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Creativity & Madness Revisited from Current Psychological Perspectives

Abstract: *Both scientific evidence and folklore have suggested that madness is associated with creativity, especially in the arts. Recently, more rigorous studies have confirmed to some extent these previous observations. The current view is that it is not severe and acute insanity that is related to heightened creativity, but the personality roots and soft manifestations of both schizophrenic and bipolar psychoses. The affective and cognitive peculiarities associated with schizotypic and hypomanic personalities may be preferentially related to different kinds of creative endeavours, such as the sciences and arts, respectively. The connection between personality traits and creativity is produced because they share some biological–cognitive–personality features, such as cognitive disinhibition. Additionally, it has been shown that the genetic liability for both bipolar and schizophrenic psychoses is related to creativity. A prevailing hypothesis is that creativity may be one type of ‘compensatory advantage’ for those carrying the genes for psychosis.*

Nullum magnum ingenium sine mixtura dementiae
(No great imaginative power without a dash of madness)
Seneca

I: Introduction

Many philosophers, artists and old folklore beliefs have maintained for centuries that there is a hint of genius in the madman and, conversely, that creativity demands some degree of lunacy. Shakespeare put it nicely in Theseus’ speech from *A Midsummer Night’s Dream*: ‘The lunatic, the poet, and the lover are of imagination all compact’. As Nettle (2001) points out, Shakespeare identified a common psychological trait in all three, that is, strong imagination: ‘Lovers and madmen have such seething brains, such shaping fantasies, that apprehend more than cool reason ever comprehends’.

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On the one hand, many geniuses have suffered from some sort of mental disorder, a fact that has insinuated that madness may be the price for possessing one of the most sublime human gifts; on the other hand, there is some intuitive similarity between the unconventional ideas produced by the mentally ill and the truly innovative and creative insights of eminent creative individuals. The present paper will review the theoretical and empirical literature examining this question, beginning with a brief review of how psychology defines and understands creativity and madness.

II: Defining the Indefinable: What is Creativity?

There are many definitions of creativity, but none of them is a consensual definition in psychology. A starting point could be that 'creativity is the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints)' (Sternberg, 1999, p. 3). A key point in differentiating true creativity from odd or capricious products is that creative output must not be idiosyncratic and only understandable by the creative individual, but meaningful for those belonging to the particular field of the creative endeavour.

Creativity is a multidimensional construct that can be studied from different *approaches*: what features define a *product* as creative; the biological, personality and cognitive characteristics of the creative *person*; the environmental and sociocultural *conditions* that favour creativity; and, lastly, the elements that compose the creative *process*. This diversity is also reflected in the wide range of tests designed to *measure* creativity: creative cognition, personality, attitudes, interests, biographic inventories, etc. Most research has been done with tests of creative cognition, mainly with *divergent thinking* tests, in which individuals are asked to produce a range of solutions to an open-ended problem for which there is neither a single correct response, nor an apparent solution. Examples include tests that ask for different uses of an item, unusual uses of a common object, listing remote consequences of a hypothesis, etc. The responses to these tests are scored attending to: *fluency* (number of meaningful responses), *cognitive flexibility* (the ability to produce varied responses belonging to different domains or conceptual categories), *originality* (the ability to produce ideas far from obvious, measured by the capacity to give infrequent answers), and *elaboration* (the capacity to provide additional details to embellish the basic response).

A challenging aspect linked to the definition of creativity is its differentiation from intelligence. For some authors creativity necessarily implies the *discovery* of a problem and finding a solution. This differs from the sole *recognition* of a problem, that is, the capacity to understand what the problem is and finding the correct solution (i.e., convergent thinking), the process that is usually assessed by conventional intelligence tests. Several longitudinal studies of children with remarkably high intelligence quotients (IQ) have shown that intelligence is a necessary but not sufficient condition for creativity (Cox, 1926; Terman, 1925), and it is presently accepted that intelligence and creativity have a high correlation and

interdependence up to a superior intelligence (IQ 120) level at which these two cognitive abilities seem to become independent (Eysenck, 1995).

The traditional *associative models* of creativity defined the creative *process* as the formation of new combinations through the association of remote elements (Spearman, 1931; Mednick, 1962). The more remote the elements were, the more creative would be the process. A current view of creativity is that it is a '*cognitive disinhibition syndrome*' characterised by a broad associative horizon and a state of defocused attention. Martindale (1999) argues that creativity derives from the tendency to oscillate back and forth along a cognitive continuum. One end of this continuum is characterised by analogical, free-associative, irrational thinking, accompanied by defocused attention and low cortical arousal. These would be the cognitive conditions that favour the creative insight or 'illumination' stage of the creative process. The other end of the continuum is characterised by logical, abstract, reality-oriented thinking, accompanied by focused attention and higher levels of cortical arousal, a state necessary for discovering a problem and verifying the viability of the new creative insight. According to this model, individual differences in the variability of the general level of cortical activation, focus of attention, and type of thought account for individual differences in creativity.

III: One Key to the Problem: Views of Madness

The association between madness and genius raises a considerable paradox: how can the morbid traits of chaotic thinking, disconnection from reality, bizarre affect, perceptual anomalies, and erratic behaviour be related to the superior mental processes and effective production necessary for creativity? Even more puzzling is the fact that biographical evidence on which the madness–genius connection has been founded suggests that the mental disorders linked to creativity are the *psychoses*, a group of illnesses considered to be the severest form of psychopathology.¹ Obviously, it would be absurd to relate any severe mental state of insanity with creativity. So what then is the solution?

