

**The Expression of Schizotypy in the Daily Lives of Artists**

**Nicola J. Holt**

**University of the West of England**

**Author Note**

Nicola J. Holt, University of the West of England.

This project was supported by an Early Career Research Starter Grant from the University of the West of England.

Correspondence concerning this article should be addressed to Dr Nicola J. Holt, Department of Health and Social Sciences, University of the West of England, Frenchay Campus, Coldharbour Lane, Bristol, BS16 1QY. Email: [Nicola.holt@uwe.ac.uk](mailto:Nicola.holt@uwe.ac.uk)

### **Abstract**

A considerable amount of research suggests that positive schizotypy (cognitive and perceptual aberrations, such as pseudo-hallucinations) is associated with creativity in the arts. In order to better understand how positive schizotypy might be expressed in the creative process, the experience sampling method was used to explore the experiential correlates of schizotypy in a sample of artists. Artists ( $N = 41$ ) were sampled over a week-long period, answering questions at random intervals that related to mood, cognition, state of consciousness and behaviour, resulting in reports on 2495 experiences. The sample scored significantly higher than normative samples on positive, but not negative, schizotypy, supporting previous research on the role of 'healthy schizotypy' in creativity. Multi-level modelling demonstrated that positive schizotypy predicted a particular experiential profile in daily life, characterised by more frequent reports of the flow state, altered experience, internal dialogue, vivid imagery, distractibility, introspection and high self-esteem. Positive schizotypy (but not other dimensions of schizotypy) was also a significant predictor of art-making and inspiration in daily life. Random intercept and slope models suggested that positive schizotypy was associated with greater increases in positive affect and self-esteem during or following art-making, supporting an 'affective hypothesis' for the relationship between schizotypy and artistic involvement. This study supports previous research linking positive schizotypy with artistic creativity, and suggests that, in this context, positive schizotypy can be associated with adaptive experiences, including inspiration, flow and self-esteem. Further, art-making may serve a therapeutic function for artists high in positive schizotypy.

*Keywords:* schizotypy, art, creativity, flow state, positive affect, experience sampling methodology

## **Introduction**

Schizotypy, particularly positive schizotypy (cognitive and perceptual aberrations, such as pseudo-hallucinations and déjà vu), has been consistently associated with involvement in the arts (Burch, Pavelis, Hemsley & Corr, 2006; Gibson, Folley & Park, 2009; Nettle, 2006; Rawlings & Locarnini, 2008). However, little is known about how schizotypy might be experienced within the artistic process or within the daily lives of artists, or how schizotypy might be translated into a creative advantage (Richards, 2000-2001). The current study aims to gain an understanding of this by using the experience sampling method (ESM), examining the links between schizotypy and everyday conscious experience in a sample of practicing artists.

Schizotypy is the presence of experiences and behaviours that are analogous, at a subclinical level, with those of schizophrenia (Mason & Claridge, 2015). Schizotypy is multidimensional and includes positive, negative, disorganised and impulsive symptoms (Mason, Claridge, & Jackson, 1995). Positive schizotypy includes perceptual-cognitive aberrations such as pseudo-hallucinations, apophenia and déjà vu, as well as magical beliefs, such as belief in the paranormal (Mason & Claridge, 2015). Negative schizotypy is typified by anhedonia: a lack of enjoyment derived from social interaction, withdrawal from emotional and physical intimacy, flat affect and a lack of sensory and aesthetic pleasure (Mason & Claridge, 2015). Disorganised symptoms include difficulties with attention, concentration and decision-making, while impulsivity includes risk taking and uninhibited behaviour (Mason & Claridge, 2015). These dimensions of schizotypy have different implications for cognitive functioning, well-being and creativity (Holt, 2015). In particular, negative schizotypy has been associated with lower-levels of well-being, poor executive functioning and lower levels of creativity (Abbott, Do & Byrne, 2012; Acar & Sen, 2013; Dinn et al., 2002); while positive schizotypy has been inconsistently associated with well-

being and executive functioning, and correlates positively with creativity (Abbott, Do & Byrne, 2012; Acar & Sen, 2013; Dinn et al., 2002; Mohr & Claridge, 2015; Tabak & Weisman de Mamani, 2013).

Positive schizotypy has been associated with various measures of creativity, including originality on word association tasks, figural preference and creative involvement, especially in the arts (Mohr et al., 2001; Nettle, 2006; Schulberg, 2000-2001). The latter finding is particularly robust (Holt, 2012; 2015). Several studies have reported that artists score higher than non-artists on positive schizotypy (Burch et al., 2006; Gibson et al., 2009; Nettle, 2006; O'Reilly, Dunbar & Bentall, 2001; Rawlings & Locarnini, 2008) or significantly higher than published norms (Ando, Claridge & Clark, 2014; Mason, Mort & Woo, 2015). In these studies, 'artist' has been operationally defined in diverse ways, including classical music students (Gibson et al., 2009) and self-defined artists at a professional or hobbyist level in the visual arts and poetry (Nettle, 2006). Various explanations for the link between positive schizotypy and artistic involvement have been made in the literature, including cognitive (Eysenck, 1993), motivational/affective (O'Reilly et al., 2001) and state models (Nelson & Rawlings, 2010) (see Holt [2015] for a review).

The 'cognitive hypothesis' proposes that the making of 'remote associations' or 'overinclusive thinking' underpins both schizotypal and creative ideation, leading to delusional thoughts in the context of psychopathology, and original thoughts that facilitate the creative process (Eysenck, 1993). This hypothesis draws upon associational models of creativity, where creativity is defined as the adaptive combination of remote associative elements, the more remote the association, the more creative the idea (Mednick, 1962; Martindale, 1999). Parallels have been drawn between the making of such remote associations and idiosyncrasies in the cognition associated with psychosis, such as the categorical assessment of common objects (Dykes & McGhie, 1976). For example, latent

disinhibition (the ineffective screening of ‘irrelevant’ stimuli from attention) explains some of the shared variance between creative achievement and schizotypy (at least in high IQ samples) (Carson, Peterson & Higgins, 2003; Eysenck, 1993; Mohr et al., 2001). Further, daydreaming, characterised by focusing on internal stimuli (typified by visual imagery, memories, fantasies of possible events and internal monologues) (Singer, 1966), appears to be predictive of both schizotypy (Koffel & Watson, 2009) and creativity (Lynn & Rhue, 1986; van Heugten-van der Kloet et al., 2015). Despite strong theoretical and some empirical support for the cognitive hypothesis, several studies have failed to find an association between cognitive components of creativity and schizotypy (e.g., Burch et al., 2006; Gibson et al., 2009; Schulberg, 1990; Wuthrich & Bates, 2001). Nevertheless, the ‘cognitive hypothesis’ proposes that positive schizotypy leads to original ideas and/or vivid daydreams that could form the basis for an original artistic product.

Based on the unreliability of creative cognition as a predictor of positive schizotypy (e.g., Burch et al., 2006), motivational (O’Reilly et al., 2001) and affective factors (Claridge & Blakey, 2009; Nettle, 2001) have been proposed to explain the well-replicated association between schizotypy and ‘being an artist’ (e.g., Gibson et al., 2009). Since positive schizotypy has been found to significantly and positively correlate with cyclothymia, Claridge and Blakey (2009) suggest that heightened experiences of positive affect and motivation might drive the creative process for those scoring highly on positive schizotypy. Motivation and moderate positive moods (especially positive and ‘approach’ emotions, such as joy) do appear to facilitate creativity (Baas, De Dreu & Nijstad, 2008; Davis, 2009); findings which have been explained by dopaminergic models (Chermahini & Hommel, 2010), which are also implicated in schizotypy (Mohr & Ettinger, 2014). O’Reilly et al. (2001) further postulated that people scoring highly on positive schizotypy might be motivated to express salient and unusual experiences through the arts in particular, since they enable subjective, idiosyncratic

exploration and representation. Since artistic expression itself may improve hedonic tone (Silvia et al., 2014) and promote well-being, enabling catharsis and the formation of meaningful narratives (Camic, 2008; Clift, 2012; Stuckey & Nobel, 2010), such artistic expression may also be rewarding and serve a therapeutic function. Therefore, a motivational or ‘affective hypothesis’ proposes that positive schizotypy is high amongst artists due to motivational and affective experiences that facilitate engagement with the creative process.

An alternative ‘state hypothesis’ has also been proposed, where positive schizotypy enables dissociative states that aid sustained concentration during the creative process (Nelson & Rawlings, 2010). Nelson and Rawlings (2010) reported that positive schizotypy was significantly correlated with the retrospective reporting of altered and absorbed states during the creative process (amongst a sample of artists). Thus, they argued that positive schizotypy might facilitate the flow state during the creative process, an enjoyable experience of intense absorption that is self-rewarding, increases feelings of well-being and is consequently sought out again (Csikszentmihalyi, 1996). Therefore, the ‘state hypothesis’ argues that positive schizotypy may be expressed as adaptive dissociative states that foster engagement with the process of art-making.

In order to further evaluate the efficacy of these three competing models to explain the relationship between creativity and schizotypy, the current study used the experience sampling method (ESM) to explore how schizotypy might be expressed in the everyday lives of artists, and how cognition, well-being and dissociative states fluctuate in relation to art-making. Developed with the aim of capturing ‘snapshots of everyday consciousness’, the ESM is a diary method that repeatedly triggers attention to be paid to ‘lived experience’. Immediate reports are provided about momentary contents of consciousness, occurring prior to a stimulus. This stimulus is usually an audible beep, emitted at random times from equipment that the participant carries with them for a pre-arranged period, whilst otherwise

continuing with their everyday activities in their natural environment. The ESM is a well-established and powerful protocol that is distinctive because it: samples experience at randomly selected epochs; does so on repeated occasions; and does so in a naturalistic setting (Hektner, Schmidt & Csikszentmihalyi, 2007). The ESM offers clear advantages to the study of creativity and schizotypy. Firstly, experiences are unselected by the participants and are reported on immediately, potentially reducing reporting artefacts and problems with retrospective recall (Hektner et al., 2007). Due to the reliance on self-report questionnaires in previous research, it is not clear to what extent the inflated positive schizotypy scores of artists are due to reporting artefacts (where artists may be more likely to report taboo or unusual experiences, for example) (Mohr & Leonards, 2005). Secondly, experiences occur in the everyday life of participants, enabling, in this case, 'schizotypal experience' to be reported in its natural context, whether this be carving a sculpture or catching a bus. Thirdly, the ESM enables the study of temporal dynamics (such as shifts in affect), and interactions between these and other factors to be modelled, such as affective shifts in relation to behaviour (such as art-making) or traits (such as schizotypy).

