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The Beliefs about Paranoia Scale: Confirmatory factor analysis and tests of a metacognitive model of paranoia in a clinical sample

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Running Head: Metacognition and paranoia

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This study aimed to confirm the factor structure of the Beliefs about Paranoia Scale (BaPS), a self-report measure to assess metacognitive beliefs about paranoia, and to test hypotheses of a metacognitive model. We hypothesised that positive and negative beliefs about paranoia would be associated with severity of suspiciousness, and that the co-occurrence of positive and negative beliefs would be associated with increased suspiciousness. A total of 335 patients meeting criteria for a schizophrenia spectrum disorder completed the BaPS, the Positive and Negative Syndromes Scale (PANSS), and the Psychotic Symptom Rating Scales (PSYRATS). Confirmatory factor analysis verified that the three BaPS subscales (negative beliefs about paranoia, paranoia as a survival strategy, and normalizing beliefs) were an adequate fit of the data. Ordinal regression showed that positive beliefs about paranoia as a survival strategy and negative beliefs were both associated with severity of suspiciousness. This was the first study to show that the co-occurrence of positive and negative beliefs was associated with increased suspiciousness. All hypotheses were confirmed, suggesting that a metacognitive approach has utility for the conceptualization of paranoia. Clinical implications suggest a role for metacognitive therapy, including strategies such as detached mindfulness and worry postponement.

Key words: persecutory delusions; schizophrenia, metacognition; cognitive; questionnaire

1. Introduction

Paranoia has been defined as 'a disordered mode of thought that is dominated by an intense, irrational, but persistent mistrust or suspicion of people and a corresponding tendency to interpret the actions of others as deliberately threatening or demeaning' (Fenigstein, 1984). Freeman and Garety (2000) have since defined paranoid ideation as the belief that harm is occurring or is going to occur, and that the persecutor has the intention to cause harm to the person. It is a frequent symptom of psychosis but paranoid thinking is also common in the general population (Freeman et al., 2011), which raises questions concerning the factors which contribute to more severe or clinical paranoia (Freeman et al., 2005).

In order to distinguish between the content of paranoid ideation, and the metacognitive processes that drive paranoid thinking, paranoia has also been conceptualized as a response to an initial perception of interpersonal threat (Morrison et al., 2005). The self-regulatory executive function (S-REF) model of psychological dysfunction (Wells and Matthews, 1994) provides a useful framework for understanding paranoia as a motivated response for managing perceived threat, and the transition to perseverative and clinically distressing paranoia. According to the S-REF model, psychological distress is maintained by a pattern of responses called the 'cognitive attentional syndrome' (CAS) consisting of worry or rumination, fixation of attention on threat, and unhelpful coping behaviours. The CAS is controlled by metacognitive beliefs, including positive beliefs about the need to engage in aspects of the CAS which drive more frequent use of those responses (e.g. 'worry means I'll be prepared'), and negative beliefs about the uncontrollability, dangerousness or importance of thoughts or feelings (e.g. 'my anxiety could make me go crazy') which result in distress and disability (Wells, 2009). Metacognitive theory predicts that the co-occurrence of positive and negative beliefs is especially problematic, resulting in a state of meta-cognitive dissonance, conflicts in self-regulation and the maintenance of distress (Wells, 2009). For example, in the metacognitive model of generalized anxiety disorder (GAD), positive beliefs about worry are considered normal but contribute to repeated worry episodes of longer duration, which can lead to a high level of automatization, the experience of disruptive worry, and the development of negative beliefs about worry as being dangerous or uncontrollable (Wells, 1995). It has been stated that 'because the person with GAD has negative beliefs about worrying and also feels that it is necessary to worry in response to negative thought triggers, a self-regulatory conflict exists' (Wells and Carter, 2001). Negative metabeliefs are linked to distress and catastrophisation about worry, counterproductive attempts to suppress worry, and have been shown to define pathological worry in GAD (Wells and Carter, 2001).

Applying these principles to a metacognitive model of paranoia, Morrison et al. (2011) outlined how paranoid thoughts could be engaged with or not, in a similar way to the model of worry in GAD (Wells, 1995). A trigger situation or event (e.g. going out and seeing a young male, or having an intrusive image of violence) could activate positive beliefs about paranoia as a method of coping with the perceived threat (e.g., 'It is important to be alert for danger in order to survive'). This could then lead to specific paranoid thoughts (e.g., 'That man is going to attack me'), and in turn, the activation of negative beliefs (e.g., 'My paranoia is uncontrollable') and catastrophization (e.g., 'I'm going mad and will end up in hospital again'), leading to emotional distress and attempts to control or avoid paranoia which may maintain the problem (e.g. avoidance behaviour, thought suppression and substance use). Simultaneously holding positive and negative beliefs is thought to predict more severe paranoia, as people vacillate between motives to engage with paranoia versus attempts to suppress it, and experience a sense of loss of control over cognition and emotion and sustained distress as a consequence.