A reasonable answer to this paradox has emerged quite recently from the view that mental disorders are dimensional phenomena (e.g., Claridge, 1998; McGorry *et al.*, 1998; Poulton *et al.*, 2000; Johns & van Os, 2001); that is, that they are continuously connected with 'normality', as suggested by the wide margins of intermediate shades that surround the dichotomous and often artifactual border between illness and health (Claridge, 1995). Indeed, the *dimensional view of psychoses* argues that these disorders are extreme or pathological variants of otherwise normal personality dispositions (Eysenck & Eysenck, 1976). This notion suggests that the difference between clinical psychosis and its

[1] The traditional classification in psychopathology has distinguished between two broad groups of mental disorders: psychoses and neuroses. The *psychoses* are the most severe forms of pathology, the true madness where a break with reality is almost inevitable. Paranoia, manic-depressive illness and the different types of schizophrenia are included in the psychoses (a description of these disorders will follow later). The *neuroses* encompass milder forms of suffering that usually do not extend to the whole sphere of mental functions (e.g., depression, obsessions, anxiety and phobias).

temperamental basis, 'psychoticism', is quantitative and not qualitative. The personality dimension 'psychoticism' is composed of traits that are phenomenologically similar to the symptoms present in the psychotic disorders but are stable and have a mild, possibly adaptive, manifestation.

This dimensional view is readily applied to other psychopathologies, for instance, anxiety. Anxiety disorders are the extreme manifestation of a personality dimension, anxiety, that is present in all people to differing degrees. Furthermore, within normal limits, anxiety has a *necessary* and *adaptive* function, that is, to be a vigilance mechanism that signals potential dangers. However, it has been conceptually much harder for many researchers to accept that there is a personality dimension, psychoticism or schizotypy, that (analogous to anxiety) may have advantageous features (Claridge, 1995).

There is a second issue of dimensionality that is crucial for understanding the creativity–madness dilemma, that is, whether mental disorders should be considered distinct *categories* or a cluster of symptoms from different psychopathological *dimensions*. For psychiatry, which adopts a categorical view, the main question in this field is to establish *what* psychosis relates to creativity. Kraepelin (1919) distinguished two major forms of psychoses: an *affective psychosis* or manic-depressive illness, and a heterogeneous set of non-affective psychoses named '*dementia praecox*' that was later relabelled as 'the schizophrenias' by Bleuler (1911/1950). Manic-depressive patients tend to experience alternating episodes of depression and mania (the reversal of depression, with elated mood, racing thoughts, hyperactivity, increased self-esteem) interspersed with symptom-free periods, with some patients experiencing psychotic symptoms (e.g., hallucinations and delusions) during the periods of affective symptoms. In contrast, *schizophrenia* is usually a more pervasive disorder causing the impairment of a wide spectrum of mental functions: perception (e.g., hallucinations), thought (e.g., delusions, distorted thought processes), language (e.g., distorted speech patterns), emotion (attenuated or inappropriate affect), and motivation. While the outcome can be variable, schizophrenia tends to have a chronic course punctuated by recurring episodes of psychosis, with some recovery of functioning between episodes.

Recent evidence has cast doubt on the sharp distinction between these disorders: they are not so easily distinguishable at the clinical level, something that prompted the creation of an intermediate diagnosis, 'schizoaffective' disorder. Furthermore, patients can alternate diagnoses; genetic liability seems to be common for both; many severe features of schizophrenia seem to be present in affective disorders than was once thought (e.g., deteriorating course and impaired cognition); and there is a conspicuous interchangeability of treatments between the two forms of psychosis (Taylor, 1992). One attempt to refine the classification of these disorders has involved defining subtypes of each psychosis that differ in the degree of severity and some clinical features. We currently talk about the *schizophrenia and bipolar spectrums* that encompass a variety of disorders that range from severe illness to the subtle personality traits referred to as

‘schizotypy’ and ‘affective temperaments’, respectively (with Eysenck’s term ‘psychoticism’ referring to the personality roots of psychosis in general).

Indeed, categorical distinctions do not satisfactorily apply to many forms of psychopathology. Instead, there seems to be a continuum of mental dysfunction rather than a collection of clear-cut morbid entities. This *continuum hypothesis* argues that there are different dimensions of pathology continuously distributed in nature (e.g., delusions, depression, mania, thought disorder, paranoia) and that these dimensions are not exclusive to any mental disease (van Os & Verdoux, 2003). Consequently, from this dimensional or continuum viewpoint the question of what particular illness relates to a creative advantage becomes superfluous to some extent (Claridge, 1995).

The acceptance of this continuum or dimensional view makes it possible to understand the connection between creativity and madness. Logically, it is not the extreme variants of psychoticism, the psychotic *states*, that mediate the connection with creativity, but it is possible that the personality *traits* that underlie psychosis share some biological, emotional, and cognitive features with creativity. The presence of these traits *per se* would not guarantee a creative advantage; most likely many other factors need to be favourable for a creative outcome to happen, both from an individual (e.g., high intelligence, persistence, etc.), and from a situational perspective (e.g., a stimulating environment, an adequate sociocultural milieu, etc.). Additionally, it allows us to understand that creativity will not be related to a single psychological profile since, as referred to above, dimensionality also operates *within* the pathological realm (Claridge, 1998).

The idea of a *common factor* that mediates the co-occurrence of creativity and madness has gained acceptance in the last decades. This hypothesis tends to view this common factor as causative, even if it is not a sufficient condition. Most researchers subscribe to this view even if there are different opinions about the nature of the third factor(s) (e.g., the relative importance of genetic liability, cognition, temperament, etc.). This perspective has overcome two alternative models of the relationship between creativity and psychopathology (Richards, 1981; 2000–2001). One model claims that *psychopathology causes creativity*, either directly or indirectly. A *direct* relation would be, for example, that strange thoughts and bizarre perceptual processes may be vital for the creative process. For example, so-called overinclusive thinking (Cameron, 1938), defined by the loss of the capacity to limit associative processes, is thought to contribute to creative insights when it does not reach severe forms that lead to complete incoherence. An *indirect* relation would be that pathology leads to cathartic writing, which, in turn, enhances the creative quality of a given work. The other model sustains that *creativity causes psychopathology*. A *direct* relation would be, especially in the arts, that creativity implies facing high levels of psychic tension, leading to psychological imbalance. An *indirect* relation would be that the conflicts created by creativity might result in maladaptive coping strategies such as drug abuse.