The ESM has been profitably used in previous schizotypy research (Barrantes-Vidal, Chun, Myin-Germeys & Kwapil, 2013; Kwapil et al., 2012; Myin-Germeys et al., 2003). This research suggests that both positive and negative schizotypy are associated with distinct behavioural, cognitive and affective experiences in daily life. For example, negative schizotypy, in a sample of psychology students, predicted being alone when signalled and experiencing less pleasure in daily life, along with low positive affect and high negative affect (Kwapil et al., 2012). Positive schizotypy predicted difficulties in concentration and unclear thoughts in everyday life, low self-esteem, as well as negative affect, and high variability in negative affect (Barrantes-Vidal et al., 2013; Kwapil et al., 2012). However, no previous experience sampling research has focused on schizotypy in relation to creativity or

art-making in daily life in order to explore the potential adaptive experiences associated with positive schizotypy in this context.

Experience sampling research on creativity has focused on fluctuations in affect. This suggests that creativity (at work) is associated with increases in positive affect (Amabile, Barsade, Mueller & Staw, 2005) and decreases in negative affect (Bledow, Rosing & Frese, 2013), as well as with activating (e.g. excited or angry) rather than deactivating moods (e.g., calm or bored) (To, Fisher, Ashkanasy & Rowe, 2012). Similarly, everyday creative activities have been found to be accompanied by reports of feeling happy and active (Silvia et al., 2014). This supports the view that creativity is associated with increases in positive affect and as such might be therapeutic (Camic, 2008; Clift, 2012).

In the present research the experience sampling questionnaire enquired about mood, cognition and states of consciousness, in addition to tracking behaviours, including art-making. A number of specific predictions were made: 1) Artists would score significantly higher than normative samples on positive but not negative schizotypy (Mason et al., 2015; Nettle, 2006); 2) Positive schizotypy would be significantly associated with increased levels of self-reported art-making (e.g. painting, poetry writing, playing music) and creative cognition (moments of inspiration and structured creative cognition) in daily life; 3) Positive schizotypy would be a significant positive predictor of entering mild dissociative states in daily life, such as the flow state; 4) This effect would be stronger during art-making, supporting the ‘state hypothesis’ (following Nelson and Rawlings [2010]); 5) Positive schizotypy would significantly predict increases in wellbeing (positive affect and self-esteem) as a result of art-making, supporting the ‘affective hypothesis’ (e.g. Amabile et al., 2005; Camic, 2008; Clift, 2012); 6) Positive schizotypy would significantly predict more frequent reporting of ‘inspiration’, ‘cognitive looseness’ and ‘vivid imagery’ in daily life; and 7) this would explain some of the variance in art-making, supporting the ‘cognitive hypothesis’.



Further examinations of the data were planned, but exploratory, to examine the relationship between dimensions of schizotypy and all measured dimensions of conscious experience (mood, cognition and states).

## **Method**

### **Participants**

Artists ( $N = 41$ ; 31 female; aged between 22 and 66 [mean age = 37.82]) were recruited from the local artistic community (Bristol, UK) through word-of-mouth, posters in art studios, galleries and notices on online groups for local artists. The study was described as exploring conscious experience in order to better understand the creative process. Participants self-defined themselves as artists, but they were required to regularly engage in the creative arts, and to be working on a creative project during the sampling week. Disciplines included the visual arts ( $n = 32$ ), creative writing ( $n = 4$ ), film-making ( $n = 1$ ) and performance art ( $n = 4$ ). Most of the artists in the sample were professional or semi-professional artists, but a number ( $n = 4$ ) were art students (studying in their third year of study or at postgraduate level).

Previous work has shown that levels of participant compliance and satisfaction, as well as ease of participant recruitment, are increased by both a good rapport with participants, and by remuneration (Mehl & Conner, 2012; Scollon et al., 2003). Ethically, it is important that any remuneration be sufficiently rewarding, demonstrating appreciation for participants' time and effort in a taxing study, without being large enough to be coercive. Based on these considerations, participants were each paid £70.

### **Design**

This was a multi-level, repeated-measures design, with 2495 sampled experiences (level one – 'the experiential level') nested within 41 participants (level two – 'the person level'). To

minimise order effects questions were presented in a random order, for both the ‘person level’ and the ‘experiential level’.

## **Materials**

**Personal data assistants (PDAs) and software.** Zire 72 PDAs, by Palm, were programmed with the revised Experience-Sampling Program (ESP, Barrett & Barrett, 2005).

**Experience sampling questionnaire (ESQ).** The ESQ consisted of 25 questions, chosen to measure theoretically important features of conscious experience, including mood, cognition and the flow state. 12 items came from the Phenomenology of Consciousness Inventory (PCI) (Pekala, 1991). The PCI measures independent dimensions of conscious experience that are neutral in terms of clinical significance and was developed to assess participants’ state of consciousness immediately following an intervention. It has good internal reliability and has been well-validated, distinguishing between a variety of states of consciousness (e.g. absorption, meditation, hypnosis and out-of-body experiences) (Hove et al., 2015; MacDonald, LeClair, Holland, Alter & Freidman, 1995). Items were selected to measure the following dimensions: altered state (which consists of 4 items: body image, perception, time, meaning), for example “time seemed to greatly speed up or slow down”; imagery (2 items: amount and vividness), for example “my imagery was as clear and vivid as objects in the real world”; attention (2 items: direction and absorption), for example “my attention was completely inner-directed”; self-consciousness (1 item); internal dialogue (1 item); rationality (1 item) and volitional control (1 item). An additional item was added, as used in previous ESQs, to measure self-esteem: “I felt good about myself” (Barrantes-Vidal, Chun, Myin-Germeys & Kwapil, 2013). Two additional items to measure the challenges and skills components of the flow state (the ‘conditions for flow’) were taken from the Short Flow Scale (Engeser & Rheinberg, 2008), for example “I felt just the right amount of

challenge in what I was doing”. Mood was measured with adjectives from the short PANAS (Thompson, 2007) to measure positive and negative affect and the UWIST Adjective Mood Scale (Matthew et al., 1990) to measure arousal (calm-tense and sluggish-active). Both mood scales have demonstrated good psychometric properties checklists (Matthew et al., 1990; Thompson, 2007). Participants were also asked to report on what they were doing and with whom (3 items) as is standard in experience sampling questionnaires (Hektner et al., 2007) and to track the time spent making art (1 item) and thinking creatively (2 items). A slider, with scores ranging from 0 to 100 (indicating strongly agree or disagree) was used as the response scale for all items, apart from mood adjectives, which were presented as a checklist to be selected if relevant, and initial contextual questions, which were open and completed with text responses. The complete ESQ is detailed in Table 1.

**The Short Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE)** (Mason, Linney & Claridge, 2005). This 43-item scale assesses four dimensions of the schizotypal personality trait: unusual experiences (positive schizotypy), cognitive disorganisation, introvertive anhedonia (negative schizotypy) and impulsive non-conformity. The O-LIFE has a binary response scale (‘yes’ or ‘no’) to questions including: “Have you ever thought that you had special, almost magical powers?” Good internal consistency and concurrent validity with the long version of the O-LIFE (Mason et al., 1995) have been demonstrated, which has excellent psychometric properties, including test-retest reliability (Burch, Steel & Hemsley, 1998).

### **Procedure**

Participants were given a link to a website which described what taking part in the study involved (focusing on the experience sampling method) and where they could register their

interest in taking part in the study. They could also, anonymously, through the generation of a unique cross-referencing code complete a battery of psychometric measures online (including the O-LIFE). The study was described as “aiming to learn more about the fluctuations of conscious experience in daily life”, especially in relation to the creative process. The researcher contacted participants through their preferred method and described the study to them further, answered any questions and arranged a time to meet them to brief them on how to participate. At this meeting care was taken to establish a good rapport with participants and to explain clearly how to take part. Participants were given the PDA to practice with, as many times as they wished. It was ensured that they understood the questions on the ESQ, could hear the PDA’s signal, and were comfortable with using it. They were given a protective case and a charger for the PDA, as well as the researcher’s contact details in case they needed assistance during the week. Participants were able to choose seven consecutive days when they would like to participate and the sampling time frame was set to suit their sleeping patterns. This time frame spanned twelve consecutive hours of each day. The mean start time was 9 am ( $SD = 1$ ), and all participants started sampling between 7 a.m. and 12 p.m. The PDA was programmed to signal participants ten times per day, at random times, to complete the ESQ. Each ESQ was time stamped and response times for answering each question were recorded. If a participant failed to respond to the signal within three minutes the PDA reverted to ‘sleep mode’ until the next stimulus. Participants could not use the PDA other than to complete ESQs when signalled – the program ‘locked’ the PDA. Participants carried the PDA with them for a week-long period and met with the researcher at the end of this period. They then discussed their experience of taking part with the researcher and returned the equipment, following which they were remunerated for their participation. This study was approved by the University of the West of England’s Research Ethics Committee.

## Results

### Response Rates, Data Screening and Analytic Approach

The majority of beeps were responded to by participants (mean response rate = 88.6%; ranging from 64% to 97% for individual participants). As such, all participants' data were included in the study, each obtaining adequate response rates (Hektner et al., 2007). ESQs that all had the same response (e.g. the default mid-point score of '50' on the sliding scales) were deleted from the data set, as were individual responses that were completed very quickly (in less than 1 second), suggesting 'tapping through' the questions without reflection (Mehl & Conner, 2012).

Participants described themselves as in the process of art making 9.4% of the time (235 occasions). The mean response (on a scale from 0 to 100) to having recently been art-making (since the 'last beep') was 25.18 ( $SD = 32.96$ ), with a range from 1 to 100. As such the sampled experiences reflect a range of 'artistic' and 'non-artistic' moments.

