CREATIVITY AND PSYCHOPATHOLOGY: A SHARED-VULNERABILITY MODEL

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Abstract

While creativity is considered a positive personal trait, highly creative individuals have demonstrated elevated risk for certain forms of psychopathology. This paper reviews the empirical evidence for an elevated risk of three disorders in creative individuals: mood disorders, schizoprocessum disorders, and alcoholism. I argue that a model of shared vulnerability explains the relationship between creativity and psychopathology. This model, supported by recent findings from neuroscience and molecular genetics, suggests that biological determinants that confer risk for psychopathology interact with protective cognitive factors to enhance creative ideation. Elements of shared vulnerability include cognitive disinhibition (which allows increased stimuli into conscious awareness), an attentional style that is driven by novelty-salience, and neural hyperconnectivity that may increase associations among disparate stimuli. These vulnerabilities interact with superior meta-cognitive protective factors, such as high IQ, working memory capacity, and cognitive flexibility, to produce an enlarged body of stimuli that is available in conscious awareness to be manipulated and combined to form novel and original ideas.

Highlights

- Cognitive systems that underlie creative ideation may be dependent upon irregularities in both serotonin and dopamine neurotransmitter systems
- Creative individuals may depend on vulnerability factors to enhance their work
- Since creativity and psychopathology may be different outcomes of biological vulnerability factors, art, music, or writing therapies may improve symptoms of psychopathology by increasing protective factors associated with creativity
When John Forbes Nash, mathematician, Nobel Prize winner, and diagnosed schizophrenic was asked why he believed that aliens from outer space had recruited him to save the world, he responded, “because the ideas I had about supernatural beings came to me the same way that my mathematical ideas did. So I took them seriously.” While creative ideas may certainly be produced by deliberate mental effort, Nash’s statement suggests that, at least in some cases, creative insight may share phenomenological elements with psychotic experiences by appearing to arrive suddenly and fully-formed into conscious awareness.

Biographies of creative individuals and an array of empirical studies provide an ever-growing catalogue of evidence for a relationship between creativity and psychopathology. I argue that this relationship is best described by a model of shared biological vulnerability. Genetic vulnerability factors, related to the functioning of dopamine and serotonin in the prefrontal and subcortical brain, may predispose certain individuals to experience altered mental states that provide access to - and interest in - associational material typically filtered out of conscious awareness during normal waking states. These vulnerability factors may manifest as either severe psychopathology or as creative ability depending upon the presence of additional cognitive factors which act to protect the individual from the most severe consequences of mental disorder. After reviewing the empirical evidence for the association between creativity and mental
illness, I will describe the shared vulnerability model, supported by clues from neuroscience and molecular genetics.

**Is There a Relationship between Creativity and Mental Illness?**

Scholars in the Humanist tradition have viewed creativity as an aspect of the fully functioning personality and a facet of self-actualization. Maslow described the creative person as one who was living a fulfilled life, and others have noted that creativity is correlated with desirable personality constructs such as openness to experience and self-confidence. Creativity is a highly valued trait in fields as diverse as business, sports, and the military, as well as the arts and sciences. Despite the association of creativity with desirable personal features, a relationship between creative individuals and mental illness has been noted since the time of the ancient Greeks. Plato, for example, suggested that poets, philosophers, and dramatists suffered from “divine madness,” while Aristotle was among the first to associate poets with melancholia.

