

Relating Schizotypy and Personality to the Phenomenology of Creativity

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Introduction: Although a considerable amount of research has addressed psychopathological and personality correlates of creativity, the relationship between these characteristics and the phenomenology of creativity has been neglected. Relating these characteristics to the phenomenology of creativity may assist in clarifying the precise nature of the relationship between psychopathology and creativity. The current article reports on an empirical study of the relationship between the phenomenology of the creative process and psychopathological and personality characteristics in a sample of artists. **Method:** A total of 100 artists (43 males, 57 females, mean age = 34.69 years) from a range of disciplines completed the Experience of Creativity Questionnaire and measures of “positive” schizotypy, affective disturbance, mental boundaries, and normal personality. **Results:** The sample of artists was found to be elevated on “positive” schizotypy, unipolar affective disturbance, thin boundaries, and the personality dimensions of Openness to Experience and Neuroticism, compared with norm data. Schizotypy was found to be the strongest predictor of a range of creative experience scales (Distinct Experience, Anxiety, Absorption, Power/Pleasure), suggesting a strong overlap of schizotypal and creative experience. **Discussion:** These findings indicate that “positive” schizotypy is associated with central features of “flow”-type experience, including distinct shift in phenomenological experience, deep absorption, focus on present experience, and sense of pleasure. The neurologically based construct of latent inhibition may be a mechanism that facilitates entry into flow-type states for schizotypal individuals. This may occur by reduced latent inhibition providing a “fresh” awareness and therefore a greater absorption in present experience, thus leading to flow-type states.

Key words: schizotypy/creativity/personality/phenomenology

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The only difference between me and a madman is that I am not mad.—Salvador Dali

Introduction

Considerable research into the relationship between psychopathology and creativity has provided evidence that creativity is associated both with schizophrenia-spectrum disorders and with affective disturbance (see Becker¹, Schuldberg², and Brod³). However, the literature has largely ignored the relationship between these aspects of psychopathology and the phenomenology of creativity. “Schizotypy” is a construct that has emerged in the literature to represent subclinical, psychotic-like characteristics or an underlying vulnerability to psychotic symptoms.⁴ This construct is supported by empirical research that has suggested that, rather than there being categorical differences in the presence of psychotic-like characteristics (ie, either present or absent), these characteristics are present in varying degrees of severity in the population, blending from the normal to the pathological.^{5–8} There is also evidence for the schizotypy construct from the schizophrenia literature, most prominently the studies that have suggested that individuals with a genetic predisposition to schizophrenia may not manifest all the signs of the illness but may display some evidence of deviant psychological functioning, eg, the familial studies of Kendler and others^{9–12} and the adoption studies of Kety and others.^{13–15}

The present article employs the framework implied by this dimensional view of psychotic illness to explore the relationship between psychopathology and the phenomenology of creativity. Although the term “psychopathology” is used throughout, we recognize that schizotypy should not necessarily be viewed as a *forme fruste* of schizophrenic disease but can also be viewed as an aspect of personality-like other individual differences, such as anxiety, that can potentially have either healthy or unhealthy outcomes.¹⁶ Claridge¹⁷ refers to the former view as the fully dimensional model and the latter as the quasi-dimensional model of schizotypy.

Creativity, Psychopathology, and Personality

The schizophrenia spectrum has tended to display an “inverted-U” relationship with creativity. That is, the

presence of some schizotypal features are associated with heightened creativity, whereas further along the schizophrenia spectrum, toward frank schizophrenia, the relationship is attenuated. “Positive” schizotypal traits (such as unusual perceptual experiences and magical beliefs) have been found to be of particular relevance to artistic creativity,^{2,18} whereas “negative” schizotypal traits (such as physical and social anhedonia and introversion) have been related to mathematical or scientific creativity (eg, Nettle¹⁹). The “inverted-U” model has developed through a combination of studies using creators (both eminent and noneminent), psychiatric patients and their biological relatives, and “normal” populations.^{2,20–23} A variety of mechanisms have been suggested to account for this relationship, including access to primary process material,^{24,25} a common over-inclusive thinking style,²⁶ unconventional associative processes,^{27,28} variability in arousal levels,²⁹ and motivational factors.^{30,31}

Affective disturbance has played a prominent role in creativity-psychopathology research, particularly in the area of artistic creativity. Evidence for the association has been gathered from biographical studies of historically eminent creative individuals,^{32–36} living creators,^{36–39} clinical samples,^{40–42} and “normal” samples.² As with the schizophrenia spectrum, the evidence has tended to support an inverted-U relationship between severity of affective disturbance and creative ability. Although some research suggests a positive association between depressive symptoms and creativity, the strongest evidence is for a connection between bipolar tendencies and creativity.^{36,37,41,43,44} Hypomanic traits have displayed a particularly strong relationship with creativity (D. K. Kinney, PhD, R. Richards, PhD, H. Daniels, PhD, and K. W. Linkins, PhD, unpublished data, 1989).^{41,45,47} As with schizotypy, a number of mechanisms have been proposed to account for the affective disturbance-creativity link, including cognitive^{18,36,47} and motivational^{18,48} aspects of hypomanic states, the “carry-over” effects of mood swings,⁴⁷ and depressive features facilitating introspection.^{36,49} We note that in some approaches the concept of schizotypy is broadened to include the minor signs of affective disorder, particularly hypomania (eg, Claridge¹⁷), in an attempt to produce a model that reflects the unitary psychosis (*Einheitspsychose*) view of psychosis. This latter model posits that schizophrenia and bipolar affective psychosis are manifestations of a single underlying psychotic disorder rather than distinct disease entities (see Kendell⁵⁰ and Berrios⁵¹).