Because the data has two levels, within-person data at the 'stimulus level', constituting responses to the ESQ, and between-person data at the 'person level', reflecting scores on schizotypy, age and gender, multi-level modelling was used. Data that is nested within individuals requires multi-level modelling in order to account for the lack of independence of data at the stimulus level (Goldstein, 1995). Indeed, null models indicated that individuals did differ significantly on dimensions of inner experience and the time spent making art, requiring this variance to be accounted for. For example, the null model for art-making, with no predictors added, suggested that there was both a significant difference in the degree of art-making both between individuals ( $\tau_{00} = .550$  ( $SE = .132$ ),  $z = 4.163$ ,  $p < .001$ ,  $CI_{95} = .343, .881$ ) and within individual experience ( $\sigma^2 = 2.442$  ( $SE = .070$ ),  $z = 34.922$ ,  $p < .001$ ,  $CI_{95} = 2.309, 2.583$ ). The intra class correlation was .184, indicating that 18.4% of the variance in art-making lies between people, justifying the need for a multi-level approach and

the potential role of level two predictors in explaining this variance. Multi-level modelling can also deal with missing data across participants and hence with different response rates, which occurs with experience sampling data (Hox & Roberts, 2011). Within-person predictor variables (level 1) were centered around individual mean scores, while between-person variables (level 2) were centered around grand mean scores (Algina & Swaminathan, 2011; Nezleck, 2012).

The data were screened for the assumptions of multi-level modelling (e.g. normal distribution of the residuals of dependent variables). The residuals for the variable ‘time spent art-making’ were significantly positively skewed. In order to meet test assumptions, the efficacy of transforming data was therefore tested. According to Akaike’s Information Criteria, a measure of a model’s quality, the model that best fit the data (including a Gamma regression model, which allows the normality assumption to be violated) was one that assumed a normal distribution, but with a natural log transformation of the dependent variable, a transformation that is recommended to reduce skewness (Heck, Thomas & Tabata, 2013). Therefore, log transformed data for ‘time spent art-making’ were used in analyses of this variable. Further screening of the data indicated that there were no statistically significant gender differences across the schizotypy variables (although this may be due to the small sample of males). However, cognitive disorganisation decreased with age ( $r = -.544, p < .001$ , two-tailed). Age and gender were controlled for in multi-level models. The stimulus number (time) was included as a predictor in multi-level models to control for potential autocorrelation, where stimuli that occur close together in time cannot be assumed to be independent (Bolger & Laurenceau, 2013).

### **Schizotypy Levels**

In order to test the hypothesis that artists would score higher than normative samples on

positive but not negative schizotypy, mean scores on schizotypy dimensions were compared to published normative scores, as illustrated in Table 2 (Mason et al., 2005). The normative scores were derived from volunteers from the Institute of Psychiatry Volunteer Twin Register ( $N = 928$ ; mean age = 47). Scores on unusual experiences (positive schizotypy) and impulsive nonconformity were more than 1 SD higher than the normative scores, for both males and females. These differences were statistically significant, using one-sample t-tests (unusual experiences:  $t = 6.323, p < .001, df = 31, d = 1.136$  [females];  $t = 3.433, p = .007, df = 8, d = 1.026$  [males]; impulsive nonconformity:  $t = 6.878, p < .001, df = 31, d = 1.235$  [females];  $t = 4.004, p = .003, df = 8, d = 1.266$  [males]). Cognitive disorganisation was also higher than normative scores, but within one SD, yet this difference was still statistically significant, for females only ( $t = 4.010, p < .001, df = 31, d = .821$  [females];  $t = 1.350, p = .214, df = 8, d = .458$  [males]). However, introverted anhedonia scores (negative schizotypy) were slightly lower than normative scores and did not differ from them statistically ( $t = -.549, p = .587, df = 31, d = -.083$  [females];  $t = -.808, p = .442, df = 8, d = -.312$  [males]). As predicted, the sample of artists is characterised by positive, but not by negative schizotypal symptoms.

### **Experiential Correlates of Schizotypy in an Artistic Sample**

It was hypothesised that positive schizotypy would predict: entering mild dissociative states in daily life, such as the flow state; ‘cognitive looseness’; and ‘vivid imagery’. In order to examine the relationship between dimensions of schizotypy and conscious experience multi-level analyses were conducted, with a random intercept (allowing intercepts to vary by participant). Dimensions of conscious experience were included as dependent variables, and schizotypy dimensions, age, gender and time as fixed predictors.

These analyses suggest that the four dimensions of schizotypy can be differentiated according to the experiences they predict in everyday life (as indicated in Table 3).

Controlling for shared variance with other dimensions of schizotypy, positive schizotypy was associated with a range of distinct cognitive and perceptual experiences. These included vivid visual imagery, attention being focused inward, distractibility, and silently talking to oneself. Positive schizotypy was also associated with factors indicative of absorption, including losing awareness of the self, reduced volitional control, experiencing moments of ‘flow’ and altered experience. Positive schizotypy was not associated with overall hedonic tone or arousal levels in daily life (indicative of tension or excitement), but was associated with high self-esteem. The hypotheses that positive schizotypy would predict dissociative states, vivid imagery and cognitive looseness in everyday life were met.

In contrast, introverted anhedonia (negative schizotypy) was significantly associated with fewer experiences of flow in daily life, low self-esteem, and low levels of positive affect, as well as reporting feeling both tense and sluggish more frequently. However, like positive schizotypy, it was also associated with internal dialogue.

Cognitive disorganisation and impulsive nonconformity were not well-described by experiential variables, although impulsivity was significantly associated with heightened self-consciousness, and cognitive disorganisation with distractibility.

### **Schizotypy as Predictors of Art-making and Creative Cognition in Daily Life**

Further multi-level analyses were conducted to test the hypothesis that positive schizotypy would be associated with increased levels of art-making and creativity in daily life. Self-reported estimates of art-making, thinking about creative projects and moments of inspiration since the previous ‘beep’ were the dependent variables and sub-types of schizotypy were fixed-effect predictors (controlling for age, gender and time). Both art-making ( $\gamma = .115$ ,  $t(34.450) = 2.700$ ,  $p = .011$ ,  $CI_{95} = .028, .201$ ) and moments of inspiration ( $\gamma = 2.521$ ,  $t(34.268) = 3.536$ ,  $p = .001$ ,  $CI_{95} = 1.072, 3.970$ ) were significantly predicted by positive



schizotypy, but by no other dimensions of schizotypy (see Table 4). Thinking about creative projects, however, was not significantly predicted by schizotypy dimensions. Therefore, the hypothesis that positive schizotypy would predict art-making and creativity in daily life was partially met, for art-making and inspiration only.

The following sub-sections will build on the above in order to examine the efficacy of competing theoretical models to explain the relationship between positive schizotypy and art-making (state, affective and cognitive). Self-reported estimates of art-making since the previous ‘beep’ was the dependent variable, and positive schizotypy was added as a level two fixed-effect predictor (controlling for other schizotypy dimensions, age, gender and time). In each of the three models relevant (level one) experiential variables were added (at ‘step two’), and the relationships between experience and art-making were allowed to vary across individuals (random slopes) (at ‘step three’). Further, each model tested for the moderating effect of positive schizotypy on these relationships (cross-level interactions) (at ‘step four’). Full details of each model and the statistical outcomes of each step are available in supplementary tables.

### **The ‘State Hypothesis’: Dissociative States as Explanatory Variables for the Link Between Art-making and Positive Schizotypy**

In order to test the hypothesis that the relationship between art-making and positive schizotypy might be explained by entering dissociative states, the level one predictors of flow and altered experience were added to the previous model for the relationship between schizotypy and art-making (at ‘step two’). These predictors were comprised of items 23-24 and 11-24 on the ESQ. However, the addition of these variables did not cancel out the significant effect of positive schizotypy ( $\gamma = .110$ ,  $t(34.528) = 2.622$ ,  $p = .013$ ,  $CI_{95} = .025$ ,  $.196$ ). Both flow ( $\beta = .007$ ,  $t(2355.452) = 10.033$ ,  $p < .001$ ,  $CI_{95} = .006$ ,  $.009$ ) and altered

states ( $\beta = .004$ ,  $t(2355.306) = 8.270$ ,  $p < .001$ ,  $CI_{95} = .003, .005$ ) were additional independent significant predictors of art-making. This suggests that, in this sample, the relationship between positive schizotypy and art-making cannot be explained by a tendency to enter dissociative states.

By adding a further component to the model (step three) it was tested whether the relationship between dissociative states and art-making differs significantly between people (a random slopes model). This appeared to be the case for the flow state – there was a significant amount of variation between artists in the association between art-making and flow ( $\beta = .00006$  ( $SE = .00002$ ),  $Z = 2.948$ ,  $p = .003$ ,  $CI_{95} = .00003, .0001$ ) but not altered states ( $\beta = .000004$  ( $SE = .000003$ ),  $Z = 1.460$ ,  $p = .144$ ,  $CI_{95} = .000001, .00002$ ). Adding positive schizotypy as a cross-level interaction with flow did not explain this significant variation in the relationship between flow and art-making. Neither were the interactions between both positive schizotypy and flow ( $\beta = .00006$ ,  $t(34.153) = .117$ ,  $p = .907$ ,  $CI_{95} = -.001, .001$ ) and positive schizotypy and altered experience ( $\beta = -.0004$ ,  $t(33.347) = .13$ ,  $p = .088$ ,  $CI_{95} = -.001, .001$ ) statistically significant predictors of art-making. Positive schizotypy, flow and altered states were retained as significant and independent predictors of art-making. Thus, the ‘state hypothesis’ was rejected, since positive schizotypy did not moderate the degree to which dissociative states were experienced in relation to artistic involvement.

### **The ‘Affective Hypothesis’: Affective States as Explanatory Variables for the Link Between Art-making and Positive Schizotypy**

In order to test the hypothesis that positive schizotypy would predict increases in wellbeing (positive affect and self-esteem) as a result of art-making, affective valence (positive and negative affect), affective arousal (tense and energetic) and self-esteem were added to the

model (with schizotypy dimensions, time, age and gender as fixed predictors of art-making). The affective items comprised items 7-10 and 25 on the ESQ. Only positive affect significantly predicted art-making ( $\beta = .316$ ,  $t(2365.368) = 9.270$ ,  $p < .001$ ,  $CI_{95} = .249, .382$ ), where having recently made art was associated with more positive moods. Again, the addition of these level one predictors did not explain the variance between art-making and positive schizotypy, which remained significant ( $\gamma = .114$ ,  $t(34.393) = 2.699$ ,  $p = .011$ ,  $CI_{95} = .0282, .200$ ). A random slopes model ('step three') showed that individuals did not vary significantly in the degree to which positive affect, negative affect, tension, energetic arousal and self-esteem were associated with art making. Nevertheless, the analysis proceeded to 'step four', to test for cross-level interactions, following best-practice recommendations, since this stage of the analysis has reduced statistical power, which can lead to Type II errors (Aguinis, Gottfredson & Culpepper, 2013; LaHuis & Ferguson, 2009).