There is increasing evidence for the role of metacognition in paranoia. Freeman and Garety (1999) found that meta-worry about the uncontrollability of delusion relevant thoughts was highly correlated with delusional distress. This suggests that the distress caused by a persecutory delusion is not simply due to the content of paranoid thoughts per se (Freeman and Garety, 1999) but also depends on how people relate and respond to their psychotic experiences (Chadwick, 2014). In non-clinical samples, positive beliefs about worry and negative beliefs about the uncontrollability of thoughts were associated with paranoid ideation (Laroi and Van der Linden, 2005; Varese et al., 2011). Furthermore, positive and negative metacognitions were found to be elevated among people with persecutory delusions (Morrison and Wells, 2003). However, these studies used general measures of metacognitive beliefs about worry and thoughts, such as the Metacognitions Questionnaire (Cartwright-Hatton and Wells, 1997) rather than a measure specific to paranoid ideation.

Morrison et al. (2005) developed the Beliefs about Paranoia Scale (BaPS) to assess metacognitive beliefs about paranoia. The measure revealed four subscales (negative beliefs about paranoia, positive beliefs about paranoia as a survival strategy, general positive beliefs about paranoia, and normalizing beliefs e.g. 'paranoia is just human nature') in a non-clinical sample (Morrison et al., 2005). Consistent with the metacognitive model, positive beliefs about paranoia as a survival strategy were associated with more frequent paranoid thoughts and negative beliefs were associated with distress due to delusional ideation. Gumley et al. (2011) subsequently developed a brief 18-item version of the BaPS using a non-clinical sample, which had a three-factor structure (negative beliefs about paranoia, paranoia as a survival strategy, and normalizing beliefs), and both negative beliefs

and survival beliefs were predictive of paranoia frequency and distress. Gumley et al., (2011) rejected the fourth factor of general positive beliefs (e.g. 'paranoia can make life seem more exciting and exhilarating') due to inadequate fit of the four-factor model. The three-factor structure and good internal consistency of the 18-item BaPS has since been replicated in a sample of 122 patients with a diagnosis of schizophrenia spectrum disorder (Morrison et al., 2011). Survival beliefs were found to be associated with severity of suspiciousness, and negative beliefs were higher among those meeting diagnostic criteria for persecutory delusions. A comparison with a non-clinical control group also found that patients with psychosis scored higher than non-patients on both survival and negative beliefs (Morrison et al., 2011). However, this study did not find that the co-occurrence of positive and negative beliefs about paranoia interacted to predict patient status. There were some limitations in that PANSS outcome scores and diagnostic data on persecutory delusions were only available for a subsample of 60 patients. Therefore, the use of a binary outcome of more generic patient status may have resulted in a lack of power to detect the interaction effect, compared to the use of PANSS scores as an outcome. In summary, these studies provide increasing evidence for good psychometric properties of the BaPS and some support for a metacognitive model of paranoia. However, there is scope to examine the BaPS and the specific hypotheses of the metacognitive model in a larger clinical sample with more complete outcome data using the PANSS.

The present study aimed to confirm the three-factor structure of the BaPS in a large clinical sample, and to test hypotheses based on a metacognitive conceptualisation of paranoia. It was expected that the three subscales of the BaPS would be verified in the clinical sample. Based on a metacognitive model, it was hypothesised that i) negative beliefs about paranoia would be associated with distress due to delusional ideation; ii) both positive and negative beliefs about paranoia would be associated with increased suspiciousness ratings on the PANSS; and iii) their co-occurrence would be associated with higher severity of suspiciousness ratings on the PANSS.

2. Methods

2.1 Participants

All participants were involved in research trials of cognitive therapy that incorporated the study measures during the baseline assessments. Two of the studies have been published (Morrison et al., 2014a; Morrison et al., 2014b) and the other trial was ongoing at the time of writing (FOCUS trial; ISRCT number 99672552). All participants met International Classification of Diseases–tenth revision (ICD-10) criteria for schizophrenia, schizoaffective

disorder, or delusional disorder, or met entry criteria for an early intervention for psychosis service (operationally defined with the PANSS as a score of 4 or more on delusions or hallucinations) to allow for diagnostic uncertainty in early phases of psychosis.

2.2 Measures

The Beliefs about Paranoia Scale (BaPS) is a self-report questionnaire developed to measure metacognitive processes involved in paranoia by measuring positive and negative beliefs about paranoia. The BaPS consists of a number of attitudes and thoughts that people have expressed about paranoia based on clinical knowledge of patients experiencing persecutory delusions (Morrison et al., 2005). Each item is scored on a 4-point scale to measure conviction (1 = not at all, 2 = somewhat, 3 = moderately so, 4 = very much). The revised 18 item short-form version of the measure was developed in a non-clinical sample and was found to measure three factors of negative beliefs about paranoia, positive beliefs about paranoia as a survival strategy (hereafter referred to as survival beliefs), and normalizing beliefs (Gumley et al., 2011). These factors were replicated in a clinical sample (Morrison et al., 2011). The internal consistency of the measure (Cronbach's alpha) in the current sample was 0.88 for the total scale, and was 0.87, 0.88 and 0.89 for the survival, negative and normalizing subscales respectively.

