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Title Page

The Role of Mental Imagery in Non-Clinical Paranoia

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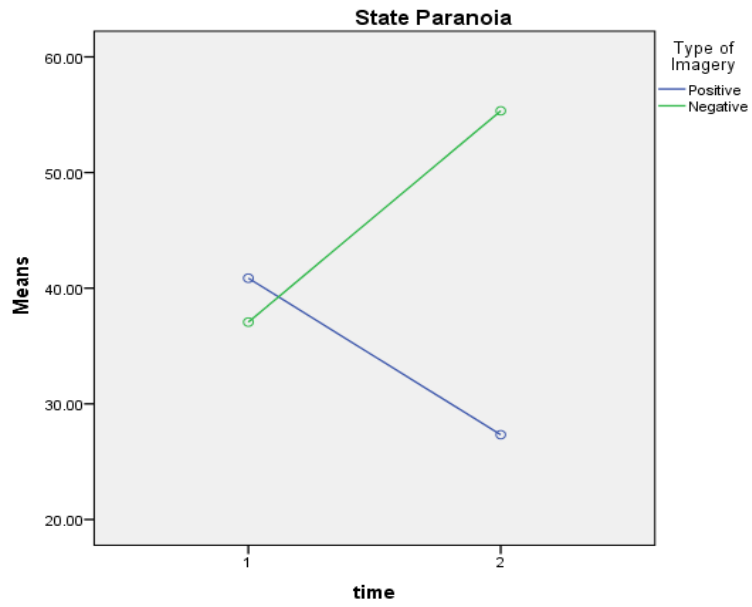
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The Role of Mental Imagery in Non-Clinical Paranoia

Graphical abstract:

Abstract

Background & objectives: Cognitive models of paranoia incorporate many of the processes implicated in the maintenance of anxiety disorders. Despite this, the role of mental imagery in paranoia remains under-researched. The current study examined the impact of a self-imagery manipulation in people with high non-clinical paranoia.

Methods: We used a mixed design with one between-subjects variable (type of self-imagery) and one within-subjects variable (time – pre and post imagery manipulation). Thirty participants with high trait paranoia were allocated alternately to a positive or negative self-imagery condition. Scripts were used to elicit positive and negative self-imagery. All participants completed self-report state measures of paranoia, mood, self-esteem and self-compassion.

Results: Group by time interaction effects were found for each of the dependent variables. Positive imagery led to less state paranoia, anxiety and negative affect, and more positive affect, self-esteem and self-compassion, compared with the negative imagery group.

Limitations: This was a non-blind study, limited by allocation method and a brief time-frame which did not allow us to assess longevity of effects. We recruited a relatively small and predominantly female sample of people with high non-clinical paranoia. The study did not include a neutral control condition, a low paranoia comparison group, or a manipulation check following the imagery task.

Conclusions: Self-imagery manipulations may affect paranoia, mood and self-beliefs. If the findings are replicated with clinical groups, and maintained over a longer period, this would suggest that imagery-based interventions targeting persecutory delusions might be usefully examined.

Highlights:

- We examined the impact of imagery manipulation on paranoia, mood and self-beliefs in people with non-clinical paranoia.
- Positive imagery led to less state paranoia, anxiety and negative affect, and more positive affect, self-esteem and self-compassion, compared with a negative imagery group.
- We now need to replicate the findings with clinical groups, and examine longevity of effects, in order to determine clinical implications.

The Role of Mental Imagery in Non-Clinical Paranoia

1. Introduction

Mental imagery is a key factor in the maintenance of anxiety disorders (Clark, 1999). Freeman (2007) argues that the cognitive and behavioural processes that maintain anxiety (e.g. emotional reasoning, imagery and safety behaviours) also maintain paranoia. While some of these processes have been examined, there is as yet very little research into the role of imagery in paranoia (Pearson, Deeprose, Wallace-Hadrill, Heyes & Holmes, 2013).

In a preliminary investigation, Morrison and colleagues interviewed people with schizophrenia-type diagnoses and found that 74% experienced images associated with their hallucinations or delusions. The images were typically recurrent, associated with a particular memory, and linked to specific emotions and paranoid beliefs (Morrison, Beck, Glentworth, Dunn, Reid, et al., 2002). Using a similar design, Schultz and colleagues found that 73% of a group with persecutory delusions reported recurrent distressing images related to their paranoia (Schultz, Freeman, Green & Kuipers, 2013).