Two cross-level interactions were statistically significant, indicating that positive schizotypy moderated the degree to which art-making was associated with both positive affect ( $\beta = -.028$ ,  $t(73.812) = -2.087$ ,  $p = .040$ ,  $CI_{95} = -.054, -.001$ ) and self-esteem ( $\beta = -.002$ ,  $t(2285.159) = -3.341$ ,  $p = .001$ ,  $CI_{95} = -.003, -.001$ ). As indicated in Figures 1 and 2, high levels of positive schizotypy (1 *SD* above the mean) were associated with higher levels of positive affect and self-esteem following periods of art-making, compared with participants with low levels of positive schizotypy (1 *SD* below the mean). Participants with high levels of schizotypy also reported lower levels of well-being when art-making had occurred less recently. This provides some support for the affective hypothesis. However, given the lack of significance for the random slopes at level three this interpretation is made with some caution.

### **The Cognitive Hypothesis: Cognitive Factors as Explanatory Variables for the Link Between Art-making and Positive Schizotypy**

Finally, in order to test the hypothesis that the relationship between ‘cognitive looseness’ and positive schizotypy would predict some of the variance in art-making, five level one variables that related to cognitive factors (indicative of unstructured cognition and daydreaming) were added to the model. The cognitive items comprised items 15-18 and 20-21 on the ESQ.

Having a lot of vivid imagery, being focused, rather than distractible, thoughts being clear and rational, and internal dialogue were statistically significant predictors of art-making (as detailed in supplementary tables). However, these cognitive factors did not explain the variance between art-making and positive schizotypy, which remained significant ( $\gamma = .115$ ,  $t(34.324) = 2.668$ ,  $p = .012$ ,  $CI_{95} = .027, .202$ ). A random slopes model (‘step three’) showed that individuals only varied significantly in the degree to which attention was directed inward ( $\beta = .0001$  ( $SE = .00002$ ),  $z = 2.115$ ,  $p = .034$ ,  $CI_{95} = .00002, .0001$ ) in relation to art-making. None of the cross-level interactions between positive schizotypy and cognitive variables were statistically significant predictors of art-making. As such, it cannot be argued, in this sample, that positive schizotypy moderates the degree to which unstructured cognition or daydreams are experienced in relation to art-making.

### **Discussion**

The current study randomly sampled moments of everyday conscious experience in a sample of artists for one week, and examined the relationship between reported experience and schizotypy. Consistent with hypotheses, this population was characterised by high levels of positive, but not negative, schizotypy. Further, as hypothesised, positive schizotypy predicted a range of behavioural, cognitive and state variables amongst artists in daily life (including art-making, the flow state, vivid imagery and self-esteem). These outcomes provide further

understanding of the potential ‘creative advantage’ of schizotypy (Richards, 2000-2001), being associated with daydream-like cognition and inspiration in daily life that might facilitate original ideas. Findings also support the argument that positive schizotypy may be associated with adaptive features, such as the flow state (Mohr & Claridge, 2015). However, although positive schizotypy was associated with dissociative states and cognitive looseness in daily life, positive schizotypy did not moderate their expression in relation to art-making. Rather, results supported an ‘affective hypothesis’, where, those scoring high on positive schizotypy had significantly higher levels of well-being (positive affect and self-esteem) subsequent to art-making.

As predicted, artists in the current sample reported high levels of schizotypal traits, particularly positive, impulsive and disorganised traits, but not negative schizotypal traits. That visual artists, poets and musicians score highly on positive, impulsive, and disorganised symptoms has been previously noted (Burch et al., 2006; Gibson et al., 2009; Mason et al., 2015; Nettle, 2006; Rawlings & Locarnini, 2008), albeit with some failed replications for the impulsivity and disorganised factors (O’Reilly et al., 2006; Nettle, 2006; Rawlings & Locarnini, 2008). Importantly, and most consistently, all of these studies, including the current study, have found that artists have a profile that is characterised by positive schizotypy in the absence of negative schizotypy. (The only discrepancy in the literature is Ando et al. (2014) who reported this profile for actors, but not for comedians, who scored highly on all dimensions of schizotypy). Nevertheless, collectively, research suggests that artists have a unique schizotypal profile, sometimes referred to as ‘healthy schizotypy’ (Mohr & Claridge, 2015; Nelson & Rawlings, 2010), that is characterised by unusual perceptual and cognitive experiences (and, to a lesser degree, impulsive and non-conformist behaviour and distractibility), along with the absence of social withdrawal and anhedonia. That artists may have a profile associated with elements of both psychopathology and health is not a new idea.

For example, Barron (1993) proposed that cognitive originality (eccentricity) combined with resilience (well-being) lead to creativity, a profile he called ‘controllable oddness’. High creativity scores have been found for participants with both psychosis-proneness and resilience (Fodor, 1995); latent disinhibition and intelligence (Carson et al., 2003; Kéri, 2011); and idiosyncratic word associations plus efficient executive functioning (Merten & Fischer, 1999). The positive features of schizotypy (untrammelled by restrictive negative symptoms, such as anhedonia) may be a similar profile.

The current study expanded understanding of the ways in which dimensions of schizotypy might be expressed, phenomenologically, in the context of artistic creativity, following an extensive examination of momentary experience in everyday life. While impulsive non-conformity and cognitive disorganisation were poor predictors of experience in the daily lives of artists, as in previous research, the positive and negative dimensions appeared to have different implications for well-being and cognitive functioning (Barrantes-Vidal et al., 2013; Dinn et al., 2002).

Positive schizotypy was a significant predictor of mild, normative dissociative states (flow and altered experience, reduced self-awareness and an altered sense of time) (Butler, 2006). This supports the argument of Nelson and Rawlings (2010) that schizotypy increases the likelihood of entering imaginative and absorbed states. Importantly, the current study records this in ‘real-time’, rather than relying on retrospective recall. However, the links between such dissociative states and the artistic creative process were not clear.

Hypothetically, experiences of flow may increase overall well-being, leading to increased feelings of self-efficacy and motivation (Bryce & Howarth, 2002), and may even act as a protective factor, enabling engagement with the creative process (Carson, 2011). Positive schizotypy also significantly predicted daydreaming or ‘loose cognition’ in everyday life (including distractibility, vivid imagery, internal dialogue and inward-focused attention),

supporting the hypothesis that schizotypy is associated with cognitive looseness, remote associations and daydream-like states (Eysenck, 1993; Koffel & Watson, 2009; Mohr et al., 2001; Rawlings & Locarnini, 2008). Further, positive schizotypy predicted ‘moments of inspiration’ in everyday life, but not thinking about creative projects more generally, which may require more sustained attention (selecting the best ideas and working out potential solutions in more detail). With its more frequent moments of ‘inspiration’ and daydream-like cognition, positive schizotypy may play a role in a particular stage of the creative process, that of idea generation and novelty rather than the sedulous development and evaluation of ideas (Finke, Ward & Smith, 1992).

Negative schizotypy correlated in the opposite direction to positive schizotypy with several variables (e.g., predicting the absence of flow), providing some support for bidirectional models of positive and negative schizotypy (Shrira & Tsakanikos, 2009). As found in previous research, negative schizotypy was associated with reduced positive affect, high levels of tension and low levels of excitement (Barrantes-Vidal, et al., 2013; Kwapil et al., 2012). These competing and different correlates with state and affective variables helps to inform previous research suggesting that positive symptoms predict creativity while negative symptoms do not, or even appear to inhibit creativity (Acar & Sen, 2012). Those scoring high on negative schizotypy may (at times) lack excitement, motivation or engagement, which are required to pursue creative ideas and activities (Amabile, 1983; Csikszentmihalyi, 1996).

While, in the current sample, negative schizotypy was indicative of low levels of wellbeing, replicating previous research (Barrantes-Vidal, et al., 2013; Kwapil et al., 2012), this was not the case for positive schizotypy. Positive schizotypy, in the current sample of artists, did not have the same correlates as found in previous ESM research with undergraduate students (Barrantes-Vidal, et al., 2013; Kwapil et al., 2012). In contrast, the following associations were not replicated, that positive schizotypy predicted: high levels of

negative affect, low levels of positive affect, unclear thoughts (rationality), current activities ‘taking effort’ or being unable to cope (together indicative of reduced flow) or reduced self-esteem (not feeling good about oneself) (Barrantes-Vidal, et al., 2013; Kwapil et al., 2012). Rather, the current study suggests that positive schizotypy can predict imaginative, absorbed states, and high levels of ‘feeling good about oneself’ (albeit, as well as distractibility). In part, this could be explained by the use of different ESQs (the current study using established measures of mood and conscious experience without a clinical focus). However, the identical ‘self-esteem’ question rebukes this interpretation. Alternatively, and perhaps more likely, these different outcomes indicate that artists are a particular schizotypal sample, where positive schizotypy may be expressed in a more adaptive form, thereby being associated with different experiences (a lack of affective disturbance, self-esteem and flow). That positive schizotypy in the current sample predicted both distractibility and absorption (associated with the flow state) may appear to be paradoxical, but concurs with Brod’s (1997) idea that creative schizotypes are ‘ambi-cognitive’, and Martindale’s (1999) neurocognitive model of creativity, which requires switching between unstructured, daydream-like cognition and structured focused cognition in order to meet the demands of different stages of the creative process. Overall, this analysis supports previous work where negative schizotypy routinely predicts poor functioning and well-being, but where the relationships for positive schizotypy appear to be more complex, their expression perhaps interacting with other factors (Dinn et al., 2002; Mohr & Claridge; 2015; Tabak & Weisman de Mamani, 2013). In the current sample positive schizotypy is associated with adaptive features of conscious experience, supporting the construct of ‘healthy schizotypy’ (Mohr & Claridge, 2015).

Positive schizotypy was the only dimension of schizotypy that significantly predicted the frequency of art-making over the sampling week. Of the models tested in order to better understand why positive schizotypy might be associated with more frequent art-making, only



the ‘affective hypothesis’ supported positive schizotypy as a significant moderator.

Dissociative states and daydream-like cognition seemed to characterise the conscious experience of artists scoring highly on positive schizotypy generally, rather than predicting states occurring during or following art-making. Art-making was associated with increased positive affect for the whole sample, supporting previous experience sampling work where creative involvement improved hedonic tone (Amabile et al., 2005; Silvia et al., 2014).

