

Creativity and its links to psychopathology

# Genius and Lunacy



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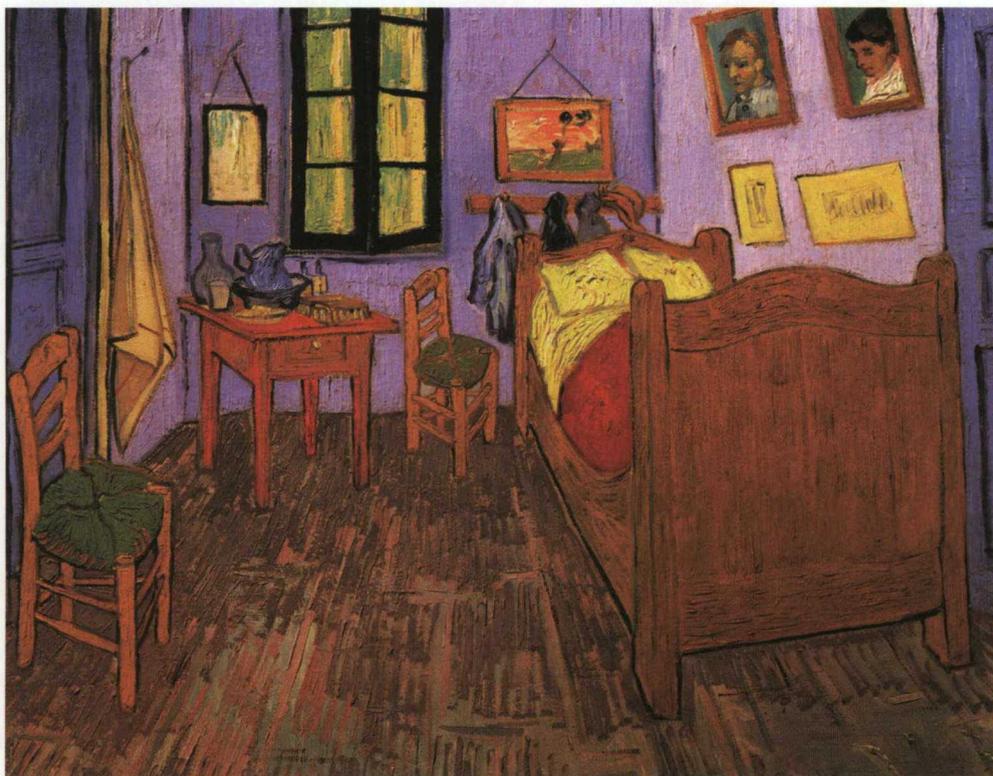
**Mood disorders, psychotic symptoms, suicidal behavior, and tendencies to abuse alcohol and other psychoactive substances all occur particularly frequently among artists. History's greatest geniuses have shown predispositions for schizophrenia. Is there a link between creative activity and psychopathology?**

Creativity is the ability to devise ideas and behaviors that are both original and useful, and then put them into effect. Such creativity developed during the evolution

of the *Homo sapiens* brain, and it may be important in facilitating better adaptation to the environment and better reproductive success. On the other hand, creativity is linked to elements of psychopathology that characterize certain mental disorders, such as the changes in motivation and mood that occur in affective disorders, especially bipolar disorder (manic-depressive illness), and the changes in the thinking process that occur in schizophrenic disorders.

The great ancient philosopher Aristotle, in his *Problemata*, pointed out the frequent occurrence of melancholy in prominent individuals of his day. Italian psychiatrist and anthropologist Cesare Lombroso (1835-1909) drew attention to the co-occurrence of genius and various psychiatric disorders and addictions. US psychologist Paul Guilford (1897-1987) hypothesized that creativity is linked to what he called "divergent thinking." British psychologist

Many historians are still pondering what led Vincent van Gogh to develop such a unique style. Like many outstandingly creative individuals, van Gogh suffered from manic-depressive illness. He also drank large amounts of absinth



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Hans Eysenck (1916–1997) claimed that a trait called “psychoticism” is the common denominator underlying both creativity and schizophrenic disorders.

