Creativity and Bipolar Disorder

Zeynep MAÇKALI[1], Sinan GÜLÖKSÜZ[2], Timuçin ORAL[3]

SUMMARY

The relationship between creativity and bipolar disorder has been an intriguing topic since ancient times. Early studies focused on describing characteristics of creative people. From the last quarter of the twentieth century, researchers began to focus on the relationship between mood disorders and creativity. Initially, the studies were based on biographical texts and the obtained results indicated a relationship between these two concepts. The limitations of the retrospective studies led the researchers to develop systematic investigations into this area. The systematic studies that have focused on artistic creativity have examined both the prevalence of mood disorders and the creative process. In addition, a group of researchers addressed the relationship in terms of affective temperaments. Through the end of the 90's, the scope of creativity was widened and the notion of everyday creativity was proposed. The emergence of this notion led researchers to investigate the associations of the creative process in ordinary (non-artist) individuals. In this review, the descriptions of creativity and creative process are mentioned. Also, the creative process is addressed with regards to bipolar disorder. Then, the relationship between creativity and bipolar disorder are evaluated in terms of aforementioned studies (biographical, systematic, psychobiographical, affective temperaments). In addition, a new model, the "Shared Vulnerability Model" which was developed to explain the relationship between creativity and psychopathology is introduced. Finally, the methodological limitations and the suggestions for resolving these limitations are included.

Keywords: Creativity, art, bipolar disorder, affective temperament, creative process.

"*Where the body and the mind are in disorder, to what use serve these external conveniences: considering that the least prick with a pin, or the least passion of the soul, is sufficient to deprive one of the pleasure of being sole monarch of the world.*" (M. de Montaigne)

INTRODUCTION

The relationship between creativity and bipolar disorder has been an intriguing topic since ancient times. Aristotle said that people who were creative on philosophy, politics and art suffered from melancholia. The affirmation of melancholia in favor of creativity by Aristotle can be said to have two effects: First, this provides opportunity for artists to interpret their mood swings. Second, this forms the basis for researchers to sustain their interest on this area (Jamison 1993, Teber 2004, Lloyd-Evans et al. 2006). Studies by researchers like Andreasen (1987), Ludwig (1992), Richards and her colleagues (1988) and especially Jamison (1989, 1993) on the relationship between creativity and psychopathology enhanced the interest on this topic. Research indicates that there is a close relationship between bipolar disorder (BD) and creativity despite the methodological limitations like analyses of (auto) biographical texts or retrospective examinations. However, Rothenberg (2006) has defended the opposite of this common belief and stated that thoughts in BD are irrational; behaviors are impulsive and disorganized although productivity and euphoria share common ground. In addition, Rothenberg has argued

Received: 30.11.2012 - **Accepted:** 02.05.2013

[1]Psychologist / Ph.D. Student, Hacettepe University, Department of Psychology, Ankara., [2]M.D., Yale University School of Medicine, Department of Psychiatry, New Haven, U.S. [2]M.D., Maastricht University Medical Center, Department of Psychiatry and Psychology, Maastricht/Netherlands., [3]M.D., Prof., Istanbul Commerce University, Department of Psychology, Istanbul.

E-mail: *zeynepmackali@hacettepe.edu.tr*

that productivity served a purpose in creativity and euphoria is related to a sense of success arising from the product creation. The possible relationship between creativity and BD is an important issue that is still discussed in present day. In this review, books that are about/related to these two concepts and their relationship, and Pubmed, ProQuest, Science Direct and PsychINFO databases were reviewed by using "creativity, manic depressive illness; creativity, bipolar disorder; creative process, manic depressive illness/bipolar disorder" as keywords. Firstly, the studies of the last 20 years were reviewed, then, in line with indications of this research, retrospective searches were made. In this review, the relationship between creativity and BD is going to be discussed in line with the sources that were accessed. At first, the explanations regarding creativity and the creative process are going to be mentioned. Then, the psychological viewpoints on the relationship between creativity and BD are going to be detailed and studies (biographical, systematic, psychobiographical, affective temperaments) that examined this relationship are going to be discussed. Also, a novel approach which examines the relationship between creativity and psychopathology is going to be demonstrated.

