Negative interpretations of ambiguous ‘psychosis-like’ and ‘anxiety-like’ experiences in recovery from psychosis or anxiety

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Objectives. Fear of relapse (FOR) after experiencing psychosis has been found to predict actual relapse; however, potential mechanisms underlying this relationship have not been investigated. Negative appraisals of ‘prodromal symptoms’ are believed to play an important role in both psychosis and mental health anxiety (MHA). This study aimed to explore whether people in recovery from psychosis or anxiety disorders show an enduring tendency to negatively interpret ambiguous experiences both related and less related to their previous mental health difficulty relative to controls.

Design. Cross-sectional between-groups questionnaire design.

Methods. Participants self-reported as in recovery from psychosis (n = 33) or anxiety (n = 77) or without previous experience of mental health problems (n = 61) were recruited online or via NHS services. Interpretations of psychosis-like, anxiety-like, and external-control experiences were measured using the newly developed Experiences Interpretation Questionnaire (EIQ). MHA and FOR were measured using self-report questionnaires.

Results. People in recovery from psychosis interpreted psychosis-like experiences significantly more negatively than the other groups. Negative interpretations of anxiety-like experiences were greater than controls but comparable between mental health groups. Contrary to predictions, FOR was not significantly different between the mental health groups. MHA and FOR did not significantly predict negative interpretations of psychosis-like items in the psychosis group, however, MHA predicted negative interpretations of anxiety-like items in the anxiety group. The EIQ subscales demonstrated good test–retest reliability.

Conclusions. People in self-defined recovery from psychosis or anxiety are more likely to negatively interpret ambiguous experiences relating to their previous mental health difficulties. Clinical and future research implications are outlined.

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**Practitioner points**

- People in recovery from psychosis or anxiety appraise possible symptoms of their previous difficulties negatively/catastrophically (as indicating relapse) relative to those without prior MH problems.
- Clinicians should consider attending to how people in recovery appraise possible symptoms when encouraging early signs monitoring as part of relapse prevention. This may be important to ensure that self-monitoring leads to helpful responses rather than being counterproductive, with catastrophic interpretations leading to anxiety and thus increasing the risk of relapse.
- Interventions drawing on CBT principles to address catastrophic interpretations of possible symptoms may potentially be a useful addition to relapse prevention work; in psychosis this may also include symptoms of anxiety.

Psychosis is related to significant changes in thoughts, perceptions, mood, and behaviours (NICE, 2014) and most frequently associated with diagnoses such as schizophrenia, delusional disorder, bipolar disorder, and schizoaffective disorder (Royal College of Psychiatrists, 2015). A UK survey reported a 0.5% prevalence rate for probable psychosis in 16 to 74-year olds (Singleton, Bumpstead, O’Brien, Lee & Meltzer, 2003), with marked heterogeneity in rates across studies and demographics (Kirkbride et al., 2012).

Reavley, Morgan, and Jorm (2017) found disclosure of a diagnosis of psychosis significantly predicted avoidance by others and discrimination. The label ‘schizophrenia’ is associated with stigma and frequently linked to violence in the UK mainstream media (Bowen, Kinderman, & Cooke, 2019). Psychosis is associated with many negative effects including a 2–3 times higher mortality risk (Brown, Kim, Mitchell, & Inskip, 2010), and more negative stereotypes and lower expectations of recovery comparative to depression or anxiety (Wood, Birtel, Alsawy, Pyle, & Morrison, 2014).

Despite the recent improvements in remission and recovery rates after treatment of psychosis (Lally et al., 2017), relapse remains common. Following a first episode, up to 54% of individuals relapse within 3 years (Alvarez-Jimenez et al., 2012) and up to 80% within five years (Robinson et al., 1999). Relapse has been associated with an increased risk of chronicity, depression, and suicidal ideation (Birchwood, Iqbal, Chadwick, & Trower, 2000) and high costs to services (Almond, Knapp, Francois, Toumi, & Brugha, 2004). There is currently no conclusive evidence that cognitive behavioural therapy (CBT) reduces relapse rates (Alvarez-Jiménez, Parker, Hetrick, McGorry, & Gleeson, 2009; Garety et al., 2008) unless specifically relapse focussed (Tarrier & Wykes, 2004) and early signs monitoring has only moderate predictive value (Eisner, Drake, & Barrowclough, 2013). Further research to aid the development of interventions to prevent relapse is therefore required (Eisner et al., 2013).

**Fear of relapse**

Following an episode of physical ill health, people can become understandably anxious about the possibility of this recurring (Ozga et al., 2015). The impact of this fear of recurrence on psychological distress, functioning (Lee-Jones, Humphris, Dixon & Bebbington, 1997; Simard, Savard, & Ivers, 2010) and quality of life (Koch et al., 2014) is well established in cancer survivors (Simonelli, Siegel, & Duffy, 2017). It has not, however, been suggested that fear of recurrence impacts actual recurrence. By contrast, in mental health increased fear of illness recurrence (also called fear of relapse; FOR) has been found to significantly predict post-psychotic post-traumatic stress disorder (PTSD) (White & Gumley, 2009). A randomized controlled trial found greater FOR was associated with shorter time to actual relapse in psychosis, and better-predicted relapse relative to
early signs monitoring (Gumley et al., 2015). The authors concluded that FOR may be related to poorer emotional recovery and greater relapse risk (Gumley et al., 2015) which has not yet been explored in other mental health (MH) conditions.

Considering the negative outcomes associated with psychosis comparative to other mental health difficulties outlined above, it follows that people who have experienced psychosis may be more fearful of relapse due to higher perceived awfulness. A cross-sectional study by Jamalamadaka, Griffith, Steer, and Salkovskis (2020) found people in recovery from psychosis reported significantly greater FOR than those who had experienced MH difficulties without psychosis, although the authors noted that the comparison group also had high levels of FOR. One limitation of that study was that the psychosis group rated themselves as significantly more recovered than the other MH group, which may explain the finding of higher FOR. Mental health anxiety was a significant predictor of FOR irrespective of group and higher in both MH groups comparative to those with no previous MH problems (Jamalamadaka et al., 2020).