However, this effect was significantly stronger for those high in positive schizotypy. Further, schizotypy was a significant moderator of the relationship between art-making and self-esteem. Artists with high positive schizotypy scores had low self-esteem when no art had been made since the last beep and high self-esteem when art had been made recently. This outcome supports the affective hypothesis (O’Reilly et al., 2001) for a link between schizotypy and the arts. However, the mechanism by which this occurs is not clear. Art-making may serve a therapeutic function, especially for artists who report unusual experiences, improving hedonic tone and self-esteem. Art-making may improve well-being through the expression and reinterpretation of unusual (or other) experiences, enable distraction from current anxieties or problems, or improve representations of the self, through feelings of achievement or self-mastery (Camic, 2008; King, 2001). Art-making may even serve a homeostatic function, maintaining emotional balance by improving mood and bolstering well-being when needed. Alternatively, the improved hedonic tone and self-esteem following art-making may be particularly high amongst those scoring highly on positive schizotypy because they may experience the highs and lows of the creative process more keenly (Claridge & Blakey, 2009). Given that positive schizotypy did not predict higher levels of positive or negative affect overall in everyday life, this effect may be specific to art-making, or may support a motivational hypothesis. Perhaps artists scoring highly on positive schizotypy are more intrinsically motivated to make art, considering it to be a valued and

meaningful activity (as suggested by the increased frequency of art-making amongst positive schizotypes), and may consequently feel a stronger sense of self-worth and positive affect when the goal of art-making is met (Deci & Ryan, 2010). The finding that positive schizotypy is associated with accentuated experiences of well-being in relation to art-making is one that deserves further empirical and theoretical exploration. In an applied context, these findings suggest that the therapeutic role of art in the context of schizotypy has some merit and deserves evaluation. Potentially, the use of creativity and the arts as a well-being intervention amongst schizotypal populations could be beneficial (Forgeard & Elstein, 2014).

While the current study has led to some interesting insights regarding the relationship between positive schizotypy and artistic creativity, these must be considered alongside caveats. For example, due to the high levels of positive schizotypy in the sample, there may be ceiling effects in the data, where variability in the sample is limited, making it difficult to find effects. For example, positive schizotypy predicted the frequency of flow in everyday life, but not in relation to art-making (not supporting Nelson and Rawlings' (2010) hypothesis that absorption in the artistic process would be heightened by positive schizotypy). However, this may have been because all artists were both highly schizotypal and flow was generally experienced during art-making. Future research might work with different populations to generate data with more variation (comparing artists with non-artists, for example). Further, with a larger sample, different schizotypal profiles could be compared according to their creativity (such as so called 'healthy schizotypes' who score highly on only positive schizotypy and 'high schizotypes', who score high on both positive and negative schizotypy) (Holt, Simmonds-Moore & Moore, 2008; Tabak & Weisman de Mamani, 2013). A further limitation of the current study relates to the ESQ, which has not been used previously in its current form, and further examination of its psychometric properties is therefore warranted. Further, the current sample included individuals from a range of creative domains and future

research might usefully focus on the role of positive schizotypy in individual domains (e.g. creative writing versus the visual arts), or on individuals with differing levels of creative achievement or expertise, since there was a broad range in the current study.

### **Conclusions**

Positive schizotypy appears to be inflated in artistic samples. This could be due to reporting artefacts, where artists may be more likely to endorse eccentric or unusual experiences (Mohr & Leonard, 2005). However, the experience sampling method is less likely to reproduce such artefacts, being based on repeated reports of immediate experience. Positive schizotypy predicted a range of cognitive and perceptual experiences (normative dissociation, inspiration and daydream-like cognition), but not experiences indicative of poor functioning, such as irrationality, negative affect or low self-esteem. This has important implications for conceptualisations of positive schizotypy, indicating that its expression is not always maladaptive, and that in some contexts it may be adaptive.

Theoretically, the current study suggests that there are multiple pathways between positive schizotypy and artistic creativity, and thus different ways by which positive schizotypy might be translated into a creative advantage. The phenomenology of artists reporting positive schizotypal experiences supports neurocognitive and associative models, being characterised by moments of inspiration, vivid imagery and unstructured cognition (Finke et al., 1992; Martindale, 1999). However, the link between positive schizotypy and actual creative behaviour (in this case ‘art-making’), albeit with caveats concerning low statistical power, was better predicted by affective and motivational factors. Further consideration of this complexity and how cognitive, state, and affective components associated with positive schizotypy might contribute to different stages of the creative process would be valuable.

## THE EXPRESSION OF SCHIZOTYPY IN THE DAILY LIVES OF ARTISTS

Art-making may serve an important affective function for artists scoring high on positive schizotypy, being associated with higher levels of hedonic tone and self-esteem. The use of art-making as a well-being intervention for those who struggle to interpret or express unusual experiences may be a novel and efficacious treatment.

## References

- Abbott, G. R., Do, M., & Byrne, L. K. (2012). Diminished subjective wellbeing in schizotypy is more than just negative affect. *Personality and individual differences, 52*, 914-918. doi: 10.1016/j.paid.2012.01.018
- Acar, S., & Sen, S. (2013). A multilevel meta-analysis of the relationship between creativity and schizotypy. *Psychology of Aesthetics, Creativity, and the Arts, 7*, 214-228. doi: 10.1037/a0031975
- Aguinis, H., Gottfredson, R. K., & Culpepper, S. A. (2013). Best-practice recommendations for estimating cross-level interaction effects using multilevel modeling. *Journal of Management, 39*, 1490-1528. doi: 10.1177/0149206313478188
- Algina, J. & Swaminathan, H. (2011). Centering in two-level nested designs. In: J. Hox, & J. K. Roberts (Eds.), *Handbook of advanced multilevel analysis* (pp. 285-312). New York: Routledge.
- Amabile, T. M. (1983). The social psychology of creativity: A componential conceptualization. *Journal of personality and social psychology, 45*, 357-376. doi: 10.1037/0022-3514.45.2.357
- Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. M. (2005). Affect and creativity at work. *Administrative science quarterly, 50*, 367-403. Retrieved from <http://journals.sagepub.com/doi/abs/10.2189/asqu.2005.50.3.367>
- Ando, V., Claridge, G., & Clark, K. (2014). Psychotic traits in comedians. *The British Journal of Psychiatry, 204*, 341-345. doi: 10.1192/bjp.bp.113.134569
- Baas, M., De Dreu, C. K., & Nijstad, B. A. (2008). A meta-analysis of 25 years of mood-creativity research: Hedonic tone, activation, or regulatory focus? *Psychological bulletin, 134*(6), 779-806. doi.org/10.1037/a0012815

- Barrantes-Vidal, N., Chun, C. A., Myin-Germeys, I., & Kwapil, T. R. (2013). Psychometric schizotypy predicts psychotic-like, paranoid, and negative symptoms in daily life. *Journal of abnormal psychology, 122*, 1077-1087. doi:10.1037/a0034793
- Barron, F. (1993). Controllable oddness as a resource in creativity. *Psychological Inquiry, 4*(3), 182-184. doi.org/10.1207/s15327965pli0403\_3
- Bledow, R., Rosing, K., & Frese, M. (2013). A dynamic perspective on affect and creativity. *Academy of Management Journal, 56*(2), 432-450. doi: 10.5465/amj.2010.0894
- Bolger, N., & Laurenceau, J. P. (2013). *Intensive longitudinal methods*. New York: Guilford.
- Brod, J. H. (1997). Creativity and schizotypy. In G. Claridge (Ed.), *Schizotypy: Implications for illness and health* (pp. 274-298). Oxford: Oxford University Press.
- Butler, L. D. (2006). Normative dissociation. *Psychiatric Clinics of North America, 29*, 45-62. doi: doi.org/10.1016/j.psc.2005.10.004
- Barrett, D. & Feldman-Barrett, L. (2005). *ESP, the experience-sampling program*. Retrieved from <http://www.experience-sampling.org/esp/>.
- Bryce, J., & Haworth, J. (2002). Wellbeing and flow in sample of male and female office workers. *Leisure Studies, 21*(3-4), 249-263. doi.org/10.1080/0261436021000030687
- Burch, G. S. J., Pavelis, C., Hemsley, D. R., & Corr, P. J. (2006). Schizotypy and creativity in visual artists. *British Journal of Psychology, 97*(2), 177-190. doi: 10.1348/000712605X60030
- Burch, G. S. J., Steel, C., & Hemsley, D. R. (1998). Oxford-Liverpool inventory of feelings and experiences: Reliability in an experimental population. *British Journal of Clinical Psychology, 37*(1), 107-108. doi: 10.1111/j.2044-8260.1998.tb01284.x
- Camic, P. M. (2008). Playing in the Mud Health Psychology, the Arts and Creative Approaches to Health Care. *Journal of Health Psychology, 13*(2), 287-298. doi: 0.1177/1359105307086698

- Carson, S. H. (2011). Creativity and psychopathology: A shared vulnerability model. *The Canadian Journal of Psychiatry*, 56(3), 144-153. doi/abs/10.1177/070674371105600304
- Carson, S. H., Peterson, J. B., & Higgins, D. M. (2003). Decreased latent inhibition is associated with increased creative achievement in high-functioning individuals. *Journal of personality and social psychology*, 85(3), 499-506. doi:10.1037/0022-3514.85.3.499
- Chermahini, S. A., & Hommel, B. (2010). The (b) link between creativity and dopamine: spontaneous eye blink rates predict and dissociate divergent and convergent thinking. *Cognition*, 115(3), 458-465. doi.org/10.1016/j.cognition.2010.03.007
- Claridge, G., & Blakey, S. (2009). Schizotypy and affective temperament: Relationships with divergent thinking and creativity styles. *Personality and Individual Differences*, 46(8), 820-826. doi: 10.1016/j.paid.2009.01.015
- Clift, S. (2012). Creative arts as a public health resource: moving from practice-based research to evidence-based practice. *Perspectives in Public Health*, 132(3), 120-127. doi: 10.1177/1757913912442269
- Csikszentmihalyi, M. (1996). *Flow and the psychology of discovery and invention*. New York: Harper Collins.
- Davis, M. (2009). Understanding the relationship between mood and creativity: A meta-analysis. *Organizational Behaviour and Human Decision Processes*, 108, 25-38. doi.org/10.1016/j.obhdp.2008.04.001
- Deci, E. L., & Ryan, R. M. (2010). *Self-determination*. New York: John Wiley & Sons, Inc..
- Dinn, W., Harris, C., Ayciegi, A., Greene, P., Andover, M. (2002). Positive and negative schizotypy in a student sample: neurocognitive and clinical correlates. *Schizophrenia Research*, 56, 171-185. doi: 10.1016/S0920-9964(01)00230-4
- Engeser, S., & Rheinberg, F. (2008). Flow, performance and moderators of challenge-skill balance. *Motivation and Emotion*, 32(3), 158-172. doi: 10.1007/s11031-008-9102-4