Empirical evidence for a connection between creativity and psychopathology began to emerge in the latter half of the last century, as two separate studies reported that the children of schizophrenic mothers were found to be more creative than the children of matched controls. These findings prompted a new generation of researchers to empirically examine the incidence of psychopathology within creative individuals. In general, this research has noted a higher risk for three types of disorders among creative individuals: mood disorders (especially bipolar spectrum disorders), schizospectrum disorders, and substance abuse disorders.
Creativity and Mood Disorders

In the 1980’s, two studies based on modern diagnostic methods indicated that prominent creative individuals incurred a greater risk for mood disorders than their less creative counterparts. Andreasen compared writers from the prestigious Iowa Writers Workshop and their first-degree relatives to a matched control group, finding that fully 80% of the writers had suffered from a mood disorder and that the writers were four times more likely to suffer from bipolar disorder than the controls. She also found that both the mood disorders and creative interests tended to run in families, concluding that “Affective disorder may be both a ‘hereditary taint’ and a hereditary gift.”\textsuperscript{11} Meanwhile, Jamison compared award-winning artists and poets from the UK to population norms and found that they were over five times more likely to be diagnosed with any mood disorder and six times more likely to be diagnosed with bipolar disorder. She further reported that rates of creative productivity seemed tied to upswings in mood in both disordered and non-disordered subjects.\textsuperscript{12} Jamison has proposed these upswings include activation of associational networks and enhanced sensory experience, both of which are important for creativity.\textsuperscript{8}

Two influential studies examined mood symptoms in deceased creative luminaries, rendering psychiatric diagnoses on the basis of available biographical sources. Post studied the lives of 291 world-famous men in different creative professional categories. Using general population demographics as controls, he found that his subjects demonstrated higher rates of undifferentiated mood disorder for all professional
categories. Ludwig, analyzing of the biographies of over 1,000 deceased luminaries, found significantly higher rates of psychopathology, including mood disorders, among persons in the creative arts (artists, musical composers and performers, and writers) than among other professions.

(Insert Figure 1 here)

While these studies indicated a connection between creativity and mood disorders (See Figure 1), Richards and Kinney et al. found that the degree of dysfunction was an important component of this connection. They found that subjects with cyclothymia and first-degree relatives in subjects with manic depression had higher creativity scores than either non-disordered controls or than manic depressive subjects themselves. The authors concluded that either hereditary risk or milder, subclinical variations of bipolar pathology may enhance creativity, but that full-blown manic depression may interfere with creative activity, a set of conclusions known as the inverted "U" hypothesis of creativity and psychopathology.

In general, the findings from the research on creativity and mood disorders suggests that 1) creative individuals may carry a risk for bipolar disorder that is greater than that of the general public, 2) mild forms of bipolar pathology or genetic risk for bipolar are more beneficial to creative output than more severe forms of the illness, 3) creativity appears to run in families, and 4) shifts in mental states associated may facilitate creativity. These findings are suggestive of a shared vulnerability between creativity and bipolar
disorder, one that is facilitated by altered states of cognition brought about by mood changes.

**Creativity and Schizospectrum Disorders**

There is a rich literature describing psychotic and odd or eccentric behavior in creative individuals. William Blake, for example, claimed that his poetry and his paintings resulted from visions of visiting spirits who sometimes jostled him while competing for his attention. The composer Robert Schumann suffered from frequent hallucinations and delusions, believing that his symphonies were dictated to him by Beethoven and Mendelssohn from their tombs. Studies of creative achievers at Berkeley’s Institute for Personality Assessment and Research (IPAR) found that creative writers and creative architects had elevated scores on the MMPI scales of Schizophrenia and Paranoia, while noting that both creative individuals often reported unusual perceptual occurrences and odd mystical experiences.

Reviews by Prentky and Brod associate schizotypy and psychosis-proneness with creative ability and demonstrate that both creativity and schizotypy tend to run in families. In addition, several recent studies have examined schizotypy and creativity, making the distinction between *positive* schizotypy (characterized by the unusual perceptual experiences and magical thinking) and *negative* schizotypy (characterized by low sociality and anhedonia). Two studies by separate research groups compared British art students to students in non-arts disciplines. Both Burch et al. and O’Reilly et
al. found that art students scored significantly higher than the control group on measures of positive but not negative schizotypal traits.\textsuperscript{24,25}