**Cognitive models of psychosis**

Central to cognitive models of psychosis is the way that appraisals of experience are key (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001; Morrison, 2002). These models draw on cognitive theories of anxiety, such as the panic model by Clark (1986). Morrison (2002) uses this parallel to suggest that the interpretation of anomalous experiences, such as voices, as physically or psychologically threatening, increases negative emotions (including anxiety and depression) and physiological arousal. In turn, these negative emotions and increased physiological arousal can lead to an increase in unusual experiences which are further misinterpreted, creating a vicious cycle. These misinterpretations also understandably lead the person to try to reduce perceived threat through safety-seeking behaviours such as avoidance and hypervigilance. Such safety-seeking strategies prevent disconfirmation of threatening beliefs and often increase the occurrence of the anomalous experiences, further increasing threat perception.

Evidence for the association between cognitive appraisals and distress from hallucinations (Birchwood, 2003; Birchwood & Chadwick, 1997; Mawson, Cohen, & Berry, 2010) and delusions is well established (Kuipers et al., 2006). Studies with people at risk of psychosis (Taylor, Parker, Mansell, & Morrison, 2013) and comparing clinical and non-clinical populations with psychotic-like experiences (Brett, Heriot-Maitland, McGuire, & Peters, 2014) support the relationship between appraisals of anomalous experiences and distress. A longitudinal study of people in recovery found perceptions of negative consequences of psychosis, but not objective symptom severity were associated with poorer quality of life (Stainsby, Sapochnik, Bledin, & Mason, 2010). These authors, therefore, propose that people’s beliefs about their difficulties are key to quality of life in recovery, rather than quantifiable symptomatology. Negative illness perceptions about psychosis are also associated with low self-esteem, depression, and anxiety; factors that have been linked to recurrence (Watson et al., 2006).

**Mental health anxiety**

The cognitive behavioural model of health anxiety (Salkovskis & Warwick, 1986) suggests that when anxious about their health people have an enduring tendency to catastrophize about ambiguous symptoms and consider them indicative of a serious illness, thus increasing their anxiety. Rachman (2012) proposed that fears often pertain to illnesses
associated with distressing prior personal experience including actual illness (Warwick, 1989); most likely people can have similar concerns about prior mental health problems. In relation to psychosis, higher levels of worry, anxiety, and fear of madness were found in those experiencing delusions relative to clinical controls, with fear of madness associated with higher persecutory delusional distress (Bassett, Sperlinger, & Freeman, 2009). A systematic review found anxiety to be associated with severity of psychosis symptoms, sub-clinical experiences of psychosis, prognosis, and relapse (Hartley, Barrowclough, & Haddock, 2013). Worry has also been found to predict paranoid thinking, and interventions targeting worry have been demonstrated to reduce persecutory delusions (Freeman et al., 2015). These findings support the role of anxiety in psychosis, and the proposition that anxiety about symptoms may worsen symptoms, creating a vicious cycle.

Catastrophic misinterpretation in the context of panic involves ‘perceiving sensations much more dangerous than they really are’ (Clark, 1986, p. 462); residual catastrophizing also predicts relapse a year after the end of treatment (Clark et al., 1997). Applied to those in recovery for mental health problems in general, it is, therefore, suggested that interpreting possible signs of relapse specific to their previous experience of MH difficulties as more threatening than they actually are may lead to increased anxiety and arousal, and subsequently increase symptoms leading to actual relapse.

The role of cognitive appraisals of experiences relating to prior MH difficulties has previously been proposed by Teasdale, Segal, and Williams (1995) to mediate relapse of depression. The authors proposed that when people in recovery from depression experience mild dysphoria, this can reactivate negative thinking patterns which sustain and intensify this negative emotional state, potentially leading to relapse. Based on this theory, Mindfulness-Based Cognitive Therapy (MBCT) aims to change the way people relate to dysphoria and has been demonstrated to significantly reduce the risk of relapse for people in recovery following three or more depressive episodes (Teasdale et al., 2000).

Gumley’s (2006) trauma-based model of psychosis relapse proposes that excessively negative appraisals of relapse are key. Considering the threat value of psychosis based upon its distressing nature and negative impacts, potential signs of relapse are likely to be appraised as catastrophic. Gumley and Schwannauer (2006) suggests people may perceive changes in their experiences (e.g., unusual thoughts and perceptions) as evidence of losing control, associating them with previous psychotic experiences and what that implies for them, thus increasing feelings of threat and anxiety. Similarly, Birchwood and Spencer (2001) have theorized that reacting to mild psychotic experiences by appraising relapse as catastrophic is likely to be associated with an increased tendency for actual relapse; however, to date no research has explicitly addressed such appraisals. The main aim of the study was, therefore, to examine how people in recovery interpret possible symptoms.

**Hypotheses**

Primary hypotheses:

- People in recovery from psychosis will be more likely to negatively interpret psychosis-like experiences (as meaning their mental health is getting worse) than people in recovery from anxiety and healthy controls.
- Similarly, people in recovery from anxiety disorders will be significantly more likely to negatively interpret anxiety-like experiences.
• There will being no differences between groups for external-control items.

Secondary hypotheses:

• People with experience of psychosis will have significantly higher FOR than people with experience of anxiety disorders.
• FOR and MHA will predict negative interpretations of possible symptoms related to their previous MH difficulty (psychosis or anxiety for the respective groups).

Method

Design

A cross-sectional between-groups questionnaire design was used, drawing on methodology from Jamalamadaka et al. (2020) and Clark et al. (1997). The independent variables were self-defined previous main MH problem (psychosis, anxiety or no MH difficulties) and item type (EIQ subscales: psychosis-symptoms, anxiety symptoms and external-control items) and the primary dependent variable was mean total score for negative interpretations per item type.

Participants

Participants were recruited online via social media sites and through recovery, Early Intervention in Psychosis (EIP), and primary care services at two UK NHS mental health Trusts.

