



## An experimental investigation of the impact of critical and warm comments on state paranoia in a non-clinical sample

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### ABSTRACT

**Background and objectives:** Interpersonal stress is key to the development and maintenance of paranoia. Much attention has been given to the impact of interpersonal stressors, such as criticism, on outcomes in psychosis. Less attention has been given to the potentially protective effects of positive interpersonal factors. This study tested experimentally whether criticism and warm comments elicited changes in state paranoia. Whether warm comments provided protective effects when participants faced subsequent social exclusion was also examined.

**Method:** A nonclinical sample (N = 97) was randomised to criticism, warm comments, or neutral comments conditions. Participants then played a virtual ball game (Cyberball), during which they were systematically excluded from the game. State paranoia was measured before and after the affective stimuli and after social exclusion. Self-esteem and trait paranoia were also measured.

**Results:** Paranoia levels increased following exposure to criticism ( $p = .011$ ). Paranoia was not significantly lower following exposure to warm comments ( $p = .203$ ). Warm comments did not provide protection against the effects of subsequent social exclusion. The warm comments condition was the only condition in which significant increases in paranoia were seen following social exclusion ( $p = .004$ ).

**Limitations:** Use of a non-clinical sample limits generalisation to clinical populations.

**Conclusions:** Criticism is sufficient to elicit increases in paranoia in non-clinical participants. Warm comments are insufficient to significantly reduce paranoia or provide protective effects against subsequent negative interpersonal experiences, highlighting the need to balance therapeutic warmth with amelioration of social stressors in paranoia.

### 1. Introduction

Delusions reflecting paranoid or persecutory themes are common and potentially distressing aspects of psychosis (Freeman & Garety, 2014; Freeman, Garety, Kuipers, Fowler, & Bebbington, 2002). However, there is a growing consensus that paranoid thinking is common within the general population and that clinical and non-clinical paranoia exist on a continuum (e.g. Elahi, Perez Algorta, Varese, McIntyre, & Bentall, 2017; Freeman, 2007). Interpersonal stress and sensitivity have been highlighted as key factors in the development and maintenance of paranoia (e.g. Bebbington et al., 2013; Freeman & Garety, 2014). A recent systematic review found a robust association between interpersonal sensitivity and paranoia in clinical and non-clinical samples (Meisel, Garety, Stahl, & Valmaggia, 2018). Social exclusion, one example of an interpersonal stressor, is purported to deprive individuals of a sense of belonging, self-esteem and control (Westermann, Kesting, & Lincoln, 2012) and contribute to delusion formation (Preti &

Cella, 2010).

A number of analogue studies have evaluated the relationship between experimentally manipulated social exclusion and paranoid thinking (Kesting, Bredenpohl, Klenke, Westermann, & Lincoln, 2013; Lincoln, Stahnke, & Moritz, 2014; Westermann et al., 2012). Increased state paranoia following social exclusion has been found to be mediated by decreases in self-esteem and moderated by baseline trait paranoia (Kesting et al., 2013). The use of particular emotion regulation strategies has also been found to moderate increases in state paranoia in response to social exclusion in individuals with high trait paranoia (Westermann et al., 2012). Furthermore, a study in which different explanations for social exclusion were provided found that conspiracy-based explanations (a proxy of paranoid thinking) had a short-term stabilising effect on self-esteem, but any benefits to such explanations were short-lived (Lincoln et al., 2014). Effects of social exclusion on paranoia levels were not assessed; however, as paranoia was only measured at baseline (Lincoln et al., 2014).

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Sensitivity to criticism is conceptualised as a key component of interpersonal sensitivity, a predictor of clinical and non-clinical paranoia (Meisel et al., 2018). Criticism is one dimension of expressed emotion (EE), a widely-researched measure of family environment, reflecting affective attitude and behaviours (Leff & Vaughn, 1985). Higher levels of caregiver ‘burden’ in psychosis have been associated with higher levels of negative EE dimensions including criticism (Kuipers, Onwumere, & Bebbington, 2010). EE studies have consistently found that criticism predicts poorer outcomes for individuals with, or at risk of, psychosis, including increased relapse rates and positive symptom severity (e.g. Alvarez-Jimenez et al., 2012; Barrowclough et al., 2003). Negative family atmosphere, as indexed by a measure of criticism and resignation, has been found to predict paranoia at 12-month follow-up (Hesse et al., 2015). Experimental work has found increased anxiety, anger, distress, and delusional preoccupation and conviction when individuals with psychosis are exposed to criticism (Finnegan et al., 2014). While criticism was included in an analogue study of social exclusion and paranoia (Kesting et al., 2013), the relative contributions of criticism and exclusion to paranoia increases could not be extricated due to paranoia not being measured after each manipulation.