- Eysenck, H. J. (1993). Creativity and personality: Suggestions for a theory. *Psychological Inquiry*, 4(3), 147-178. doi.org/10.1207/s15327965pli0403\_1
- Finke, R. A., Ward, T. B., & Smith, S. M. (1992). *Creative cognition: Theory, research, and applications*. Bradford: The MIT Press.
- Fodor, E. M. (1995). Subclinical manifestations of psychosis-proneness, ego strength, and creativity. *Personality and Individual Differences*, 18(5), 635-642. doi: 10.1016/0191-8869(94)00196-Y
- Forgeard, M. J., & Elstein, J. G. (2014). Advancing the clinical science of creativity. *Frontiers in Psychology*, 5(613), 1-4. doi:10.3389/fpsyg.2014.00613
- Gibson, C., Folley, B. S., & Park, S. (2009). Enhanced divergent thinking and creativity in musicians: A behavioral and near-infrared spectroscopy study. *Brain and cognition*, 69(1), 162-169. doi: 10.1016/j.bandc.2008.07.009
- Goldstein, H. (1995). Hierarchical data modeling in the social sciences. *Journal of Educational and Behavioral Statistics*, 20(2), 201-204. Retrieved from <https://us.sagepub.com/en-us/nam/journal-of-educational-and-behavioral-statistics/journal201853>
- Heck, R. H., Thomas, S. L., & Tabata, L. N. (2013). *Multilevel and longitudinal modeling with IBM SPSS*. London: Routledge.
- Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2007). *Experience sampling method: Measuring the quality of everyday life*. New York: Sage.
- Holt, N. (2012). The muse in the machine: Creativity, anomalous experiences and mental health. *Exceptional Experience and Health*, 131-170.
- Holt, N. J. (2015). Schizotypy: A creative advantage? In O. Mason & G. Claridge (Eds.), *Schizotypy: New dimensions* (pp. 197-214). Oxford: Routledge.



- Holt, N. J., Simmonds-Moore, C., & Moore, S. (2008, August). Benign schizotypy: investigating differences between clusters of schizotype on paranormal belief, creativity, intelligence and mental health. In S. Sherwood (Ed.), *Proceedings of presented papers: The parapsychological association 51st annual convention* (pp. 82-96). Winchester: Parapsychological Association.
- Hove, M. J., Stelzer, J., Nierhaus, T., Thiel, S. D., Gundlach, C., Margulies, D. S., ... & Merker, B. (2015). Brain network reconfiguration and perceptual decoupling during an absorptive state of consciousness. *Cerebral Cortex*, *26*(7), 3116-3124. doi: 10.1093/cercor/bhv137
- Hox, J., & Roberts, J. K. (Eds.). (2011). *Handbook of advanced multilevel analysis*. New York: Routledge.
- Kéri, S. (2011). Solitary minds and social capital: Latent inhibition, general intellectual functions and social network size predict creative achievements. *Psychology of Aesthetics, Creativity, and the Arts*, *5*(3), 215-221. doi: 10.1037/a0022000
- King, L. A. (2001). The health benefits of writing about life goals. *Personality and Social Psychology Bulletin*, *27*(7), 798-807. Retrieved from <http://journals.sagepub.com/doi/pdf/10.1177/0146167201277003>
- Koffel, E., & Watson, D. (2009). Unusual sleep experiences, dissociation, and schizotypy: Evidence for a common domain. *Clinical Psychology Review*, *29*(6), 548-559. doi: 10.1016/j.cpr.2009.06.004
- Kwapil, T., Brown, L., Silvia, P., Myin-Germeys, I., & Barrantes-Vidal, N. (2012). The expression of positive and negative schizotypy in daily life: An experience sampling study. *Psychological Medicine*, *42*, 2555-2566. doi: 10.1017/S0033291712000827

- LaHuis, D. M., & Ferguson, M. W. (2009). The accuracy of significance tests for slope variance components in multilevel random coefficient models. *Organizational Research Methods, 12*(3), 418-435. doi: 0.1177/1094428107308984
- Lynn, S. J., & Rhue, J. W. (1986). The fantasy-prone person: Hypnosis, imagination, and creativity. *Journal of Personality and Social Psychology, 51*(2), 404-408. Doi: 10.1037/0022-3514.51.2.404
- Macdonald, D. A., & Friedman, H. L. (2002). Assessment of humanistic, transpersonal, and spiritual constructs: State of the science. *Journal of Humanistic Psychology, 42*(4), 102-125. doi: 10.1177/002216702237126
- Mason, O., & Claridge, G. (Eds.). (2015). *Schizotypy: New dimensions*. Oxford: Routledge.
- Mason, O., Claridge, G., & Jackson, M. (1995). New scales for the assessment of schizotypy. *Personality and Individual Differences, 18*(1), 7-13. doi: 10.1016/0191-8869(94)00132-C
- Mason, O., Linney, Y., & Claridge, G. (2005). Short scales for measuring schizotypy. *Schizophrenia research, 78*(2), 293-296. doi: 10.1016/j.schres.2005.06.020
- Mason, O. J., Mort, H., & Woo, J. (2015). Research letter: investigating psychotic traits in poets. *Psychological medicine, 45*(03), 667-669. doi: :10.1017/S0033291714002670
- Matthews, G., Jones, D. M., & Chamberlain, A. G. (1990). Refining the measurement of mood: The UWIST mood adjective checklist. *British Journal of Psychology, 81*(1), 17-42. doi: 10.1111/j.2044-8295.1990.tb02343.x
- Mehl, M. R., & Conner, T. S. (2012). *Handbook of research methods for studying daily life*. The Guildford Press: New York.
- Merten, T., & Fischer, I. (1999). Creativity, personality and word association responses: associative behaviour in forty supposedly creative persons. *Personality and Individual Differences, 27*(5), 933-942. doi: 10.1016/S0191-8869(99)00042-2

- Mohr, C., & Claridge, G. (2015). Schizotypy—do not worry, it is not all worrisome. *Schizophrenia bulletin*, *41*(suppl 2), S436-S443. doi: 10.1093/schbul/sbu185
- Mohr, C., & Ettinger, U. (2014). An overview of the association between schizotypy and dopamine. *Frontiers in psychiatry*, *5*, 184. doi: 10.3389/fpsy.2014.00184
- Mohr, C., Graves, R. E., Gianotti, L. R., Pizzagalli, D., & Brugger, P. (2001). Loose but normal: a semantic association study. *Journal of psycholinguistic research*, *30*(5), 475-483. Retrieved from:  
<https://link.springer.com/article/10.1023%2FA%3A1010461429079?LI=true>
- Mohr, C. & Leonards, U. (2005). Does contextual information influence positive and negative schizotypy scores in healthy individuals: The answer is maybe. *Psychiatry Research*, *136*, 135-141. doi: 10.1016/j.psychres.2005.06.006
- Myin-Germeys, I., Peeters, F. P. M. L., Havermans, R., Nicolson, N. A., DeVries, M. W., Delespaul, P. A. E. G., & Van Os, J. (2003). Emotional reactivity to daily life stress in psychosis and affective disorder: an experience sampling study. *Acta Psychiatrica Scandinavica*, *107*(2), 124-131. doi: 10.1034/j.1600-0447.2003.02025.x
- Nelson, B. & Rawlings, D. (2010). Relating schizotypy and personality to the phenomenology of creativity. *Schizophrenia Bulletin*, *36*, 388-399. doi: 10.1093/schbul/sbn098
- Nettle, D. (2001). *Strong imagination: madness, creativity and human nature*. Oxford: Oxford University Press.
- Nettle, D. (2006). Schizotypy and mental health amongst poets, visual artists, and mathematicians. *Journal of Research in Personality*, *40*, 876-890. doi: doi.org/10.1016/j.jrp.2005.09.004

- Nezlek, J. B. (2012). Multilevel modeling analyses of diary-style data. In T. S. Conner & M. R. Mehl (Eds.), *Handbook of research methods for studying daily life* (pp. 357-383). New York: Guilford Press.
- O'Reilly, T., Dunbar, R., & Bentall, R. (2001). Schizotypy and creativity: An evolutionary connection? *Personality and Individual Differences, 31*, 1067-1078. doi: 10.1016/S0191-8869(00)00204-X
- Pekala, R. J. (1991). *Quantifying consciousness: an empirical approach*. New York: Plenum Press.
- Rawlings, D., & Locarnini, A. (2008). Dimensional schizotypy, autism, and unusual word associations in artists and scientists. *Journal of Research in Personality, 42*, 465-471. doi: 10.1016/j.jrp.2007.06.005
- Richards, R. (2000-2001). Creativity and the schizophrenia spectrum: More and more interesting. *Creativity Research Journal, 13*(1), 111-132. doi: 10.1207/S15326934CRJ1301\_13
- Schulberg, D. (1990). Schizotypal and hypomanic traits, creativity, and psychological health. *Creativity Research Journal, 3*(3), 218-230. doi: 10.1080/10400419009534354
- Schulberg, D. (2000-2001). Six subclinical spectrum traits in normal creativity. *Creativity Research Journal, 13*(1), 5-16. doi: 10.1207/S15326934CRJ1301\_2
- Scollon, C. N., Chu, K. & Diener, E. (2003). Experience sampling: Promises and pitfalls, strengths and weaknesses. *Journal of Happiness Studies, 4*(1), 5-34. Retrieved from [http://ink.library.smu.edu.sg/sooss\\_research/928](http://ink.library.smu.edu.sg/sooss_research/928)
- Shrira, A., & Tsakanikos, E. (2009). Latent inhibition as a function of positive and negative schizotypal symptoms: evidence for a bi-directional model. *Personality and Individual Differences, 47*(5), 434-438. doi: 10.1016/j.paid.2009.04.015