One hundred and seventy-one participants were recruited: 33 people self-identifying as being in recovery from psychosis, 77 people from an anxiety disorder and 61 non-clinical controls. Only people aged 18 or older could participate. Exclusion criteria were self-reported current or previous Health Anxiety (due to associated tendency to negatively interpreting health-related information), Substance Use Disorder (as may provide alternative substance use related interpretation of some EIQ items) or having a Learning Disability (as measures not suitably adapted).

Inclusion criteria for mental health groups

• Self-reported experience of psychosis as their main MH problem for which they received a diagnosis or treatment, OR;
• Self-reported experience of an anxiety disorder (Obsessive-Compulsive Disorder, Panic Disorder with or without agoraphobia, Generalized Anxiety Disorder or Social Anxiety Disorder) as their main MH problem for which they received a diagnosis or treatment

AND, consider themselves to be in recovery.

Non-clinical control group

• No self-reported experience of an MH problem for which they received a diagnosis or treatment
Recovery definition and screening

In line with Jamalamadaka et al. (2020), this study used the recovery definition provided by the South London and Maudsley NHS Foundation Trust and South West London and St George’s Mental Health NHS Trust (2010, p. 4):

Recovery does not necessarily mean “clinical recovery” (usually defined in terms of symptoms and cure)—it does mean “social recovery”—building a life beyond illness without necessarily achieving the elimination of the symptoms of illness. Recovery is often described as a journey, with its inevitable ups and downs and people often describe themselves as being 'in recovery' rather than 'recovered'.

Recovery was, therefore, assessed as a continuous variable based upon each persons’ perception of their progress, rather than as a categorical, symptomatic approach. This is consistent with views of recovery as a personal journey rather than being dualistic and diagnostic-based (Lloyd, Waghorn, & Williams, 2008; Slade, 2009; Slade & Longden, 2015). Thus, the screening question used by Jamalamadaka et al. (2020) was employed by this study: ‘Would you say you have been able to build a life beyond your main mental health problem (even if all your symptoms haven’t disappeared)? Responses were given on a 9-point Likert scale from 1 (Strongly disagree) to 9 (Strongly agree). Participants answering ‘mildly disagree’, ‘moderately disagree’, ‘disagree’ or ‘strongly disagree’ were excluded.

Measures

Primary hypotheses

Experiences Interpretation Questionnaire (EIQ). A 24-item questionnaire developed for this study to measure negative interpretations of ambiguous possible MH symptoms (see Appendix S1). The EIQ is closely based on the 27-item Bodily Sensations Interpretation Questionnaire (BSIQ; Clark et al., 1997), which has been previously adapted (Garner, Salkovskis, & Walker, 2015) and has established validity (Clark et al., 1997) and satisfactory-to-good internal consistency across the four subscales (Cronbach’s α = .73 to .86; Vancleef & Peters, 2008). The EIQ has three subscales with eight items each: psychosis-like experiences, anxiety-like experiences and external-control items. MH items were based on the DSM 5 (APA, 2013) diagnostic criteria for the relevant disorders. External-control items were included to check that any differences could not be explained by a tendency to interpret situations negatively in general, rather than this being specific to experiences related to their previous mental health difficulty. Interpersonal situations were excluded due to potential overlap with paranoia or social anxiety. Example item: ‘You come home and notice your front door is ajar. Why?’ Respondents were asked to write free-text the first explanation that came to mind, and on the following page rank from 1 (most likely) to 4 (least likely) four given explanations (one negative, two neutral/normalizing and one positive). Question order by subscale and explanation responses were randomized throughout the questionnaire.

In line with the BSIQ, scores were calculated based on the negative explanation’s rank order; if ranked first this scored 4, second scored 3, third 2, and fourth 1, and scores summed per subscale. Clark et al. (1997) reported time-intensive analysis of open-ended responses did not contribute significant further information to ranking data, so these were
not analysed and included primarily to prompt participants to consider their initial response before options were presented.

To examine the preliminary psychometric properties of the EIQ in this version, 32 participants completed this measure again after approximately two weeks; six in recovery from psychosis, 17 in recovery from anxiety and nine controls. Pearson’s correlation coefficient indicated excellent test–retest reliability for the EIQ psychosis symptoms \((r = .928)\) and external-control \((r = .944)\) subscales, and good test–retest reliability for the anxiety symptoms subscale \((r = .889)\).

**Secondary hypotheses**

**Mental health anxiety.** The mental health anxiety inventory (MHAI; Commons, Greenwood, & Anderson, 2016) is an 18-item questionnaire with two subscales: 14-item MHAI and 4-item perceived awfulness. It has good construct validity and internal reliability (Cronbach’s \(\alpha = .92\)). Scores range from 0–42 (0–3 per item), with higher total scores signifying greater MHA and a clinical cut-off of 27. Where more than one item was endorsed, the highest score was used (Salkovskis, Rimes, Warwick, & Clark, 2002).

**Fear of relapse.** The Fear of Recurrence Scale (FORSE; Gumley et al., 2015) is a 23-item measure of FOR developed for psychosis, with excellent internal reliability (Cronbach’s \(\alpha = .92\)) and good test–retest reliability \((r = .70)\) (Gumley et al., 2015). Total scores range from 23–92 (1–4 per item), with larger scores indicating higher fear of relapse.

**Group characteristics**

**Quality of life in recovery.** The 10-item validated Recovering Quality of Life measure (ReQoL; Keetharuth et al., 2017) of MH recovery focussed quality of life, which has acceptable internal consistency (Cronbach’s \(\alpha = .92\)), test-retest reliability \((r = .85)\), and convergent validity.

**Functioning and severity.** The Work and Social Adjustment Scale (WSAS; Mundt, Marks, Shear, & Greist, 2002) is a 5-item scale with good internal consistency (Cronbach’s \(\alpha = .70–.94\)) and test–retest reliability \((r = .75)\). It measures functioning in the following domains: work, home management, social and private leisure activities, and relationships. Participants completed this measure twice; once relating to current functioning and once for when their main MH problem was at its worst (to provide information about severity based on functional impact). Participants also rated the severity of current symptoms of their main MH problem comparative to the worst they have been on a 7-point Likert scale ranging from 1(No symptoms) to 7(Extremely severe).