The association between creativity and individual differences in normal personality has also attracted strong research interest, and a wide range of personality traits have been associated with creativity (see Feist⁵² for review). Although this aspect of the current study is somewhat secondary, 2 aspects of personality were explored as providing potential clarification of the psychopathology-creativity connection. The personality

domain that has most consistently been associated with creativity, both in theoretical and empirical work, has been Openness to Experience,^{53–55} one of the 5 dimensions of the Five Factor Model, or Big Five, viewpoints, which form the most popular contemporary conceptualizations of personality description.⁵⁶ McCrae and Costa⁵⁴ describe Openness to Experience as gratuitous interest in a variety of experiences in the areas of fantasy, aesthetics, feelings, actions, ideas, and values and as a recurrent need to enlarge and examine experience.

Thin mental boundaries have been associated empirically and conceptually with creativity and minor signs of mental disturbance.⁵⁷ The concept of thin or permeable “mental boundaries”⁵⁷ refers to a grouping of personality characteristics that include traits such as being open, sensitive, vulnerable, artistic, trusting, defenseless, and fluid. On the basis of a factor-analytic study of a range of personality measures, McCrae⁵⁸ suggests that thin boundaries may be a possible explanatory mechanism for Openness (see also Van Hiel and Mervielde⁵⁹).

Relationship With the Phenomenology of Creativity

While the relationship between psychopathological and personality variables and creativity has been extensively researched, it has not been explored with regard to the phenomenology, or subjectively experienced aspects, of creativity. This has partly been due to the fact that a reliable measure of creative experience has not been available. In previous work, we developed such a measure, the Experience of Creativity Questionnaire (ECQ).⁶⁰ The scales of this questionnaire emerged from the factor analyses of the responses to a wide range of questions given by practicing artists from diverse fields. The scales represented different experiential (Distinct Experience, Anxiety, Absorption, Power/Pleasure, Clarity/Preparation) and existential (Transformation, Centrality, Beyond the Personal) aspects of creativity. For present purposes, we focus on the experiential aspects, which are briefly described below.

Distinct Experience related to the creative process being a definite shift in nature or type of experience. This change in experience included such aspects as loss of self-awareness, a breakdown of boundaries, a sense of contact with a force beyond the individual self, and a confidence and effortlessness about the artistic activity. A subjective heightening or intensification—of affect, awareness, and technical and expressive abilities—is generally associated with this state but it may also be associated with a stabilization of emotional state. The Anxiety Scale related to a sense of anxiety and vulnerability associated with the creative process, particularly after completion of the process. Absorption encompassed the artist’s feeling inspired and being deeply absorbed in the artistic activity. A sense of freedom and close “connection” with the work and with self was present, as

though the process was providing the artist with a sense of inner coherence. Rather than having a clearly defined sense of the direction of the artwork, the scale included a sense of discovery and of being receptive to the emergent nature of the artwork. Power/Pleasure related to a sense of control, power, and pleasure felt during the creative process. Several items also reflected the role of analytical mental processes in the creative process. Clarity/Preparation referred to a sense of certainty and clarity about the direction in which the artistic activity should proceed, including the meaning of the piece of work, and to cultivating an appropriate mood for the creative process.

The Current Study

Previous studies by the authors focused on the phenomenology of the artistic creative process using a qualitative methodology⁶¹ and on developing a questionnaire to measure experiential and existential aspects of creativity for use in psychometric studies.⁶⁰ The current study builds on this work by addressing the relationship between the phenomenology of creativity and aspects of psychopathology and personality, as measured using the questionnaire.

This research question is in keeping with the view that creativity is not a single homogeneous entity. Accordingly, some commentators have encouraged the view that the phenomena of creativity appear as a variety of creativity “profiles” (eg, Russ⁶² and Richards⁶³), which develop around the different dimensions that have been identified as important in creativity, such as personality, affective, and cognitive processes. Richards⁶⁴, eg, proposes the notion of profiles differentiating bipolar and schizophrenia-spectrum individuals (see also Schuldberg⁶⁵). She speculates that the hypomanic state might involve an outward-directed gaze, with the individual “buzzing with ideas, affects, and associations” (p128), whereas the schizotypal state might involve a turning inward and detachment from cultural constructions, with awareness consisting of isolated “snapshots.” In other words, Richards proposes characteristic and possibly quite distinct patterns of cognition, affect and experience associated with creativity in bipolar and schizophrenia-spectrum individuals. The concept of profiles is not inconsistent with the alternative “unitary psychosis” view of schizotypy mentioned earlier, though it would appear to imply a much less obvious differentiation between manifestations of creativity in individuals showing minor features of the 2 major forms of psychosis.

