



## Amotivation as central to negative schizotypy and their predictive value for happiness



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### ABSTRACT

Negative schizotypal traits may be related to anhedonia and/or amotivation; however it is unclear which of these symptoms is related to negative schizotypy to a greater extent. Moreover, the impact of schizotypal traits on overall subjective well-being remains uncertain. The present study examined these two questions in a non-clinical sample assessed for schizotypal traits ( $n = 138$ ). Schizotypal traits were measured using the Schizotypal Personality Questionnaire, amotivation was assessed using Marin's Apathy Evaluation Scale, anhedonia was assessed using the Snaith–Hamilton Pleasure Scale, and happiness was assessed using both the Satisfaction with Life Scale and a single-item happiness measure. Greater schizotypal traits were individually associated with both greater anhedonia and amotivation. Amotivation was a key predictor of negative schizotypy, with no independent predictive value offered by hedonic capacity. Furthermore, schizotypal traits, particularly negative schizotypal traits, were significantly associated with lower levels of happiness. This relationship between negative schizotypy and happiness remained even after controlling for the influence of amotivation. Our findings affirm that negative schizotypal traits are more closely related to symptoms of amotivation rather than anhedonia. Potential mechanisms mediating the relationship between negative schizotypy and happiness are discussed; nonetheless, future research exploring such mechanisms underlying lower well-being in schizotypy is needed.

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### 1. Introduction

Anhedonia has long been considered a core feature of the schizophrenia-spectrum (Meehl, 1962; Rado, 1953). In fact, dimensional scales assessing various facets of anhedonia (e.g., reduced hedonic reaction to social situations) have been adopted as measures of schizophrenia liability (i.e., schizotypy) (Chapman, Chapman, & Raulin, 1976; Gooding, Tallent, & Matts, 2005; Kwapil, 1998). Recent evidence, however, suggests that individuals with schizophrenia may, in fact, experience pleasure in the moment (Cohen & Minor, 2010; Kring & Moran, 2008), but are particularly impaired in their ability to mobilize motivational systems when pleasure is non-current (Gard, Kring, Gard, Horan, & Green, 2007; Heerey & Gold, 2007). The term anhedonia reflects one's

inability to experience pleasure (Ribot, 1896); whereas, the term amotivation, or apathy, reflects the lack of feeling, emotion, interest or concern, and is more closely related to goal-directed behaviour (Marin, 1990). Although anhedonic symptoms in schizophrenia have been shown to covary with symptoms of amotivation (Blanchard & Cohen, 2006; Horan, Kring, & Blanchard, 2006), the symptoms are not redundant and may be separable (Faerden et al., 2008; Strauss, Wilbur, Warren, August, & Gold, 2011). Indeed, the neurobiological substrates of hedonic reaction and motivated behaviour are dissociable (Berridge & Robinson, 1998; Berridge & Robinson, 2003). The nature of anhedonia in non-clinical schizotypy remains less clear, with some evidence suggesting impaired in-the-moment hedonic experience in this population (Chan et al., 2012; Cohen, Callaway, Najolia, Larsen, & Strauss, 2012; Gooding & Pflum, 2012; Kwapil, Brown, Silvia, Myin-Germeys, & Barrantes-Vidal, 2012; Martin, Becker, Cicero, Docherty, & Kerns, 2011). In addition, others have shown that motivational drive may be intact among schizotypal individuals

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(Yan, Liu, Cao, & Chan, 2011), while others have demonstrated the contrary (Padrao, Mallorqui, Cucurell, Marco-Pallares, & Rodriguez-Fornells, 2013). Hence, the literature on the whether anhedonia and/or amotivation underlies schizotypy (particularly the negative or interpersonal factor of schizotypy) remains unclear.

Negative schizotypal traits among non-clinical individuals have been shown to be predictive of later development of clinical schizophrenia-spectrum illnesses (Gooding et al., 2005; Kwapil, 1998). Moreover, negative schizotypal traits are associated with decrements in psychosocial functioning (Cohen & Davis, 2009; Henry, Bailey, & Rendell, 2008; Thaker, Adami, & Gold, 2001). Greater negative schizotypal traits are also related to less positive affect, more negative affect and decreased reported pleasure in daily life (Kwapil et al., 2012). Given these social consequences, a better understanding of the phenomenological underpinnings of schizotypy is clearly warranted.

It is well established that patients with schizophrenia experience marked impairments in psychosocial functioning and self-report low evaluations of subjective well-being (Rosenheck et al., 2006; Strauss, Sandt, Catalano, & Allen, 2012; Uzenoff et al., 2010), yet paradoxically they still report being no less happy than healthy volunteers (Agid et al., 2012; Strauss et al., 2012). In non-clinical populations, variance in schizotypal traits has also been shown to be related to psychosocial functioning and well-being associated with various life domains (Abbott & Byrne, 2012; Cohen & Davis, 2009; Cohen & Matthews, 2010). However, the relationship between schizotypal traits in non-clinical individuals and global estimations of satisfaction with life or happiness has yet to be explored.