- Singer, J. L. (1966). *Daydreaming: An introduction to the experimental study of inner experience*. New York, US: Crown Publishing Group/Random House.
- Silvia, P. J., Beaty, R. E., Nusbaum, E. C., Eddington, K. M., Levin-Aspenson, H., & Kwapil, T. R. (2014). Everyday creativity in daily life: An experience-sampling study of “little C” creativity. *Psychology of Aesthetics, Creativity and the Arts*, 8, 183-188. doi: doi.org/10.1037/a0035722
- Stuckey, H. L., & Nobel, J. (2010). The Connection between art, healing, and public health: A review of current literature. *American Journal of Public Health*, 100(2), 254-263. doi:10.2105/AJPH.2008.156497
- Tabak, N. T., & de Mamani, A. G. W. (2013). Latent profile analysis of healthy schizotypy within the extended psychosis phenotype. *Psychiatry research*, 210(3), 1008-1013. doi: 10.1016/j.psychres.2013.08.006
- To, M. L., Fisher, C. D., Ashkanasy, N. M., & Rowe, P. A. (2012). Within-person relationships between mood and creativity. *Journal of Applied Psychology*, 97(3), 599-612. doi: 10.1037/a0026097
- Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the positive and negative affect schedule (PANAS). *Journal of Cross-Cultural Psychology*, 38(2): 227-242. doi: 10.1177/0022022106297301
- van Heugten-van der Kloet, D., Cosgrave, J., Merckelbach, H., Haines, R., Golodetz, S., & Lynn, S. J. (2015). Imagining the impossible before breakfast: the relation between creativity, dissociation, and sleep. *Frontiers in psychology*, 6(324), 1-8. doi: 10.3389/fpsyg.2015.00324
- Wuthrich, V., & Bates, T. C. (2001). Schizotypy and latent inhibition: Non-linear linkage between psychometric and cognitive markers. *Personality and Individual Differences*, 30(5), 783-798. doi: 10.1016/S0191-8869(00)00071-4

Figure caption

Figure 1. The relationship between art-making and positive affect according to level of positive schizotypy (low versus high)

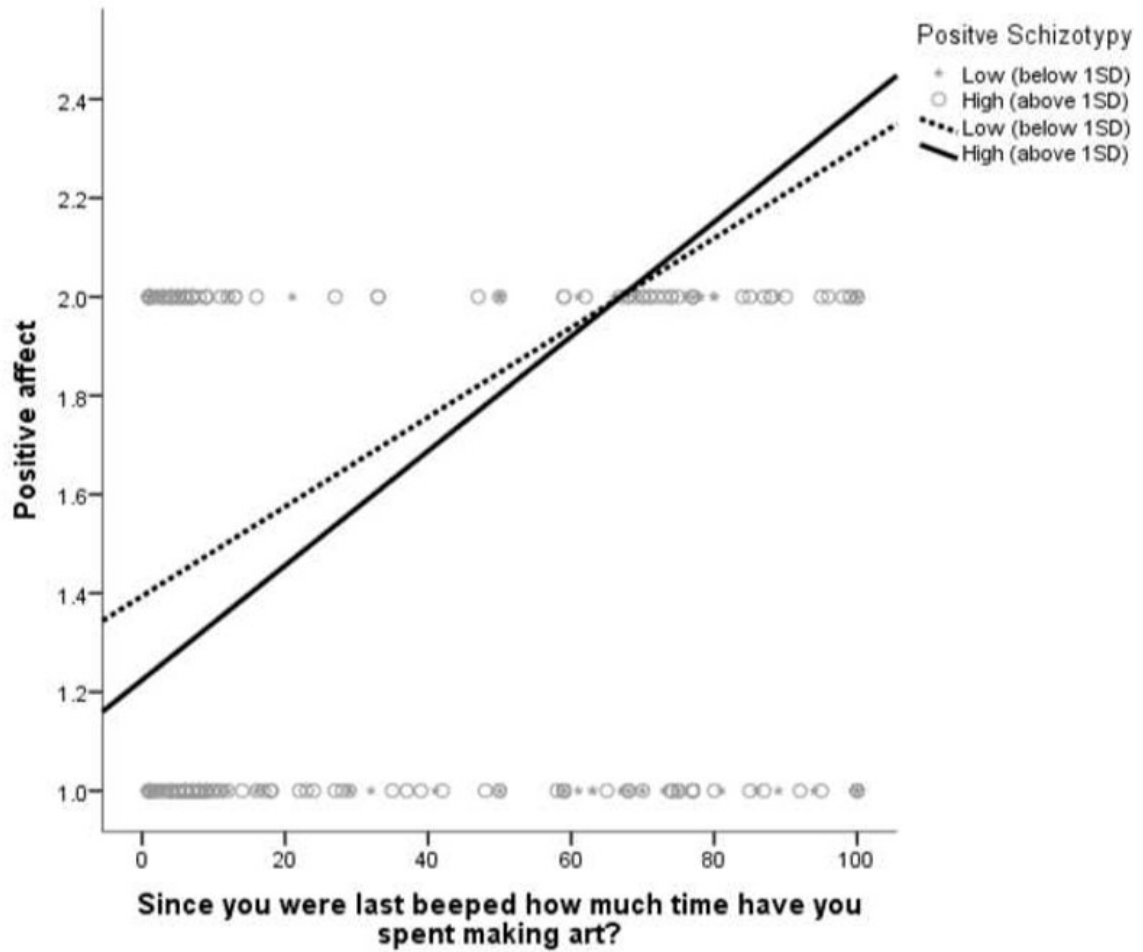


Figure caption

Figure 2. The relationship between art-making and self-esteem according to level of positive schizotypy (low versus high)

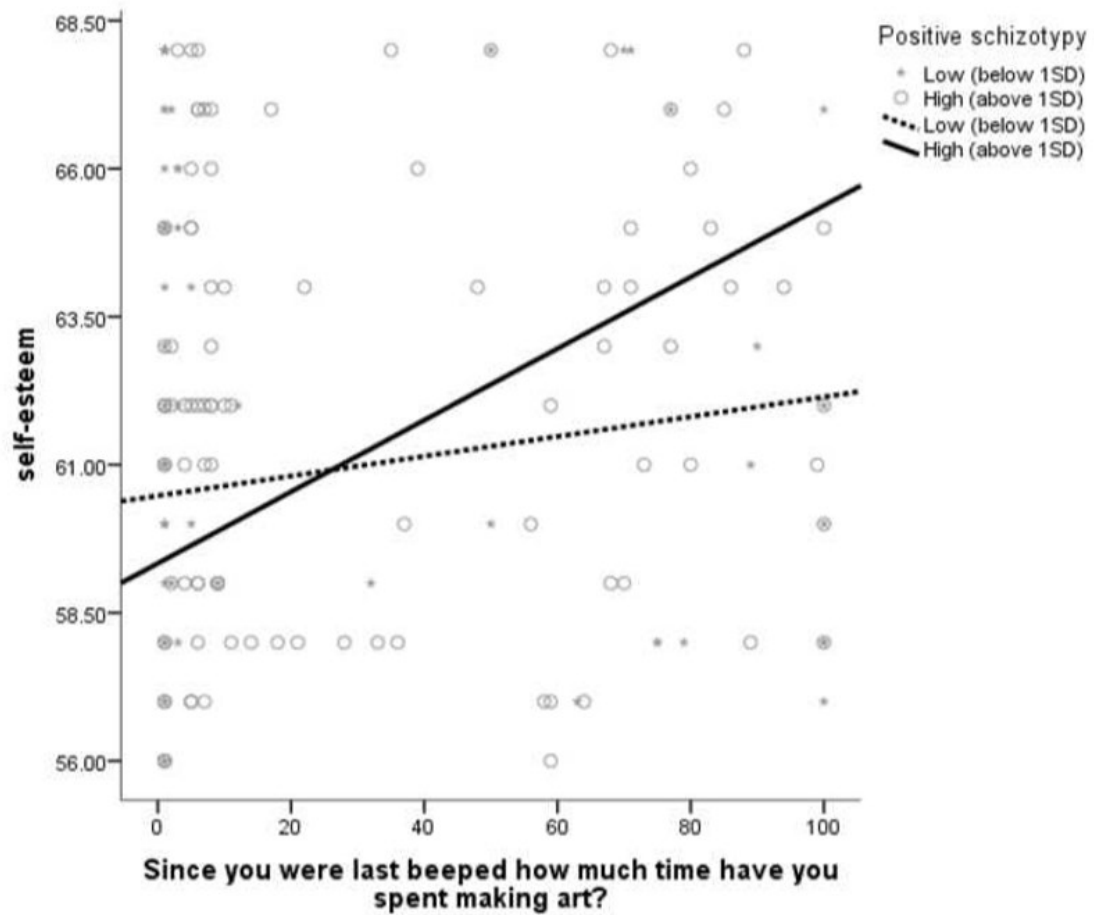


Table 1

*The Experience Sampling Questionnaire*

1.	When you were beeped, where were you?
2.	When you were beeped, who were you with?
3.	When you were beeped, what was the main thing that you were doing?
4.	Since you were last beeped how much time have you spent making art?
5.	Since you were last beeped how much time have you spent thinking about creative projects?
6.	Since you were last beeped have you had any creative ideas or moments of inspiration?
	At the time of the beep:
7.	... I was feeling  Happy Sad Satisfied Low-spirited Inspired
8.	... I was feeling  Tense Nervous Relaxed Calm Upset
9.	... I was feeling  Active Sluggish Sleepy Energetic Alert Attentive
10.	... I was feeling  Hostile Ashamed Determined Angry Annoyed Afraid
11.	... I felt my body greatly expanded beyond the boundaries of my skin
12.	... time seemed to greatly speed up or slow down
13.	... the world around me became extremely different in colour or form
14.	... I experienced very profound and enlightening insights of certain ideas or issues
15.	... I experienced no or very few images
16.	... my imagery was as clear and vivid as objects in the real world
17.	... my attention was completely inner-directed (vs. outer-directed)
18.	... I was distracted and unable to concentrate on anything
19.	... I lost consciousness of myself
20.	... I was silently talking to myself a great deal
21.	... my thinking was clear and understandable
22.	... I relinquished control and became passive and receptive to what I was experiencing (vs. wilfully controlling what I was experiencing)
23.	... I felt just the right amount of challenge in what I was doing
24.	... I knew what I had to do each step of the way
25.	... I felt good about myself



Table 2

*Descriptive Statistics for Scores on Schizotypy Subscales Compared with Normative Samples*