The current study investigated the question of whether the phenomenology of the artistic creative process varies in relation to psychopathology and personality features in a sample of artists. We use the term “artistic” creativity in a broad sense, referring to the variety of artistic fields, including music, visual art, theatre, and literature. Given

the connections established between psychotic psychopathology and creativity in a wide range of contexts, we anticipated that there would be a number of relationships between “positive” schizotypy and dimensions of creative experience. However, due to the lack of prior research in this area, no specific hypotheses concerning possible connections between psychopathology, personality, and the experiential dimensions of creativity are specified.

Methods

Participants

A total of 100 artists (43 males, 57 females) participated in the study. The mean age was 34.69 years (SD = 11.20 years, range = 19–69). Participants were recruited through contacts of the researchers (artists known directly by or through acquaintances of the researchers) and advertisements placed in various locations, including art schools and studios, a music school, a writers’ center, and a writers’ newsletter. The inclusion criteria were regular involvement in the creative arts for at least the previous 2 years and being over 18 years of age. It was not necessary for participants to be professional artists. The regularity of involvement was judged informally by the researchers, with the general guideline of at least weekly involvement. This criterion was used to ensure that participants had a reasonable degree of familiarity with the creative process and commitment to artistic activity. In an attempt not to attract a biased sample, the wording of the advertisement did not make an explicit link between creativity and psychopathology, referring simply to “aspects of personality,” “feelings,” “attitudes,” and “experiences.” If the advertisement had made a connection between creativity and psychopathology, artists with strong opinions about the relationship between creativity and psychopathology, artists suffering from psychopathology, or artists intrigued by their mental health status, eg, might have been overly represented in the sample (see Rothenberg⁶⁶ for discussion of this issue).

Materials

Participants completed a battery of questionnaires, as listed below.

Demographic Information. Participants recorded the following details: age, gender, main creative medium (eg, prose writing, visual art, etc), style in this medium (eg, improvisational, classical, etc), length of time involved in the creative arts, current level of involvement, whether artwork was their main source of income, and whether they had ever received mental health treatment and, if so, for what problems.

Experience of Creativity Questionnaire. The ECQ is designed to measure experiential (Part A) and existential (Part B) aspects of artistic creativity.⁶⁰ The questionnaire items were generated on the basis of a qualitative investigation.⁶¹ Responses on these questionnaire items were factor analysed (see Nelson and Rawlings⁶⁰). The ECQ scales correspond to the factors that resulted from this factor analysis. Part A (44 items) consists of 5 scales: Distinct Experience, Anxiety, Absorption, Power/Pleasure, Clarity/Preparation. Part B (19 items) consists of 3 scales: Transformation, Centrality, and Beyond the Personal. Only the experiential scales (Part A) will be discussed here, all of which reported sound internal reliability (Guttman coefficients between 0.79 and 0.82), except Clarity/Preparation (0.60). The experiential scales (Part A) request the participant to rate a particular moment or period of creative activity, rather than general aspects of subjective experience, as in the personality-based measure of positive schizotypy.

Big Five Inventory. This 44-item questionnaire uses short phrases to assess prototypical traits associated with each of the Big Five personality domains.⁶⁷ The trait adjectives (eg, “thorough”) that form the core of each of the 44 items (eg, “does a thorough job”) have been shown in previous studies to be univocal, prototypical markers of the Big Five domains.^{68,69} Ratings are made on a 5-point scale ranging from 0 (“disagree strongly”) to 4 (“agree strongly”). In US and Canadian samples, the alpha reliabilities of the Big Five Inventory (BFI) Scale typically range from .75 to .90 and average above .80; 3-month test-retest reliabilities range from .80 to .90, with a mean of .85.⁷⁰

Unusual Experiences Questionnaire. This questionnaire is a scale from the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE³¹), which consists of 4 scales in total: Unusual Experiences (UnuExp), Cognitive Disorganization, Introvertive Anhedonia, and Impulsive Nonconformity. The O-LIFE was devised as a measure of the 4 factors that have been found to underlie the construct of schizotypy.^{8,71,72} The UnuExp Questionnaire Scale was devised to measure classic schizotypic traits of a “positive” kind, such as unusual perceptual experiences and magical beliefs. It consists of 30 items with dichotomous (yes/no) response options. Based on a sample of 508 participants consisting mainly of undergraduate and postgraduate students (mean age = 32.4 years, SD = 14.8 years), Mason et al³¹ report high internal consistency for the UnuExp Scale ($\alpha = .89$). Factor loadings of items in the O-LIFE questionnaire also indicate the factorial validity of each scale.³¹

Boundary Questionnaire—Shortened Version. The Boundary Questionnaire—Shortened Version (BQ-Sh) is a short measure of mental boundaries derived from the 145-item