Creativity

While creativity has been defined as new and useful (or adaptive) behaviors or thoughts by a group of authors (Feist 1998, Murray and Johnson 2010), Mednick (1962) has defined creativity as an ability to combine distinct associative phenomena in a new and useful way. Tusa (2003) widened the scope of creativity, then defined as an expression of a nonexistent, imaginary thing as an artistic product after being discovered. According to Rollo May (1975), creativity is "the process of doing, disclosure of existence." From Winnicott's viewpoint, creativity is an expression of vitality, life energy, and an integration of pieces of his/her existence (Winnicott 1971; Levine 1992).

Andreasen (2005) mentioned three components of creativity: genuineness, utility and production. Genuineness was defined as new relationships, perspectives and awareness. Regarding artistic creativity, utility means eliciting new, different feelings in someone, creating new associations through impression. The last component, production, is about creating a product. In addition, Andreasen (2011) has defined creativity as a process with multiple stages. The process starts with *preparation* during which information and abilities are gathered, and continued with *incubation*. At this stage, the person does not strive consciously to solve a problem, but several connections are made unconsciously. Incubation results in inspiration, in other words, the person suddenly comes up with the answer. The process ends with *production* during which insights and comprehensions are put into a useful form.

Rothenberg (2001) discussed three concepts of the creative process: articulation, Janusian process and homospatial process. During articulation, entities are both interposed and superimposed, meaning that different pieces of an artwork are integrated in a new, different way and join together into a whole. Janusian process is defined as an ability of thinking multiple opposites simultaneously, whereas homospatial process is described as an ability of conceiving a new entity or component by thinking of two or more different entities occupying the same place together.

Eysenck (1993) has examined the relationship between personality traits and creativity. He indicates that psychoticism as a dimension of personality is the principal factor for both psychosis and creativity. He argues that the common feature among creativity and psychosis is *overinclusive cognitive style*. This concept refers to an ability of combining very different cognitive elements in an unusual but useful way. Within this context, Fodor (1999) has examined creativity by using a test which measures unusual associations that are commonly associated by a series of words. He has demonstrated that individuals with subclinical mood symptoms are more able to make rational but remote associations in a faster way. *Latent inhibition*, which is negatively correlated with *cognitive overinclusion*, is also inversely related to creativity in a similar fashion. As latent inhibition decreases, namely when irrelevant details regarding an issue are taken into account, creativity increases (Burch et al. 2006; Glazer 2009). Another personality trait of Eysenck's theory, openness to experience, was found to be moderately related to creativity (Feist 1998). Murray and Johnson (2010) have conveyed that openness to experience is related to sensitivity to novel ideas and experiences, while motivation is related to creative successes. Nowakowska and her colleagues have stated that bipolar patients were more open to experience than healthy controls. Furnham et al. (2008) has chosen divergent thinking (an ability of generating many different ideas about an issue) as one of the measures of creativity in their research and found significantly meaningful relationships between extraversion, openness and hypomania.

While explaining creativity, the psychoanalytic theory mentions the primary and secondary processes. According to Freud (1915), the primary thinking process is primitive, based on drives and not oriented to reality. In the primary process, expressions are complicated, symbolic, disordered and without cohesion (Alper 2002). Primary process provides a basis for fluent and flexible thoughts, thereby making divergent thinking easier (Glazer 2009). Primary thinking process includes cognitive and emotional elements. Emotional elements play important roles in the creation of creative thought. In fact, primary thinking process represents a structure of thinking commonly seen in psychotic disorders, as primary and secondary processes work harmoniously for artistic creativity (Cebeci 2004). Creative thinking is associated with the

primary thinking processes due to fluency of associations, and the presence of primitive thoughts and images (Russ 2000). In the secondary thinking process, logic and seeking meaning are more important, while thoughts are aimed to be transmitted to another person in a meaningful way (Alper 2002).

According to Martindale (1989), creativity occurs between two poles: a pole of free associations and illogical thinking and another pole of abstract, factual and illogical thinking. At the first pole, since attention cannot be focused, the primary thinking process predominates, and creative material is recognized here. The other pole takes charge in the verification of creative thoughts, attention is more focused, and cortical stimulation is higher when compared to the other pole. Glazer (2009) has stated that Martindale's theory explained manic and depressive processes together with Jamison's findings: Creative people recognize his/her floating ideas in the manic phase, while s/he is mildly depressive, s/he can form these floating ideas into a meaningful integrity. It has been said that in bipolar disorder, the primary thinking processes are less primitive and more integrated than the ones in schizophrenia, but emotional components are more apparent (Russ 2000). This notion was supported by the findings of several researchers that showed an increase of creativity in hypomanic periods, and an enhancement of latent creativity by positive affect (Jamison 1993, Richards 1990, Isen et al. 1987).