Imagery-based interventions benefit people with a range of clinical presentations (see Arntz, 2012; Holmes & Matthews, 2010 for reviews). Initial case studies have shown that these approaches may also be effective for people with paranoia; CBT based imagery interventions targeting persecutory delusions led to reductions in distress and paranoia, with some evidence that gains were maintained at follow-up (Morrison, 2004; Serruya & Grant, 2009).

The limited research to date indicates that people with paranoia often experience intrusive images, and these may be a valuable target in therapy. However, there have been no experimental studies to help us understand exactly how imagery manipulations affect paranoia, mood and self-beliefs.

The present study employed an experimental design to investigate the role of mental imagery in people with high levels of non-clinical paranoia. We hypothesised that positive self-imagery would lead to less state paranoia, anxiety and negative affect, and more positive affect, self-esteem and self-compassion, compared to negative self-imagery. University of Southampton ethical approval was sought and confirmed (ref: 5890).

2. Material and methods

2.1 Design

The study used a mixed design with one between-subjects variable (type of self-imagery) and one within-subjects variable (time – pre and post imagery manipulation). The dependent variables were state measures of paranoia, anxiety, general mood, self-esteem and self-compassion. Trait paranoia, anxiety and self-esteem were measured to ensure comparable groups.

2.2 Participants

Participants were students recruited from a British university. Ninety-six people met criteria (see procedure, below), and 30 agreed to participate. The final sample was made up of 21 women (70%) and 9 men (30%), with a mean age of 20.9 years (*SD*=5.93).

2.3 Measures

2.3.1 Trait measures

Paranoia Scale (PS; Fenigstein & Vanable, 1992). The PS is a 20-item measure designed to measure trait levels of sub-clinical paranoia. Participants rate the extent to which statements are applicable using a 1 (not at all applicable to me) to 5 (extremely applicable to me) scale. Fenigstein and Vanable (1992) report acceptable test-retest (0.70) and internal reliability (0.72) in their original sample. Internal consistency in the current sample was good (α=0.84).

Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965). The RSE is a 10-item measure of global self-worth. Item scores range from 1 (strongly agree) to 4 (strongly disagree). The measure yields positive and negative self-esteem sub-scores which are combined to give a total, after negative items are reversed. The RSE has excellent internal reliability (α=0.92) and good two-week test-retest reliability (0.88) (Corcoran & Fischer, 1987). Internal consistency was also good in the current sample (α=0.88).

State and Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983). The STAI is a 40-item inventory comprising two questionnaires of 20 items each. Respondents rate state items on a 4-point likert scale (not at all to very much so) and trait items on a 4-point scale (almost never to almost always). Both have good to excellent internal consistency (state: 0.90-0.94; trait: 0.89-0.92). The trait measure has good test-retest reliability (0.86) and internal consistency was good in the current sample (α=0.87).

2.3.2 State measures

Paranoia Checklist (PC; Freeman et al., 2005). The PC is an 18-item scale of paranoid ideation. The adapted state version (Lincoln et al., 2010) was used for the present study. Participants rate the extent to which the items apply ''at the moment'' on a 5-point scale from 1 (not at all) to 5 (very strongly). The adapted version has good internal consistency (α=0.86). Internal consistency for the current sample was excellent (α=0.91).

State Self-Esteem Scale (SSES; McFarland & Ross, 1982). The SSES is a 12-item self-report measure of explicit state self-esteem. Items are rated from 1 (not at all) to 11 (extremely). The scale contains seven positive and five negative items. The SESS can be reported as a total score, with the negative items reverse scored, or as two separate sub-scales measuring positive and negative self-esteem respectively. We report total scores. The SSES demonstrated excellent internal consistency in the current sample (α=0.90).

Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). The PANAS is a 20-item measure of positive and negative affect. Participants rate 10 positive and 10 negative emotions on a scale from 1 (very slightly) to 5 (extremely) at the present moment. Both scales have good internal reliability (PA α=0.89, NA α=0.85; Crawford & Henry, 2004), and this was replicated in the current sample (PA α=0.90; NA α=0.82).

