

Interpretation Biases in Paranoia

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Information in the environment is frequently ambiguous in meaning. Emotional ambiguity, such as the stare of a stranger, or the scream of a child, encompasses possible good or bad emotional consequences. Those with elevated vulnerability to affective disorders tend to interpret such material more negatively than those without, a phenomenon known as “negative interpretation bias.” In this study we examined the relationship between vulnerability to psychosis, measured by trait paranoia, and interpretation bias. One set of material permitted broadly positive/negative (valenced) interpretations, while another allowed more or less paranoid interpretations, allowing us to also investigate the content specificity of interpretation biases associated with paranoia. Regression analyses ($n = 70$) revealed that trait paranoia, trait anxiety, and cognitive inflexibility predicted paranoid interpretation bias, whereas trait anxiety and cognitive inflexibility predicted negative interpretation bias. In a group comparison those with high levels of trait paranoia were negatively biased in their interpretations of ambiguous information relative to those with low trait paranoia, and this effect was most pronounced for material directly related to paranoid concerns. Together these data

suggest that a negative interpretation bias occurs in those with elevated vulnerability to paranoia, and that this bias may be strongest for material matching paranoid beliefs. We conclude that content-specific biases may be important in the cause and maintenance of paranoid symptoms.

Keywords: paranoia; interpretation bias; cognitive bias; psychosis

INFORMATION IN THE ENVIRONMENT is frequently ambiguous in meaning. Emotional ambiguity, such as the stare of a stranger, or the scream of a child, encompasses possible good (admiration or excitement, respectively) or bad (hostility or distress, respectively) emotional consequences. Those with elevated vulnerability to affective disorders (e.g., depression, anxiety disorders) tend to interpret such material more negatively than those with lower vulnerability, a phenomenon known as “negative interpretation bias” (Blanchette & Richards, 2010). Biased interpretations result in overexposure to negative information that reinforces a pathological state or symptoms (e.g., Wilson, MacLeod, Mathews, & Rutherford, 2006). The more these biases act specifically upon emotional information that matches the core symptoms of a psychopathology, the more potent they are in maintaining that pathology and its symptoms (e.g., interpreting ambiguous social cues in a negative direction is likely to exacerbate social anxiety). This phenomenon is sometimes called “content specificity” and was articulated by Mathews and MacLeod (1994) in an early review.

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Research has shown that biased interpretations can be a causally contributing factor in the development and maintenance of the affective disorders (Mathews, 2012). Experimental techniques designed to induce positive interpretations have shown a range of therapeutic effects, such as reductions in trait anxiety (Mathews, Ridgeway, Cook, & Yiend, 2007), vulnerability to stress (Mackintosh, Mathews, Yiend, Ridgeway, & Cook, 2006), and depressive symptoms (Watkins, Baeyens, & Read, 2009). Early identification of negative thinking biases in depression (Lawson, MacLeod, & Hammond, 2002) has led to recent studies demonstrating that a more positive interpretation bias can be induced in vulnerable (Lester, Mathews, Davison, Burgess, & Yiend, 2011) and clinical populations, such as generalized anxiety disorder (Hayes, Hirsch, Kerbs, & Mathews, 2010), eating disorders (Yiend, Parnes, Shepherd, Roche, & Copper, 2014), and depression (Yiend et al., 2013), thus suggesting the potential for a clinically useful application. Modified interpretation bias has also been shown to improve mood (Holmes, Mathews, Dalgleish, & Mackintosh, 2006) and reverse maladaptive checking behavior in perfectionism (Yiend, Savulich, Coughtrey, & Shafran, 2011). However, little experimental work has been done on interpretation biases potentially lending vulnerability to other disorders, such as paranoid psychosis.

Paranoia denotes the unfounded fear that others intend to cause you harm (Freeman & Garety, 2000) and is a key symptom of psychosis. Characterized by feelings of mistrust and suspicion, whether of a particular person, a group of people, or an entire organization, paranoia ranges from mild social evaluative concerns to severe threat of harm. Between 10 and 15% of the population report some form of paranoid thinking, including thoughts of persecution (Freeman, 2007). It has been proposed that paranoid thoughts are arranged according to a “hierarchy,” in which mild paranoia (e.g., fear of being talked about) is prevalent in the general population, whereas more severe paranoid thoughts (e.g., conspiracies) are most prevalent in clinical samples (Freeman, 2007). Questionnaire assessments of paranoia have adopted multidimensional approaches to investigate varying types and degrees of paranoid thinking (Freeman, Garety, et al., 2005; Green et al., 2008). Recent advances in laboratory methods have successfully utilized virtual reality as a naturalistic trigger to demonstrate that a significant minority of healthy individuals report paranoid thoughts when interacting with neutral characters (Freeman, Dunn, et al., 2005; Freeman et al., 2008).

Studies of cognition in paranoia have primarily focused on reasoning and attributional biases in

individuals with persecutory delusions. It has been widely shown that deluded individuals “jump to conclusions” on the basis of little information and are more confident in their decisions than nonpsychiatric control groups (e.g., Garety & Freeman, 1999; Garety, Hemsley, & Wessely, 1991; Huq, Garety, & Hemsley, 1988). This is likely linked to a bias against disconfirmatory evidence (BADE), or the failure to accept and integrate new information that disconfirms fixed, false beliefs. Evidence of a BADE has been shown in healthy individuals who are delusion prone (Woodward, Buchy, Moritz, & Liotti, 2007) and in individuals with schizophrenia (Moritz & Woodward, 2006). Studies of attributional bias have suggested that individuals with persecutory delusions attribute positive events to themselves and negative events to others, which might defend against the activation of negative beliefs underlying paranoia (Bentall & Kaney, 1996; Bentall, Kaney, & Dewey, 1991; Kinderman & Bentall, 1996). An established body of literature also reports large emotional perception deficits in individuals with schizophrenia (e.g., Edwards, Jackson, & Pattison, 2002; Mandal & Palchoudhury, 1989; Morrison, Bellack, & Bashore, 1988). More specifically, it has been shown that paranoia and persecutory delusions are associated with reduced recognition for angry facial expressions (Combs, Michael, & Penn, 2006; Green, Williams, & Davidson, 2003; Huang, Hsiao, Hwu, & Howng, 2013).

Although cognitive processes have been implicated in the development and maintenance of persecutory delusions (Freeman, Garety, Kuipers, Fowler, & Bebbington, 2002; Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001), the importance of biases specific to paranoia is less clear. For example, a recent study targeting negative emotions in a sample with subclinical psychotic symptoms reported benefits that included decreased negative emotion, increased self-esteem, and fewer paranoid thoughts following a compassion-focused intervention. This intervention trained participants to use positive imagery after being induced with negative emotion relevant to a personally distressing situation (Lincoln, Hohenhaus, & Hartmann, 2013). It has also been reported that activation of depressive cognitive schemas (and not paranoia related) underlies attentional biases in subclinical paranoia (Provencio, Vázquez, Valiente, & Hervas, 2012). Notably, these findings do not assess the degree to which observed biases act specifically on emotional information that matches the content of paranoid concerns (i.e., the level of content specificity). This is particularly important, as higher levels of content specificity suggests greater etiological importance of biased processes (Yiend & Mackintosh, 2004). At present, cognitive processes

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