The features of the creative process in bipolar disorder

Several studies have mentioned that the features of the creative process, namely fluency of associations and positive affect, were also valid for bipolar disorder (Murray and Johnson 2010). The creative process is associated with hypomanic features in terms of fluency of associations, divergent thinking and cognitive over-inclusion (Fodor 1999; Funham et al. 2008). In their study comparing manic patients, schizophrenic patients and writers in terms of cognitive over-inclusion, contrary to their first assumption, Andreasen and Powers (1974) demonstrated that schizophrenic patients and writers shared similar thinking styles. They have observed that cognitive styles of writers and manic patients resemble each other in terms of making big groups, making changes during categorization or taking into account ambiguously-related concepts while categorizing. On the other hand, Andreasen and Powers (1974) have observed that writers could control their imaginary thoughts while categorizing, whereas manic patients can categorize concepts according to bizarre or "their own arbitrary, personal" reasons.

In their study comparing manic patients, healthy individuals, and schizophrenic patients in terms of their thought processes, Solovay et al. (1987) have found that manic patients are more inclined to combinatory thinking. Combinatory thinking means that thoughts and images are combined incongruously, and then they become excessive and detailed. Combinatory thinking processes among manic patients are manifested as sometimes humorous and sometimes arrogantly flippant (Goodwin and Jamison 2007). Schuldberg (1990; 2001) found that hypomanic features enhance creative performance and showed that these were related to creative thoughts, attitudes and behaviors. He associated the creative thought process to hypomanic flight of ideas rather than disorganized associations in schizophrenia (Goodwin and Jamison 2007). It is seen that positive affect is abnormally high in hypomania and mania (Alloy et al 2006, Urosevic et al. 2008). Murray and Johnson (2010) have stated that symptoms of positive affect, which are main features of extraversion, predict manic episodes (despite being more severe). Authors argued that positive affect played a significant role in the relationship between creativity and BD. In light of their findings, they proposed that when someone feels good, s/he can form many different associations with information in his/her memory. Then, his/her focus of attention widens, thus s/he can come up with many possible reasons. Fodor (1999) have stated that experiences which enhance positive mood (e.g. writing a memory about his/her success), also increase creativity among people with mild symptoms. In this respect, he emphasizes that just having bipolar disorder is not sufficient for creativity. In their study testing the hypothesis of a positive association between positive emotion and thought acceleration which was one of the distinctive features of manic thinking process, have demonstrated that as thought speed increased, positive affect increased; also people felt more creative, energetic and powerful.

Biographical Studies

Most of the studies regarding creativity and psychopathology utilized biographies of artists. In this section, only the studies about creativity and bipolar disorder are going to be included. Trethowan (1977) examined the biographies of 60 composers and stated that 30 composers had melancholic temperament, among those people mood disorders were most commonly and apparently seen. Lester (1993) analyzed the biographies of 13 famous writers who lived during the 20th century and committed suicide. He indicated that mood disorders and alcohol abuse were seen mostly among those writers.

In her study reviewing autobiographies, biographies, medical records and family histories of 36 British and Irish poets who were born in years between 1705 and 1805, Jamison (1974) observed that mood disorders, suicides and hospitalizations were markedly prevalent among poets and their families. Six of them were hospitalized and this ratio was 20 times greater than the general population who lived during the time period that was specified. Symptoms that are suggestive of mood disorders were determined among more than half of the poets and almost 25% of them were thought to have bipolar disorder. It was stated that six poets would have been cyclothymic

and would have had BD-II. Four poets were indicated as having recurrent depressive episodes. During that period, the prevalence of bipolar disorder, cyclothymia, and major depressive disorder was 1%, 1-2%, and 5%, respectively. Taking these ratios into account, it was concluded that BD was seen 30 times more, and cyclothymia or BD-II 10-20 times more among the poets of this sample.

Systematic studies on bipolar disorder and creativity

One of the first studies examining the relationship between BD and creativity was made by Juda (1949). In this research, Juda (1949) made face-to-face interviews with almost 5000 people between 1927 and 1943. The sample involved 113 German artists (architect, sculptor, painter, musician and poet) and 181 scientists. Of the sample, 1.3% were determined as "*manic-depressive psychosis*". Contradictory to the other research, it has been indicated that "*manic-depressive psychosis*" was more prevalent among scientists.