IV: Historical Roots of the Creativity–Madness Connection: Psychobiographical and Family Studies

An aspect that has usually been overlooked in this field is the importance of the historical and cultural influences on the concept of creativity and the extent to which these factors have influenced our understanding of the relationship between creativity and mental disorders. Psychology and psychiatry tend to assume a transhistorical and transcultural nature of creativity, but some authors have cast doubt on such assumptions.

The history of the creativity–madness hypothesis can be traced back to classic antiquity. Socrates conceived the ‘demon’ as a divine gift granted to a few individuals (the philosopher, the poet, the priest . . .) that enabled them to communicate with the gods. Aristotle stated in his *Problemata XXX* that the *homo melancholicus* was gifted with sublime capacities and inextricably prone to madness: ‘Those who have become eminent in philosophy, politics, poetry, and the arts have all had tendencies toward melancholia’. It is important to note that they did not assume that insanity was the key for creativity, but rather that the liability to experience states of melancholia was linked with creativity. The trespass into the realm of true madness would depend for Aristotle on the balance of a subject’s humours.

The Italian Renaissance notion of *pazzia* or melancholia revived this tradition and, later, the Enlightenment stressed the necessity for genius to combine an active imagination with judgement or reason. It was Romanticism that changed the concept and function of genius. During the late eighteenth and nineteenth centuries, men of genius, generally lacking in wealth or status, attempted to challenge the hierarchical order of social values by considering innate creative ability as the supreme criterion for the evaluation of men. According to Becker (1978), the aspiring artist and men of ideas did not have a clear status in this historical period, feeling engulfed in the anonymous masses. The recovery and magnification of the classic ideas of divine madness as the source of inspiration and creativity instantiated a sense of identity and endowed the creative individual with a mystical and superior quality. As a result, spontaneous and irrational imagination became the essence of genius, leading to a necessary connection between madness and creativity.²

[2] From a sociological viewpoint, Becker (2000–2001) hypothesises that this imposed on the creative individual the *role expectation* of experiencing and manifesting mental suffering as one constitutive element of creative inspiration. It may well be that this role expectation influenced the biographical studies of eminent creators. Specifically, this cultural expectation may bias how creative individuals describe their mental problems in psychological examinations and how history has viewed their mental functioning, due to the definitional value of this deviance in the cultural concept of creativity. As a result, the perceived relationship between insanity and creativity may have become a sociological self-fulfilling prophecy. However, the evidence produced by studies conducted with non-eminent populations has overcome such a problem. While the adherence to role expectations by those with a creative career or eminent genius may bias the results of their psychological assessment, it seems unlikely that this can have a significant effect in non-artist populations whose self-concept is not that of a creative genius.

This polemic question only started to be systematically analysed by scientists one century ago. The first psychobiographic³ study, *The Men of Genius*, was published in 1895 by an Italian psychiatrist, Cesare Lombroso, who carefully studied biographies of creative individuals from diverse fields (e.g., Julius Caesar, Newton, Schopenhauer. . .). Lombroso reached several conclusions that later studies have supported with more refined methods: 'Between the physiology of the man of genius and the pathology of the insane, there are many points of coincidence; there is even actual continuity'. He also established that creativity is genetically intertwined with the predisposition to affective and schizophrenic psychosis, psychopathy, and alcoholism.

Later on the association between psychopathology and creativity shifted towards neurosis. It coincided with the rise of psychoanalysis starting at the beginning of the twentieth century and the preferential interest that Freud gave to these disorders. From his perspective, creativity was a means to dampen the neurotic states. Subsequently, many humanists (e.g., Fromm, Rogers) defended the opposite notion, that mental health was necessary for creativity to occur.

As Becker (1978) concluded from an analysis of the psychobiographic studies published until 1950, the vast majority validate the anecdotal observation of an excess of psychopathology in eminently creative people. There are two main exceptions. Havelock Ellis (1904) found that only 4% of 1,020 British geniuses he studied suffered from a clearly diagnosable mental disorder, while Bowerman (1947) found similar results in the analysis of American geniuses. However, as Claridge *et al.* (1998) point out, although both authors refuted *a priori* the connection between creativity and madness, they agreed upon the existence of characteristic temperamental traits such as hypersensitivity, irritability, a tendency towards melancholy and affective instability; traits that belong to the 'affective temperaments' or soft end of the spectrum of affective disorders. It is also important to note that they selected subjects who appear in the Dictionary of National Biography, that is, subjects with a noteworthy role in the public life of their country, which does not necessarily mean that they were truly and eminently creative (Andreasen & Canter, 1974).

There were two influential psychobiographical studies in the first half of the twentieth century. Lange-Eichenbaum (1932) focused on the temporal relation between creativity and psychosis. It was one of the first studies to signal that creative work is not performed during the active psychotic periods but in periods of remission, and that often psychosis follows intensely creative phases. Logically, the acute and severe psychotic state did, if anything, diminish the possibility of any creative output. As Sylvia Plath wrote eloquently: 'When you are insane you are busy being insane — all the time. . . . When I was crazy that was *all* I was'. Juda (1949) studied for 26 years a sample of 19,000 subjects of whom 204 were highly gifted scientists and artists. It was concluded that 'geniuses show a much

[3] The *psychobiographical method* consists in the detailed analysis of creative subjects' biographies, self-biographies, and available clinical records in order to study the presence of psychopathology and its relation to his/her creative productions. Obviously, one of the main limitations of these studies lies in their retrospective nature and the impossibility of contrasting the author's diagnostic judgement.

higher incidence of psychosis and psychoneurosis than the average population (. . .) schizophrenia occurred only in the artists, and manic-depressive insanity only in the scientists, in a frequency 10 times the incidence of the average population’.