The Self-Compassion Scale (SCS; Neff, 2003). The SCS assesses six trait factors relating to three components of self-compassion: self-kindness/self-judgment, common humanity/perceived isolation, and mindfulness/over-identification. The state version includes 16 items rated ''right now" on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). The state version has acceptable internal consistency (α=0.76; Breines & Chen, 2013), and this was good in the current sample (α=0.80).

2.3.3 Imagery manipulation scripts

Imagery scripts designed for people with social anxiety (Hirsch, Clark, Mathews & Williams, 2003) were adapted to manipulate paranoia and elicit positive and negative self-images. Participants were asked to recall a memory of a situation in which they had felt significantly secure and trusting (positive) or suspicious and mistrusting (negative). Once an image was identified, participants closed their eyes and described the image in detail. Questions focused on how the participant looked and felt, how they and others in the image acted, and various sensory details. Participants rated the vividness of the image on a scale of 0 (not at all vivid) to 100 (extremely vivid). Where vividness was rated below 60, we elicited additional details to

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strengthen the image generated. Participants held the image in mind while completing questionnaires.

2.4 Procedure[1]

Participants were recruited via advertisements, and received research credits or a small payment. Informed consent was gained from everyone who took part. The Paranoia Scale (PS; Fenigstein & Vanable, 1992) was used to screen participants. Normative percentile scores from the PS were used to determine a high paranoia group based on the mean score for non-clinical groups (M=42.7, SD=10.2) identifying participants in the 84th percentile or above (+1SD of 53 or greater). There were no other inclusion or exclusion criteria. Those who were selected following screening were invited to attend the experimental session. Consecutive participants were allocated alternately to either the positive or the negative self-imagery condition. At the experimental session, participants repeated the PS to confirm that they still met criteria for high paranoia. No people were excluded at the second completion of the screen. All other participants then completed the trait and state measures. Participants were guided through the imagery exercise and asked to hold the image in mind while they repeated the state measures. Participants in the negative imagery condition took part in a brief visualisation exercise as a mood repair in case of any increased distress. All participants were fully debriefed.

2.5 Analysis strategy

Data were analysed using the IBM SPSS21 for Windows. We tested for normality and homogeneity of variance. Visual inspection of the data suggested normal distribution, and z-scores for skewness and kurtosis were in the critical range (+/- 1.96). The hypotheses were tested using a series of six mixed model analyses of variance, all with one between-subjects factor (negative imagery vs. positive imagery) and one within-subjects factor (pre vs. post imagery induction). A series of post hoc t-tests were conducted to explore simple effects for each dependent variable. A Bonferroni corrected p value of 0.008 (0.05/6) was set for all tests.

3. Results

3.1 Pre-manipulation differences between groups

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[1] Further details on the procedure, including sequence of questionnaires and duration of each activity, are available on request.

We compared group differences in demographic, trait and state characteristics using t-tests and chi-square tests. Table 1 shows that there were no differences in age, gender, vividness ratings, trait paranoia, trait anxiety or trait self-esteem between groups. There were also no between group pre-manipulation differences on any of the state measures (t values all < 0.98, p values all > 0.36). One person in the positive imagery group and one in the negative imagery group initially rated the vividness of their imagery at less than 60/100.

Table 1

3.2 Post-manipulation differences between groups

There were significant differences following the self-imagery manipulation on each of the state measures: state paranoia, $t(28)=11.21$, $p<0.001$, $d=4.1$; state anxiety, $t(28)=7.63$, $p=<0.001$, $d=2.7$; state self-esteem, $t(28)=5.97$, $p=<0.001$, $d=2.18$; state self-compassion, $t(28)=4.70$, $p<0.001$, $d=1.7$; state positive affect, $t(28)=4.98$, $p<0.001$, $d=1.82$; and state negative affect, $t(28)=5.51$, $p<0.001$, $d=2.01$.

Table 2

3.3 Within participants' effects

State paranoia increased in the negative self-imagery group, $t(14)=-8.71$, $p<0.001$, $d=2.34$, and decreased in the positive self-imagery group, $t(14)=5.29$, $p<0.001$, $d=1.66$.