**Depression.** The PHQ-9 is a 9-item measure of depression (Kroenke, Spitzer, & Williams, 2001), with good internal consistency (Cronbach’s \(\alpha = .89\)) and test-retest reliability \((r = .84)\). Higher scores indicating increased severity, ranging from 0 to 27.
Anxiety. The GAD-7 is a 7-item measure of anxiety symptoms (Spitzer, Kroenke, Williams, & Löwe, 2006) with excellent internal consistency (Cronbach’s $\alpha = .92$) and good test–retest reliability (intraclass correlation = 0.83). Ranging from 0 to 21, higher scores indicate more severe anxiety symptoms.

Involvement of People with Personal Experience (PPE)
Two people with personal experience of psychosis and one of anxiety were consulted regarding the project’s usefulness, design and acceptability. They also assisted with the development of the EIQ questionnaire; designing and giving feedback on items, layout and wording. Another PPE reviewed and piloted the additional study materials.

Procedure
Ethical approval was obtained from the NHS Health Research Authority (ref: 18/SC/0522) and the Research and Development teams of the relevant NHS Trusts. Clinicians gave potential NHS participants an information sheet regarding the study with research team contact details for questions. All participants could take part online or by post via a pre-paid envelope. After reading the information sheet, participants read and completed a consent form and completed an eligibility screening phase which included an automated computerized bot test. Participants then provided demographic and MH information and completed the questionnaires. Upon completion, participants viewed the debrief sheet explaining the study rationale and signposting to sources of support and research team contact details to request further information and study findings. Participants were invited to have a £2 MH charity donation made on their behalf; no other incentives were provided. Two weeks later, those who opted-in online to provide test-retest data for the EIQ completed another consent form, provided their unique codeword (anonymously linking their data sets), completed the EIQ again and viewed a debrief sheet.

Statistical analysis
Power considerations
An a priori power calculation using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009) indicated a minimum sample size of 159 (53 per group) was required for 80% power to detect differences between the three groups at 0.05 two-tailed significance level, with a medium effect size of $f = 0.25$. This effect size was selected due to the research’s exploratory nature and large effect size of Cohen’s $d = 1$ reported by Clark et al. (1997) using a similar design.

Analysis
Data were analysed using IBM SPSS v24 according to the a priori data analytic plan. Categorical and continuous group characteristics were compared using Chi-square tests and one-way analysis of variance (ANOVAs), respectively. A two-way (group: psychosis, anxiety, or no MH difficulties) by item type (EIQ subscales: psychosis-symptoms, anxiety symptoms, and external-control items) mixed-model ANOVA was used for primary hypothesis testing (ANCOVA if indicated by differences in group severity or recovery),
with significant interactions examined using one-way independent measures ANOVAs and a priori contrasts for main effects of group by subscale. Least Significant Difference (LSD) was reported, or Dunnett’s T3 if Levene’s test indicated issues in equality of variance. An independent samples t-test was used to investigate differences in the measure of FOR between MH groups. Two linear hierarchical regression analyses were used to test whether the measures of MHA and FOR predicted negative interpretations of possible symptoms related to previous MH difficulty, one per MH group. The EIQ’s test–retest reliability was explored using Pearson’s correlation coefficient.

Results

Participants

Of the 244 respondents, 171 met the studies inclusion criteria. 54 were screened out as their main MH problem was not psychosis or an included anxiety disorder (OCD, GAD, panic disorder, SAD) (Table 1). Fourteen people with psychosis experience and five with anxiety experience were considered not sufficiently recovered in line with the pre-specified criteria. One participant was excluded as a lack of information concerning MH experience prevented group allocation. Of the 171 included in the study, six participants were recruited from MH services.

Categorical group characteristics

Categories were collapsed due to low cell frequencies to allow statistical comparison (see Table S1). Accordingly, Chi-square for gender was performed for males and females only. Due to outliers and missing data, number of episodes of main MH problem was categorized for comparison (Table 2).

There were no significant differences between the groups except for employment and relationship status. Partitioned Chi-square tests indicated significant differences in both

| Table 1. Self-reported main diagnosis for mental health groups |
|-------------------------------------------------------------|
| **Group**          | **Self-reported diagnosis** | **Number (%)** |
|-------------------|-----------------------------|----------------|
| Psychosis         | Schizophrenia               | 8 (24.2)       |
|                   | First episode psychosis     | 6 (18.2)       |
|                   | Bipolar with psychotic features | 4 (12.1)   |
|                   | Schizoaffective disorder    | 4 (12.1)       |
|                   | Psychotic depression        | 3 (9.1)        |
|                   | Delusional disorder         | 2 (6.1)        |
|                   | Brief psychotic disorder    | 2 (6.1)        |
|                   | Other                       | 4 (12.1)       |
|                   | **Total**                   | **33/33 (100)**|
| Anxiety           | Generalized Anxiety Disorder (GAD) | 47 (63.5)     |
|                   | Panic disorder (with or without agoraphobia) | 11 (14.9)     |
|                   | Social anxiety/social phobia | 8 (10.8)       |
|                   | Obsessive-Compulsive Disorder (OCD) | 8 (10.8)      |
|                   | **Total**                   | **74/77 (96)**

