Intrusive prospective imagery, posttraumatic intrusions and anxiety in schizophrenia

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ABSTRACT

Trauma exposure and intrusive thoughts are commonly reported in both schizophrenia and posttraumatic stress disorder (PTSD). Information processing accounts suggest that intrusions occur in the two conditions as a result of insufficient state and/or trait contextual processing in long-term memory. Most research has focused on intrusions about past events, while growing evidence suggests that intrusions about prospective imagined events warrants further investigation. Prospective intrusive imagery has yet to be examined in psychotic disorders but could provide crucial information regarding the aetiology and maintenance of psychotic symptoms. The current study examines the role of prospective intrusive imagery, posttraumatic intrusions and anxiety in schizophrenia. Fifty-seven participants (30 patients and 27 healthy controls) completed measures of trauma, PTSD, anxiety, general non-affective use of imagery, and intrusive prospective imagery. Patients reported significantly more intrusive prospective imagery relative to control participants but, importantly, not greater use of general non-affective imagery. Intrusive prospective imagery was associated with posttraumatic intrusions and anxiety in schizophrenia. The findings are consistent with information processing models of intrusions and psychosis, and provide novel insights for theoretical accounts, clinical formulation and therapeutic targets for psychotic symptoms in schizophrenia.

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1. Introduction

A well-established link exists between trauma exposure and the development of schizophrenia (e.g. Bebbington et al., 2004; Bendall et al., 2010; van Os et al., 2010). Research finds varying rates of co-morbid PTSD in schizophrenia from around 13% to 53% (Mueser et al., 1998; Resnick et al., 2003; Howgego et al., 2005; Kilcommons and Morrison, 2005) with large differences in findings likely due to differing methodology (e.g. self-report versus clinical assessment; see Mueser et al., 2001) and the clinical context. However, the findings suggest higher rates of PTSD in schizophrenia than would be expected in the general population- around 7.8–9.2% (Breslau et al., 1991; Kessler et al., 1995). Psychotic symptoms are also frequently and co-morbidly reported with PTSD (Anketell et al., 2010). However, the pathophysiological link between trauma and schizophrenia still remains unclear. To elucidate this link current research has explored common features and shared vulnerability factors for PTSD and schizophrenia.

Intrusive cognitions are a transdiagnostic feature of both PTSD and schizophrenia and may shed light on underlying cognitive mechanisms linking the two disorders. Intrusions are involuntary, unbidden cognitions, regarded as the "hallmark" of PTSD (Ehlers and Clark, 2000), but now considered to play a role in a range of other psychological disorders, including schizophrenia (Brewin et al., 2010; Morrison, 2001). Intrusions are believed to arise due to insufficient contextual integration during information processing and storage into long-term memory (Brewin, 2001; Brewin et al., 2010; Ehlers and Clark, 2000). Contextual integration, a function of the hippocampus, involves the processing and storage of autobiographical information with corresponding temporal and spatial information. Without adequate contextual processing, memory traces become disconnected from their temporal-spatial context; such that when the memory trace is triggered it intrudes into consciousness with a sense of "nowness" (Ehlers and Clark, 2000). During a traumatic event, information is processed rapidly via the amygdala with limited contextual integration, resulting in intrusions in the form of re-experiencing (e.g. "flashbacks"). For example, a year after an individual was involved in a terrifying car accident they may re-experience an intrusive image of the crash

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with a sense that it is happening in the present moment when they hear the screech of a car breaking.

Cognitive models locate intrusions, and particularly the appraisal of intrusions, as central in the development and maintenance of psychotic phenomena (e.g. Morrison, 2001; Garety et al., 2001; Morrison et al., 2002; Read et al., 2005). Patients who experience positive psychotic symptoms are also more likely to report intrusions than other psychiatric and healthy control groups (Morrison and Baker, 2000; Morrison et al., 2002). Research has identified an attribution bias in individuals with psychosis whereby there is a tendency to attribute intrusions to external and malign sources (rather than internally generated memories) leading to emotional distress when intrusions are experienced (e.g. Bentall, 1990). The intrusion is then unwittingly maintained through maladaptive coping such as thought suppression or paranoid hypervigilence (Beck and Rector, 2003). Further, research (Steel et al., 2005; Fowler et al., 2006) has extended the cognitive models of memory processing (e.g. Brewin et al., 2010) to psychosis, identifying a "catastrophic interaction" between an underlying cognitive processing deficit and previous trauma in schizophrenia. Steel et al. (2005) cite evidence from experimental paradigms of context-dependent memory that baseline contextual processing is weaker in schizophrenia, conferring vulnerability to more frequent intrusions. Subsequent research has consistently found specific impairments in context-dependent memory and hippocampal function in schizophrenia, relative to non-context dependent memory, which remains intact (e.g. Weniger and Irle, 2008; Zierhut et al., 2010). Steel et al. (2005) further posit that past trauma results in emotional experiences that are insufficiently integrated in time and place, leading to a sense of current ongoing threat that influences the appraisal of intrusions.