In the second half of the twentieth century, psychobiographical studies dramatically improved their reliability by using consensual diagnoses and standardised diagnostic interviews when dealing with live cases. Most of them have focused on artists and especially writers (Obiols & Barrantes-Vidal, 1997).

Claridge *et al.* (1998) applied several sets of diagnostic criteria to the biographies and medical records of ten psychotic writers (e.g., Margery Kempe, Virginia Woolf) and concluded that they all suffered from schizophrenia or schizoaffective disorder, with varying results according to the diagnostic criteria used.

Jamison (1993), a psychiatrist and sufferer of a bipolar disorder, studied the most important British and Irish poets of the eighteenth century. She found a strikingly high rate of affective disorders, suicides, and institutionalisation in both poets and their relatives (e.g., Blake, Scott, Coleridge).

Ludwig (1994) reported an increased rate of suicidal behaviour in poets (18% versus 1% in the general population). He studied 59 female writers and 59 female control subjects matched on education and socioeconomic level (although not on intelligence) and found higher rates of affective, anxiety, drug abuse, and eating disorders, as well as more psychopathology and creativity in the family trees of the female writers. Interestingly, both personal and maternal psychopathology were significant predictors of creative performance. Furthermore, the exposure to sexual or physical abuse during childhood was also a significant predictor of creativity, suggesting a complex interaction between hereditary and environmental factors. Ludwig conceived of the connection between creativity and psychopathology as resulting from verbally talented individuals using their writing skills to communicate their experiences within a narrative structure, thus putting order in their prone-to-chaos internal milieu.

Similarly, Schildkraut *et al.* (1996) found that affective disorders were ten times more prevalent and suicidal behaviour was three times greater in the New York abstract expressionist painters (e.g., Pollock, Rothko . . .) than in the general population.

A few studies have compared creative people from different fields of endeavour. Post (1994) selected 291 eminent and recognised creative men (only men were included due to the lack of accurate biographies of creative women) from many different fields (visual artists, philosophers, scientists, politicians, composers, novelists, and playwrights). He found that 54% of them presented with personality disorder traits and 69% had suffered some kind of mental disorder. A comparison between different fields showed that scientists were the least affected group. A significant proportion of novelists and playwrights had a florid history of familial psychopathology, problematic family environments during childhood, depressive episodes, drug abuse, and marital problems. Artists and intellectuals had significant psychosexual difficulties and a greater presence of alcoholism than scientists. In a later study, Post (1996) analysed a larger number

of biographies and confirmed that schizophrenia was less prevalent in this sample than in the general population, whereas affective disorders and alcoholism were strikingly high among writers. Bipolarity was specifically higher in poets, whereas the other writers as a whole presented more alcoholism, psychosexual problems, and depression. Post (1996) hypothesised that the combination of a high level of emotional imagination, the intense neural activity involved in writing, and depressive personality traits, may account for writers' increased risk of affective disorders. At the same time, as Storr (2000) points out, the act of writing can be contemplated as a way of objectifying negative emotions and enabling the writer to control grief and despair. As Graham Greene expressed it: 'Writing is a form of therapy; sometimes I wonder how all those who do not write, compose or paint can manage to escape the madness, the melancholia, the panic fear which is inherent in the human condition' (Greene, 1981, p. 211; cf. Storr, 2000).

Ludwig (1995) also compared different fields of creative endeavour by analysing 1,005 biographies. He found a positive correlation between the presence of severe psychopathology and the magnitude of the creative achievements. Again, scientists presented with fewer problems, while poets had the highest rate of mental disorders (87%), including more suicide and psychosis.

Psychobiographical studies have been complemented with *family studies* since the end of the nineteenth century. At that time it was already believed that both creativity and psychopathology were *heritable phenomena* and that, as Lombroso (1895) defended, these traits were cosegregated (i.e., inherited together and therefore expressed in the same subject). Two questions are posed: to what extent is creativity heritable and to what extent is there an association between creativity and psychopathology in families?

Is creativity a genetic trait? Currently, creativity is widely viewed as an '*emergenetic*' trait (Lykken, 1998), that is, a second-order trait that results (or emerges) from the synergistic interaction among a cluster of more fundamental characters (e.g., novelty seeking, analogical thinking, capacity for extreme hard work, high self-confidence, love of mental activity, high ego strength, etc; Martindale, 2000). To the extent that these traits are at least partially under genetic control, they will have a better chance to be more present in certain families.

The possible *genetic link between creativity and psychopathology* has been explored systematically in a few family studies. Heston (1966) showed that half of the children of schizophrenic mothers who were separated early from their biological mother and reared in adoptive families achieved an excellent adaptation, an exceptional talent on different creative fields, and, as expected, a higher risk of developing schizophrenia. Karlsson (1970) carried out a retrospective family study in which the professional status of all first-degree relatives of psychiatric patients admitted into hospital (that is, most likely with severe disorders like psychosis) in Iceland from 1851 to 1940 were recorded. He found that these relatives had a creative profession more often than the standard level in the general population, with twice as many writers than expected. Jamison (1993) analysed the family trees of many geniuses (Schumman, Woolf, van Gogh,

Hemingway, James) and also showed an excess of affective pathology in the biological relatives of these individuals. Andreasen (1987) did a study for 15 years in which 30 eminent American writers attending the prestigious Iowa writing workshop were compared to 30 carefully matched control subjects. There was an overall higher rate of affective disorders in the writers, especially bipolar forms, and alcoholism. The writers' first-degree relatives also exceeded the relatives of the control group in the rate of affective disorders and also had more creative professions. These studies suggest that there is some commonality in the genes that convey the risk for psychosis and creativity.