Boundary Questionnaire (BQ⁵⁷).⁷³ It is a 46-item questionnaire with a 5-point (0–4) self-rating Likert response scale. The questionnaire consists of 6 subscales: unusual experiences, need for order, childlikeness, perceived competence, trust, and sensitivity. This study will only be dealing with the BQ-Sh total score. The BQ-Sh correlates strongly with the full BQ ($r = 0.88$) and demonstrates satisfactory internal reliability ($\alpha = .74$).⁷³

General Behavior Inventory. The General Behavior Inventory (GBI) is a 73-item, self-report inventory measuring probable affective disorder or risk of developing affective disorder.⁷⁴ It is a trait-based measure of these conditions and thus is not designed to measure current clinical severity. The items cover mood, motivational, cognitive, and somatic changes specific to affective disorders. The scale yields an overall score, a depression score, and a biphasic + hypomania/mania score. The scale can be scored either dichotomously or continuously, and both forms of scoring were used in the current analysis. Eleven validation studies have been conducted on the GBI in both clinical and nonclinical populations, the results of which suggest that the measure has excellent specificity and moderate sensitivity.⁷⁵ Depue et al,⁷⁴ for instance, compared the GBI with clinician ratings based on structured diagnostic interviews using criteria more stringent than either Research Diagnostic Criteria (RDC) or *Diagnostic and Statistical Manual of Mental Disorders, Third Edition*,⁷⁶ criteria. They found that the GBI demonstrated high positive (0.94) and negative (0.99) predictive power, moderate sensitivity (0.78), and high specificity (0.99) for affective disorders.

Procedure

Questionnaires were sent to participants in the postal mail. Participants were asked to complete the questionnaires at their convenience and to mail them back in a reply-paid envelope within 2 weeks of receipt. A total of 141 questionnaire packs were mailed out, of which 100 were returned.

Results

Participant Demographics

Of the 100 participants, 27 identified themselves as musicians (including 2 composers), 18 as visual artists, 18 as using multiple mediums, and 17 as writers (poetry and prose), while the remaining 20 used an assortment of other mediums (theatre, photography, sculpture, etc). With regard to the main style of their artwork, 33 participants did not specify their style, 14 identified their style as eclectic, 11 as contemporary, 5 as classical, 5 as improvisational, 4 as abstract, 4 as experimental, and the remaining 24 as an assortment of other styles. For analysis of results by medium, see Nelson.⁷⁷

Participants had been engaged in their artwork for an average of 18.94 years ($SD = 9.49$ years, range = 3–50 years). Artwork was the main source of income for 31 participants. A total of 15 participants reported having received mental health treatment for depression, 4 for both depression and anxiety, 4 for bipolar disorder, 1 for drug-induced psychosis, and 1 for an eating disorder. Five participants reported having received mental health treatment but did not specify the reasons for this, and 4 participants did not answer this question. A total of 66 participants reported never having received mental health treatment.

Comparisons With Norm Data

Data on the psychopathology and personality measures are presented in table 1. Although a secondary focus, the data were compared with norm data. The mean of the UnuExp Questionnaire was 13.11 ($SD = 7.00$, range = 0–30). The mean value was compared with norm data from the English sample of 508 participants used by Mason et al³¹ to assess the psychometric properties of the O-LIFE, the larger questionnaire of which the UnuExp Scale is a component. This norm data consisted of 219 males and 289 females; the mean age was 32.4 years ($SD = 14.8$). The mean of the current sample's UnuExp score was found to be significantly greater than the norm data mean of 9.70 ($SD = 6.70$): $t_{99} = 4.87$, $P < .001$. It is noted that more recent studies have found a slightly lower UnuExp mean in much larger samples.⁷⁸

The mean of the dichotomous depression score was 11.06 ($SD = 11.57$, range = 0–41). The mean of the dichotomous biphasic + hypomania/mania score was 6.32 ($SD = 5.88$, range = 0–25). No Australian data were available, so the dichotomous score means were compared with nonclinical norm data from 6490 white American undergraduate students with a modal age of 18 years and a gender breakdown of 52% females ($n = 3378$) and 48% males ($n = 3112$).⁷⁹ The current sample's depression score ($M = 11.06$) was found to be significantly greater than the norm data depression score ($M = 6.96$): $t_{99} = 3.54$, $P = .001$. The current sample's biphasic + hypomania/mania score ($M = 6.32$) was similar to the norm data biphasic + hypomania/mania score ($M = 5.86$), with no significant difference between them: $t_{99} = .78$, $P = .44$.

Descriptive data of the continuous GBI scores are summarized in table 1. Norm data for continuous scores on the GBI are not available. However, the current study's continuous GBI scores were compared using 1-sample t tests with continuous GBI scores reported by Frantom and Sherman⁸⁰ in a sample of 50 visual artists. As indicated in the table, there were no significant differences between the current data and data of Frantom and Sherman.⁸⁰

Table 1. UnuExp, GBI, BQ, BFI Scores, and 1-Sample t Test Comparisons With Norm Data

BFI Scale	M	SD	Norm Data Mean	t Value	P
UnuExp	13.11	7.00	9.70	4.87	<.001
GBI total	65.07	40.56	64.44	0.16	.89
Depression	41.28	27.13	40.14	0.42	.68
Bipolar	23.79	15.39	24.92	-0.73	.46
BQ-Sh	89.02	15.66	78.50	6.72	<.001
E	19.34	6.47	19.62	-0.42	.68
A	25.38	5.82	25.56	-0.31	.76
C	23.85	6.61	22.55	1.97	.05
N	17.16	7.01	15.61	2.21	.03*
O	34.26	3.98	26.18	20.28	<.001

Note: UnuExp = Unusual Experiences; GBI = General Behavior Inventory; BQ-Sh = Boundary Questionnaire–Shortened Version; BFI = Big Five Inventory; Bipolar = GBI biphasic + hypomania/mania; E = Extraversion; A = Agreeableness; C = Conscientiousness; N = Neuroticism; O = Openness to Experience; $df = 99$ in t tests.

