



# The behavioural assessment of savouring in schizotypal anhedonia: The Verbal Fluency Test of Enjoyable Experiences (VFTEE)



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## ABSTRACT

Hedonic response is abnormal in negative schizotypy. Using self-report methods, Applegate, El-Deredy, and Bentall (2009) reported that schizotypal anhedonia was associated with a poor capacity to savour, where savouring is the ability to mentally rehearse past, present and future pleasant experiences. A behavioural measure of savouring, the Verbal Fluency Test of Enjoyable Experiences (VFTEE), was developed, and reliability and validity were assessed. The VFTEE elicits memories and predictions of positive experiences, using ease of generation as an index of savouring ability.

Sixty-seven students, who scored high and low on measures of negative schizotypy and hypomania, completed questionnaire measures of hedonic functioning. Evoked affect was assessed on four trials of the VFTEE and an incentivised card-sorting task. The VFTEE demonstrated good internal reliability. Correlation and regression analyses revealed stylistically different abnormalities in how hypomanic and negatively schizotypal groups savour behaviourally.

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## 1. Hedonic processing in schizophrenia

Recent reviews have challenged the assumption that anhedonia in negative symptom patients reflects an abnormal in-the-moment response to pleasurable stimuli (Burbridge & Barch, 2007; Kring & Moran, 2008). Research examining reactions of those with schizophrenia, their first degree relatives and those at high risk to pleasant pictures (Lang, Bradley, & Cuthbert, 1999), sounds (Bradley & Lang, 1999) faces, (Gur et al., 2001) and film clips (Gray, 2001; Gray, Braver, & Raichle, 2002) suggests instead that pleasure response in this group is principally intact, despite self-accounts to the contrary (Berenbaum & Oltmanns, 1992; Cohen & Minor, 2010; Earnst & Kring, 1999; Kring & Caponigro, 2010; Kring & Moran, 2008; Trémeau, 2006).

An examination of hedonic response during stage-by-stage processing has led researchers to propose that it is the cognitive abnormalities associated with schizophrenia, such as reduction in working memory capacity, which explain the difference between actual and self-perceived emotional response (Trémeau et al., 2010). Pleasure can be parsed into distinct temporal stages, which correspond to anticipation, hedonia (immediate gratification) and hedonic memory in Trémeau's model and anticipatory and

consummatory pleasure in the work of Gard and colleagues (Gard, Germans-Gard, Kring, & John, 2006; Gard, Kring, Gard, Horan, & Green, 2007).

By examining evoked response to unpleasant, pleasant and neutral pictures, Heerey and Gold (2007) noted that people with schizophrenia had difficulties translating immediate emotional experiences into appetitive action, which they attributed to a decoupling of affect from motivated activity, a theory known as the 'pleasure disconnection hypothesis'. In support of this theory, positively valenced emotional memories drop their incentive salience over time in those with schizophrenia, so early emotional processing is unaffected but later processing is reduced (Herbener, Rosen, Khine, & Sweeney, 2007).

A more recent study found that participants with negative schizophrenia reported comparable levels of anticipatory (appetitive) and online (present moment) pleasure, and greater levels of remembered pleasure than healthy controls (Trémeau et al., 2010). Intriguingly, ability to remember pleasure could predict translation into motivated action whereas directly experienced hedonia could not. Thus, one alternative explanation is that the anticipation, online experience and memory of pleasure is intact in those with schizophrenia, but systemic integration of ordinarily inter-connected affective information into motivational states at a later stage of processing is not (Becerril & Barch, 2010; Trémeau et al., 2010).

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Another study found that memory of an evoked pleasurable event was intact in those with schizophrenia following a four hour delay (Horan, Green, Kring, & Nuechterlein, 2006). A further study which distinguished between memory accuracy, and accurate memory of felt emotion, found that those with schizophrenia did not maintain memory of their induced emotional state when the evocative stimuli was no longer present (Kring, Germans Gard, & Gard, 2011). Thus, those with schizophrenia may be able to remember the factual substance of a positive event but may be unable to remember the way it made them feel.

## 2. Savouring

Hedonic experience has in parallel been examined in non-disordered populations through the study of savouring, where savouring is the ability to cognitively rehearse past, present and future pleasant experiences (Bryant, 2003). Scores on self-report measures show that healthy groups anticipate greater pleasure from an imagined future event than they actually experience once it has occurred (Kahneman, 1999; Trémeau et al., 2010; Wilson & Gilbert, 2003). As imagined or remembered pleasure can be more reinforcing than felt affect during or shortly after a real-life experience (Kahneman, 1999; Thomas & Diener, 1990) then deliberate, conscious efforts to savour emotional experiences could provide leverage to enhance the memory of positive affective states, causing an upward spiral of positive emotion (Garland et al., 2010).