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Table 2. Categorical characteristics of participants by group

| Group | Recovery from psychosis Number (%) | Recovery from anxiety Number (%) | Control Number (%) | Total (all participants) Number (%) | Pearson’s Chi-square | χ² | df | p  |
|-------|------------------------------------|----------------------------------|-------------------|-------------------------------------|----------------------|-----|-----|----|
| n     | 33                                 | 77                               | 61                | 171                                 |                      |     |     |    |
| Gender |                                   |                                  |                   |                                     |                      |     |     |    |
| Male  | 7 (21.2)                           | 12 (15.6)                        | 16 (26.2)         | 35 (20.5)                           | 2.31                 | 2   | .319|
| Female | 24 (72.7)                          | 64 (83.1)                        | 45 (73.8)         | 133 (77.8)                          |                      |     |     |    |
| Gender non-conforming | 1 (3)                             | 1 (1.3)                          | 0                 | 2 (1.2)                             |                      |     |     |    |
| Prefer not to say | 1 (3)                             | 0                                | 0                 | 1 (0.6)                             |                      |     |     |    |
| Educational level |                                  |                                  |                   |                                     |                      |     |     |    |
| No formal education | –                                 | –                                | –                 | –                                   | 0.5                  | 2   | .779|
| Primary |                                  | –                                | –                 | –                                   |                      |     |     |    |
| Secondary (GCSE’s/O-levels) | 2 (6.1)                           | 1 (1.3)                          | 2 (3.3)           | 5 (2.9)                             |                      |     |     |    |
| A-levels | 3 (9.1)                           | 7 (9.1)                          | 5 (8.2)           | 15 (8.8)                            |                      |     |     |    |
| Diploma or professional qualification | 6 (18.2)                         | 3 (9.1)                          | 4 (6.6)           | 13 (7.6)                            |                      |     |     |    |
| Undergraduate degree | 10 (30.3)                          | 27 (35.1)                        | 19 (31.1)         | 56 (32.7)                           |                      |     |     |    |
| Postgraduate degree | 11 (33.3)                          | 34 (44.2)                        | 19 (31.1)         | 64 (37.4)                           |                      |     |     |    |
| PhD | 1 (3)                             | 5 (6.5)                          | 10 (16.4)         | 16 (9.4)                            |                      |     |     |    |
| Prefer not to say | –                                 | –                                | –                 | –                                   |                      |     |     |    |
| Other | –                                 | –                                | 2 (3.3)           | 2 (1.2)                             |                      |     |     |    |
| Relationship status |                                  |                                  |                   |                                     |                      |     |     |    |
| Single | 15 (45.5)                          | 17 (22.1)                        | 11 (18)           | 43 (25.1)                           | 7.92*                | 2   | .018|
| In a relationship | 6 (18.2)                           | 24 (31.2)                        | 16 (26.2)         | 46 (26.9)                           |                      |     |     |    |
| Co-habiting | 1 (3)                             | 13 (16.9)                        | 14 (23)           | 28 (16.4)                           |                      |     |     |    |
| Married | 10 (30.3)                          | 21 (27.3)                        | 17 (27.9)         | 48 (28.1)                           |                      |     |     |    |
| Divorced | 1 (3)                             | 2 (2.6)                          | 3 (4.9)           | 6 (3.5)                             |                      |     |     |    |
| Widowed | –                                 | –                                | –                 | –                                   |                      |     |     |    |
| Prefer not to say | –                                 | –                                | –                 | –                                   |                      |     |     |    |
| Other | –                                 | –                                | –                 | –                                   |                      |     |     |    |

Continued
| Group                        | Recovery from psychosis | Recovery from anxiety | Control | Total (all participants) | Pearson’s Chi-square |
|------------------------------|--------------------------|-----------------------|---------|--------------------------|----------------------|
|                              | Number (%)               | Number (%)            | Number (%) | Number (%)               |                      |
|                              | v                        | df                    | p       |                          |                      |
| Ethnicity                    |                          |                       |         |                          |                      |
| Asian                        | 2 (6.1)                  | 2 (2.6)               | 3 (4.9) | 7 (4.1)                  | 1.34                 | 2  .615             |
| Black                        | 2 (6.1)                  | -                     | 2 (3.3) | 4 (2.3)                  |                      |                    |
| Caucasian                    | 27 (81.8)                | 69 (89.6)             | 53 (86.9)| 149 (87.1)              |                      |                    |
| Mixed background             | 2 (6.1)                  | 6 (7.8)               | 2 (3.3) | 10 (5.8)                 |                      |                    |
| Prefer not to say            | –                        | –                     | 1 (1.6) | 1 (0.65)                 |                      |                    |
| Other                        | –                        | –                     | –       | –                        |                      |                    |
| Employment status            |                          |                       |         |                          |                      |
| Paid employment              | 18 (54.5)                | 58 (75.3)             | 51 (83.6)| 127 (74.3)              | 16.73*               | 4  .002             |
| Student                      | 11 (33.3)                | 19 (24.7)             | 7 (11.5)| 37 (21.6)               |                      |                    |
| Voluntary work               | 1 (3)                    | 3 (3.9)               | 2 (3.3) | 6 (3.5)                  |                      |                    |
| Sick leave                   | 2 (6)                    | 4 (5.2)               | -       | 6 (3.5)                  |                      |                    |
| Homemaker                    | 1 (3)                    | –                     | 2 (3.3) | 3 (1.8)                  |                      |                    |
| Unemployed                   | 5 (15.2)                 | 4 (5.2)               | 1 (1.6) | 10 (5.8)                 |                      |                    |
| Other                        | 1 (3)*                   | 1 (1.3)*              | 1 (1.6)*| 3 (1.8)*                 |                      |                    |
| Number of episodes           |                          |                       |         |                          |                      |
| 1                            | 11 (35.7)                | 13 (23.2)             | –       | 24 (28.6)                | 5.55                 | 3  .14              |
| 4-Feb                        | 10 (35.7)                | 19 (33.9)             | –       | 29 (34.5)                |                      |                    |
| 19-May                       | 6 (21.4)                 | 12 (21.4)             | –       | 18 (21.4)                |                      |                    |
| 20+                          | 1 (3.6)                  | 12 (21.4)             | –       | 13 (15.5)                |                      |                    |
| n                            | 28                       | 56                    | –       | 84                       |                      |                    |
| Treatment for main MH problem|                          |                       |         |                          |                      |
| Yes                          | 32 (97)                  | 75 (97.4)             | –       | 107 (97.3)               | 0.016                | 1  .9               |
| No                           | 1 (3)                    | 2 (2.6)               | –       | 3 (2.7)                  |                      |                    |

df, degrees of freedom.