Richards *et al.* (1988) found that first-degree relatives of manic-depressive patients obtained the highest creativity scores when compared to normal control subjects, manic-depressive patients, and cyclothymic patients (a milder form of bipolar disorder). The difference was not explained by the effects of education or intelligence. The creative advantage found in these relatives may be extended to a large number of people if we take into account that around 1% of the general population suffers from manic-depressive illness.

Kinney *et al.* (2000–2001) studied the adoptees of biological parents with schizophrenia and a group of demographically matched control adoptees with no family history of psychiatric hospitalisation. It was found that the adoptees with genetic liability for schizophrenia who did not manifest the disorder were rated as more creative by blind independent researchers. Furthermore, adoptees who showed signs of personality traits that mimic schizophrenia (schizotypy) were rated as even more creative. Interestingly, schizotypic signs share a genetic relationship with schizophrenia. This study avoids the *post hoc* nature of most previous work and adds further evidence to the notion that there may be an adaptive value to certain genes for psychopathology, like those for both affective and schizophrenic psychosis.

How is the relationship between liability for psychosis and creativity explained? The *evolutionary hypothesis*⁴ linking madness to creativity suggests that the genes that carry the liability for the psychoses have been retained in human evolution because they also convey a *compensatory advantage*: enhanced creativity may be one type of compensatory advantage to the genes that convey the liability for psychosis. This would help to maintain these putative genes in the population despite the low mating and fertility rates of psychotic patients (Kinney & Mathysse, 1978; Richards *et al.*, 1988; Kinney *et al.*, 2000–2001).

V: What Form of Madness is Associated with Creativity?

As introduced earlier, one of the main debates in psychiatry has been to establish the link between creativity and some particular form of mental disorder. For much of the twentieth century the connection was established with schizophrenia, whereas in recent years the situation shifted towards almost a denial of any link between creativity and the schizophrenia spectrum and the assumption of a

[4] For a Darwinian theory of creativity see Simonton (1999).

strong link between milder forms of bipolarity with creativity. This dramatic change is mainly related to two factors.

First, the diagnosis of affective psychosis, in particular bipolar disorder, was revived in the latter half of the twentieth century, broadening the affective spectrum cases and narrowing the schizophrenia spectrum. This is reflected in the fact that the psychobiographical analyses of the same geniuses led to different diagnoses from author to author. Those who are schizophrenic in one analysis appear as bipolar in another and vice-versa.

Secondly, the psychopathology–creativity link was restricted to schizophrenia because it was assumed that the *cognitive* rather than the *affective* characteristics of personality and psychopathology would account for the connection and schizophrenia is more fundamentally defined by cognitive symptoms (e.g., thought disorder and language peculiarities) than affective psychosis (Claridge, 1998).

In the 1970s research focused on the similarity between creative thinking and schizophrenic formal thought disorder,⁵ establishing that there was a cognitive continuum ranging from normality through creativity to disorder (Hasenpus & Magaro, 1976). McConaghy (1960) defined two cognitive styles that may reflect predispositions to psychosis and to creative cognition: *allusive thinking*, in which filtering mechanisms are impaired and permit the intrusion of irrelevant associations, with vague thought processes dominated by intuition; in the other style the capacity for making logical attributions is enhanced, and the adherence to the conclusion arrived at is greater than normal devotion. This cognitive style is more dominated by logic than common sense and has been hypothesised to predispose to both scientific thinking and paranoid ideation. Other thinking styles include pathological *overinclusive thinking* (Cameron, 1938), in which the person is not able to establish boundaries between ideas and images, and its healthier counterpart, *divergent thinking* (Guilford, 1970).

However, in the last decades, schizophrenia research returned to a focus on the deteriorating, dementia-like view of the disorder and the *negative or deficit symptoms*, considered by Bleuler (1911/1950) to be the core feature of schizophrenia. ‘Negative’ symptoms involve the impoverishment or loss of the capacity for pleasure (anhedonia), volitional impulses (abulia), interests (apathy), motivation (avolition), and the experience of restricted or flat affect. A restrictive focus on these features makes the idea of a link with creativity much less plausible. However, the concept of negative symptoms as the hallmark of schizophrenia is controversial and unresolved.

Moreover, studies on the cognition of bipolar disorders suggested that there are cognitive aspects in the bipolar spectrum akin to creative cognition (Holzman *et al.*, 1986). Overinclusive thinking was found to be present not only in schizophrenia but also in mania (Andreasen & Powers, 1974). The analysis of

[5] Thought disorder is differentiated in *content* and *form* or course. Disruptions in the content of thought primarily include false beliefs such as delusions. Disruptions in the form of thought (or *formal thought disorder*) refer to disturbances in the way that information is processed and is often indirectly assessed through decreases in the amount and coherence of speech.

cognition in hypomanic⁶ states shows that it shares common aspects with creative cognition: a quantitative increase of ideational fluency, high mental speed and cognitive flexibility, and the enhanced capacity for combinatory thinking, that is, the association of old elements into new and original ideas (Jamison, 1993).

The link between bipolarity and creativity used to be attributed to the remarkable similarity between hypomania and creativity in terms of *motivational* and *emotional* features (Barrantes-Vidal & Vieta, 2001). For example, Jamison (1989) analysed the role of emotional states in the creative process in a study of 47 living eminent British writers and artists. More than one third had received psychiatric treatment due to affective disorders. Interestingly, artists and writers had only received treatment during depressive episodes, whereas poets had also required treatment due to hypomanic or manic phases. As many as 89% described the experience of having tremendously productive, creative and intensive periods in which there was a marked elation of mood, high energy, enthusiasm, self-confidence, speed in ideational association, sharpened and faster perception, higher mental fluency, and an intense sense of well-being. Indeed, all these experiences have a remarkable overlap with the affective and cognitive symptoms that constitute the diagnostic criteria for a hypomanic episode. Interestingly, the mood elation usually preceded the creative period rather than being a product of it and most subjects considered this emotional state fundamental for their creative work.