Two additional studies have found that positive and negative schizotypal traits may differentiate types of creative individuals. Nettle found that poets and artists, along with psychiatric patients, had elevated levels of positive schizotypal traits. However, mathematicians reported levels of positive schizotypy that were actually lower than those of the general population, as well as high levels of negative schizotypal traits.\textsuperscript{26} These results were replicated by Rawlings and Locarnini, who found that their group of professional artists and musicians scored higher on measures of positive schizotypy, hypomania, and a tendency to make loose associations, than their group of biologists and mathematicians. This latter group had higher scores on an Asperger’s scale that included many of the symptoms of negative schizotypy. The authors conclude that the relationship between creativity and psychopathology may be divided by domain into a propensity to over-systematize stimuli in the science/math domains and a psychosis-prone tendency toward under-systemization and loose associations in the fine arts domains.\textsuperscript{27}

(Insert Figure 2 here)

Replicating the inverted “U” pattern of creativity and psychopathology noted with bipolar patients in their earlier study, Kinney and Richards et al. found that peak creativity levels were higher in subjects with schizotypal personality disorder or two schizotypy signs (such as magical ideation or illusion experiences) than in subjects with no schizotypal signs or with full-blown schizophrenia.\textsuperscript{28}
In general, the schizospectrum studies have supported three conclusions: 1) there is an elevated level of schizotypy and psychosis-proneness in divergent thinkers and creative individuals,\textsuperscript{21-28} 2) schizotypy and psychosis-proneness appear to run in families,\textsuperscript{21,22,28} and 3) as with bipolar spectrum disorders, milder symptom sets are more conducive to creativity than more severe forms of the schizospectrum.\textsuperscript{28} Sass has suggested that the break with reality associated with schizotypal cognition enhances creativity by allowing the individual to view situations from a totally new perspective.\textsuperscript{29} The tendency toward schizotypal thinking constitutes an altered state in which the individual is aware of material that is typically suppressed before entering consciousness.

**Creativity and Alcoholism**

In addition to the findings on a creativity correlation with mood disorders and schizotypal symptoms, there is also a large body of findings relating creativity to alcohol and drug disorders. Creative luminaries have long associated alcohol ingestion with creative inspiration. Over two thousand years ago, the Roman poet Horace wrote “No poems can please for long or live that are written by water drinkers.”\textsuperscript{30}

Andreasen\textsuperscript{11} found that in her study of writers from the Iowa Writers Workshop, that 30\% of the writers suffered from alcoholism versus 7\% from the control group, a significant difference. Post, in his biographical review of famous men, found about 14\% of the group of writers, composers, and artists met criteria for alcoholism.\textsuperscript{13} Likewise, Ludwig reported that a mean level of alcoholism in artists, musicians, fiction writers, and poets at between 19\% and 41\%, but low rates (1-2\%) among natural scientists.\textsuperscript{31} Levels
of alcoholism appear particularly elevated in fiction writers. Of the eight American novelists who have won the Nobel Prize, five have been alcoholics. Unfortunately, biographical accounts of the lives of famous writers such as Hemingway, Poe, and Fitzgerald provide evidence that progressive alcoholism diminishes both the creative ability and the creative productivity of writers.\(^{32}\)

(Insert Figure 3 here)

Results of the research on creativity and alcoholism support a greater prevalence of alcoholism in creative groups (see Figure 3).\(^{11,13,14}\) Alcohol induces an altered state of consciousness which may allow unusual ideas to enter consciousness through the relaxing of inhibitory mechanisms. As with other disorders, it appears that although creative individuals may find drinking inspires creativity, full-blown alcoholism is detrimental to creative efforts.\(^{32}\) Because rates of alcoholism are extremely elevated, not only in creative individuals but in the bipolar and the schizospectrum populations as well,\(^{33}\) the tendency toward alcoholism may be indicative of an underlying shared vulnerability.