The BFI Scale scores were compared with norm data from a sample of 342 Australian undergraduate psychology students (males = 59, females = 283) of mean age 20.69 years ($SD = 3.31$) (D.R., unpublished data, 2001). Openness and Neuroticism were both found to be significantly greater in the current sample, with Openness displaying a particularly strong effect and Conscientiousness closely approaching statistical significance (see table 1).

At this point, we note that the number of t test comparisons and correlations in the above and following tables indicates a need for caution in the interpretation of barely significant results. While not formally adjusting the significance levels, we note that emphasis will be placed in interpretation on findings that are clearly significant or on the results of the multivariate (regression) analyses at the end of the section.

The BQ-Sh scores were compared with norm data from a large study ($n = 300$) with an Australian undergraduate psychology sample.⁷³ The norm data consisted of 79 males and 221 females with a mean age of 18.95 ($SD = 3.74$). The BQ-Sh score was found to be significantly greater in the current sample (see table 1).

Correlational Analyses

The data were appropriate for parametric analysis. Pearson correlations were performed to investigate relationships between the psychopathology and personality variables. A number of significant correlations were found between the measures, as presented in table 2. Of particular note were the moderate correlations

Table 2. Correlations Between the Psychopathology and Personality Measures

	UnuExp	Dep	Bip	BQ-Sh	E	A	C	N	O
UnuExp	—								
Dep	0.56***	—							
Bip	0.63***	0.81***	—						
BQ-Sh	0.61***	0.42***	0.48***	—					
E	-0.11	-0.28**	-0.05	-0.21*	—				
A	-0.23*	-0.33**	-0.31**	-0.06	0.13	—			
C	-0.24*	-0.26*	-0.27**	-0.49***	0.36***	0.26**	—		
N	0.25*	0.54***	0.30**	0.33**	-0.32**	-0.33**	-0.34**	—	
O	0.09	0.05	0.18	0.16	0.16	-0.02	-0.04	0.03	—

Note: UnuExp = Unusual Experiences; Dep = General Behavior Inventory Depression Scale; Bip = General Behavior Inventory Biphasic + Hypomania/Mania Scale; BQ-Sh = Boundary Questionnaire—Shortened Version; E = extraversion; A = Agreeableness; C = Conscientiousness; N = Neuroticism; O = Openness to Experience; * $P < .05$; ** $P < .01$; *** $P < .001$.

between the UnuExp, BQ-Sh, and GBI measures. Correlations between the ECQ scales and the psychopathology and personality measures are presented in table 3. Schizotypy displayed moderate to strong correlations with all the ECQ scales, apart from Clarity/Preparation. The depression and biphasic + hypomania/mania measures displayed moderate correlations with the Distinct Experience, Anxiety, and Power/Pleasure scales, while the boundary measure displayed moderate correlations with the Distinct Experience, Anxiety, and Absorption scales. The personality measures were particularly correlated with the Anxiety scales, with Openness displaying a moderate correlation with the Power/Pleasure Scale.

To examine the possible moderating effects of demographic variables on the relationship between UnuExp and the 4 ECQ scales that correlated significantly with UnuExp, analyses of variance were performed using medium (musicians, visual artists, writers) and UnuExp (split using a median split) as the 2 independent factors

and the 4 ECQ scales as dependent variables. These analyses were then repeated, first using gender and then using presence or otherwise of financial support as independent factors instead of medium. All these analyses resulted in nonsignificant interaction effects. Demographic variables did not moderate the relationship between the UnuExp and the ECQ scales.

While the UnuExp Scale is highly reliable, and factor analysis of the scale clearly points to a single coherent dimension, a forced split of the 30 items into 2 separate factors produces a factor with a clearly perceptual/sensory focus (eg, “Does your voice ever seem distant, faraway?”) and a second factor representing anomalous or unusual thought processes (eg, “Can some people make you aware of them just by thinking about you?”). We were thus able to investigate the possibility that one aspect of the broader construct might be more strongly associated than the other with the various ECQ scales, using the factor scores produced by a forced

Table 3. Correlations Between the Experience of Creativity Questionnaire Scales and the Psychopathology and Personality Measures