Among the spectrum of affective disorders, empirical data and theoretical formulations seem to support a specific association between creativity and *bipolarity* (e.g., Akiskal & Akiskal, 1988; Andreasen, 1987; Goodwin & Jamison, 1990). Depression alone is considered unlikely to be linked with enhanced creativity because it tends to slow and restrict cognitive processes to the prototypical ruminative depressive topics. Furthermore, it has been shown that those depressive patients with a family history of bipolar disorders are more creative than those without a positive family history of bipolarity (Richards *et al.*, 1992). The argument is that the cyclic and sometimes even juxtaposed experience of positive (manic) and negative (depressive) moods and their associated cognitive and biological features may give rise to a more complex mental organisation (Richards *et al.*, 1992; Jamison, 1993). This enhancement in the complexity of thought patterns may facilitate the usage of certain forms of creative cognition (Carreño & Goodwin, 1998), such as Janusian and homospatial thinking. *Janusian thinking* was defined by Rothenberg (1990) as the mental process by which multiple opposites or antitheses are conceived simultaneously. The person remains aware that the concepts are in opposition, which prompts the mental effort to generate original thoughts that provide reconciliation. *Homospatial thinking* operates later in the creative process and consists of conceiving two or more discrete entities occupying the same space, which leads to the articulation of a new identity (Rothenberg, 1990).

[6] Hypomania is a milder form of mania (e.g., an unmotivated elated mood, irritability, speeded mental processes, hyperaesthesia, etc.). It differs from mania in that it is less severe and never involves psychosis.

Jamison (1993) added to the argument of a specific link between creativity and bipolarity that the abrupt replacement of the melancholic experience by intense manic states of elation and expansiveness endows the bipolar subject with a special capacity for introspection and a heightened need to express it in a creative, mainly artistic, way. This connects with the classic theme of *inspiration* in artistic creation: the need to deepen or regress into the prerational or irrational while maintaining contact with reality. As Jamison (1993) puts it: 'The integration of these deeper, truly irrational sources with more logical processes can be a tortuous task, but, if successful, the resulting work often bears a unique stamp, a 'touch with fire' for what it has been through' (p. 104).

Given the current state of knowledge, the idea of an association between creativity and a unique form of psychosis is clearly untenable. Psychosis and its temperamental roots are highly heterogeneous domains of symptoms and traits. What seems more likely is that schizophrenia and bipolar *vulnerability* manifest in different creative advantages because of their possible differential personality and cognitive-perceptual characteristics. Actually, there is evidence indicating that people falling into the bipolar spectrum exhibit greater work-related than leisure-related everyday creativity, whereas the opposite is the case for schizophrenia spectrum subjects (Richards, 2000–2001). It may well be that the extraverted, competitive, driven, gregarious personality roots of bipolarity allow these subjects to display this creative advantage in the social contexts where professional activities take place, whereas the traits of introversion, social anxiety, or awkwardness, more common in the schizophrenia spectrum, may make it easier for these subjects to display their creative potential in more relaxed, less socially pressured and judged environments such as leisure and avocational activities (Richards, 2000–2001).

From a different angle, Sass (1992) argued that *artistic creativity* is probably much more likely to result from the psychological characteristics that define the bipolar spectrum, thus causing an overrepresentation of affective disorders in artistic fields, especially literature (e.g., Jamison, 1993; Post, 1994). However, other kinds of creativity present in fields such as sciences, philosophy, architecture may benefit from other psychological profiles that define the schizophrenia-spectrum, such as Storr (1972) suggested when analysing the schizoid personalities of Descartes, Newton, and Einstein. Sass (2000–2001) goes further by wondering whether the distinction between successfully creative and truly innovative, paradigm-breaking work, analogous to Kuhn's (1970) famous distinction between 'normal' and 'revolutionary' science, may be somehow connected to this issue. In most fields, creative work relies on a considerable degree of conventionality that allows the creation to be understood, accepted, and successful in its particular field. Only a minority attain a truly revolutionary creative production and abandon all previous canons. Sass' argument is that:

what accounts for the higher proportion of persons with a connection to affective than to schizophrenic psychosis might, surprisingly enough, have as much to do with the greater conventionality of the former as with their superior originality or innovativeness *per se* (p. 70).

In favour of this hypothesis is the fact that the personalities comprised in the affective spectrum seem to be overly dependent on social approval and dependent on social norms (Barrantes-Vidal *et al.*, 2002a). Sass suggests that both depression and mania are not a source of radical innovation but a heightening of psychological states that are reasonably familiar to most that share a particular culture. On the contrary, schizotypy would be associated with a greater degree of eccentricity and an easy engagement in states of detachment from the 'given for granted' natural evidence of the world, thus enabling the subject to discover truly new perspectives or frameworks. Emotional detachment, loneliness and abstract thought is a combination that many studies have noted in the lives of many significant philosophers (Descartes, Locke, Hobbes, Pascal, Spinoza, Kant, Schopenhauer, Nietzsche, Kierkegaard, Wittgenstein), and scientists (Storr, 2000). Einstein, although married twice, described himself as 'a loner, who never belonged with his whole heart to the state, his country, his circle of friends, or even his closer family, but who felt with regard to all those ties a never overcome sense of being a stranger with a need for solitude' (p. 26; cf. in Storr, 2000). These features, far from the romantic concepts of creativity, are close to the hyper-self-consciousness and alienation that characterise *modernism* and *postmodernism* (Sass, 2000–2001).⁷

Claridge (1998) suggested that various types of creativity map on to different aspects of psychosis and that, even within each field and form of creative expression, there will be different creative processes and stylistic differences that will, at least in part, relate to the various cognitive and personality traits. Currently, some neurocognitive models attempt to account for these different psychopathology–creativity patterns.