**The Shared Genetic Vulnerability Model**

Because the disorders associated with creativity, as well as creativity itself, are both heritable\(^ {34,35,12}\) and polygenic,\(^ {36,37}\) several investigators have suggested that creative thought processes may share genetic factors with such disorders but may also include other genetic elements that discourage the expression of mental illness.\(^ {38,39}\) Such a shared
vulnerability model explains a number of findings, including the greater risk for psychopathology found in some creative individuals and the findings of increased creativity in the first-degree relatives of individuals with serious psychopathology. The model also accounts for the stable rate of disorders such as schizophrenia, despite evidence that schizophrenics reproduce at a lower rate than the general population. The role of creativity in maintaining the adaptability of the species may provide a reproductive advantage for the transmission of at least some portion of the schizophrenic genotype.

Based on available results from neuroimaging and genetic studies, I suggest a shared vulnerability model in which factors common to both creativity and psychopathology act to increase access and attention to material being processed below the level of conscious awareness, while protective factors for creativity allow executive monitoring and control of such access. Protective factors exert meta-cognitive control over bizarre or unusual thoughts, allowing an individual to take advantage of such thoughts without being overwhelmed by them. Candidates for vulnerability factors include reduced latent inhibition, novelty-salience, and neural hyperconnectivity. Candidates for protective factors include high IQ, enhanced working memory capacity, and cognitive flexibility (see Figure 4).

(Insert Figure 4 here)

**Reduced Latent Inhibition as a Shared Vulnerability Factor**
Latent inhibition (LI) is the capacity to screen from conscious awareness stimuli previously experienced as irrelevant. When latent inhibition is reduced, information that would typically be categorized as irrelevant is allowed into conscious awareness.\textsuperscript{43} Reduced LI has been observed in schizophrenic and psychosis-prone individuals,\textsuperscript{44-46} and can be induced by ingesting psychoactive substances.\textsuperscript{47} Reduced LI has also been reported in non-disordered subjects who score high on the personality variable openness to experience, a trait often associated with creativity. My colleagues and I have proposed that reduced LI may enhance creativity by enlarging the inventory of unfiltered stimuli available in conscious awareness, thereby increasing the odds of synthesizing novel and useful combinations of stimuli.\textsuperscript{48} In a series of studies we demonstrated that LI was in fact reduced in high-functioning individuals who had high scores on measures of creativity and openness to experience.\textsuperscript{48-50}

**Novelty-Seeking as a Shared Vulnerability Factor**

While reduced latent inhibition may increase the stimuli available in conscious awareness that can be combined to form novel ideas, novelty-seeking may provide the intrinsic motivation to attend to them. Creative individuals tend to seek out novel or complex stimuli over familiar or simple stimuli.\textsuperscript{51-53} Internal rewards (via the dopamine system) for seeking novel aspects of the environment or novel of stimuli may provide the creative individual with intrinsic motivation and intellectual curiosity.\textsuperscript{54}

However, novelty-seeking is also associated with alcohol abuse and addiction,\textsuperscript{55} and with bipolar states of hypomania and mania.\textsuperscript{56} Further, bipolar individuals with substance
abuse disorders have demonstrated significantly higher scores on measures of novelty-seeking. Therefore, novelty-seeking may be both an incentive for creative work and a risk factor for psychopathology.

**Neural Hyperconnectivity as a Shared Vulnerability Factor**

A third potential shared vulnerability factor, neural hyperconnectivity, includes an abnormal neural linking of brain areas that are not functionally connected. Hyperconnectivity, generally supposed to be caused by a failure of synaptic pruning during development, has been detected in both schizophrenics and their first-degree relatives, perhaps accounting for the bizarre associations often reported by schizophrenics. Hyperconnectivity has also been noted in neuroimaging studies of synaesthesia, the tendency to make cross-modal sensory associations. Synaesthesia runs in families and is seven to eight times more prevalent among highly creative individuals than among the general population. Brain imaging studies have also reported more alpha synchronization, both within and across hemispheres, in the brains of high creative versus less creative subjects during creativity tasks, suggesting unusual patterns of connectivity. Ramachandran has speculated that patterns of hyperconnectivity may form the basis of human metaphorical thinking, a type of thinking often described by both creative individuals and those experiencing hypomania, psychotic episodes, and drug intoxication. Mednick theorized that the ability to synthesize remotely associated elements of thought into new and useful combinations is the basis of creativity. Functionally unrelated parts of the brain that are connected due to lack of synaptic
pruning may provide a mechanism for remote associations between stimuli that are the basis of creative thought.