*(Mason et al., 2005)*

Sample		Unusual experiences	Impulsive Nonconformity	Cognitive Disorganisation	Introvertive Anhedonia
Sample	<i>n</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Female	31	6.57 (2.80)***	5.53 (2.38)***	6.59 (2.62)***	2.22 (2.18)
Female (normative)	1530	3.39 (2.92)	2.59 (1.99)	4.44 (2.88)	2.40 (1.98)
Male	10	6.34 (3.09)*	4.65 (1.54)**	5.60 (2.88)	2.31 (1.57)
Male (normative)	262	3.17 (2.92)	2.70 (1.99)	4.28 (3.00)	2.80 (2.16)

*Note.* \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

THE EXPRESSION OF SCHIZOTYPY IN THE DAILY LIVES OF ARTISTS

Table 3

*Parameter Estimates for Multilevel Model of Experiential Variables as a Function of Schizotypy Dimensions*

Level one variables	Level two predictors			
	Unusual experiences	Impulsive nonconformity	Cognitive disorganisation	Introvertive anhedonia
Flow	2.426 (1.107) *	-2.739 (1.565)	.452 (1.585)	-4.114 (1.587) *
Altered experience	11.625 (3.069) ***	-2.327 (4.349)	3.868 (4.398)	-3.739 (4.408)
Self-consciousness	-1.587 (.780) *	2.786 (1.105) *	-1.791 (1.118)	-.832 (1.120)
Imagery	5.959 (1.878) **	-4.071 (2.660)	4.782 (2.690)	-2.523 (2.696)
Attention (inward)	1.708 (.686) *	-.978 (.971)	1.542 (.983)	-.677 (.984)
Distractibility	1.881 (.721) *	-1.478 (1.021)	2.139 (1.033) *	.823 (1.035)
Rationality	-.016 (.591)	-.693 (.856)	-1.550 (.846)	-.432 (.847)
Volitional control	-2.080 (.823) *	1.143 (1.165)	1.178 (1.178)	-.819 (1.180)
Internal dialogue	1.763 (.821) *	-1.319 (1.162)	1.390 (1.176)	2.525 (1.178) *
Self-esteem	1.423 (.581) *	-.667 (.822)	-1.165 (.832)	-2.867 (.834) **
Positive affect	.017 (.031)	.050 (.044)	-.015 (.044)	-.092 (.044) *
Negative affect	.006 (.017)	.018 (.024)	< .001 (.024)	.024 (.024)
Tense arousal	-.023 (.029)	-.071 (.041)	.061 (.042)	.106 (.042) *
Energetic arousal	< .001 (.021)	.005 (.029)	.044 (.029)	-.108 (.029) ***

*Note.* Estimates are unstandardized multi-level regression coefficients (standard errors are in parentheses). df, Degrees of freedom. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

Table 4

*Dimensions of Schizotypy as Predictors of Art-making and Creative Cognition*

Level two predictors	Art-making	Thinking about creative projects	Inspiration
Unusual Experiences	.115 (.042) *	1.334 (.841)	2.521 (.713)***
Impulsive non-conformity	-.011 (.060)	.347 (1.191)	-.483 (1.009)
Cognitive Disorganisation	.016 (.061)	-.906 (1.201)	-.108 (1.021)
Introvertive Anhedonia	-.028 (.061)	1.399 (1.207)	-1.548 (1.023)

*Note.* Estimates are unstandardized multi-level regression coefficients (Standard Errors are in parentheses). \*\*\*  $p \leq .001$ , \*\*  $p < .01$ , \*  $p < .05$ .

Table S1

Results of multi-level modelling to examine whether positive schizotypy moderates the relationship between art-making and dissociation (flow and altered experience)

Level and variable	Model			
	Null (step 1)	Random intercept and fixed slope (step 2)	Random intercept and random slope (step 3)	Cross-level interaction (step 4)
<b>Level One</b>				
Intercept ( $\gamma_{00}$ )	1.959 (.120) ***	2.199 (.243) ***	2.208 (.243) ***	2.206 (.243) ***
Beep		.004 (.002)*	.003 (.002)*	.004 (.002)*
Flow		.007 (.001) ***	.007 (.001) ***	.007 (.001) ***
Altered experience		.004 (.001) ***	.004 (.001) ***	.004 (.001) ***
<b>Level Two</b>				
Age		.018 (.012)	.018 (.013)	.018 (.013)
Gender		-.469 (.271)	-.467 (.271)	-.494 (.275)
Unusual experiences		.110 (.042) *	.111 (.042) *	.111 (.042) *
Impulsive non-conformity		-.013 (.060)	-.013 (.060)	-.013 (.060)
Cognitive disorganisation		.020 (.060)	.019 (.060)	.019 (.060)
Introvertive anhedonia		-.028 (.060)	-.027 (.060)	-.027 (.060)
<b>Cross level interactions</b>				
UE * Flow				.0001 (.001)
UE * Altered experience				-.0004 (.0002)
<b>Variance components</b>				
Within-person variance ( $\sigma^2$ )	2.442 (.071) ***	2.263 (.070) ***	2.159 (.064) ***	2.158 (.064) ***
Intercept (level two) ( $\tau_{00}$ )	.550 (.132) ***	.449 (.122) ***	.450 (.118) ***	.450 (.118) ***
Flow			.0001 (.00002) **	.0001 (.00002) **
Altered experience			.000004 (.000003)	.000004 (.000003)
<b>Additional information</b>				
ICC	.184			
-2*log likelihood	9363.025	8924.549	8873.576	8901.905
Pseudo $R^2$	0	.257	.298	.298

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table S2

Results of multi-level modelling to examine whether positive schizotypy moderates the relationship between art-making and therapeutic effect

Level and variable	Model			
	Null (step 1)	Random intercept and fixed slope (step 2)	Random intercept and random slope (step 3)	Cross-level interaction (step 4)
<b>Level One</b>				
Intercept ( $\gamma_{00}$ )	1.959 (.120) ***	2.216 (.244) ***	2.220 (.244) ***	2.211 (.244) ***
Beep		.003 (.002)	.003 (.002)	.003 (.002)
Positive affect		.316 (.034) ***	.316 (.038) ***	.318 (.038) ***
Negative affect		-.032 (.058)	-.015 (.065)	-.015 (.065)
Self-esteem		-.0001 (.002)	.001 (.002)	.001 (.002)
Energetic arousal		-.013 (.043)	-.006 (.050)	-.011 (.050)
Tense arousal		-.033 (.035)	-.055 (.042)	-.056 (.050)
<b>Level Two</b>				
Age		.017 (.012)	.017 (.013)	.017 (.012)
Gender		-.467 (.273)	-.464 (.273)	-.467 (.272)
Unusual experiences		.114 (.042) *	.114 (.043) *	.114 (.042) *
Impulsive non-conformity		-.013 (.060)	-.013 (.060)	-.013 (.060)
Cognitive disorganisation		.015 (.061)	.015 (.061)	.015 (.061)
Introvertive anhedonia		-.031 (.061)	-.031 (.061)	-.031 (.061)
<b>Cross level interactions</b>				
UE * Positive affect				-.028 (.013) *
UE * Negative affect				-.020 (.021)
UE * Self esteem				-.002 (.001) ***
UE * Energetic arousal				.027 (.017)
UE * Tense arousal				.024 (.016)
<b>Variance components</b>				
Within-person variance ( $\sigma^2$ )	2.442 (.071) ***	2.276 (.066) ***	2.188 (.066) ***	2.188 (.065) ***
Intercept (level two) ( $\tau_{00}$ )	.550 (.132) ***	.454 (.119) ***	.455 (.119) ***	.455 (.119) ***
Positive affect			.010 (.009)	.011 (.009)
Negative affect			.012 (.021)	.012 (.022)
Self-esteem			.00004 (.00003)	< .001 (< .001)
Energetic arousal			.026 (.016)	.026 (.016)
Tense arousal			.016 (.013)	.022 (.014)
<b>Additional information</b>				
ICC	.184			
-2*log likelihood	9363.025	8987.530	8960.070	8984.181
Pseudo $R^2$	0	.243	.277	.277

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

Table S3

Results of multi-level modelling to examine whether positive schizotypy moderates the relationship between art-making and unstructured cognition

Level and variable	Model			
	Null (step 1)	Random intercept and fixed slope (step 2)	Random intercept and random slope (step 3)	Cross-level interaction (step 4)
<b>Level One</b>				
Intercept ( $\gamma_{00}$ )	1.959 (.120) ***	2.186 (.248) ***	2.186 (.248) ***	2.188 (.248) ***
Beep		.004 (.002) **	.004 (.002) *	.004 (.002) *
Imagery		.007 (.001) ***	.007 (.001) ***	.007 (.001) ***
Attention (inward)		-.001 (.001)	-.001 (.002)	-.001 (.002)
Distractibility		-.003 (.001) *	-.003 (.001) *	-.003 (.001)
Rationality		.003 (.001) *	.003 (.001)	.003 (.002)
Internal dialogue		.006 (.001) ***	.006 (.002) ***	.006 (.002) ***
<b>Level Two</b>				
Age		.018 (.012)	.018 (.013)	.018 (.013)
Gender		-.459 (.277)	-.454 (.277)	-.453 (.277)
Unusual experiences		.114 (.043) *	.115 (.043) *	.115 (.043) *
Impulsive non-conformity		-.011 (.061)	-.011 (.061)	-.011 (.061)
Cognitive disorganisation		.018 (.062)	.017 (.062)	.017 (.062)
Introvertive anhedonia		-.030 (.062)	-.030 (.062)	-.030 (.062)
<b>Cross level interactions</b>				
UE * Imagery				.0003 (.0004)
UE * Attention (inward)				-.001 (.001)
UE * Distractibility				-.0002 (.001)
UE * Rationality				.0003 (.001)
UE * Internal dialogue				-.00002 (.001)
<b>Variance components</b>				
Within-person variance ( $\sigma^2$ )	2.442 (.071) ***	2.278(.066) ***	2.179 (.065) ***	2.178 (.067) ***
Intercept (level two) ( $\tau_{00}$ )	.550 (.132) ***	.470 (.123)	.471 (.123) ***	.471 (.122) ***
Imagery			.00002 (.00001)	.00002 (.00001)
Attention (inward)			.0001 (.00002) *	.0001 (.00003) *
Distractibility			.0000003 (.00001)	< .001 (< .001)
Rationality			< .001 (< .001)	< .001 (< .001)
Internal dialogue			.00004 (.00002)	.00004 (.00002)
<b>Additional information</b>				
ICC	.184			
-2*log likelihood	9363.025	8957.190	8923.094	8988.217
Pseudo $R^2$	0	.213	.251	.252

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$