### The psychoticism of genius

A review of the biographies and psychopathologies of prominent artists and authors indicates the frequency of psychiatric disorders is significantly greater among them than for other professions. In specific, they exhibit 2–3 times higher incidences of mood disorders (depression and mania), psychotic symptoms, suicidal behaviors, and tendencies to abuse alcohol and other psychoactive substances. Several years ago, the outstanding US psychiatrist Nancy Andreasen hypothesized in her book *The Creative Brain* that there is a link between artistic creativity and a susceptibility to manic-depressive illness, as well as a link between mathematical creativity and a predisposition for schizophrenia.

Such a predisposition for schizophrenic disturbances (either individual or family-related) was exhibited by the geniuses who made history’s greatest advances in mathematics and natural science. These include Isaac Newton, the pioneer of higher mathematics, Albert Einstein, creator of the theory of relativity, and Francis Crick, one of the discoverers of the DNA helix. Schizophrenia also afflicts John Nash, who won the 1994 Nobel Prize in economics for his research on game theory and whose illness was depicted in the book and film *A Beautiful Mind*.

### An unquiet mind

One outstanding researcher studying bipolar disorders is Prof. Kay Redfield Jamison, who works at Johns Hopkins University in Baltimore. Together with Frederick Goodwin she wrote the “bible” on the subject – *Manic-Depressive Illness* (first edition 1990, second edition 2007). She also described her own manic-depressive illness and its treatment with lithium in the book *An Unquiet Mind*. Her 1993 book *Touched with Fire*, in turn, is one of the best academic investigations of the link between creative processes and manic-depressive illness.

Personality traits such as neuroticism, cyclothymia, irritability, increased openness to experience, and a penchant for novelty seek-



Sarah Joss, www.ssc.hu

ing are characteristic both for patients with bipolar disorders and for individuals who exhibit a high degree of creativity, without any symptoms of illness. Compared to healthy individuals, adults with bipolar disorder and their children score significantly higher results on the Baron-Welsh Art Scale (BWAS), which rates creativity.

Schizotypal personality disorder, in turn, is a schizophrenia spectrum disorder that is characterized by a tendency for eccentricities and “magical thinking.” Studies have evidenced a positive correlation between psychoticism (in the Eysenck personality questionnaire), divergent thinking, and higher scores on the BWAS creativity scale. One group of visual artists studied showed significantly higher scores of schizotypal intensity as well as higher degrees of neuroticism, openness to experience, and divergent thinking.

