connected to the distress individuals experience in relation to such phenomena.

Future research exploring vulnerability to psychosis in non-patients should attempt to resolve the methodological limitations of the present study. Essentially, a prospective/longitudinal design is required in order to uncover the direction of the relationships explored. It is also suggested that a fuller range of the variables involved in vulnerability to psychosis be explored. For example, the role of personality factors (Laroi, DeFruyt, van Os, Aleman and Van der Linden, 2005) and information processing styles (Steel, Fowler and Holmes, 2005) should be examined in addition to appraisals and responses. It is clear that some experimental manipulation of these variables would also be valuable as it would allow causal conclusions to be made, but important practical and ethical issues would need to be overcome. Path analysis is likely to be a useful alternative in such research as it allows the testing of causal models without manipulation.

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