Intrusions from past long-term memory have received considerable theoretical attention (e.g. Ehlers and Clark, 2000; Brewin et al., 2010) but only provide a limited insight into the nature and consequences of intrusions. A large body of research over the past decade has provided consistent evidence that thinking about the future recruits the same cognitive processes and neural circuitry as remembering the past (see Szpunar et al., 2014 for a review), in part through the extraction and recombination of stored information to simulate a novel prospective event, leading to the concept of the "prospective brain" (Schacter et al., 2007). The concept of the prospective brain has led to an interesting line of research exploring how we can apply the vast body of knowledge of retrospective memory to understanding and enhancing cognition for future events (e.g. McLelland et al., 2014). Likewise, drawing on the concept of the prospective brain, Deeprose and Holmes (2010) have argued that intrusions about future events, specifically intrusive *imagery,* which exerts a stronger influence on emotions than verbal cognition (Beck, 1976), warrant further investigation. Historically it has been assumed that one must have already experienced an unpleasant event to experience intrusions for that event. Deeprose and Holmes (2010) have challenged that assumption, finding evidence that individuals report "flashforwards" or "pre-experiencing" of imagined *future* events, known as prospective intrusive imagery. Flashforwards exhibit the same phenomenological qualities as intrusive memories for past events: they are unbidden, involuntary and are accompanied by a sense of "nowness" (Holmes et al., 2007). Negative and distressing intrusions (e.g. a flashforward to the individual carrying out a suicidal act), maintain depression by perpetuating low mood (Deeprose and Holmes, 2010). Prospective intrusive imagery is associated with greater mood instability in bipolar disorder (Holmes et al., 2011) and greater state anxiety and depression in a range of affective disorders (Morina et al., 2011). There has been no work to date on prospective intrusive imagery in psychotic disorders but,

based on cognitive models of psychosis, it is expected that greater intrusive prospective imagery would be present in patients with schizophrenia. Anxiety is also common in schizophrenia (Braga et al., 2005) and exacerbates psychotic symptoms (Huppert and Smith, 2001). If present in schizophrenia, intrusive prospective imagery may similarly contribute to the positive symptoms and the elevated rates of anxiety in schizophrenia.

The aims of this study were to investigate the presence of intrusive prospective imagery in schizophrenia relative to healthy controls, and identify the relationship between intrusive prospective imagery, retrospective intrusions and anxiety in schizophrenia. It was hypothesised that (1) individuals with schizophrenia will experience greater intrusive prospective imagery than controls, and (2) within the clinical group, prospective intrusive imagery will be positively associated with anxiety and retrospective intrusions in the form of posttraumatic re-experiencing.

2. Methods

The research was approved by the London Stanmore (ref.: 12/LO/0813) and Royal Holloway, University of London Psychology Department Ethics Committees (ref.: 2012/056). Patients completed measures in face-to-face interviews with the same researcher. Control participants completed measures in face-to-face interview format or as self-report measures depending on preference.

2.1. Participants

Fifty-seven participants comprising patients ($N=30$; 22 male) and healthy controls ($N=27$; 16 male) were recruited. Sample size was determined by an a priori power calculation in line with Cohen's (1988) conventions to detect a large effect size ($R^2 > 0.05$) in a correlational analysis, with alpha set at 0.05 and beta set at 0.2 (thus power is set at 0.8). The patients were formally diagnosed by a consultant psychiatrist with an ICD-10 (F20-21 and F25-25.9) schizophrenia spectrum disorder and recruited from 12 inpatient mental health wards in the south of England. All of the patients reported current positive symptoms, with most ($N=26$) reporting hallucinations. The control group was recruited through advertisements online and in public buildings.

Participants were included if they were aged between 18 and 65 and provided written informed consent after a full description of the study. Patients were included if they had a diagnosis of a schizophrenia spectrum disorder. Exclusion criteria were history of significant head injury (loss of consciousness > 5 min), neurological disorder or organic psychosis, current substance misuse, diagnosis of a personality disorder, poor comprehension of English, or an IQ of less than 70. Control participants were excluded if they reported a mental health diagnosis or symptoms of psychosis on the SCID IV psychosis screen (First et al., 1996). Control participants were excluded if they reported a trauma in addition to posttraumatic stress symptoms that constituted criteria for diagnosable PTSD as measured by the Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1997).

2.2. Measures

Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983): is a 14-item measure used to detect current symptoms of depression and anxiety and is a valid predictor of diagnosis and severity of depression and anxiety disorders (Bjelland et al., 2002). The HADS is composed of two subscales: HADS-A (7 items to detect anxiety) and HADS-D (7 items to detect depression). The HADS has good reliability for detecting anxiety and