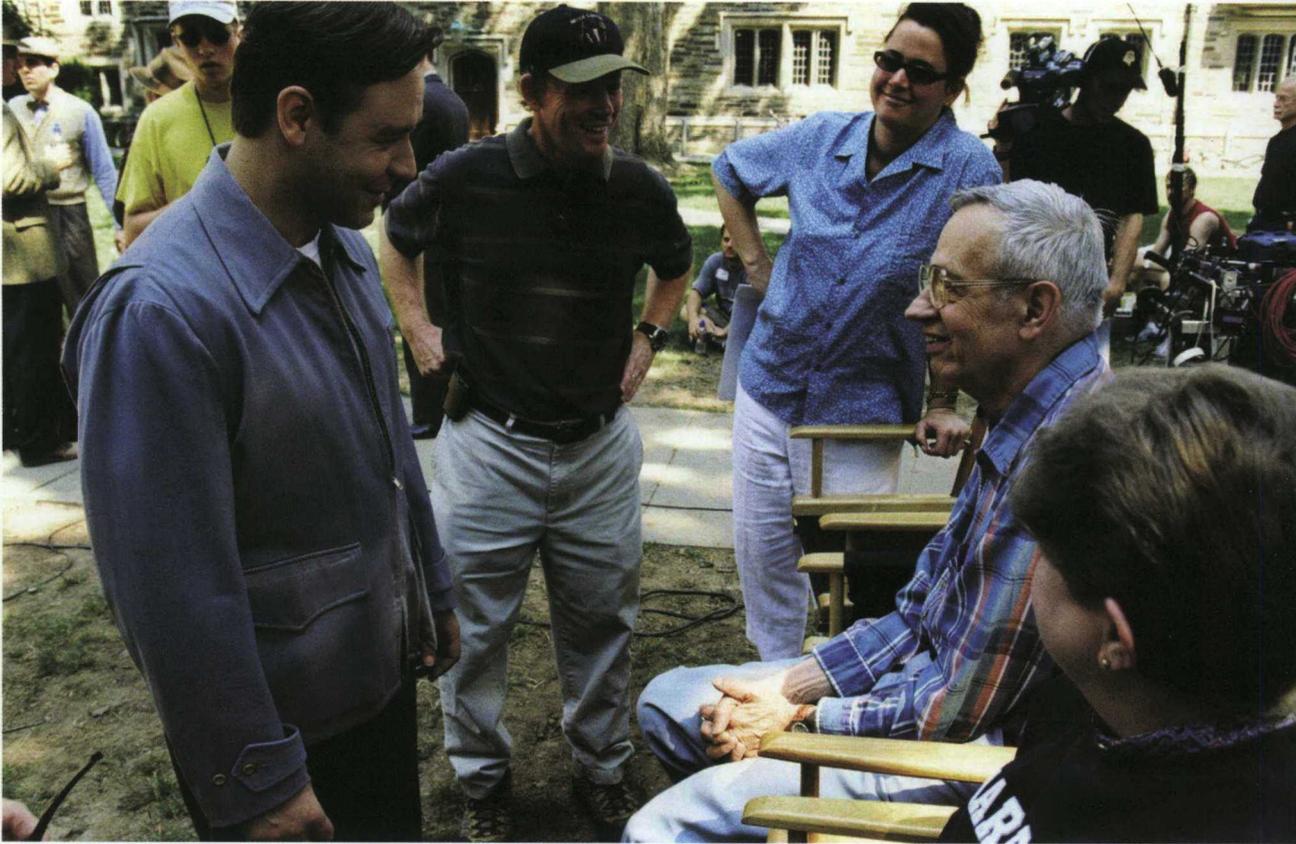
### Latent inhibition

Such a link between susceptibility to psychosis and higher creativity is related to a cognitive mechanism known as latent inhibi-

**Creativity requires cooperation between the brain structures involved in cognitive processes and the centers that control motivation**

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The film "A Beautiful Mind" tells the story of John Nash, a mathematician and Nobel Prize winner who suffered from schizophrenia. Here the lead actor, Russel Crowe, talks to the real Nash as he visits the film set

tion (LI). This is a process whereby environmental stimuli deemed unimportant cease to be perceived at all. A lower LI threshold is related to openness to experience and a tendency for divergent thought. Creative individuals are more likely to perceive things that are "shut out" for others, to have the "gift" of accessing a wide range of stimuli at an early stage of processing, and therefore to stand greater chances of original thinking. Highly creative individuals have shown significantly lower LI scores as compared to individuals with low creativity. Having a high IQ is likely a factor that helps an individual to cope with such a low LI and mediates in transforming that trait into creative success.

Schizotypal traits and psychoticism are more intense in bipolar disorder and correlate with creativity and the traits of hypomania. It seems that the common genes underlying predispositions for bipolar disorder and schizophrenia are related to the occurrence of psychotic symptoms. Individuals suffering from bipolar disorder (as well as artists, for instance) frequently abuse alcohol and psychoactive substances, which can lead to addiction. Such abuse serves as a way to

modulate environmental stimuli, in response to an excessive sensitivity to them.

### Creative mania

Many outstanding writers and poets (Lord Byron, Ernest Hemingway, Sylvia Plath, Virginia Woolf), musicians (Robert Schumann, Irving Berlin, Charlie Parker, Kurt Cobain) and painters (van Gogh) suffered from bipolar disorders. Many of them were addicted to alcohol and drugs and experienced periods of psychosis. Many of their lives ended in suicide. One of the founders and leading representatives of the famous New York School of painting was Mark Rothko (Marcus Rothkowitz; 1903–1970), an artist of Latvian origin who sought through his canvasses to express the fundamental human emotions. He himself suffered from manic depression, experiencing severe depressions, and also abused alcohol. He committed suicide at the age of 67.