Whether positive interpersonal factors, such as warmth, relate to better outcomes in psychosis, has received less attention. This relative imbalance has been argued to undervalue and disempower families by focusing on their influence as a risk factor and overlooking their potential protective role (Amaresha & Venkatasubramanian, 2012). Furthermore, inattention to positive factors may neglect potential mechanisms of change within family interventions (Claxton, Onwumere, & Fornells-Ambrojo, 2017). Evidence is emerging that family warmth and positive remarks may be protective for individuals who have experienced, or are at risk of experiencing, psychosis (Greenberg, Knudsen, & Aschbrenner, 2006; Lee, Barrowclough, & Lobban, 2014). Some studies have highlighted the combination of high warmth with moderate levels of family involvement as optimal (Breitborde, Lopez, Wickens, Jenkins, & Karno, 2007; Schlosser et al., 2010). Cognitive models of caregiving in psychosis hypothesise that both positive pre-existing relationships and positive caregiver responses to episodes of psychosis contribute to better outcomes (Kuipers et al., 2010). Mechanisms underlying protective effects of positive family factors are yet to be elucidated, but those posited include: buffering of stressful experiences, increased medication adherence and service engagement, and effects on cognitive processes implicated in the development of psychosis, such as ‘jumping to conclusions’ (Glick, Stekoll, & Hays, 2011; Lee, Barrowclough, & Lobban, 2011; Lee et al., 2014; Schlosser et al., 2010).

Self-esteem and interpersonal self-concepts have been purported to mediate the relationship between paranoia and interpersonal stress in clinical and non-clinical samples (Hesse et al., 2015; Kesting & Lincoln, 2013; Kesting et al., 2013). Multiple theories regarding the nature of the relationship between self-esteem and paranoia exist (e.g. Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Freeman & Garety, 2006). A review of these is beyond the scope of the current paper, but a recent review concluded that greater paranoia is associated with lower, more fluctuating, global self-esteem (Kesting & Lincoln, 2013).

This study aimed to extend investigation of potential protective effects of positive-interpersonal factors to paranoia specifically. A repeated-measures experimental design assessed the impact of two manipulations of interpersonal variables on state paranoia in a non-clinical sample. The first manipulation comprised exposure to affective stimuli (critical, warm, or neutral comments). The second manipulation was a social exclusion paradigm. It was predicted that changes in state paranoia in response to the affective stimuli would vary according to whether the comments were critical, warm, or neutral (Hypothesis 1). It was predicted that critical comments would be associated with increased paranoia (Hypothesis 1a) and warm comments with decreased paranoia (Hypothesis 1b). Neutral comments were not expected to affect paranoia (Hypothesis 1c). Impact of social exclusion was expected to vary, depending on whether participants had been exposed to

critical, warm, or neutral comments (Hypothesis 2). In the neutral condition, increased paranoia was expected following social exclusion (Hypothesis 2a). Consistent with emerging effects for protective effects of warmth, it was predicted that participants in the warm condition would not show significant increases in paranoia after social exclusion (Hypothesis 2b). No hypothesis was made regarding the effects of social exclusion in the criticism condition. It was considered possible that a cumulative effect of criticism, followed by social exclusion could occur, resulting in greater increases in paranoia (relative to the neutral condition). However, it was also acknowledged that there could possibly be attenuated effects in the criticism group due to reaching a ceiling of what was likely achievable in terms of increases in paranoia in an experimental setting in a non-clinical group. As paranoia scores could be influenced in either direction (or both, leading to a negligible effect), no specific prediction was made. Secondary analyses explored whether changes in state paranoia related to self-esteem and trait paranoia, given the strong evidence for a relationship between self-esteem and paranoia and that trait paranoia may moderate changes in state paranoia following social exclusion manipulations.

## 2. Material and methods

The study was approved by the University of Manchester Research Ethics Committee (reference: 14431).

### 2.1. Design

A 3 x 3 repeated-measures experimental design was employed, with time as a within-participants variable (T1: baseline, T2: following affective stimuli manipulation [critical, warm, or neutral comments], T3: following social exclusion manipulation (Cyberball) and condition as a between-participants variable (critical, warm, or neutral). The main outcome variable was state paranoia. Self-esteem was measured at the same three time points, and mood was measured at T3. Trait paranoia and depression were measured at baseline to determine equivalence.

### 2.2. Participants

An opportunity sample of 97 participants was recruited from the University of Manchester and general public. Using a repeated measures ANOVA test for interactions between group and time at T1 to T2 and T2 to T3, 30 participants per group would have 80% power with 5% significance to detect a small effect [ $d=0.2$ ] in the main outcome measure.<sup>1</sup> Inclusion criteria (determined via self-report) were minimum age of 18 years and English language proficiency. Individuals under the care of secondary care psychiatric services were excluded. The study was advertised as investigating effects of emotion on video game performance. Participants were paid for participation.

### 2.3. Measures

*Paranoia & Depression Scale* (PDS; Bodner & Mikulincer, 1998): state paranoia was measured using the paranoia sub-scale of the Paranoia & Depression Scale (PDS-P). The sub-scale includes seven items (e.g. “I feel that people talk about me”), measured on a 6-point scale (1 = Not at all, 6 = Very often). The depression sub-scale (PDS-D) comprises 10 items, measured on the same scale. The PDS-D, which is highly correlated with established measures of depression (Bodner & Mikulincer, 1998), includes multiple items that relate to negative appraisals of task performance (e.g. “I’m critical of my task performance”). The PDS-D was administered at T3 to assess whether cross-group differences might reflect differences in mood following task completion (as used in

<sup>1</sup> A small effect size was expected on the basis of a previous review of ‘paranoia induction’ paradigms (Ellett, Owens, & Berry, in submission).

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