



## Schizotypal personality and vulnerability to involuntary autobiographical memories

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### ABSTRACT

*Background and objectives:* Individuals who score high on positive schizotypy personality traits are vulnerable to more frequent trauma-related intrusive memories after a stressful event. This vulnerability may be the product of a low level of contextual integration of non-stressful material combined with a heightened sensitivity to a further reduction in contextual integration during a stressful event. The current study assessed whether high scoring schizotypes are vulnerable to frequent involuntary autobiographical memories (IAMs) of non-stressful material.

*Methods:* A free-association word task was used. Participants completed three recorded trials which were then replayed to allow the identification of any associations where an involuntary autobiographical memory had come to mind. Self-report measures of schizotypy and anxiety were completed.

*Results:* All participants retrieved at least one IAM from the three free-association word trials, with 70% experiencing two or more IAMs. Individuals scoring high in schizotypy reported more IAMs than those who scored low. Over 75% of the memories retrieved were neutral or positive in content.

*Limitations:* The current study is an improvement on previous methodologies used to assess IAMs. However, bias due to retrospective recall remains a possibility.

*Conclusions:* Individuals scoring high in schizotypy are vulnerable to an increased level of neutral intrusive memories which may be associated with a 'baseline' level of information-processing which is low in contextual integration.

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### 1. Introduction

There has been considerable recent interest in the potential relationship between traumatic life events and the presence of psychotic symptoms (Mueser, Rosenberg, Goodman, & Trumbetta, 2002; Shevlin, Dorahy, & Adamson, 2007). Such research indicates a high prevalence of co-morbid post-traumatic stress disorder within individuals diagnosed with schizophrenia (Kilcommons & Morrison, 2005) and highlights areas of symptom overlap between the two disorders. Based on phenomenological observation, clinical researchers have noted the presence of involuntary intrusive memories occurring within post-traumatic stress disorder (PTSD) and psychotic disorders. Whilst vivid intrusive memories are a diagnostic criteria for PTSD (American Psychiatric Association, 1994), there is also evidence of a link between the content of intrusive memories occurring within individuals diagnosed with a psychotic disorder and the content of their psychotic symptoms (Morrison, 2001)

Steel, Fowler, and Holmes (2005) put forward a theoretical account as to how intrusive memories may develop within psychosis-prone individuals and form the basis of a psychotic episode. This account draws on the cognitive models of PTSD (Brewin, 2001; Ehlers & Clark, 2000). These models state that intrusive memories are the product of a fundamental shift in information processing style which occurs during moments of intense fear and distress. It is argued that whilst individuals normally engage in conceptual processing (a high level of processing within which information is 'contextually integrated' with associated information of place, time etc.), there is a need to shift to a more basic and faster form of processing during a traumatic event. Consequently, there is a shift to perceptual processing (a low level form of processing based on basic perceptual information) during moments of intense distress. Whilst this shift in information processing style has a function, i.e. enabling a quick activation of an emotional response and potential action, the consequence is that the traumatic event is processed in a manner which is weak in 'contextual integration', that is the memory of the event is not integrated into a meaningful context. The result is a trauma-related memory which is hard to recall voluntarily, but is vulnerable to

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being triggered as an involuntary intrusive memory. Several recent studies have provided evidence for the proposed shift in processing style during a trauma (Halligan, Clark, & Ehlers, 2002; Holmes, Grey, & Young, 2005).

Steel et al. (2005) extend the role of contextual integration within the processing of stressful information to the concept of a full continuum, as opposed to categorical states. They argue that individual differences may occur within the baseline, or neutral information processing style that is adopted when processing non-emotional information. That is, individuals may vary in their strength of 'contextual integration' of incoming stimuli, such that individuals also vary in the frequency of intrusive autobiographical memories of non-distressing past events. The authors refer to the concept of schizotypal personality as a dimension which may vary in line with individual differences in 'baseline contextual integration'.

Schizotypal personality traits reflect the proposal that psychotic beliefs and experiences occur within a continuum across the non-clinical and clinical population (Claridge, 1985). Thus mild forms of hallucinations and delusions occur within individuals who score high on schizotypal personality questionnaires. High levels of these phenomena, along with many other variables, may be used to indicate psychosis-prone individuals (Woods et al., 2009). Recent schizotypy questionnaires include subscales which enable the measurement of both positive and negative dimensions of schizotypy (O-LIFE: Mason, Claridge, & Jackson, 1995), where positive schizotypy scales contain items related to magical thinking and unusual perceptual experiences. Individuals who score high on this subscale have been shown to perform in a similar style to individuals diagnosed with schizophrenia within a number of experimental paradigms (Steel, Hemsley, & Jones, 1996; Tsakanikos, Sverdrup-Thyngenson, & Reed, 2003). A more recent measure, the Cardiff Anomalous Perceptions Scale (Bell, Halligan, & Ellis, 2006) was developed to focus specifically on the unusual perceptual experiences aspects of schizotypy: this reported significant positive correlations with the Unusual Experiences subscale of the O-LIFE mentioned above.

