



Mindfulness training and false perception in individuals with high unusual experiences



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ABSTRACT

The present study explored the impact of mindfulness training on the relationship between false perceptions (hallucinations) and high levels of unusual experiences. 130 participants completed the O-LIFE(B) scale and a visual-detection task in which they had to identify fast-moving words in a visual display. Each participant completed a version of the visual-detection task twice, once after a 10 min mindfulness induction session, and once after a 10 min unfocused attention control session. Participants scoring high on the unusual experiences subscale of the O-LIFE reported seeing more words that were not there than those scoring low on this scale. However, this difference between high and low unusual experience scorers was not pronounced or statistically significant in the mindfulness condition. These data suggest that mindfulness can reduce the number of hallucination-like experiences in individuals with high levels of self-reported schizotypy.

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1. Introduction

Hallucinations are regarded as a severe psychopathology (Bentall, 1990; Waters et al., 2012), and can be defined as perceptual experiences that occur in the absence of any appropriate external perceptual stimuli (Slade & Bentall, 1988). Hallucinations can occur in any sensory modality, but are most often experienced in the auditory and visual modalities, and are associated with a range of disorders (Cella et al., 2008). Hallucinations are most often noted in individuals with schizophrenia (Bauer et al., 2011; Waters et al., 2012); 16–72% of schizophrenic patients reporting regular visual hallucinations, and 50–70% reporting regular auditory hallucinations (Bauer et al., 2011; Mueser, Bellack, & Brady, 1990). However, at least one hallucinatory experience has been noted by up to 70% of the nonclinical population (Barrett & Etheridge, 1992; Pechey & Halligan, 2012; Posey & Losch, 1983; Slade & Bentall, 1988).

One theory of the etiology of false perceptions (hallucinations) is that they are associated with a cognitive bias, and hallucination-prone individuals tend to believe that a stimulus is present when it is absent because an information-processing bias causes them to attribute their own internally-generated experiences to external sources (Brebion, Smith, Amador, Malaspina, & Gorman, 1998; Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001). Evidence for a reality-monitoring deficit has been obtained in a number of studies. Heilbrun and Blum (1984) found that patients suffering from hallucinations tended to make incorrect and overconfident judgments regarding ambiguous words compared to non-hallucinating controls. Brebion et al. (1998) asked schizophrenic and control participants to recall words previously generated by themselves or

the experimenter, and noted that schizophrenic individuals had a greater tendency to recall items that had not actually been present, and to believe that these items had been present. They also had a greater tendency to wrongly believe that the experimenter had generated items that they had actually generated themselves (see also Bentall & Slade, 1985; Young, Bentall, Slade, & Dewey, 1987).

Individuals in the non-clinical population who score highly on schizotypal traits (Claridge & Brooks, 1984) also report high levels of hallucinations relative to those scoring low on this trait (Cella et al., 2007; Chapman et al., 1994; Tsakanikos & Reed, 2005a, 2005b; Winkel, Nicholas, & Myin-Germeys, 2008). Schizotypal traits are taken to be normally distributed among the general population (Boyle, 1998; Claridge & Brooks, 1984; Raine, 1991), and to have a multidimensional structure corresponding to the structure of schizophrenic symptoms involving both positive and negative symptom dimensions (Loughland & Williams, 1997), with factor analytic studies suggesting four main schizotypal domains (Bentall, Claridge, & Slade, 1989; Claridge & Brooks, 1984; Mason, Claridge, & Jackson, 1995). Tsakanikos and Reed (2005a, 2005b) noted that individuals who scored highly on the unusual experiences scale of a schizotypy questionnaire also reported more false visual perceptions when detecting fast moving words (see also Bentall & Slade, 1985; Rankin & O'Carroll, 1995). Similar studies have demonstrated how this bias may be mediated by the ambiguity of the perceptual information, and by violations of expectancies of stimulus presentation (Cella et al., 2007; Reed et al., 2008).

In the last decade, research has investigated the effectiveness of mindfulness as part of a psychological intervention (Kabat-Zinn, 2003; Khong, 2011). Mindfulness can be described as: “an enhanced attention to and awareness of current experience or present reality” (Brown & Ryan, 2003). A wide range of literature supports the idea that

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mindfulness-based therapies can help in treatment for many psychiatric disorders, such as depression, eating disorders, anxiety, and borderline personality disorder (Baer, 2003; Mason & Hargreaves, 2001). There is some, albeit limited, evidence that mindfulness can be effective for psychosis, particularly where positive symptoms, such as hallucinations, are concerned (Abba, Chadwick, & Stevenson, 2008; Bach & Hayes, 2002; Gaudino & Herbert, 2006; Khoury et al., 2013; Newman Taylor et al., 2009). In a meta-analysis, Khoury et al. (2013) noted that mindfulness-based interventions are moderately effective for psychosis. For example, Bach and Hayes (2002; Gaudino & Herbert, 2006) investigated whether Acceptance and Commitment Therapy (ACT) involving mindfulness would result in lower re-hospitalization rates for patients with a variety of diagnoses who reported hallucinations and delusions. Patients receiving ACT reported lower levels of believability and distress associated with their hallucinations, and the re-hospitalization rates of the control group were twice as high as the ACT group. The mechanisms whereby a mindfulness/ACT intervention could benefit those with psychotic experiences are, at present, unclear, but these could include mindfulness: increasing attention to environmental cues, and reducing the impact of automatic biases to external events by allowing better discrimination between internal and external cues; reducing levels of stress associated with psychosis-proneness; and reducing fatigue and anxiety, which may be critical in affecting information processing ability.