**High IQ as a Protective Factor**

Although the construct of IQ is highly debated, high IQ is generally considered a protective factor for a number of serious psychopathologies. A body of research indicates that IQ is correlated with measures of creativity up to an IQ score of 120, suggesting an threshold score for IQ that is necessary but not sufficient to explain creativity. It should be noted, however, that the IQ threshold is somewhat dependent upon the domain or creative endeavor, with visual artists demonstrating a lower IQ threshold than theoretical physicists. My colleagues and I hypothesized that if reduced latent inhibition increases the stimuli available in conscious awareness, then high IQ may allow an individual to process and manipulate the additional stimuli rather than becoming confused or overwhelmed by it. In the presence of low IQ, reduced LI may increase the probability of psychosis. In the presence of very high IQ, however, reduced LI may allow individuals to visualize novel connections between internally- and/or externally-generated stimuli. In a study of eminent creative achievers, the combination of reduced LI and high IQ predicted 30% of the variance in creative achievement scores. (See Figure 5.)

(Insert Figure 5 here)
**Enhanced Working Memory as a Protective Factor**

Enhanced working memory capacity might also constitute a protective factor in a shared vulnerability model of creativity and psychopathology by allowing individuals to process additional cognitive stimuli produced by altered states of consciousness. Indirect support for this factor was obtained in a high-functioning group of subjects in which the latent inhibition deficit combined with high scores on a measure of working memory for abstract forms to predict over 25% of the variance in creative achievement scores. Working memory for abstract forms has also been shown to predict the ability to solve insight problems (a type of creative task) in a sample of college undergraduates. If, as suggested by Mednick, creativity is based on the ability to combine aspects of remotely associated constructs, then the ability to hold and process a large number of constructs in mind simultaneously without becoming confused or overwhelmed should predispose the individual to creative rather than disordered cognition.

**Cognitive Flexibility as a Protective Factor**

A final protective factor, cognitive flexibility, is the ability to switch attentional states by disengaging attention from one stimulus or concept and reengaging it on other stimuli through conscious mental control. Deficits in this ability have been a hallmark of schizophrenic thought. Cognitive flexibility allows a person to entertain information from more than one perspective and is associated with the trait of openness to experience, the personality trait most often associated with creativity. If creative individuals are experiencing magical thoughts or unusual perceptions, cognitive flexibility may provide
them with a method of either 1) disengaging attention from the psychotic-like experiences or 2) interpreting them in a benign manner rather than as a sign of madness. Recent research indicates that psychotic-like experiences are more prevalent in the general population than previously expected and that the interpretation of such events (rather than the events themselves) may determine the extent of the associated mental illness. Therefore, cognitive flexibility, allowing one to move in and out of altered states of consciousness and allowing one to interpret anomalous experiences in a healthy manner, may constitute a protective factor in the interface between creativity and psychopathology.

**Genetic Research**

Molecular genetic studies have identified a set of genes related to dopamine and serotonin transmission that appear to be associated with a variety of mental illnesses, including bipolar disorder, schizophrenia, and/or alcoholism. A number of these genes are also associated with the vulnerability and protective factors identified thus far in the shared genetic vulnerability model. Although the findings are in some cases contradictory and the discipline of molecular genetics is still in its toddlerhood, a body of evidence is beginning to accrue that indicates variants of genes that mediate dopamine availability may contribute to both creativity and the creative psychopathologies of schizospectrum, bipolar, and addiction disorders.