	A1 Distinct Experience	A2 Anxiety	A3 Absorption	A4 Power/Pleasure	A5 Clarity/Preparation
UnuExp	0.48***	0.37***	0.26**	0.39***	0.12
BQ-Sh	0.26**	0.30**	0.23*	0.14	-0.02
Depression	0.29**	0.34***	0.16	0.22*	0.02
Bipolar	0.32**	0.33**	0.08	0.26**	0.10
Extraversion	-0.17	-0.20*	-0.22*	0.01	0.03
Agreeableness	-0.17	-0.26*	0.13	-0.02	0.17
Conscientiousness	-0.07	-0.26**	0.04	0.12	0.15
Neuroticism	0.11	0.30**	0.13	0.10	-0.07
Openness	0.06	0.10	0.12	0.21*	0.12

Note: A1–A5 = Experience of Creativity Questionnaire-A Scales 1–5; UnuExp = Unusual Experiences; BQ-Sh = Boundary Questionnaire—Shortened Version; Depression = General Behavior Inventory—Depression; Bipolar = General Behavior Inventory-hypomania/mania + biphasic; * $P < .05$; ** $P < .01$; *** $P < .001$.

Table 4. Correlations Between the Experience of Creativity Questionnaire Scales and the Unusual Experiences Scales in 2 Separate Factors

	A1 Distinct Experience	A2 Anxiety	A3 Absorption	A4 Power/Pleasure	A5 Clarity/Preparation
UnuExp—factor 1	0.44***	0.33**	0.23*	0.34***	0.12
UnuExp—factor 2	0.40***	0.33**	0.21*	0.37***	0.03

Note: A1–A5 = Experience of Creativity Questionnaire—A Scales 1–5; UnuExp = Unusual Experiences; * $P < .05$; ** $P < .01$. *** $P < .001$.

2-factor Promax rotation, following maximum likelihood extraction.

We are aware that 100 is a small sample size for factor analysis and accordingly checked our 2 factors with the factors produced using the large dataset ($n = 1073$) employed in developing the original O-LIFE questionnaire.³¹ It is noted that 24 of the 30 items have their stronger loading on the same factor in both samples. Furthermore, the highest loading items in the 2 rotations showed considerable overlap. Thus, high-loading items (greater than 0.5) in the larger sample are always among the 10 highest loading items in the smaller sample, for both factors 1 and 2.

The patterns of correlations were the same for the 2 factors (see table 4). Statistically significant correlations obtained using the full scale were always obtained using both separate factors, and the 2 factors themselves produced very similar results.

Psychopathology and Personality Measures as Predictors of ECQ Scales

Stepwise regression analyses were conducted in order to identify the strongest predictors of each of the ECQ scales among the psychopathology and personality measures (see table 5). All the psychopathology and personality measures were included as independent variables in each of the regression analyses. All assumptions were satisfied for regression analysis, apart from multicollinearity between the independent variables of depression and biphasic + hypomania/mania. In order to avoid violation of this assumption, 2 separate analyses were conducted for each ECQ Scale—the first time using depression as an independent variable, the second time using biphasic + hypomania/mania as an independent variable. There were no differences in results between these 2 sets of regression analyses. The regression analyses that included depression as an independent variable are reported here (table 5).

The results indicated the prominent role of the UnuExp Scale as a predictor of a range of ECQ scales. It was the strongest predictor of each of the 4 ECQ scales where significant predictors were indicated. Depression, biphasic + hypomania/mania, and BQ-Sh were not found to be significant predictors in any of the regression analyses. On the other hand, each of the 5 BFI measures appeared as

significant predictors of the ECQ scales. None of the independent variables met criteria for inclusion in the regression model of the Clarity/Preparation Scale.

Discussion

This study investigated whether the phenomenology of the artistic creative process varies in relation to psychopathology and personality. The sample of artists displayed elevated scores on “positive” schizotypy, unipolar affective disturbance, thin boundaries, and the personality domains of Openness to Experience and Neuroticism, compared with norm data. This finding is consistent with previous research into personality

Table 5. Stepwise Regression Analyses With Experience of Creativity Questionnaire Scales as Dependent Variables and Psychopathology and Personality Measures as Independent Variables

Model	Significant Predictors	β	t
Distinct Experience (adjusted $R^2 = 0.22$, $F = 29.10$ ***)	Unusual Experiences	.48	5.40***
	Anxiety (adjusted $R^2 = 0.17$, $F = 10.79$ ***)		
Absorption (adjusted $R^2 = 0.12$, $F = 5.62$ **)	Unusual Experiences	.31	3.27**
	Neuroticism	.23	2.39*
Power/Pleasure (adjusted $R^2 = 0.22$, $F = 10.02$ ***)	Unusual Experiences	.29	2.97**
	Agreeableness	.22	2.26*
	Extraversion	-.21	-2.24*
Clarity/Preparation (adjusted $R^2 = 0.02$, $F = 1.21$)—no significant predictors	Unusual Experiences	.44	4.72***
	Conscientiousness	.24	2.56*
	Openness	.18	2.06*

Note: * $P < .05$; ** $P < .01$; *** $P < .001$.

features of creative artists,^{52,54,55} although the lack of elevation of bipolar affective disturbance is somewhat divergent from previous findings.^{37,41,43,44}

The regression analyses provide a pattern of results in which 1 ECQ Scale (Clarity/Preparation) appears to be largely independent of the various predictor variables; this may be partly due to the fact that this scale has a substantially lower reliability than the other 4. Each of these other 4 scales is predicted by positive schizotypy and one or more of the normal personality variables. This suggests that positive schizotypy is a major predictor of most aspects of creative experience, while personality explains the differences between these aspects.