State anxiety increased in the negative self-imagery group, $t(14)=-9.1$, $p<0.001$, $d=2.32$, and decreased in the positive self-imagery group, $t(14)=4.69$, $p<0.001$, $d=1.23$.

State self-esteem decreased in the negative self-imagery group, $t(14)=5.71$, $p=<.001$, $d=1.79$, and increased in the positive self-imagery group, $t(14)=6.11$, $p=<0.001$, $d=0.95$.

State self-compassion decreased in the negative self-image group, $t(14)=5.36$, $p<0.001$, $d=1.38$), and increased in the positive self-imagery group, $t(14)=3.51$, $p<.005$, $d=0.9$.

State positive affect decreased in the negative self-imagery group, $t(14)=4.95$, $p<0.001$, $d=1.28$, and increased in the positive self-imagery group, $t(14)=-4.01$, $p<0.005$, $d=1.04$.

State negative affect increased in the negative self-imagery group, $t(14)=6.82$, $p<0.001$, $d=1.88$, but remained stable in the positive self-imagery group $t(14)=2.08$, $p=0.056$.

3.4 Effect of self-imagery manipulation; Group by time interactions

State paranoia. There was a main effect of group, $F(1, 28)=16.79$, $p=<0.001$, $\eta_p^2=0.38$, but no effect of time, $F(1, 28)=2.05$, $p=0.164$, $\eta_p^2=0.07$. There was a group by time interaction, $F(1, 28)=92.30$, $p=0<.001$, $\eta_p^2=0.77$ (Figure 1).

Figure 1

State anxiety. There was a main effect of group, $F(1, 28)=13.83$, $p=0.001$, $\eta_p^2=0.3$, but no effect of time, $F(1, 28)=3.46$, $p=0.073$, $\eta_p^2=0.1$. There was a group by time interaction, $F(1, 28)=85.71$, $p<0.001$, $\eta_p^2=0.75$.

State self-esteem. There were significant main effects of group, $F(1, 28)=9.63$, $p<0.005$, $\eta_p^2 = 0.26$, and of time, $F(1, 28)=4.91$, $p<0.05$, $\eta_p^2 =0.15$. There was also a significant group by time interaction, $F(1, 28)=62.33$, $p=<.001$, $\eta_p^2= .69$.

State self-compassion. There was no main effect of group, $F(1, 28)=5.24$, $p<0.05$, $\eta_p^2=0.16$) and no effect of time, $F(1, 28)=0.91, 13$, $p=0.35$, $\eta_p^2=0.03$, but there was a group by time interaction, $F(1, 28)=38.25$, $p<0.001$, $\eta_p^2=0.58$.

State positive affect. There was a main effect of group, $F(1, 28)=9.58$, $p=0.004$, $\eta_p^2=0.26$, no effect of time, $F(1, 28)=0.29$, $p=0.59$, $\eta_p^2=0.01$, but there was a group by time interaction, $F(1, 28)=37.15$, $p<0.001$, $\eta_p^2=0.57$.

State negative affect. There were main effects of group, $F(1, 28)=10.02$, $p<0.005$, $\eta_p^2=0.26$, and of time, $F(1, 28)=19.06$, $p<.001$, $\eta_p^2=0.41$, and a group by time interaction, $F(1, 28) =45.83$, $p<0.001$, $\eta_p^2=0.62$.

4. Discussion

The current study examined the impact of imagery manipulation in people with high non-clinical paranoia, by asking participants to hold a positive or negative self-image in mind, while completing state measures of paranoia, mood and self-beliefs. To our knowledge, this is the first experimental study to examine the role of positive and negative imagery in non-clinical paranoia.

As predicted, paranoia-related negative imagery led to increases in paranoia, anxiety and negative affect, and decreases in positive affect, self-esteem and self-compassion. Positive imagery led to decreases in paranoia and anxiety, and increases in positive affect, self-esteem and self-compassion. Imagery has an impact on paranoia, mood and self-beliefs. Not only did imagery change the variables of interest in each group, the analyses indicated differential changes between groups, that is, we found a between group difference in changes before and after the self-imagery manipulation.