This approach might enhance existing cognitive behavioural interventions, which only demonstrate modest efficacy for patients with negative schizophrenia (Wykes, Steel, Everitt, & Tarrier, 2008) by causing longer term changes in motivation (Trémeau et al., 2010). Hence, an exploration of savouring in relation to negative symptoms may have considerable clinical utility. Applegate, El-Dereby, and Bentall (2009) administered Bryant's Savouring Beliefs Inventory (Bryant, 2003), a self-report measure, to 517 university students who completed the negative schizotypy subscale of the Oxford-Liverpool Inventory of Feelings and Experiences (Mason, Claridge, & Jackson, 1995). Participants also completed the Hypomanic Personality Scale (Eckblad & Chapman, 1986) as it was anticipated that hypomanic trials would be associated with increased hedonic functioning (O'Sullivan et al., 2011). Surprisingly, hypomania and negative schizotypy scores were essentially zero correlated. However both hypomania and negative schizotypy scores were predicted by behavioural activation and only ability to savour predicted negative schizotypy.

Given the relationship of savouring to negative schizotypy, the aims of the present investigation are to develop a behavioural measure of savouring, to assess its internal reliability and concurrent validity through examining its relation to other self-report and behavioural measures of hedonic processing, and finally to investigate behavioural savouring in those who score high and low on measures of negative schizotypy and hypomanic personality.

## 3. Methods

### 3.1. Participants

220 out of 516 university student participants from a previous online cohort (see Applegate et al., 2009) who scored high and low on measures of hypomania (Hypomanic Personality Scale, HPS, Eckblad & Chapman, 1986) and negative schizotypy (introverted anhedonia subscale of the OLIFE-sf) were invited to take part. 74 agreed and 67 (20 males and 47 females) presented for testing. The researcher was blind to individual scores from the previous study. Mean sample age was 20.77 years old (range 18–29); HPS scores ranged from 3 to 40 and anhedonia scores ranged from

0 to 22. The correlation between HPS and anhedonia scores was  $-.02$  ( $p = 0.86$ ).

Participants had previously completed online two subscales of the Oxford-Liverpool Inventory of Feelings and Experiences (OLIFE, Mason et al., 1995): Introverted anhedonia (negative schizotypy,  $\alpha = 0.89$ ) and Unusual experiences (positive schizotypy,  $\alpha = 0.92$ ), the Hypomanic Personality Scale (HPS, Eckblad & Chapman, 1986;  $\alpha = 0.88$ ), the Beck Depression Inventory (BDI-II: Beck, Steer, & Brown, 1996;  $\alpha = 0.88$ ), the BIS/BAS Scales (Carver & White, 1994;  $\alpha = 0.77$ ), the Savouring Beliefs Inventory (SBI: Bryant, 2003;  $\alpha = 0.92$ ), and the Temporal Experience of Pleasure Scale (TEPS: Gard et al., 2006,  $\alpha = 0.78$ ). The composition, validity and reliability of these measures is documented in Applegate et al. (2009).

### 3.2. Measures and procedure

Participants were tested in a standard test cubicle and completed the following measures:

The Positive and Negative Affect Scale: (PANAS; Watson, Clark, & Tellegen, 1988) is a reliable self-report measure of experienced affect, presented at baseline and between each experimental trial (a total of nine times). Participants rated whether they were presently experiencing any of 20 affective states, such as interest, excitement, irritability, shame, on scales of one to five, (five = extremely, four = quite a bit, three = moderately, two = a little, one = very slightly or not at all). The PANAS produces aggregated subscale scores for positive and negative affect.

The Verbal Fluency Test of Enjoyable Experiences: (VFTEE) standardised instructions compelled participants to produce four one minute narratives aloud during which they described as many positive events in the: (1) near future, (next 24 h), (2) far future, (lifetime) or, (3) that they could remember from the far past, (lifetime), and (4) the near past, (last 24 h).

A digital stopwatch and recorder were used to monitor elapsed time and record sound whilst participants verbalised their experiences. The experimenter modelled a single example response before each trial which was discounted from scores if repeated. Participants were instructed that the events they described must be within the scope of their normal experience (e.g. not flying to the moon). If participants stopped speaking standard verbal prompts were used to encourage further responding.

Each extract was transcribed verbatim. Valid and invalid spoken responses, pauses, non-included noises, and questions or statements unrelated to the task were transcribed in context. Coding was conducted by the experimenter using a coding manual. Verbal fluency was assessed in two ways by examining: (a) the overall number of productive words spoken in single and combined trials and (b) by the number of distinct experiences recounted within single and combined trials. Productive words included those which described positive (not negative) experiences. Words relating to time periods outside of the requested period, that were described as having a negative impact, that related to the sole enjoyment of others, and that were recounted outside of the 60-s time allowance were not included.

Positive experience examples were demarcated using a similar strategy to that used by Brown and Schopflocher (1998) in their study of autobiographical memory where events were separated by identifying if they occurred: (a) in a discrete time period, (e.g. 'Well last Christmas the whole family got together and ate turkey...'), (b) in relation to a specific object or agent, (e.g. 'Then I went to visit my Mum and we had a cup of tea'), or (c) in relation to a specific geographical location, (e.g. 'I went into the Arncliffe (Centre) because I needed a new dress').

The Card Arranging Reward Responsivity Objective Test: (CARROT; Al-Adawi, Powell, & Greenwood, 1998) is used to measure

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