The Positive and Negative Syndrome scale (PANSS) Kay et al., 1987) is a clinician-administered, 30-item semi-structured interview assessing positive symptomatology, negative symptomatology and general psychopathology. Previous studies have shown the reliability and validity of the measure (Kay et al., 1987). Inter-rater reliability was assessed in the current sample for those participating in trials with more than one rater. Intra-class correlation coefficients indicated good reliability between raters (mean 0.83, SD 0.12 (Morrison et al., 2014b) and mean 0.8, SD 0.07 for the ongoing FOCUS trial), and Cronbach's alpha within the current sample was 0.78. We used ratings on the PANSS 'suspiciousness/ persecution' item as the main outcome to assess clinical paranoia (defined on the PANSS as 'unrealistic or exaggerated ideas of persecution, as reflected in guardedness, a distrustful attitude, suspicious hypervigilance or frank delusions that others mean harm') and which we refer to as 'severity of suspiciousness' in the current study. We also included three other items from the PANSS thought to be associated with the experience of paranoia. The additional items were the 'delusions' item (defined as 'beliefs which are unfounded, unrealistic and idiosyncratic') and two items from the general psychopathology subscale: 'anxiety' ('subjective experience of nervousness, worry,

apprehension or restlessness, ranging from excessive concern about the present or future to feelings of panic') and 'active social avoidance' (diminished social involvement associated with unwarranted fear, hostility, or distrust'). All items are rated by the interviewer and scored between 1 (not present) and 7 (severe).

The *Psychotic Symptom Rating Scales (PSYRATS)* (Haddock et al., 1999) is a clinician-administered 17-item semi-structured interview assessing dimensions of auditory hallucinations and delusional beliefs. The reliability and validity of the measure has been previously examined, and the inter-rater reliability of each dimension of the measure (intra-class correlation) has been shown to range from 0.79 to 1.00, Haddock et al., 1999). Cronbach's alpha within the current sample was 0.90. In the current study, the six items of the delusions scale were examined which included i) the amount of preoccupation with beliefs (time spent thinking about the beliefs), ii) duration of preoccupation with beliefs (how long the belief persists when it comes into their mind), iii) conviction in the beliefs (how convinced they are that the beliefs are true), iv) amount of distress (whether the beliefs cause distress and for how much of the time), v) intensity of distress (how severe the distress feels) and vi) disruption (whether the belief interferes with activities, self-care or relationships). All items are scored from 0 to 4, with higher scores showing more severe phenomena.

2.3 Data analysis

AMOS version 22 (Arbuckle, 2013) was used to perform confirmatory factor analysis to test the goodness of fit of the BaPS to a three factor solution. The remaining analyses were performed using SPSS version 19.0 (IBM, Released 2010). Exploratory correlational analysis (Pearson's r) was initially used to present the overall associations between the BaPS subscales with the PANSS items and the PSYRATS delusions subscale. As a priori hypotheses were not specified for every association between the BaPS with the PANSS (4-items) and PSYRATS (6-items), the significance value for the correlation analysis was adjusted for multiple comparisons. In order to test the first hypothesis that negative beliefs about paranoia would be associated with distress due to delusional ideation, the specific correlation between BaPS negative beliefs about paranoia and PSYRATS amount and intensity of distress due to delusional ideation was examined. Descriptive data on mean BaPS subscale scores was presented for those with a lower score of 1 to 4 on the suspiciousness/ persecution item on the PANSS versus a higher score of 5 ('Moderate Severe') or above and significance values were generated via t-test. This cut-off point was chosen as consistent with one of the criteria for defining the presence of psychosis for entry

into clinical trials (whereby all participants must score at least 4 on PANSS delusions or hallucinations, or at least 5 on suspiciousness or persecution, conceptual disorganisation, or grandiosity).

Ordinal logistic regression was used to test the specific hypotheses that BaPS positive beliefs about paranoia would be associated with PANSS suspiciousness, that BaPS negative beliefs about paranoia would be associated with PANSS suspiciousness, and finally that the co-occurrence of positive and negative beliefs would be associated with higher severity of suspiciousness. To test the interaction hypothesis, the regression model included the subscale scores for negative beliefs, positive beliefs and the product term of these two variables. The subscale scores were standardized (z-scores) prior to creation of the product term (Miles and Shevlin, 2001). We used ordinal regression because the PANSS suspiciousness/ persecution item was a single item rated according to ordinal categories ('not present' to 'severe'). The assumption of proportional odds was met for the ordinal regression models (showing that the effect of the explanatory variables was consistent across each level of the ordinal outcome variable).