The present study was designed with two specific aims. First, we sought to determine the specific contribution(s) of anhedonia and/or amotivation in predicting schizotypal traits, especially negative schizotypal traits. Given recent evidence suggesting that amotivation as being core to the schizophrenic syndrome (Foussias & Remington, 2010), we hypothesized that symptoms of amotivation would underlie negative schizotypy, rather than anhedonic symptoms. Second, we wanted to investigate whether schizotypal traits were associated with an individual's level of happiness, and in particular we wanted to discern which aspects of schizotypal traits have the greatest impact on level of happiness. For this, we hypothesized that greater schizotypal traits (primarily negative) would be related to lower levels of overall happiness. This was based on a previous finding that negative symptoms in patients with schizophrenia adversely impact happiness (Agid et al., 2012), as well as previous findings suggesting that schizotypal traits are related to lower levels of psychological well-being associated with specific life domains (Abbott & Byrne, 2012; Cohen & Davis, 2009; Cohen & Matthews, 2010).

## 2. Methods

### 2.1. Participants

Participants were undergraduate students enrolled in a psychology course at the University of Toronto who voluntarily participated in the current study for course credit by individually enrolling on an on-line experiment registry ( $n = 187$ ). Data were discarded for subjects with invalid responses ( $n = 46$ ; see Measures below), and for those deviating from the sample mean on any measure by greater than three standard deviations ( $n = 3$ ). A total of 138 subjects were included in the analyses. Means and standard deviations for demographic variables and all measurements are included in Table 1. Briefly, the participants had a mean age of 21 years and were 65% female. This study was approved by the research ethics board at the University of Toronto and all

**Table 1**

Demographic and scale descriptive statistics for study sample.

	Mean (S.D.)	Range
Age, years	20.7 (2.3)	18–31
Gender (male:female)	48:90	–
SPQ total	116.3 (40.9)	26–215
SPQ negative subscale	52.7 (21.2)	0–101
SPQ positive subscale	51.6 (19.7)	6–96
SPQ disorganized subscale	25.8 (10.7)	1–49
AES total	32.6 (7.5)	18–53
SHAPS total	48.7 (5.9)	30–56
SWL total	21.0 (6.6)	5–34
Single-item happiness	7.0 (1.3)	3–10
Happiness composite score	27.9 (7.6)	10–43

Abbreviations: SPQ, Schizotypal Personality Questionnaire; AES, Apathy Evaluation Scale; SHAPS, Snaith–Hamilton Pleasure Scale; SWL, Satisfaction with Life; S.D., standard deviation.

participants provided written informed consent before proceeding to the survey.

### 2.2. Instruments and procedure

All measures were completed as part of an online survey. The questionnaires were presented sequentially and all items within each questionnaire were randomized to minimize order effects. Schizotypal traits were measured using a Likert version of the 74-item Schizotypal Personality Questionnaire (SPQ) (Raine, 1991; Wuthrich & Bates, 2005). Of note, we opted to employ a Likert version of the SPQ over the original dichotomous response version due to the increased sensitivity and superior psychometric properties of the former (Cohen, Matthews, Najolia, & Brown, 2010; Wuthrich & Bates, 2005). The questions of the SPQ are modelled after DSM-III-R criteria for schizotypal personality disorder, and factor analytic studies have supported a three-factor model comprising positive (e.g., suspiciousness, magical ideation), negative (e.g., asociality, constricted affect) and disorganized subscales (e.g., odd behaviour and speech) (Raine et al., 1994). It is noteworthy that DSM-III-R defined schizotypal traits are largely consistent with schizotypal traits outlined in DSM-IV (American Psychiatric Association, 2000). Higher scores on the SPQ denote greater expression of schizotypal traits. Amotivation was measured using the 18-item Likert-based self-report version of the Apathy Evaluation Scale (AES) (Marin, Biedrzycki, & Firinciogullari, 1991). Higher scores on the AES denote greater severity of amotivation or apathy. Hedonic capacity was measured using the 14-item Likert-based Snaith–Hamilton Pleasure Scale (SHAPS) (Snaith et al., 1995). Higher scores on the SHAPS denote greater pleasure capacity or lower levels of anhedonia. Satisfaction with Life was measured with the 5-item Likert-based Satisfaction with Life Scale (SWL) (Diener, Emmons, Larsen, & Griffin, 1985). Higher scores on the SWL denote greater overall life satisfaction. Happiness was assessed using a Likert-based single-item (Abdel-Khalek, 2006). Of note, the SWL and happiness measure were presented before the other scales to avoid focusing confounds (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2006).

All scales demonstrated good internal reliability (all Cronbach's  $\alpha > 0.8$ ). To screen for random or invalid responding we created a series of questions that, if endorsed, would suggest invalid responses. The questions were as follows: "I can remember a time when I spoke to someone who wore glasses" (reverse coded), "Have you ever felt tired or sleepy" (reverse coded), "I am lying on this questionnaire" and "My responses to this questionnaire are falsified". Subjects endorsing any of these four validity questions were excluded from the analyses (Fervaha & Remington, 2013).

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