For example, Reuter et al found that the A1+ allele of the TAQ 1A polymorphism of the DRD2 (D2 dopamine receptor) gene was linked to creativity in a sample of German
university students. The A1+ allele has also been associated with novelty-seeking,\textsuperscript{73} schizophrenia,\textsuperscript{74} and alcohol addiction.\textsuperscript{75} D2 receptor sensitivity has also been linked to reduced latent inhibition in mice\textsuperscript{76} and humans; however, precise DRD2 alleles associated with latent inhibition have not been reported. Additional genes related to dopamine, including DRD4 (dopamine D4 receptor gene) and SLC6A3 (dopamine transporter gene) have been linked to both risk for schizophrenia and bipolar disorder\textsuperscript{77} and to novelty-seeking.\textsuperscript{78,79} As novelty-seeking is important in creative cognition,\textsuperscript{53} the availability and sensitivity to dopamine may constitute a shared vulnerability to both creative cognition and the types of psychopathology associated with creativity.

COMT (catechol-O-methyltransferase), an enzyme responsible for degrading catecholamines including dopamine, has been implicated in a variety of cognitive processes. The VAL158MET polymorphism of the COMT gene appears to yield particular influence over the availability of dopamine in areas of the frontal cortex.\textsuperscript{80} The VAL allele of the VAL158MET polymorphism allows greater expression of COMT in the prefrontal areas, thus diminishing the availability of dopamine, while the MET allele increases availability of prefrontal extra-cellular dopamine. The VAL+ alleles (including both the VAL/VAL and the VAL/MET variants) are associated with risk for schizophrenia,\textsuperscript{81,82} while the VAL- allele (MET/MET) is associated with higher IQ, working memory, and cognitive flexibility.\textsuperscript{82-84} Variants of the COMT gene may, therefore, distinguish the psychotic from the poet, with the VAL+ variants conferring risk for psychopathology and the VAL- variant acting as a protective factor that enhances creativity.
Variations in three genes involved in serotonin availability, HTR2A, SLC6A4, and TPH1, may also constitute either shared vulnerability among psychiatric disorders and creativity, or confer protective factors that favor creativity. The T102C polymorphism of the HTR2A (serotonin receptor) gene has been linked to schizotypy and risk for schizophrenia, although which alleles confer this risk have been disputed. The T/T allele of T102C has been associated with higher levels of absorption, a measure of the propensity to experience altered states of consciousness. Because absorption is associated with creativity, variants of the T102C polymorphism may establish either a genetic link or a genetic distinction between creativity and psychotic risk. However, further research will be necessary to clarify the contribution of the T102C relationship with creativity. While not identifying a specific polymorphism, Brang and Ramachandran have identified HTR2A as the gene underlying the expression of synaesthesia, further connecting this gene location to the shared vulnerability model.

SLC6A4, the serotonin transporter gene (also denoted as 5-HTT), has been widely studied in relation to psychiatric disorders. The short allele of the 5-HTTLPR promoter region of the SLC6A4 gene has been associated with several constructs related to creativity, including the personality traits openness to experience and absorption, as well as creative dance performance. SLC6A4 regulates the concentration of serotonin in the synapses, with the short allele of the 5-HTTLPR region apparently reducing the reuptake of serotonin. Because high levels of serotonin are implicated in hallucinogenic and unusual perceptual experiences, it is possible that variants in this gene are also related to a propensity for altered states of consciousness. Studies have also linked the
short allele of the 5-HTTLPR polymorphism with risk for bipolar disorder.\textsuperscript{92-94} The short variant of this polymorphism, therefore, appears to be important in both creative ideation and psychopathology associated with creativity.

Finally, the A779C polymorphism of the TPH1 (enzyme that regulates levels of serotonin) gene has been linked to risk for schizophrenia,\textsuperscript{95} suicide,\textsuperscript{96} and smoking addiction.\textsuperscript{97} Reuter et al\textsuperscript{72} found that carriers of the A allele of A779C polymorphism scored higher on measures of creativity, especially figural and mathematical creativity, than carriers of the C allele in a large group of university students.