Total percentage over 100% as multiple selections allowed; *Significant difference between groups at p < .05 level.
employment and relationship status between the psychosis and anxiety/control groups, 
\( p < .001 \), however, not between anxiety and control \( p > .05 \).

**Continuous group characteristics**

One-way ANOVAs (see Table 3) indicated no significant main effects of group on age or MHAI-awfulness. Significant main effects of group were found for GAD-7, PHQ-9, WSAS, WSAS-worst, ReQoL, and MHAI scores. Levene’s test was significant for PHQ-9 \( (p = .001) \) and WSAS \( (p = .049) \) indicating unequal group variances, therefore, Dunnett T3 was used for between groups multiple comparisons of these variables. The anxiety and control groups differed significantly in levels of anxiety (GAD-7). For all other variables, the control group differed significantly from the two MH groups, however, the psychosis and anxiety groups did not.

**Recovery status of mental health groups**

No significant difference was found between the psychosis \( (M = 7.79, SD = 1.14) \) or anxiety \( (M = 7.92, SD = 1.10) \) groups in self-rated recovery, \( t(108) = -.62, p = .537 \), with a mean score of 7 indicating ‘moderately agree’ and 8 ‘agree’. The current self-rated severity of symptoms for the psychosis \( (M = 2.67, SD = 1.10) \) and anxiety groups \( (M = 3.10, SD = 1.12) \) also did not significantly differ, \( t(108) = -1.88, p = .062 \). A mean score of 2 corresponded to ‘very mild’ and 3 to ‘mild’ current symptoms. For the MH groups, the mean PHQ-9 score was 9.05 (mild depression), the mean GAD-7 score was 7.44 (mild anxiety). The mean WSAS score was 15.17, falling within the 10–20 range associated with significant impairment in functioning but less severe symptoms (Mundt et al., 2002). Furthermore, for the MH groups, the mean ReQoL score was 24.04; on the borderline of the clinical range cut-off for (0–24) (Keetharuth et al., 2017). Considered together, the research team concluded the sample was sufficiently recovered to proceed to hypothesis testing.

**Primary hypothesis**

A mixed-model ANOVA with group (psychosis, anxiety, and control) as the between-subject and item type as the within-subject variable (psychosis-like, anxiety-like, and external-control) (see Figure 1). Mauchly’s test of sphericity indicated the assumption of sphericity was not met, Greenhouse-Geisser \( (2) = .94, p = .004 \), therefore, Greenhouse-Geisser p’s were reported. There were significant main effects of item type, \( F(2, 330) = 5.65, G.G p = .004 \) and group, \( F(2, 168) = 16.31, p < .001 \). These effects were modified by a significant group by item type interaction, \( F(4, 336) = 7.13, G.G p < .001 \).

As the interaction was significant, pre-planned one-way ANOVAs (simple main effects) were conducted by group for each of the three subscales (Table 4). Levene’s test indicated a significant issue with homogeneity of variance for the psychosis-symptom subscale \( (p = .007) \) and control-item subscale \( (p = .017) \), therefore, Dunnett’s T3 reported for these subscales (Table 5).

There were significant differences in total negative interpretations of psychosis symptoms between all groups, with the psychosis group significantly more likely to interpret psychosis items negatively than the anxiety \( (p = .036) \) and control groups \( (p < .001) \), and the anxiety group more likely to negatively interpret these items than the control group \( (p = .003) \) (Table 5).
Table 3. Continuous characteristics of participants by group

|                     | Recovery from psychosis Mean (SD) | Recovery from anxiety Mean (SD) | Control Mean (SD) | ANOVA |
|---------------------|-----------------------------------|--------------------------------|------------------|-------|
| Age                 | 35.44 (10.46)                     | 32.34 (10.60)                  | 35.49 (12.47)    | 1.63  |
|                     |                                   |                                |                  | 2, 169| .2    |
| Anxiety (GAD-7)     | 6.21 (5.78)                       | 7.96 (5.06)                    | 5.05 (4.44)      | 5.8   |
|                     |                                   |                                |                  | 2, 170| .003  |
| Low mood (PHQ-9)    | 9.06 (7.57) ^a                    | 9.04 (6.846) ^a                | 5.18 (4.61)      | 7.38  |
|                     |                                   |                                |                  | 2, 170| .001  |
| Functioning (WSAS)  | 14.20 (10.36) ^a                  | 15.58 (7.89) ^a                | 7.72 (7.62)      | 16.02 |
|                     |                                   |                                |                  | 2, 170| <.001 |
| Functioning at worst (WSAS-worst) | 33.36 (9.64) ^a            | 30.14 (8.46) ^a                | 12.33 (10.29)    | 80.13 |
|                     |                                   |                                |                  | 2, 170| <.001 |
| Quality of life (ReQoL) | 22.76 (9.78) ^a            | 24.58 (8.26) ^a                | 28.10 (6.93)     | 5.47  |
|                     |                                   |                                |                  | 2, 170| <.001 |
| Mental Health Anxiety (MHAI) | 20.24 (827) ^a           | 19.44 (7.51) ^a                | 9.15 (6.49)      | 40.80 |
|                     |                                   |                                |                  | 2, 168| <.001 |
| Mental Health Anxiety-awfulness (MHAI-awful) | 4.97 (3.20)                | 4.70 (2.56)                    | 4.02 (2.36)      | 1.79  |
|                     |                                   |                                |                  | 2, 168| .170  |
| Fear of Relapse (FORSE) | 51.21 (13.41)            | 47.59 (13.37)                  | –                | 1.30  |
|                     |                                   |                                |                  | 107   | .197  |

(a,b) Differing subscripts letters denote significant differences between these groups (p < .05).
*Significant difference between groups at p < .05 level.
Table 4. Differences between groups by EIQ subscale

| EIQ Subscale          | Recovery from psychosis Mean (SD) | Recovery from anxiety Mean (SD) | Control Mean (SD) | ANOVA                  |
|-----------------------|-----------------------------------|---------------------------------|-------------------|------------------------|
| Psychosis-symptoms    | 18.79 (6.94)                      | 15.03 (7.11)                    | 11.36 (5.65)      | 14.14* 2.168 <.001 .38 |
| Anxiety symptoms      | 18.39 (6.06)                      | 17.66 (6.13)                    | 12.15 (5.15)      | 19.36* 2.168 <.001 .43 |
| External-control      | 16.79 (6.55)                      | 18.60 (6.71)                    | 14.18 (5.14)      | 8.76* 2.168 <.001 .31  |

*Significant difference between groups at p < .05 level.