The prominent American film actress Patty Duke, the youngest-ever Oscar winner, described her own manic-depressive illness and lithium treatment in the book *Call me Anna* published in 1987. In recent years,

such major film artists as Uma Thurman, Linda Hamilton and Robin Williams have admitted to suffering from bipolar disorders.

### Two hemispheres

Creativity requires cooperation between the brain structures involved in cognitive processes and the centers that control motivation. The major role here is played by the activity of the prefrontal cortex, the temporal lobes, and the mesolimbic system. Neuroimaging research on the prefrontal cortex has indicated a link between creativity and the bilateral activation of this structure, especially intense on the right side. An impairment of prefrontal cortex activity, such as in depression, leads to a decrease in the generation of creative ideas. In states of hypomania, on the other hand, creativity and easy decision making may increase. When the intensity of mania symptoms significantly rises further, however, they may lead to a complete loss of control over behavior and a decrease in creativity.

One example of a pathological creative drive is the phenomenon of hypergraphia, a powerful urge to write, which occurs with disturbances in temporal lobe function – such as in temporal epilepsy, involved mainly the right hemisphere. This causes a disinhibition of the function of the left hemisphere, which is related to verbal processes. Hypergraphia is frequently accompanied by mood disorders, including manic states or psychotic disorders.

Such intense moods and “psychotic” thinking, considered to be factors linked to creativity, are related to the function of the dopaminergic system, one of the brain’s neurotransmitter systems. The activity of the dopaminergic mesolimbic system stimulates increased motivation and increased exploration of the environment, as well as heightened experiencing of positive emotional sensations (*hedonia*). Dopamine leads to a decrease in processes of habituation, a sense of more intense perception and salience of incoming stimuli, and decreased latent inhibition.

### The artist’s genes

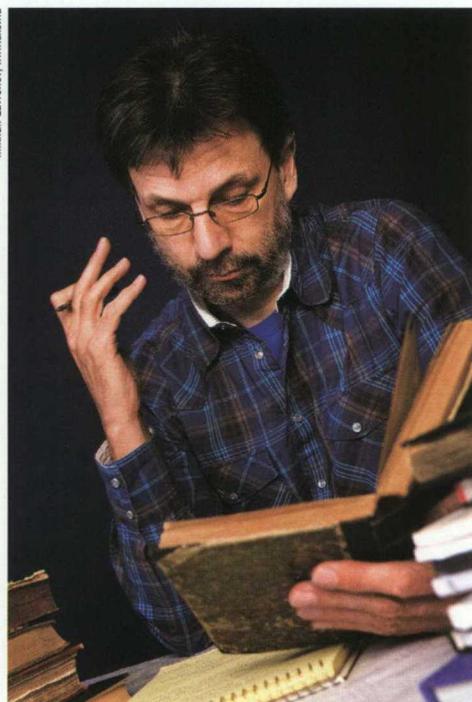
Progress in genetic-molecular research has yielded many interesting results concerning the genetic underpinnings of creative processes, in connection with bipolar mood changes or psychotic disorders. An

association has been demonstrated between the gene for the dopaminergic receptor D2 and symptoms of delusion or disorganized thought, as well as schizotypal traits and characteristics of verbal creativity. The gene for the dopaminergic receptor D4, in turn, has been linked to a tendency for novelty seeking, greater creativity, and also a predisposition for bipolar disorder.

Interestingly, recent research has confirmed the notion that artistic creativity may act as an attractive factor for sexual partners and thus, in the evolutionary context, increase reproductive success. British research on poets and artists has shown that there is a link between creative activity, a tendency to seek extraordinary experiences, and a higher number of partners. ■

#### Further reading:

- Jamison K.R. (1993). *Touched with fire: Manic-depressive illness and the artistic temperament*. New York: Free Press Paperback.
- Andreassen N.C. (2005). *The creating brain: The neuroscience of genius*. New York-Washington: Dana Press, D.C.
- Rybakowski J., Klonowska P., Patrzala A., Jaracz J. (2006). Psychopatologia a kreatywność [Psychopathology and Creativity]. *Psychiatr Pol*, 40, 1033-1049.
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In the evolutionary context creativity may serve to boost an individual's reproductive success, being a factor attractive to sexual partners