3. Results

3.1 Sample

The number of participants completing the study measures was 335. The mean age of the group was 40.6 years ($SD = 11.7$; range 17–73 years), 66.8% of participants were male and 91.5% were of White ethnicity, with the remainder being from Black (5.2%), Asian (2.7%) and other ethnic groups (0.6%). The BaPS data were normally distributed (Kolmogorov-Smirnov statistic 0.04, $p = 0.2$). The mean total PANSS score of the sample was 79.2 ($SD 13.7$), which equates to a 'moderately' ill population on average (Leucht et al., 2005).

3.2 Confirmatory factor analysis

The three component solution was modelled with data from all 335 participants. All standardised regression weights were found to be acceptable, as they were above the cut-off of 0.5 (range: 0.60 - 0.88, Hair, Black et al., 2014); except for one item on the negative beliefs scale which had a regression weight of 0.47 ('my paranoia gets exaggerated'). The correlations between the each of the three factors were found to be in moderate range and were as follows: survival (positive) beliefs and negative beliefs = 0.33, survival beliefs and

normalising beliefs = 0.47, and negative beliefs and normalising beliefs = 0.31). A well-fitting model is indicated by a non-significant chi-square result. In this case, the chi-square found was significant ($\chi^2 (132) = 358.59, p < 0.001$). However, the chi-square result is extremely sensitive (Hu and Bentler, 1995) and can be problematic in large samples (Hoe, 2008) and so the adjusted chi-square (CMIN/DF¹) was examined for a more reliable indication of fit. The CMIN/DF is considered acceptable if it is lower than 3 (Hoe, 2008) and was found here to be 2.72. The RMSEA² indicates good fit if it is below 0.08 (Hoe 2008) and ideally below 0.06 (Hu and Bentler, 1999). The RMSEA found here was 0.07, and so indicated moderate fit. The GFI³ was 0.89 and so was just below the suggested cut off of above 0.9. The SRMR⁴ was 0.07, and so was below the accepted cut-off of < 0.08 (Hu and Bentler, 1999). The CFI⁵ met the recommended cut-off of above 0.90 (0.93), as did the TLI⁶ (0.92, Hoe, 2008). Therefore, the minimum requirement was met for most indices and the model was considered an adequate fit.

Modification indices suggested allowing several of the error terms to correlate within each subscale. These made theoretical sense given that pairs of questionnaire items often share variance apart from the variance accounted for by the factors, due to item content overlap (Floyd and Widaman, 1995). Allowing correlation of the error terms improved model fit as follows: $\chi^2 (123) = 205.05, p < 0.001$; CMIN/DF = 1.67, RMSEA = 0.05, GFI = 0.94, SRMR = 0.07, CFI = 0.98, TLI = 0.97. Except for the chi-square, which remained significant, all other indices and the adjusted chi-square indicated that the model was a good fit. Figure 1 summarises the modified model and shows the standardized regression weights for each of the BaPS items onto its corresponding subscale.

[Insert Figure 1 about here]

¹ CMIN/DF = Chi-square / Degrees of freedom ratio

² RMSEA = Root mean square error of approximation

³ GFI = Goodness of fit SRMR = Standardised root mean square residual index

⁴ SRMR = Standardised root mean square residual

⁵ CFI = Comparative fit index

⁶ TLI = Tucker-Lewis Index

3.3 Associations between the BaPS, PANSS and PSYRATS

Table 1 shows correlations between the BaPS subscales, PSYRATS delusions subscale and items from the PANSS (measuring delusions, suspiciousness/ persecution, anxiety and active social avoidance). As hypothesised according to a metacognitive model, BaPS negative beliefs were significantly associated with PSYRATS amount and intensity of distress due to delusional ideation ($r = 0.38, p < 0.001$ and $r = 0.33, p < 0.001$ respectively). The BaPS negative beliefs subscale was also significantly correlated with the anxiety and social avoidance items of the PANSS. Both the BaPS negative beliefs and BaPS survival beliefs subscale were correlated with suspiciousness ratings on the PANSS as expected. Normalizing beliefs were not correlated with any of the PANSS or PSYRATS items.

[Insert Table 1 about here]

Table 2 shows the mean BaPS subscale scores among individuals classified as having moderate to severe scores on the PANSS suspiciousness/ persecution item (5 or above) versus lower scores. Significant differences were observed for the BaPS total score as well as the survival and negative beliefs subscales.

[Insert table 2 about here]

3.4 Ordinal regression analyses

3.4.1 BaPS survival beliefs and negative beliefs as predictors of PANSS suspiciousness

As hypothesised, the BaPS negative and survival beliefs both predicted PANSS suspiciousness ratings. The subscales predicted PANSS suspiciousness independently of one another when entered together with normalizing beliefs into a multivariate ordinal logistic regression model (Table 3). The BaPS negative and survival subscales remained significant predictors after adding PANSS anxiety and depression scores to the model: the odds ratios or survival and negative beliefs were 1.06, 95%CI (1.01, 1.12), $p = 0.001$ and 1.08, 95%CI (1.03, 1.13), $p = 0.012$ respectively.