These findings support and extend preliminary evidence for the role of imagery in paranoia. Intrusive images are a common feature of many anxiety presentations (Harvey, Watkins, Mansell & Shafran, 2004; Hirsch & Holmes, 2007) and this may also apply to paranoia (Morrison, 2001; Schultz et al., 2013).

The finding that imagery has an impact on self-beliefs in paranoia is novel. Self-esteem and self-compassion improved with positive imagery and reduced with negative imagery. This is consistent with the hypotheses that paranoia may reflect beliefs about threats from the self, as well as from others (Mills et al, 2007) and that there is an inverse relationship between paranoia and self-esteem (e.g. Freeman et al., 1998; Martin & Penn, 2001).

Changes in imagery, and the impact on mood and cognition, are assumed to underpin the effectiveness of treatments such as re-scripting (e.g. Holmes, Arntz & Smucker, 2007). If the present findings are replicated in clinical groups, it would be valuable to extend initial case studies in this area to examine the impact of re-scripting or compassion-based imagery work more systematically.

The finding that positive as well as negative imagery had an impact is consistent with evidence that positive imagery interventions may be beneficial for people with BPD (Arntz & Weertman, 1999; Giesen-Bloo et al., 2006) and depression (Gilbert & Irons, 2004), and an initial study with people vulnerable to psychosis (Lincoln, Hohenhaus & Hartmann, 2012). These processes may now be examined in clinical groups.

4.4 Limitations

The study is limited by non-random allocation and a brief time-frame which did not allow us to assess longevity of effects. We recruited a small and predominately female sample. We did not include a control group with low non-clinical paranoia, and so it is not clear whether effects found are specific to heightened paranoia. Neither did we include a neutral control condition (e.g. a neutral imagery task). The researcher was not blind to group or hypotheses. Demand effects may have influenced the results; participants were asked to imagine a threat situation and may have answered questions in a way that they believed was expected of them. Also, we did not include a manipulation check following the imagery task (e.g. to record the percentage of time the image was held in mind).

5. Conclusions

Mental imagery may have an impact on paranoia, mood and self-beliefs in people with high trait paranoia. Notwithstanding the study limitations, this suggests that imagery may be a factor in the maintenance of paranoia, and that imagery-based interventions might now be examined more systematically in clinical groups.

Declaration of interest: None.

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Table 1

Demographic and trait statistics for positive and negative imagery groups

	Positive imagery group (N = 15)		Negative imagery group (N = 15)		
	Mean	*SD*	*Mean*	*SD*	
Age	21.53	8.15	20.33	2.38	*t*(28)=0.547, *p*=0.588
Gender					*χ*(1) =0.244, *p*=0.621
Vividness of imagery	80	10.86	76	8.70	*t*(28)=0.644, *p*=0.429
PS	57(*Mdn*)	4.78	62(*Mdn*)	5.88	*U*=157.5, *p*=0.061
STAI trait	49.67	7.56	51.73	9.01	*t*(28)=-0.681, *p*=0.502
RSE	26.13	4.95	26.53	5.11	*t*(28)=-0.218, *p*=0.829

Key: PS = Paranoia Scale; STAI = State and Trait Anxiety Inventory; RSE = Rosenberg Self-Esteem.

Table 2

Changes over time in state variables for positive and negative imagery groups

		Positive imagery group (*N* = 15)		Negative imagery group (*N* = 15)	
		Mean	*SD*	*Mean*	*SD*
PC	pre	40.87	11.87	37.07	10.46
	post	27.33	5.48	55.33	7.97
	change	13.53	9.91	-18.27	8.13
STAI state	pre	44.67	12.07	42.87	9.53
	post	33.00	10.03	60.40	9.64
	change	11.67	9.64	-17.53	7.50
SSES	pre	84.13	21.04	83.93	20.73
	post	99.33	16.40	56.87	22.16
	change	-15.20	9.63	27.07	18.36
SCS	pre	53.87	8.20	55.73	8.47
	post	60.80	9.20	46.27	7.64
	change	-6.93	7.66	9.47	6.84
PANAS positive	pre	28.33	8.56	25.40	7.75
	post	34.47	7.78	20.27	7.85
	change	-6.13	5.93	5.13	4.02
PANAS negative	pre	17.00	5.36	16.07	5.62
	post	14.47	4.55	27.80	8.20
	change	2.53	4.72	-11.73	6.66