Many genes and their polymorphisms have been implicated in the risk for serious psychiatric disorders. The variants of the genes mentioned above, which act on the neurotransmitters dopamine and serotonin, comprise only a small segment of this risk. Yet these neurochemicals appear to be especially important in mediating cognitive states associated with creative cognition, as well as psychosis, mood disorders, and addiction. However, individual genes do not confer creativity, psychosis, or addiction upon the individual. The complex interactions of multiple genes, with each other and with the individual’s environment, are important in determining a tendency toward either creativity or toward psychopathology. Neuroscience, psychology, psychiatry, and molecular biology all have a role to play in our growing understanding of these interactions.

**Conclusions**
Highly creative individuals are at greater risk for certain types of psychopathology, including mood disorders, schizospectrum disorders, and alcoholism, than are members of the general population. However, creativity is also a valued trait associated positive personal characteristics. Although these two sets of findings seem to be at odds with each other, a shared genetic vulnerability model of the relationship between creativity and psychopathology can account for the discrepancy. Creative cognition may share common biological vulnerabilities with psychopathologies that grant access to altered states of consciousness. These vulnerabilities may include a tendency toward transient cognitive disinhibition and, to date, appear to be associated with particular dopamine- and serotonin-related genes. Cognitive strengths, such as high IQ, good working memory capacity, and cognitive flexibility, may interact with these vulnerabilities to enhance creativity and act as protective factors against severe forms of the relevant psychopathologies. Genes that have been identified as important in both vulnerability and protective factors target dopamine and serotonin functioning. The shared vulnerability model currently includes only factors for which there is some corroborating support from molecular biology. However, there are likely additional shared vulnerabilities and protective factors that warrant inclusion. Future research will extend this model.

**Implications for Treatment**

Creativity is widely considered a healthy and desirable trait. A shared genetic vulnerability model of creativity and psychopathology suggests that psychopathology outcomes may be reduced by a) treating symptoms associated with vulnerability factors,
b) enhancing protective factors associated with creativity, or c) enhancing overall creativity. Because highly creative individuals may count on the cognitive manifestations of shared vulnerability to access altered states of consciousness that inform their work, they may be better served by treatment goals that aim for partial rather than complete neutralization of psychopathology symptoms. Creative individuals may prefer to tolerate higher levels of symptomatology in exchange for lower dosages of “creativity-killing” pharmaceuticals. They may also respond well to cognitive behavioral interventions that target the *interpretation* of psychotic symptoms rather than the *removal* of such symptoms (see Can J Psychiatry 2009;54(3) for a discussion of the reappraisal of psychotic symptoms).

Individuals with mood, schizospectrum, and addiction disorders who have not displayed creative propensities may be benefit from the addition of one of the many creative therapies, such as art, creative writing, drama, or music therapy, to their treatment regimen. Creativity is a respected and valuable personal characteristic. Because several factors that may predispose an individual to these types of psychopathology may also predispose them to creative modes of thought, redirecting patient interest into creative fields may help them to find a voice for their suffering as well as provide productive activity and even protection against the demons of psychopathology while enhancing their access to the muse.
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Figure 1: Percentage of Creative Individuals with Mood Disorder Compared to Population Norms Across Studies

Figure 2: Unusual Experience Scores (Positive Schizotypy) in Creative Individuals Compared to Population Norms Across Studies

Figure 3: Percentage of Creative Individuals with Alcoholism Compared to Population Norms Across Studies

Figure 4: Shared Vulnerability Model of the Relationship Between Creativity and Psychopathology

Figure 5: High IQ and Reduced Latent Inhibition Predict Creative Achievement in Eminent Achievers and Controls
*Population norm taken from Kessler et al. (2005)
* Unusual Experiences subscale of the O-LIFE and Population norm taken from Mason & Claridge (2006)
*Population norm taken from Kessler et al. (2005)
Creative Achievement Score

from Carson, et al. (2003)