Figure 1. Interaction of group by EIQ item type for total negative interpretations, with CI (95%) error bars.

Table 5. Mean differences, standard errors, significance and confidence internals between individual groups by EIQ subscale

| EIQ Subscale          | Groups  | Mean Diff | SE  | p      | 95% CI    |
|-----------------------|---------|-----------|-----|--------|-----------|
| Psychosis-symptoms    | RP-RA*  | 3.76      | 1.45| .036   | 0.20 to 7.32 |
|                       | RP-C*   | 7.43      | 1.41| <.001  | 3.96 to 10.89 |
|                       | RA-C*   | 3.67      | 1.09| .003   | 1.04 to 6.29  |
| Anxiety symptoms      | RP-RA   | 0.73      | 1.20| .544   | −1.64 to 3.11 |
|                       | RP-C*   | 6.25      | 1.25| <.001  | 3.78 to 8.71  |
|                       | RA-C*   | 5.51      | −0.99| <.001  | 3.56 to 7.47  |
| External-control      | RP-RA   | −1.81     | 1.37| .469   | −5.17 to 1.55  |
|                       | RP-C    | 2.61      | 1.32| .148   | −0.63 to 5.85  |
|                       | RA-C*   | 4.42      | 1.01| <.001  | 1.98 to 6.85  |

Notes: C, Control group; RA, Recovery from anxiety; RP, Recovery from psychosis.
Significant difference between groups at p < .05 level.
For the anxiety subscale (LSD) there were significant differences between the psychosis and control groups \( (p < .001) \), and the anxiety and control groups \( (p < .001) \), on total negative interpretations. No significant difference was found on negative interpretations of anxiety symptoms between the psychosis and anxiety groups \( (p = .54) \), therefore, both MH groups were significantly more likely to negatively interpret anxiety items than controls.

There were significant differences between the anxiety and control group in total negative interpretations of external-control items, however, not between the psychosis and anxiety groups \( (p = .469) \) or psychosis and control groups \( (p = .148) \). The anxiety group were significantly more likely to negatively interpret external-control items than the control group \( (p < .001) \).

**Secondary hypotheses**

An independent samples \( t \)-test indicated no significant difference in fear of relapse between the two MH groups, \( t(107) = 1.30, p = .197, d = .27 \), with a small effect size (Table 3).

A hierarchical multiple linear regression was performed to consider whether MHA and FOR predict negative interpretations of psychosis symptoms in the psychosis group. Tests indicated no concern regarding multicollinearity (VIF = 1.85). MHA and FOR were not significant predictors, with the model accounting for 6.5% of variance in negative interpretations (Table 6).

A hierarchical multiple linear regression was used to test whether MHA and FOR predict negative interpretations of anxiety symptoms in the anxiety group. Tests indicated multicollinearity was not an issue (VIF = 1.49). A significant model \( (p < .001) \) accounting for 41.7% of variance in negative interpretations of anxiety symptoms was found (Table 6), with MHA being the only significant predictor.

**Discussion**

This study investigated whether people in recovery from psychosis and anxiety negatively interpret symptom-like experiences related to their previous MH difficulties, as a first step towards exploring the possible role of negative symptom appraisals in relapse. People in recovery from psychosis interpreted psychosis-like experiences significantly more negatively than the other two groups. The anxiety and psychosis groups both interpreted anxiety-related experiences significantly more negatively than the controls. The anxiety

| DV | Model | \( R^2 \) | Adjusted \( R^2 \) | \( F \) change | B | \( \beta \) | t | p |
|---|---|---|---|---|---|---|---|---|
| (a) Psychosis-symptoms | MHA | .123 | .065 | 2.10 | .14 | .17 | .71 | .481 |
| | FOR | .11 | .22 | .55 | .359 |
| (b) Anxiety- symptoms | MHA | .432 | .417 | 27.80 | .50 | .60 | 5.61 | <.001* |
| | FOR | .04 | .09 | .82 | .416 |

DV, Dependent variable.

*Significant at \( p < .001 \) level.
group interpreted external-control items significantly more negatively, but did not differ from the psychosis group; nor did they differ from this group in terms of anxiety, depression, MHA, recovery or severity, suggesting the findings are unlikely to be accounted for by generally interpreting situations more negatively or variations in these other factors.

The finding that people in recovery from psychosis were relatively more likely to interpret possible psychosis symptoms negatively is consistent with the hypothesized role of appraisals in psychosis recurrence (Birchwood & Spencer, 2001; Gumley & Schwannauer, 2006). This also fits with research that fear of relapse predicts actual relapse (Gumley et al., 2015) and the proposed application of cognitive models (Rachman, 2012; Salkovskis and Warwick, 1986) to relapse. These findings indicate that having prior experience of psychosis means people are more likely to interpret possible psychosis symptoms as threatening. Considering arousal and affect-based models of relapse in psychosis (Gumley and Schwannauer, 2006), this sense of threat is likely to increase negative emotions and physiological arousal, and potentially counterproductive safety-seeking behaviours such as avoidance delayed help-seeking and hypervigilance. These cognitive, emotional and behavioural responses may, in turn, have the effect of increasing unusual experiences, contributing to worsening relapse and potentially worse outcomes such as hospital admission, therefore, fulfilling catastrophic interpretations. This study provides the first step towards testing this hypothesized cycle (Birchwood & Spencer, 2001; Gumley and Schwannauer, 2006); that following prior experience of psychosis, appraising possible symptoms negatively (as indicative of relapse) may then increase anxiety, leading to further symptoms and thus create a self-fulfilling prophecy. As negative interpretations of possible symptoms similarly occurred in recovery from anxiety, a similar mechanism may also be present for this group.