As noted, the BQ and GBI variables did not produce significant predictors in the various regression analyses. However, the correlation tables indicate that each of these variables show patterns of relationship with the ECQ scales similar to, though somewhat weaker than, the pattern produced by the UnuExp measure. This strongly suggests that the ineffectiveness of the BQ and GBI variables in the regression analyses were due to their intercorrelations with UnuExp. In a normal sample of the type used here, schizotypy is not clearly differentiated into “schizophrenic” and “affective” subtypes.

There was a somewhat surprising failure in the current results to find an elevation in mania/hypomania scores compared with norm data, or mania/hypomania being predictive of aspects of creative experience, given previous work that has postulated bipolar mood to be a creativity-inducing factor from within affective psychopathology.^{36,37} A possible explanation for this relates to the notion of “creativity profiles” mentioned in the “Introduction.” The current sample is a group of contemporary artists, with only a minority identifying their artistic style as “classical.” As noted by Sass,⁸¹ much of the work relating artistic creativity to affective disturbance, particularly bipolar disturbance, is based on eminent figures from earlier periods, especially the Romantic period, or on artists with affinities with Romanticism. Creativity is a construct that varies not only across fields but also across styles and artistic movements. The current sample of artists is operating in the modernistic and postmodernist era, which, it has been argued, has affinities with psychotic or schizotypal type experience.^{81,82} These affinities include an adversarial stance, perspectivism and relativism, a certain fragmentation and passivization of the ego, loss of the “worldhood of the world,” rejection or loss of the sense of temporal flow or narrative unity, forms of intense self-reference, and extreme and pervasive detachment or emotional distancing.^{81,82} This cultural-historical context may have contributed to the “creativity profile” of positive schizotypy-creative experience found in the current results.

The remainder of the “Discussion” deals with the major finding of the present results: the prominent role of “positive” schizotypy in the findings of the present study.

As noted, a wide range of explanatory mechanisms have been proposed for the schizotypy-creativity relationship. While our findings are consistent with all these models, the nature of the experiential ECQ scales related to positive schizotypy suggested the particular relevance of the concept of latent inhibition. This is due to the newness of perception and sense of “flow” that is prominent in the experiential scales related to positive schizotypy, which will be discussed below. Latent inhibition is a neurologically based concept that describes the phenomenon of attenuated attention to stimuli upon repeated exposure. It is based on the notion of a gating mechanism that allows organisms with complex nervous systems to cease responding to stimuli with no apparent motivational or emotional value.⁸³

Reduced latent inhibition has been found to be characteristic of the schizophrenia spectrum, including both schizotypy^{84–86} and frank schizophrenia, particularly in its acute rather than chronic manifestations.^{87,88} This suggests that individuals within this spectrum are marked by relative openness to environmental stimuli irrespective of the past significance of the stimuli; an attenuated “screening out” of stimuli is operative. Hemsley⁸⁹ argues from a cognitive perspective that schizophrenia is characterized by a loosening of expectations based on previous experience and suggests that, although this may contribute to a disruption in sense of self, it may in fact confer some positive advantages. Interestingly, recent genetic research findings are consistent with the view that heritable phenotypes associated with schizophrenia liability provide an adaptive advantage by conferring heightened creative ability.^{90,91} The connection between reduced latent inhibition and schizophrenia also exists on the neurobiological level: abnormalities in dopaminergic transmission have played a central role in neurobiological theories of schizophrenia (eg, Seeman and Guan⁹², Swerdlow and Koob⁹³) and are associated with reduced latent inhibition (see Cassaday⁹⁴). Reduced latent inhibition has also been found among creative individuals (see Carson et al⁹⁵) and associated with personality traits that correlate highly with creativity.⁸³ It has been suggested that reduced latent inhibition may facilitate creativity by allowing access to a greater inventory of unfiltered stimuli during early processing, thereby increasing the possibility of combining this information in an original manner.^{95,96}

The fact that both the schizophrenia spectrum and creativity correlate with reduced latent inhibition has led researchers to propose that reduced latent inhibition may be a shared vulnerability factor, based on a common neurological substrate, for psychosis and creativity, and therefore partly responsible for the connection between the 2.^{83,95,96} The question, as with the other factors that have been identified as common predisposing factors for creativity and psychopathology, is what makes this common factor lead to one outcome (ie, creativity or

psychopathology) rather than the other. In the case of latent inhibition, what distinguishes a person who, to use Kierkegaard's phrase, "drowns in possibility" from the person who derives creative advantage from access to a broad range of possibilities produced by the attenuated filtering of information? That is, what factors are responsible for latent inhibition resulting in "happy schizotypy"⁹⁷ as opposed to a pathological state? Rather than it being an issue of extremity, as with, eg, the inverted-U models of the creativity-psychopathology relationship, some researchers have proposed and provided empirical support for intelligence and working memory functioning as protective moderating factors.^{83,95,96} These factors may enable an individual to make adaptive use of the broad range of information with which reduced latent inhibition provides them. In this manner, reduced latent inhibition may be another instance of Barron's⁹⁸ notion of "controllable oddness" being a resource for creativity.