Key: PC = Paranoia Checklist; STAI = State and Trait Anxiety Inventory; SSES = State Self-Esteem Scale; SCS = Self-Compassion Scale; PANAS = Positive and Negative Affect Schedule.
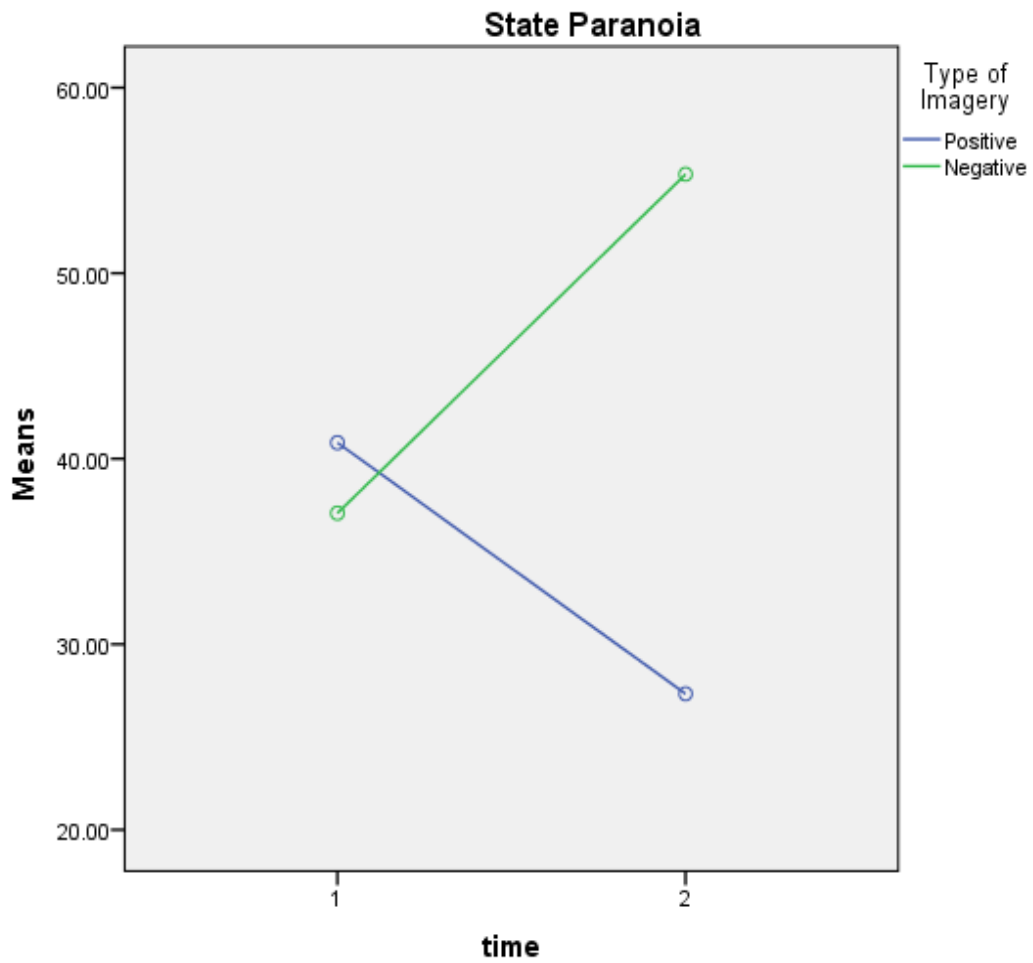
Figure 1: State paranoia means for positive and negative imagery conditions across time points (effects are similar for each dependent variable)

The Role of Mental Imagery in Non-Clinical Paranoia

Highlights:

- We examined the impact of imagery manipulation on paranoia, mood and self-beliefs in people with non-clinical paranoia.
- Positive imagery led to less state paranoia, anxiety and negative affect, and more positive affect, self-esteem and self-compassion, compared with a negative imagery group.
- We now need to replicate the findings with clinical groups, and examine longevity of effects, in order to determine clinical implications.