People in recovery from psychosis were comparable to the anxiety recovery group for negative interpretations of anxiety-related symptoms. Whilst not specifically predicted, this is consistent with Morrison’s (2002) cognitive model of psychosis proposing interpreting anomalous experiences as threatening causes people to feel anxious. Anxiety is a common experience during psychosis (Freeman & Freeman, 2008), thus people likely also negatively interpret other signs related to their previous MH difficulties, not just positive psychosis symptoms.

Inconsistent with previous research (Jamalamadaka et al., 2020), FOR was not significantly higher in those in recovery from psychosis comparative to anxiety. This conflicting finding may be due to differences in the clinical comparison group as Jamalamadaka et al. (2020) included any MH difficulties without psychosis; FOR may also be of particular concern following anxiety. The FORSE was developed for psychosis and thus may lack specificity to relapse for the anxiety group as some items could relate to anxiety more generally.

When within-group associations were considered, neither MHA nor FOR significantly predicted negative interpretations of psychosis symptoms for the psychosis group. However, MHA did significantly predict negative interpretations of anxiety symptoms for the anxiety group. This result is surprising given previous research (Jamalamadaka et al., 2020), and suggests variance in negative interpretations for the psychosis group are due to factors not measured within this study. Insight (into symptoms) and self-stigma may be potential candidates, as there is more research supporting their relevance to outcomes for psychosis than anxiety disorders (Ghaemi & Pope, 1994). For example, people who view anomalous experiences as relating to psychosis may be more likely to negatively interpret them, thus insight into symptoms may moderate the relationship with MHA or FOR.
Increased insight within psychosis is associated with recovery but also negative outcomes such as depression (Lincoln, Lüllmann, & Rief, 2007) and lower psychological well-being; relationships which are reportedly mediated by self-stigma (Cavelti, Kvrgic, Beck, Rüsch, & Vauth, 2012; Norman, Windell, Lynch, & Manchanda, 2011).

Clinical implications
Hewitt and Birchwood (2002) highlighted the importance of self-monitoring to reduce psychosis relapse. As suggested by a review of early signs monitoring (Eisner et al., 2013), this study’s findings indicate encouraging self-monitoring may be unhelpful if this results in hypervigilance and catastrophizing of low-level symptoms. Therefore, clinicians should consider attending to how people relate to their MH experience (both for psychosis and anxiety disorders) and to possible symptoms when in recovery, to ensure that self-monitoring leads to helpful responses rather than being potentially counterproductive. These results indicate interventions aiming to alter people’s relationship with low-level anomalous experiences may reduce relapse, for example responding mindfully, consistent with MBCT for reducing relapse of depression (Teasdale et al., 2000).

The inclusion of interventions drawing on CBT principles to address catastrophic interpretations of possible symptoms may potentially be a useful addition to relapse prevention work. Consistent with panic and health anxiety treatment (Clark, 1986; Salkovskis & Warwick, 1986), this could involve offering people alternative, less threatening explanations for their experiences and testing these out using behavioural experiments.

The findings also tentatively support the idea of viewing recovery as relating to quality of life and functioning, rather than dependent on the absence of symptoms, as potentially helpful (Slade & Longden, 2015). If recovery is not dependent on experiencing symptoms, then people may be less likely to interpret the occurrence of anomalous experiences negatively.

Implications for future research
The findings suggest further research investigating how people in recovery interpret, and subsequently respond emotionally and behaviourally to possible symptoms may be beneficial to better understand and prevent relapse. Tailoring this to people’s idiosyncratic experience of MH difficulties may be useful to increase validity. Longitudinal research to explore whether negative interpretations play a causal role and are predictive of subsequent relapse may be particularly valuable.

Qualitative research to further elucidate how people may relate to possible symptoms of their previous MH difficulties may also be valuable. Robust research including assessment of mental health diagnoses and narrowly defined clinical comparison group inclusion criteria may be useful, as would further exploration of FOR across clinical groups to clarify the specificity of this concern to psychosis or/and anxiety.

Limitations
Online data collection potentially restricted the sample’s representativeness by excluding people without internet access. Postal completion was offered to address this but with limited uptake. The sample’s homogenous nature may also limit generalizability of results; the majority of participants were Caucasian women with graduate education in paid
employment. Anonymous responses meant self-reported previous MH experience, recovery status and not meeting exclusion criteria were not verifiable. As group inclusion criteria relied on self-report, we cannot be certain of the accuracy of participants’ stated primary MH problem. A validated measure of recovery such as the Recovery Assessment Scale (Law, Morrison, Byrne, & Hodson, 2012) would have increased screening robustness comparative to the self-report Likert scale chosen for brevity and replication (Jamalamadaka et al., 2020).

**Conclusion**

This study suggests people in recovery from psychosis or anxiety appraise possible symptoms of their previous difficulties negatively relative to those without prior MH experience. These findings indicate this may be a promising area warranting further research to explore the potential relationship between negative interpretations of possible symptoms and relapse. Attending to specific appraisals of possible symptoms when encouraging early signs monitoring as part of relapse prevention planning may be beneficial.

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**Conflicts of interest**

All authors declare no conflict of interest.

**Author contributions**

Rebecca Sired, DClinPsy (Conceptualization; Formal analysis; Investigation; Methodology; Project administration; Writing – original draft; Writing – review & editing)
Emma Griffith (Conceptualization; Investigation; Methodology; Project administration; Supervision; Writing – review & editing)
Taruna Jamalamadaka (Conceptualization; Methodology; Supervision; Writing – review & editing)
Paul Salkovskis (Conceptualization; Formal analysis; Investigation; Methodology; Project administration; Supervision; Writing – review & editing)

**Data Availability Statement**

The data that support the findings of this study are available from the corresponding author upon reasonable request.
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**Supporting Information**

The following supporting information may be found in the online edition of the article:

**Table S1.** Collapsed categorical categories for statistical analysis.

**Appendix S1.** Experiences Interpretation Questionnaire (EIQ).