The first systematic research regarding the relationship between creativity and mental disorders was Andreasen's (1987) Iowa Study. In this research, 30 writers from the University of Iowa Writers' Workshop (27 male, 3 female) were matched demographically to people from various occupations. A higher incidence of mood disorders, especially bipolar disorder (43%), was observed among writers. Of the writers, 80% experienced a mood episode at one period of their lives, whereas this ratio was 30% in the control group. The prevalence of mood disorder and creativity was significantly high among first degree relatives of writers. However, creativity among relatives was more related to other fields (journalism, painting, music, dance, mathematics, etc.) rather than literary creativity.

In another study sample consisting of 47 British poets, novelists, script writers, biography writers or visual artists, Jamison (1989) demonstrated that 87% of the participants reported mood escalations when they were productive in terms of creativity. Jamison (1994) stated that these creative periods met the criteria for hypomania in terms of cognitions, emotions and behaviors. In addition, mild hypomania had positive effects on the creative process; in addition, logical, critical, and inhibitory thoughts predominated during these depressive periods. Therefore, she inferred that the hypomanic mind stimulated imagination, however depression restrained this imagination.

Richards and colleagues (1988) have raised the concept of *everyday creativity* instead of studying creativity among eminent, successful artists. They defined this concept in terms of creative potential in many different fields, hence not just as eminent creativity (Richards and Kinney 1997). This research was the first study which took psychiatric diagnostic criteria into account. The everyday creativity scores of patients with BD-I and cyclothymia and their first degree relatives were significantly higher than control participants. The highest creativity was observed among cyclothymics and normal relatives. In light of their findings, they concluded that mild symptoms enhance creativity (Richards 1990, Richards and Kinney 1997).

Arnold Ludwig (1992) examined the biographies of artists which were published in a New York Times Book Review between the years of 1960-1990. He included 1005 artists from 15 different occupations. Psychosis, mania and hospitalizations were most prevalent among poets; also high incidences of diagnoses of psychosis and depression were determined among composers. When he compared artists with the control group which was composed of other occupations like businessmen, scientists, etc, he observed that psychosis, mood disorders, alcohol abuse and suicide attempts were 2-3 times more prevalent among artists. Schildkraut and his colleagues (1994) worked with 15 abstract expressionists from the New York School, and found that almost half of the participants had a mood disorder.

In his study comparing 59 female writers and their first degree relatives with 59 women who were demographically matched with the research group, Ludwig (1994) demonstrated that mood disorders and panic attacks, substance abuse, generalized anxiety and eating disorders were more prevalent among female writers. Also, the prevalence of mental disorders was found to be higher among mothers of female writers. In general, it was inferred that the creativity of female writers was associated with physical or sexual abuse in childhood, mental disorders of their mothers and the level of creativity of their parents, respectively. Although the higher prevalence of mental disorders among female writers indicated the relationship between creativity and psychopathology, it was concluded that familial and environmental factors were also important regarding this relationship.

Mumcu (1997) examined the association between creativity and mood disorders among 54 artists (musician-writer/poet-visual artist) and 33 healthy people who had no psychiatric disorder and worked in the general management division of a bank. It was found that mood disorders were more prevalent among artists and their families (mother, father, sibling and second degree maternal and paternal relatives) and there were more creative people among families of artists. It was observed that creative productivity increased the most in manic/hypomanic periods and decreased in depression and partly in euthymia. A significant relationship was obtained between creative acts and seasonality; also it was observed that artists with mood disorder were beginning creative acts at young ages.

Frantom and Sherman (1999) assessed creativity among people who had a genetic risk for BD. One of the research

variables, affect instability, was defined as subclinical behavioral symptoms which did not meet the criteria for BD. In this research that included fifty-four visual artists, it was demonstrated that the possibility of affect instability was higher among participants whose relatives had mood disorder and there was a significant relationship between affect instability and creativity. There was no difference between male and female visual artists.

Shapiro and Weisberg (1999) examined to what extent the relationship between BD and creativity could be generalized among noneminent creative people in a university sample. The highest creativity scores were obtained by participants who met the criteria for hyperthymia (subclinical elevated mood and/or mild depression), the values of creativity were not as high as expected among people who met the criteria for cyclothymia or had cyclothymic patterns. In fact, there was no significant difference between their scores and scores of euthymic participants. It was seen that creativity was related to hypomanic or euphoric symptoms, whereas depressive symptoms had inhibitory effects on creativity. In addition, hypomanic symptoms that associated the most with creativity were determined to be increased energy, ideational fluency, sensation-seeking, impulsivity and dedication to work.