The present study aimed to extend the investigation of the impact of mindfulness on the experience of false perceptions to a nonclinical sample scoring differentially on a schizotypy scale. Erisman (2010) demonstrated that several emotional and affective difficulties displayed by high schizotypal individuals could be improved through a very brief single mindfulness session. These findings suggest that even a brief mindfulness intervention can alter the emotions and cognitions predisposed in schizotypal individuals, suggesting the cognitive biases associated with hallucinatory experiences in schizotypal individuals may also be susceptible to mindfulness interventions. Given this, the present study examined the impact of a brief mindfulness session (Arch & Craske, 2006; McHugh, Simpson, & Reed, 2010) on experimentally-detected false perceptual experiences (Tsakanikos & Reed, 2005a, 2005b), using non-clinical participants who were assessed for their level of schizotypy. It was hypothesized that positive schizotypal participants would report more non-existent words during the word detection task than lower-scoring individuals, and that this effect would be most strongly observed for the unusual experiences scale of the O-LIFE. Moreover, it was predicted that a brief mindfulness induction session presented immediately before a word-detection task would reduce the number of non-existent words positive schizotypal subjects reported seeing during the task. It was thought that this effect may be especially pronounced among those scoring highly on the unusual experiences scale of the O-LIFE, which has previously been shown to be associated with the report of false experiences to a greater extent than the other scales (Tsakanikos & Reed, 2005a).

2. Method

2.1. Participants

140 participants (87 females and 53 males), aged 18–64 ($M = 22.82$, $SD = 7.02$), volunteered to take part in the study, and none received compensation for their participation. All participants were recruited from the general population through advertisements, all had normal or corrected-to-normal vision, and all were native English speakers. None of the participants reported any history of psychiatric disorder.

2.2. Questionnaires

2.2.1. Oxford Liverpool inventory of feelings and experiences – brief version (O-LIFE-B; Mason et al., 2005) is a 43 item scale consisting of four subscales (unusual experiences, cognitive disorganization, introverted

anhedonia, and impulsive non-conformity) designed to measure schizotypy in the normal population. The scale has an internal reliability (Cronbach α) of between 0.72 and 0.89.

2.2.2. Beck's depression inventory

(BDI; Beck et al., 1961) is a 21-item questionnaire that assesses the clinical symptoms of depression through asking about feelings over the past week. The score is a sum of the positive answers, ranging from 0 to 63. The internal reliability (Cronbach α) is 0.93. This measure was used as a control, as depression has been noted to be associated with schizotypy and with hallucinations.

2.2.3. Spielberger trait anxiety inventory

(STAI-T; Spielberger, 1983) rates the affective, cognitive, and physiological manifestations of anxiety in terms of long-standing patterns (i.e., trait anxiety). Scores for each question range from 1 = never, to 4 = almost always), and the total score can range from 20 to 80. The internal reliability (Cronbach α) is 0.93. This measure was used as a control, as anxiety has been noted to be associated with schizotypy and with hallucinations.

2.3. Attention induction

Participants were informed that they were to complete two separate 10 min exercises – an unfocused attention induction and a focused attention induction (mindfulness induction), based on exercises used by McHugh et al. (2010; Arch & Craske, 2006). The participants received both sessions separated by a period of 2 h. The instructions for the two exercises were initially read aloud to each participant once before they began each exercise. The instructions were read by a female investigator in person, and were repeated if the participant had any questions. The exercise was completed alone by the participant while sitting in a dimly lit small room.

2.3.1. Mindfulness (focused attention) induction

The instructions for the mindfulness induction were: "Focus your attention on your breathing. Notice the sensation of breathing air in. Notice the sensation of breathing air out. As you breathe air into your body, fill your mind with the thought 'just this one breath'. As you breathe air out of your body, fill your mind with the thought 'just this one exhale'". Whenever any other thoughts came into the participants' minds, they were instructed to try and push them aside, and continue to focus only on their breathing patterns.

2.3.2. Unfocused attention induction

The participant instructions for the unfocused attention exercise were: "Let your mind wander freely among thoughts about past and present events. Start by allowing your mind to roam. Don't try to focus on your thoughts; just let them drift without hesitation. There is no need to focus on anything in particular. Allow yourself to think freely. Try not to focus on any one thing. Just let your mind wander."

2.4. Word detection task

The task consisted of a computer-based presentation (Super Lab), which presented a series of word-recognition trials. Each presentation (trial) comprised four, 5-letter strings, each string set in an oval shape, presented in the four corners of the screen. The 5-letter strings were either non-words, and or 5-letter words one standard deviation above or below average frequency, using a logarithmic combine measure of the English frequency vocabulary (Zeno et al., 1995). Each trial was presented for 500 ms, with a 2 s blank screen between each trial. Some of the letter strings on each trial corresponded to words, and some were non-words. The participants had to respond "Yes", if one of the oval shapes contained a word letter string. There were 48 such trials (24

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