A number of studies have been conducted which suggest that high scoring schizotypes report more frequent trauma-related intrusive memories after a stressful event than low scoring schizotypes (Holmes & Steel, 2004; Marzillier & Steel, 2007; Steel, Mahmood, & Holmes, 2008).

These results suggest that high scoring schizotypes are particularly vulnerable to a change in information processing style, and an associated reduced level of contextual integration, during a stressful or traumatic event. Steel et al. (2005) also argue that high scoring schizotypes exhibit a baseline style of information processing which is lower in contextual integration than low scoring schizotypes. This difference in baseline processing style also contributes to these individuals vulnerability to engaging in very weak contextual integration during the information processing shift associated with a traumatic event.

Whilst several studies support high scoring schizotypes' vulnerability to trauma-related intrusions (Holmes & Steel, 2004; Marzillier & Steel, 2007; Steel et al., 2008), little is known about individual differences in baseline information processing style. Based on Steel et al.'s (2005) theoretical account, high scoring schizotypes will exhibit more frequent non-distressing involuntary autobiographical memories (IAMs) than low scoring schizotypes. The current study was designed to test this hypothesis.

Within memory research, IAMs are often described as "the retrieval of a specific personal episode that is brought to consciousness with apparent spontaneity" (Ball, Mace, & Corona, 2007, p. 116), differing from 'voluntary memory' in that there is

no preceding deliberate search of an individual's memory for that event. The most common methods of studying IAMs have used retrospective narratives and diary studies (Berntsen, 2009). Whilst these methods have produced a large body of research, they do have significant methodological weaknesses. The main weakness is that the participant has to be told the purpose of the task, which can easily impact on their experience of any subsequent involuntary memories. More recent methods of triggering involuntary autobiographical memories in a laboratory setting have been developed. Some of these, such as asking participants to note when they have an IAM whilst undergoing other tasks (Mace, 2006), still have the disadvantage that the participant is informed about IAMs at the start of the task, potentially leading to confusion between the deliberate and involuntary recall of autobiographical memories. However, Ball (2007) devised a paradigm which removes this problem by using a continuous free word-association task. A word-association session between participant and experimenter is recorded, and subsequently played back to the participant. They are then asked to identify any moments in the free association where they had experienced an involuntary autobiographical memory (IAM).

Thus, the true purpose of the study is disguised as participants are not given any information as regards involuntary memories until after the word-association task. Ball (2007) reported that 87.5% of all trials resulted in the identification of an involuntary memory.

Using the paradigm described above (Ball, 2007) it was predicted that involuntary autobiographical memories would be more frequently triggered in high scoring schizotypes than in low scoring schizotypes. Additionally, in line with the findings from Ball (2007) it was predicted that involuntarily retrieved memories would come to mind faster and more spontaneously than memories that come to mind after a deliberate, voluntary search for autobiographical experiences, and that these involuntarily retrieved memories would contain comparable amounts of information as those memories retrieved voluntarily.

## 2. Method

### 2.1. Participants

The total sample consisted of 49 participants (38 female, 11 male) with a mean age of 20 years old (s.d. 4.64, range 18–44). The data from one participant was excluded due to the task being interrupted. A total of 42 participants were psychology undergraduates at the University of Reading, who received course credit for taking part. The other participants were recruited from a general invitation which had been publicised locally.

### 2.2. Materials

The word stimuli were those used by Ball (2007). There were two sets of three starting words: coffee/dog/rain and popcorn/cat/thunder. Thus, both sets of words adopted the same semantic categories ('food and drink', 'pets' and 'weather-related terms').

The recording equipment consisted of a computer with an external microphone and speakers. A digital stopwatch was used to measure time to retrieval in the deliberate autobiographical memory task. Participants used two Likert scales: one to rate the spontaneity of the memory retrieval (1 = "came to mind spontaneously" to 7 = "came to mind after a lot of thought") and the second to rate the amount of detail retrieved (1 = "recalled very few details of the experience" to 7 = "recalled a lot of details of the experience").

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