Prentky (1980) argued that there are two distinct profiles characterised by cognitive, physiological, and clinical features, giving rise to different forms of creativity. The *A-type (abstract)* is cognitively characterised by a 'radar' type of functioning, with weak attentional focus, distractibility, easy attentional shifting, and a higher propensity for the loosening of ideational boundaries (i.e., overinclusion). Physiologically it is defined by high tonic arousal and overactivation of the right hemisphere or underactivation of the left hemisphere. Clinically it is more likely to present symptoms that range from depression, schizoid personality (e.g., solitary, emotionally cold, lack of close friends, anhedonic), and the before-mentioned schizophrenic negative symptoms (in which a higher activation of right hemisphere seems to occur). The creative output of this type is often relegated to the 'mystical' realm of intuition because there is not a sense of cognitive effort preceding it.

The *C-type (concrete)* is hypothesised to underinclude or constrict the attentional field, has low distractibility, and difficulty shifting attention. Clinically it is more related to the 'positive symptoms' of schizophrenia (e.g.,

[7] Sass uses *modernism* and *postmodernism* according to the standard usage of these terms in art history: the former refers to the formally innovative, avant-gardes period of the first half of the twentieth century, whereas the latter refers to the developments that took place after World War II (cf. Sass, 2000–2001).

hallucinations, delusions, bizarre behaviour, pressured speed), in which a higher left than right hemisphere activation is reported. The C-type creative style is characterised by an analytic dissection of the constitutive elements of a problem. Prentky (2000–2001) suggests that

the normal range of input regulation is distorted by imbalances in hemispheric activity, resulting in two very different data processing strategies that facilitate creative solutions to problems. Because these imbalances are often associated with genetic predispositions to mental illness, there is a greater-than-chance probability that highly creative individuals may evidence signs associated with mental illness (p. 103).

VI: Answers From Psychometric Studies

As previously noted, the dimensional view of psychopathology states that psychotic disorders are continuous with normal personality dimensions. This has led to the development of psychometric instruments (i.e., questionnaires) that measure the degree to which these traits are present in normal subjects and disordered individuals. In a parallel fashion, creativity research has moved away from the sole analysis of eminent geniuses or artists to the assessment of psychometric or ‘*trait-creativity*’, that is, the cognitive and personality factors considered to be the basis of creativity. Put in other words, creativity has also been ‘dimensionalised’ by distinguishing trait-creativity from creative achievements.

The first issue addressed by psychometric studies was to define the personality correlates of trait-creativity. It was found that creativity is significantly associated with a set of *normal personality traits* including individualism, originality, rebelliousness, independence, persistence, tolerance to ambiguity, motivation guided by internal rewards, and risk taking (McKinnon, 1961). Interestingly, normal subjects with high creativity scores tend to combine the presence of elevated levels of self-reported psychological deviance on various dimensions (e.g., narcissism, impulsivity, alcoholism, aggression, etc.) with high scores on the construct ‘*ego strength*’ (Barron, 1969). Ego strength is characterized by resourcefulness, a proper sense of control, psychological well-being, good self-esteem, and self-realisation. Ego strength tends to be inversely related with psychopathology, although individuals defined as highly creative present with this peculiar combination of high ego-strength and high psychological deviance.

Another issue has been to examine whether creativity in normal individuals is related to the personality traits that are supposed to be the soft end of schizophrenia (schizotypic personality) and bipolar spectrum (hypomanic and depressive traits). Schuldberg *et al.* (1988) found in undergraduate students a positive and significant relation among several measures of positive schizotypy⁸ and creativity tests, although a significant relationship between divergent thinking and

[8] Positive schizotypy is the personality foundation of positive psychotic symptoms (delusions and hallucinations). An example of the items used to measure the unusual experiences contained in positive schizotypy questionnaires would be: ‘Have you felt that you might cause something to happen just by thinking too much about it?’, ‘Are your thoughts sometimes so strong that you can almost hear them?’. *Negative schizotypy* encompasses high introversion and social and physical anhedonia. An

positive schizotypy was not found. When scales of hypomanic and impulsive personality traits were added in a later study, results pointed to a stronger link between creativity and the affective/motivational sphere than with the schizotypy (Schuldborg, 1990). O'Reilly *et al.* (2001) also failed to find an association between schizotypy and divergent thinking, although schizotypy was related to engagement in creative pursuits.

It is important to note that positive schizotypy and hypomania correlate strongly and that their relative, perhaps differential, contribution can be difficult to disentangle. A study comparing 'pure' high scorers on hypomanic traits, 'pure' high scorers on positive schizotypy, and average scorers on both tests found that 'hypomanics' presented higher divergent thinking than 'schizotypals', and these were higher than average scorers (Barrantes-Vidal *et al.*, 1999; Barrantes-Vidal *et al.*, submitted). These results raise the possibility that creative cognition is more akin to manic 'flight of ideas' than to schizophrenic 'loose associations'.

Similarly, Schuldborg (2000–2001) concluded that there are positive associations between creativity and *both* schizophrenia-like positive schizotypy traits and hypomanic traits, with a slightly stronger association with the latter. Impulsivity, highly related to hypomania, also had a significant relation to creativity measures. Depressive traits and negative schizotypy traits (physical anhedonia) were not related to creativity, rather they had a negative correlation with creativity. It is interesting to note that this differential association of positive and negative schizotypal traits with creativity is consistent with the finding that normal subjects with high scores on positive schizotypy and low scores on negative schizotypy do not present with the subtle cognitive impairment that characterises high scorers on negative schizotypy (Barrantes-Vidal *et al.*, 2002b). As Claridge (1997) reviewed, *positive* schizotypy seems to predispose to a wide variety of both pathological (schizophrenia, obsessive–compulsive disorders, eating disorders) and *healthy* outcomes (profound spiritual experiences and out-of-the-body experiences).