[Insert Table 3 about here]

3.4.2 Co-occurring BaPS survival and negative beliefs as predictors of PANSS suspiciousness

As hypothesized, the co-occurrence of BaPS negative and survival beliefs was associated with greater severity of PANSS suspiciousness as shown by the significant interaction term (Table 4). The entry of the interaction term removed the independent effect of survival beliefs as a predictor of PANSS suspiciousness, though the negative subscale remained significant. The interaction term also remained significant after controlling for PANSS anxiety and depression (OR 1.27, 95%CI (1.03, 1.56), $p = 0.024$).

[Insert Table 4 about here]

Figure 1 details the nature of the interaction. The regression lines show that BaPS survival beliefs were only associated with PANSS suspiciousness for those participants with moderate to high ratings on BaPS negative beliefs. Regarding the relative effects, the correlation coefficients between BaPS survival beliefs and PANSS suspiciousness for the different levels of BaPS negative beliefs (split by tertiles) were $r = -0.02$ ($p = 0.836$) for low negative beliefs, $r = 0.146$ ($p = 0.136$) for moderate negative beliefs and $r = 0.308$ ($p = 0.001$) for high negative beliefs. Considering the relationship between BaPS negative beliefs and PANSS suspiciousness at different levels of BaPS survival beliefs (split into tertiles) reveals $r = 0.195$ ($p = 0.03$), $r = 0.317$ ($p < 0.001$) and $r = 0.429$ ($p < 0.001$) for low, medium and high levels of survival respectively. In the whole sample, the correlation between BaPS survival beliefs and PANSS suspiciousness was 0.220 ($p < 0.001$) and the correlation between BaPS negative beliefs and PANSS suspiciousness was 0.319 ($p < 0.001$).

[Insert Figure 2 about here]

4. Discussion

4.1 Main findings

The three BaPS subscales of survival, negative and normalizing beliefs were confirmed in a large clinical sample. The three subscales were at least an adequate fit of the data, and the modified model showed a good fit of the data. As hypothesised by a metacognitive conceptualization, negative beliefs about paranoia were associated with distress due to delusional ideation on the PSYRATS. Our hypotheses that survival (positive beliefs) and negative beliefs about paranoia would both predict suspiciousness ratings on the PANSS were also supported. Moreover, the co-occurrence of survival and negative beliefs was found to be associated with higher PANSS suspiciousness ratings, which is consistent with a metacognitive model of paranoia (Morrison et al., 2011).

4.2 Findings in relation to previous studies

The three subscales of the BaPS replicates two previous studies of the 18-item version of the measure (Gumley et al., 2011; Morrison et al., 2011) which suggests reliability of its factor structure. The finding that both survival beliefs and negative beliefs about paranoia were predictive of the severity of suspiciousness, as measured by the PANSS, provides additional support for the metacognitive model of paranoia (Morrison et al., 2011), and therefore highlights that the severity of paranoia is not just due to the content of paranoid thoughts per se. The metacognitive model of paranoia outlines how positive metabeliefs (e.g. viewing paranoia as a survival strategy) represent motivation to engage with paranoia as a cognitive attentional response for coping with perceived interpersonal threat. Negative metabeliefs (e.g. perceiving paranoia as uncontrollable or harmful), results in clinically distressing paranoia. The findings are consistent with previous tests of the measure in a smaller clinical sample (Morrison et al., 2011) and non-patient groups (Gumley et al., 2011; Morrison et al., 2005). The findings also add to a growing body of evidence for the role of metacognition in paranoia (Freeman and Garety, 1999; Laroie and Van der Linden, 2005; Morrison and Wells, 2003; Varese et al., 2011).

A novel finding of the present study was our support for the hypothesis that the co-occurrence of positive and negative beliefs about paranoia would be associated with more severe suspiciousness on the PANSS. The interaction of these metabeliefs independently predicted the severity of suspiciousness, above the individual contribution of survival and negative beliefs. We observed that survival beliefs only predicted suspiciousness when negative beliefs were simultaneously high. This suggests that positive beliefs about paranoia