In the current findings, the nature of the ECQ scales with which positive schizotypy displays a strong connection supports the view that latent inhibition is a mechanism that contributes to the schizotypy-creativity relationship. Because reduced latent inhibition involves failure to "screen out" stimuli based on prior experience and failure to pre-categorize stimuli as irrelevant, it would result in immediate experience not being as shaped or determined by preceding events. This suggests that the creative individual experiences situations with relative "freshness," with "new eyes," as it were. In some phenomenological accounts of schizophrenia,^{82,99-102} this novelty of perception can take the more disturbing form of a disturbance of a basic sense of self. Sass and Parnas,⁹⁹ for instance, discuss how that which is tacit or "taken for granted," normally forming the "background" of awareness, is brought to the forefront of awareness in schizophrenia, thereby objectifying and externalizing aspects of experience that are normally "inhabited."

Nelson and Rawlings⁶¹ report how it is precisely this newness of appreciation, and the associated sense of exploration and discovery, that stimulates the deep immersion in the creative process, which itself may trigger a shift in quality of experience, generally in terms of an intensification or heightening of experience. These elements of creative experience are represented in the Absorption and Distinct Experience scales of the ECQ, respectively. A sense of anxiety or vulnerability (represented in the Anxiety Scale) can be associated with the shift in experience and loss of personal boundaries associated with creative experience.⁶¹ Positive schizotypy was found to be a prominent predictor of all these scales. The reduced latent inhibition of artists with positive schizotypal tendencies possibly produces creative experience that is particularly marked by a sense of deep immersion, focus on present experience, and sense of a shift in experience. These elements are central features of flow,¹⁰³⁻¹⁰⁵

which has been found to be a key element of artistic creative experience.^{61,104,106} The other defining feature of flow found in the current findings is the sense of pleasure or joy associated with this state. This was represented in the Power/Pleasure Scale, of which schizotypy was also found to be the strongest predictor.

The finding that positive schizotypy relates to this constellation of ECQ scales (Distinct Experience, Anxiety, Absorption, and Power/Pleasure) suggests a linkage between the constructs of positive schizotypy, latent inhibition, and flow. While reduced latent inhibition may be a cognitive mechanism that facilitates creativity by increasing the breadth of information available to the individual, it may exist on the experiential level of the creative process as flow-type experience. The construct of flow certainly captures the sense of immersion in present experience that is suggested by the lack of "pre-categorization" integral to reduced latent inhibition. Nelson and Sass¹⁰⁷ outline how the disruption of a commonsense social understanding of self and world (or slippage of sign-referent relationship) can be experienced in psychosis as a sense of alienation from self and world, whereas in hallucinogenic intoxication this disruption can be experienced as a sense of mystical union or revelation. In a similar fashion, there may be a common underlying process (reduced latent inhibition or "filtering" of experience) between schizotypy and creativity, which is expressed in the case of creativity as pleasurable flow-type experience. While the association between schizotypy and flow being suggested here may be somewhat at odds with traditional conceptions of schizotypal personality as characterized by awkwardness, rigidity, alienation, and withdrawal to inner life (see Parnas and Bovee¹⁰⁸ Parnas et al¹⁰⁹), it needs to be kept in mind that schizotypy assessed in this study is a single aspect of the construct ("positive" schizotypy). It may well be the case that other aspects of schizotypy (introvertive anhedonia or cognitive disorganization, eg), or the construct when assessed as a whole, do not relate to flow in the same fashion.

To turn attention to methodological aspects of the study, it is possible that the recruitment advertisement attracted individuals who are inclined toward schizotypic experiences or emotional distress, thus leading to a selection bias. Although psychopathology or mental or emotional distress were not mentioned in the advertisement (which simply referred to "aspects of personality," "attitudes," "feelings," and "experiences"), it is possible that its mention of psychological and emotional states may have attracted such individuals or at least a disproportionate number of individuals who are at least intrigued by their own psychological or emotional state. Along these lines, Rothenberg⁶⁶ speculates that participants might be attracted to studies of the relationship between creativity and psychopathology if they subscribe to the notion of a connection between the 2 constructs or because they are seeking some sort of psychiatric evaluation.

A similar bias might have been introduced through participants who failed to return the questionnaires.

Future studies should attempt to replicate the connection between reduced latent inhibition, positive schizotypy, and flow and experimentally test the ramifications of this model. Alternative and more comprehensive measures should be used in future research. Schizotypy is a broad, multidimensional construct (most analyses yield 3–4 factors^{8,71,72}). Our measurement of the construct was limited to the “positive symptom” component of schizotypy, “unusual experiences.” Although this aspect of the construct has tended to display the greatest relevance to artistic creativity, the role of other aspects of schizotypy to creativity should be assessed.

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