This psychometric work has been complemented in recent years by studies associating creativity with new personality dimensions. For instance, *Openness to Experience* (OE), one of the dimensions of the dominating 'big five' personality model, seems to encompass many of the 'normal' personality traits that have been linked to creativity: intellectual curiosity, aesthetic sensitivity, liberal values, and emotional differentiation (McGrae, 1987). McGrae (1987) found that divergent thinking was significantly associated with self-reports and ratings of OE, and not with the remaining big five personality dimensions (extraversion, neuroticism, agreeableness, conscientiousness). Another personality variable, *Sensation Seeking*, has been also related to creativity (Zuckerman, 1979). Interestingly, this variable is significantly correlated to OE (McGrae, 1987), and both have been shown to be important influences in sophisticated forms of aesthetic judgement and preference (e.g., Rawlings *et al.*, 2000).

example would be: 'Are there very few things you have ever really enjoyed doing?', 'Is it true that your relationships with other people never get very intense?'.

One of the most elaborated and influential theories is that the personality dimension *psychoticism* underlies the link between trait-creativity and psychopathology (Eysenck, 1995). According to Eysenck, psychoticism (P) is genetically transmitted and reflects a general predisposition to all psychoses. A substantial bulk of studies have shown a positive and significant association between Eysenck's Psychoticism Scale (P)⁹ and trait-creativity, whereas the other two dimensions of Eysenck's personality model, extraversion-introversion and neuroticism, have shown an inconsistent relationship with creativity (Eysenck, 1995).

Subjects high on P and on creativity tests present some common features: unusual patterns of word-sorting, more divergent thinking, and less degree of *cognitive inhibition* as measured by different attentional paradigms (e.g., latent inhibition, negative priming) (Eysenck, 1995). According to Eysenck, these common traits result from a shared biological profile, characterised by high dopamine and low serotonin levels. High dopamine would enhance creativity by decreasing cognitive inhibition, something that would make the subject more prone to divergent and combinatory thinking.

The relationship between dopamine levels and P has not been directly shown by molecular genetics, but there are several indirect evidences that link these variables, such as the elevation of dopamine receptors in post-mortem brains of schizophrenic patients (who score high in P), and the fact that high P scores are found in other disorders characterised by dopaminergic abnormalities (e.g., substance abuse, attention deficit hyperactivity disorder, etc.) (Martindale *et al.*, 2000). Further evidence comes from the genetic studies of a temperamental trait called *novelty seeking* (NS). NS is defined as 'the tendency toward intense exhilaration or excitement in response to novel stimuli or cues for potential rewards or potential relief of punishment' (Cloninger, 1987, p. 575). NS is hypothesised in Cloninger's theory to depend on cortical dopaminergic activity. There is an association between NS and certain allelic variants of the dopamine receptor D4 (Ebstein *et al.*, 1996; Benjamin *et al.*, 1996), adding further indirect evidence to the link between creativity and dopaminergic function. New developments in this area point out the role of individual differences in other neurotransmitter systems as a common factor for creative cognition and vulnerability for psychosis (e.g., Folley *et al.*, in press).

Summary and Conclusions

This paper has revisited the ancient link between madness and creativity. The review of psychobiographical, psychometric and family studies supports that there is a consistent association between the two. The main argument defended in this paper is that *states* of true madness do not lead to creativity, but that both phenomena share common causative *traits* that make them go together. Substantial empirical work has shown that both creativity and the temperamental roots of

[9] The Psychoticism scale has been strongly criticised as a valid measure of a general predisposition towards psychosis because it is strongly contaminated by impulsivity and antisocial behaviour.

psychoses have common features at a biological (e.g., high levels of dopamine), cognitive (e.g., a brain organisation characterised by a weak inhibitory control that enables loosened or more flexible styles of mental activity), and emotional level (e.g., high openness to experience and phases of elation and intense enthusiasm).

The traditional interest of psychiatry has been to establish what particular form of psychosis, either schizophrenia or bipolarity, is truly related to creativity. Nowadays the effort has moved towards a more fruitful enterprise: to explore in detail what specific forms of creative endeavour are connected to the temperamental traits of the psychoses. There seems to be enough evidence to support that the prominent emotional changes and motivational features of affective psychosis would be especially suited to the 'romantic', inspirational, creativity more involved in writing and other sorts of artistic creation; whereas the personal detachment, prominent abstract thinking and cognitive peculiarities present in the schizotypic temperament, would have more in common with scientific or philosophical creativity. Obviously, this is not to say that creativity arises solely from such a temperamental basis, since many other factors should be included in the equation to give account of creativity.

Further empirical support to the idea that creativity may be a compensatory advantage to the vulnerability for psychosis will point out how our current medical and 'deficit' view of the psychotic spectrum is too simplistic and inadequate. One wonders if the relatively recent attention that academia is paying to this popular idea will support what the pioneer researchers in this field had already intuited:

... it seems as though nature had intended to teach us respect for the supreme misfortunes of insanity; and also to preserve us from being dazzled by the brilliancy of those men of genius who might well be compared, not to the planets which keep their appointed orbits, but to falling stars, lost and dispersed over the crust of the earth (Lombroso, 1895).

Acknowledgments

I thank Thomas Kwapil for his very useful comments on the paper. I am indebted to Gordon Claridge for his many inspiring suggestions and guidance.

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