as a survival strategy are normal to a degree and not clinically problematic per se, perhaps representing paranoia as an evolved or learnt response for coping with threat. Consistent with a metacognitive model, it appears that only when the paranoia is concurrently appraised as uncontrollable, distressing or as interfering with other aspects of the person's life, that it reaches higher levels of clinical severity. Negative beliefs about paranoia retained a main effect as an independent predictor of suspiciousness. This is expected given that negative metabeliefs are thought to define the transition from non-problematic to more severe clinical paranoia (Morrison et al., 2011). As in the model of GAD (Wells, 1995), this transition may initially arise from repeated use of paranoia as a survival strategy, following which increasing automatization of paranoid ideation may lead to the experience of uncontrollability and increased disruption. The effect was amplified when negative beliefs co-occurred with high endorsement of survival beliefs. The co-occurrence of positive and negative metabeliefs is said to have a causal role in clinical distress due to contributing to a self-regulatory conflict (Wells, 1995). In the metacognitive model of paranoia (Morrison et al., 2011) this includes conflicting motives to engage with paranoid thinking and threat monitoring, versus motives to avoid or suppress paranoia. The latter promotes cognitive and behavioural control attempts (such as social avoidance, thought suppression and substance misuse) which may lead to vicious maintenance cycles which further increase the experience of uncontrollability, disruption and consequent distress.

This was the first study to show that the interaction of positive and negative metabeliefs was associated with increased paranoia. Whereas previous studies of metacognition in paranoia have mainly used general measures of metacognition, the development of the BaPS measure enabled the examination of specific hypotheses of the metacognitive model of paranoia. A previous BaPS study (Morrison et al., 2011) also examined this interaction hypothesis as a predictor of patient status but did not find a significant effect. However, the outcome of diagnosis of a psychotic disorder versus non-patients may have been too general as opposed to the specific prediction of persecutory delusions. The results of the present study are more likely to be reliable, since the measurement of paranoia is more comprehensive (using PANSS for the whole sample), and the sample size is considerably larger.

Although normalizing beliefs are not included in a metacognitive conceptualisation of paranoia, they were included in the measure because they could be viewed as beliefs that should increase as a result of normalizing interventions in cognitive therapy. Normalizing beliefs were not associated with severity of suspiciousness or dimensions of delusional

beliefs in our large clinical sample. The lack of association between normalizing beliefs and paranoia is consistent with the previous studies of the BaPS (Morrison et al., 2005; Gumley et al., 2011; Morrison et al., 2011), as well a recent study normalizing beliefs and psychotic experiences in a large non-clinical sample (Schlier et al., 2016). This suggests that normalizing interventions would not result in an increase in symptoms (Schlier et al., 2016), and they may be functional in terms of and increasing willingness to engage with cognitive interventions and reducing feelings of shame and hopelessness (Morrison et al., 2016). Further research is required to assess the sensitivity of the BaPS subscales to therapeutic change.

4.3 Limitations

A strength of the study is the large clinical sample; however, a number of limitations require consideration. The sample was a self-selected sample of people who had consented to participate in a clinical trial, which may influence the generalisability of the results. The cross-sectional design prevents inferences of causality with respect to testing the model. The metacognitive model outlines how positive and negative metabeliefs contribute to the initial development of paranoia, but they could also develop as consequence of paranoia. For example, positive beliefs could reflect a view of paranoia as necessary given the seriousness of the perceived threat, and negative metabeliefs can also result from the distress and disruption caused by paranoia. Longitudinal or experimental designs are, therefore, required to delineate the precise direction of effects. However, the metacognitive model does account for bi-directional effects in that additional negative beliefs and catastrophization about paranoia are said to result from appraisal of its distressing consequences, which motivate further unhelpful responses and perpetuate paranoia (Morrison et al., 2011). Therefore, even if such metabeliefs primarily arise as a result of paranoia, they may still have a role in its maintenance and be a potential target for intervention.

The large sample size meant that some small correlations between the BaPS with PANSS and PSYRATS items reached statistical significance, and should therefore be interpreted cautiously. Medium-sized correlations were observed between negative metabeliefs and anxiety, suspiciousness, and distress due to delusional ideation as expected, given that negative metabeliefs are hypothesised to contribute to clinically distressing paranoia (Morrison et al., 2005). The survival beliefs subscale had a smaller correlation with PANSS suspiciousness. Larger correlations may have been observed had we examined separate,

specific outcomes of paranoia frequency and paranoia distress, but the theorised relationships between positive metabeliefs and paranoia frequency and negative metabeliefs and distress have been previously shown in non-clinical samples (Gumley et al., 2011; Morrison et al., 2011); and the expected relationship between negative beliefs and delusional distress was also shown in the present clinical sample. The main PANSS suspiciousness/ persecution item is rated according to symptom severity and disruption, and was included as a measure of clinical paranoia which combined aspects of frequency and distress. All staff received training and supervision regarding use of the PANSS.

4.4 Clinical implications

When working with people experiencing distressing paranoia it may be important to assess for positive and negative metabeliefs; for example, by exploring the perceived advantages and disadvantages of paranoia, including the experience of uncontrollability. This could be done verbally or using our questionnaire. It appears unlikely that people would be motivated to reduce their paranoia if they viewed it as necessary for survival or as their main means of coping. High endorsement of positive beliefs about paranoia may also contribute to overuse of paranoia as a strategy and development of uncontrollability beliefs and distress. It may therefore be important to help the person find other ways to increase their sense of personal safety, assess other means of coping available to the individual, or replace other positive functions before commencing work to reduce paranoia. As described by Morrison and colleagues (2011), a shared view should also be formed about the accuracy of their paranoia, particularly as many patients have had life experiences that promote a paranoid world-view (Bentall and Fernyhough, 2008; Varese et al., 2012) and positive beliefs about the necessity of paranoia. Acknowledging this historically, perhaps by developing a longitudinal formulation (e.g. Morrison, 2001), may benefit engagement whilst also highlighting the importance of examining the accuracy of their paranoia in relation to current context. If the person holds catastrophic beliefs about paranoia, which are contributing to distress, these could be examined using cognitive techniques and behavioural experiments similar to strategies outlined to modify negative beliefs about worry (Wells, 1997). The provision of normalizing information, such as the common frequency of paranoid thoughts (Freeman et al., 2005) and information about famous people who are known to experience paranoia, may help to promote more accepting appraisals of paranoia. As well as reducing distress due to stigma and shame, the acceptance of symptoms may also lessen the need to either engage with or control the experience (Brett et al., 2014).

As an alternative to working with the content of paranoid thoughts, there may also be utility in intervening in the process of paranoia as a motivated response to the initial perception of threat, using metacognitive therapy (e.g. Wells, 2008). This may be useful when the person finds the uncontrollability of paranoia as more problematic than the conviction in their thoughts. This could involve a focus on reducing preservative processing (worry and rumination), threat monitoring and self-focused attention, as well as replacing unhelpful behavioural or thought control strategies with more adaptive ways of responding to thoughts. Specific strategies include detached mindfulness, attention training and worry/ rumination postponement (Wells, 2008). An exploratory trial using metacognitive therapy for psychosis found evidence of acceptability and clinically significant symptom change (Morrison et al., 2014a). Furthermore, a recent randomised controlled trial of a brief intervention targeted at worry rather than the content of paranoid thoughts, resulted in significant reductions to long-standing paranoid delusions in a large sample (Freeman et al., 2015). However, further trials of metacognitive therapy for psychosis are required before firm recommendations can be made.

Conflict of interest

None.

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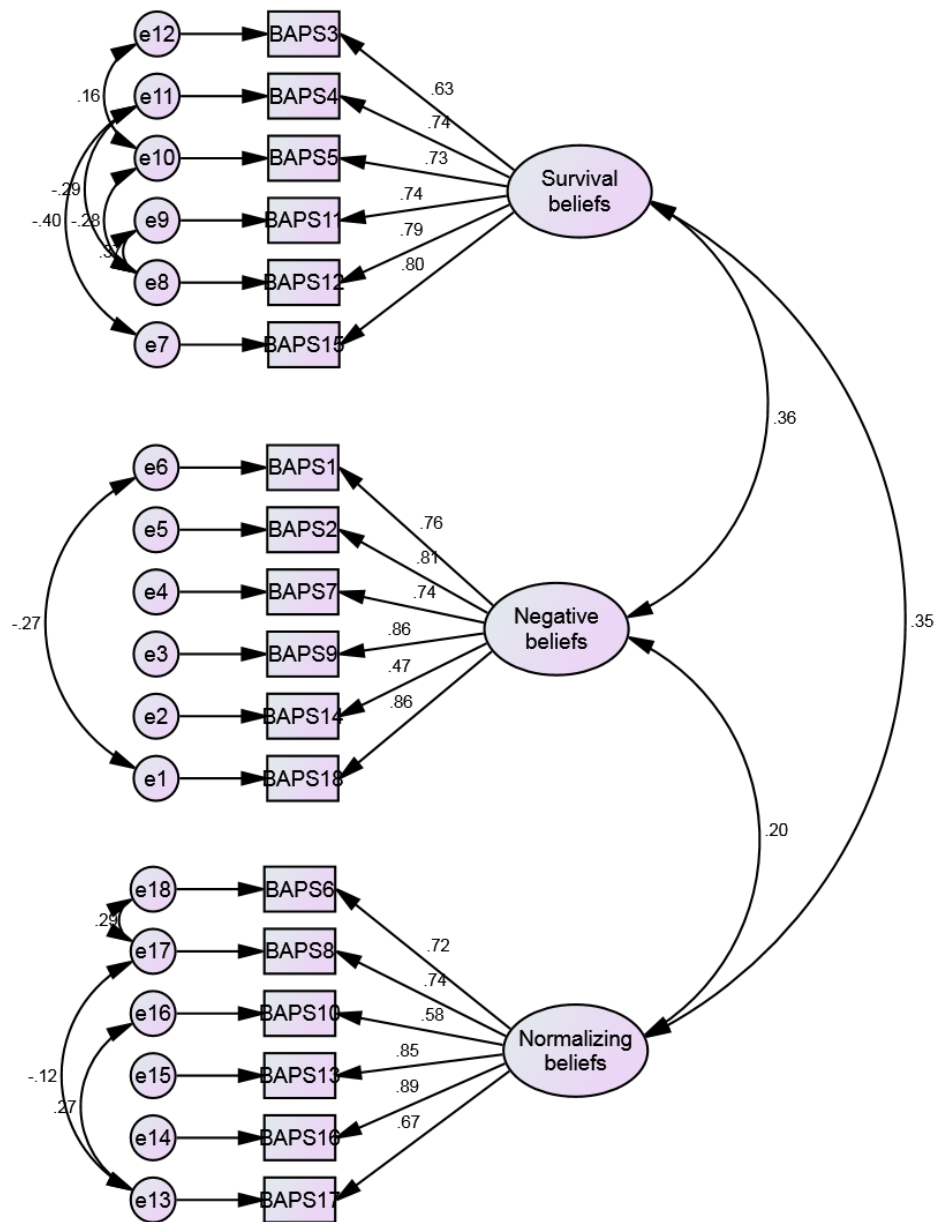
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Figure 1 – Path diagram for the confirmatory factor analysis showing standardized regression weights for the BaPS items onto the subscales, correlations between the subscales, and the correlated error terms



Note: The item numbers for each subscale correspond to each questionnaire item as follows:
Negative beliefs - BAPS1) My paranoia gets out of control; BAPS2) I get upset when I feel paranoid; BAPS7) My paranoia prevents me from doing things I enjoy; BAPS9) My paranoid thoughts worry me; BAPS14) My paranoia gets exaggerated, BAPS18) My paranoia distresses me. **Survival beliefs** - BAPS3) It is important to be paranoid; BAPS4) If I were not paranoid others would take advantage of me; BAPS5) It is safer to be paranoid; BAPS11) My paranoia keeps me on my toes; BAPS12) Being paranoid keeps me sharp; BAPS15) My paranoia protects me. **Normalizing beliefs** - BAPS6) Everybody feels paranoid at some time or other; BAPS8) Most people get paranoid sometimes; BAPS10) Paranoia is normal; BAPS13) Everybody is paranoid on some level; BaPS 16) Paranoia is something everybody has to some extent; BAPS17) Being paranoid is just human nature.

Table 1. Correlations between the BaPS and items from the PANSS and PSYRATS

	PANSS Item				PSYRATS Item						
	Delusions	Suspiciousness / persecution	Anxiety	Social avoidance	Amount of preoccupation	Duration of preoccupation	Conviction	Amount of distress	Intensity of distress	Disruption	Subscale total
Total BAPS score	0.150	0.279*	0.309*	0.199*	0.093	0.159	0.109	0.273*	0.271*	0.087	0.237*
Survival strategy	0.157	0.220*	0.177	0.188	0.113	0.127	0.134	0.149	0.187*	0.143	0.166
Negative beliefs	0.085	0.319*	0.424*	0.306*	0.081	0.180	0.058	0.380*	0.332*	0.083	0.280*
Normalizing beliefs	0.093	0.066	0.059	-0.071	0.012	0.041	0.053	0.052	0.067	-0.033	0.065

* Significant at $p < 0.001$. A conservative p value was chosen to correct for multiple comparisons in this table ($0.05 / 44 = 0.001$).

Table 2. Mean BaPS scores among lower versus higher scorers on the PANSS suspiciousness/ persecution item

	PANSS suspiciousness < 5 Mean (SD)	PANSS suspiciousness 5 + Mean (SD)	<i>p</i> -value
Total BaPS score	37.64 (9.99)	41.79 (11.12)	<0.001
Survival strategy	9.43 (3.63)	11.14 (5.17)	0.001
Negative beliefs	14.66 (5.25)	17.19 (5.06)	<0.001
Normalizing beliefs	13.54 (4.73)	13.46 (4.80)	0.877

Table 3. BaPS subscales as predictors of PANSS suspiciousness/ persecution

Variable	Odds Ratio	95% CI	<i>p</i> -value
Survival beliefs	1.07	1.02, 1.12	0.007
Negative beliefs	1.10	1.06, 1.15	<0.001
Normalizing beliefs	0.97	0.93, 1.02	0.225

Table 4. Interaction between survival¹ and negative beliefs¹ on PANSS suspiciousness/ persecution

Variable	Odds Ratio	95% CI	<i>p</i> -value
Survival beliefs	1.20	0.96, 1.49	0.107
Negative beliefs	1.75	1.41, 2.19	<0.001
Survival by negative beliefs	1.27	1.04, 1.56	0.021

1. The subscale scores were standardized (z-scores) prior to the creation of the product term for the interaction.

Figure 2. Scatterplot of BaPS survival beliefs versus PANSS suspiciousness/persecution, grouped by BaPS negative beliefs