The findings of Simenova et al. (2005) support genetic transmission of creativity and BD. Also, this research showed that children with BD who had parents with BD were more creative than healthy controls. On the other hand, the negative relationship between the length of illness and creativity was explained as a negative effect of recurrent manic periods on school performance and psychosocial functioning which resulted in a decrease of creativity.

Tremblay and his colleagues (2010) examined occupational creativity among noneminent patients with BD. In their study benefiting from the findings of ECA (Epidemiological Catchment Area Study), they found that participants with BD had more creative occupations (e.g. musicianship or authorship) and the probability of engaging in creative acts was higher among these people.

Affective Temperaments and Creativity

Akiskal has argued that affective temperament plays an important role in the occurrence of vulnerability to mood disorders (Akiskal and Mallya 1987). He defines five main *affective temperaments* (depressive, hyperthymic, cyclothymic, irritable and anxious) by identifying bipolarity as a continuum from subclinical mood symptoms to severe mood disorder (Akiskal and Akiskal 2005).

In their study comprising 20 award-winning, European writers, poets, painters and sculptors, Akiskal and Akiskal (1998) found that almost two-thirds of participants had hypomania or cyclothymia; half of the participants experienced one major depressive period. Moreover, in their study comprising a group of outpatients that was heterogeneous in terms of diagnosis (BD, unipolar, anxiety) and occupation (physician, lawyer, administrator, artist, etc.), they demonstrated that architects and artists had cyclothymia 3-4 times more than control participants.

Strong et al. (2007) compared mood disorder patients with highly creative people and healthy controls. Neuroticism/cyclothymia/dysthymia and openness were significantly associated with creativity. Neuroticism/cyclothymia/dysthymia formed the basis for emotional experience: also, neuroticism was associated with negative affect, while cyclothymia was related to labile affect. Therefore, they stated that neuroticism and cyclothymia enhanced the creative process. Openness was considered facilitating cognitive flexibility by increasing creativity.

Santosa et al. (2007) compared noneminent creative artists with BD patients and healthy controls. They observed that the highest creativity scores were obtained by participants with BD and creative control participants. They concluded that patients with BD were more creative than participants with unipolar depression, and then they inferred that this could be associated with temperament/personality differences. This inference was based on the finding that bipolar patients were more cyclothymic than unipolar patients and they were more open to experience than healthy controls, as also indicated in Nowakowska et al.'s study (2005). Furthermore, both variables were related to creativity (Strong et al. 2007). Srivastava et al. (2010) examined the relationship between BD and creativity regarding emotional and cognitive components. Unlike the other studies, *intuition* was taken as another cognitive component in addition to *openness* factor. They observed that creative controls, bipolar and unipolar patients obtained high scores of cyclothymia and neuroticism factors. In light of the findings, they proposed that processing information through intuition enhances creativity by positive discrimination.

Psychobiographical studies

Anthony Storr (1992) examined the relationship between creativity and psychopathology in terms of temperament/personality structures and psychoanalytic/psychodynamic theory in his book "The Dynamics of Creation". He mentioned about the life and creative process of Honore de Balzac in the section that he examined manic-depressive temperament and creativity. According to Storr, self-esteem is very closely related to interpersonal relationships in manic-depressive temperament. Not to be loved, not to be liked and to be rejected by others leads to anxiety. The relationship with his mother has been characterized with the physical and emotional absence of her. The absence of his mother led depressive emptiness in Balzac's inner world which could not be filled. Thus, throughout his life, Balzac maintained his desire

to be famous and to be loved. Storr quoted an expression of "to bring all men to his knees and to force all women to love him" from a letter written by Balzac to his friend. While his mood swung, he fancied himself either as everything or nothing. He cited that as a "typical characteristic of mania", he did everything in an extreme manner (spending too much money, being constantly in debt, being obliged to work hard to pay his debts), and he consistently confused external reality with his future expectations. Using his debts to motivate himself can be interpreted as his need for "external ego". Also, Storr evaluated some of his behaviors as manic exuberance: either working hard or having too much fun, regarding himself as a nobleman and attaching "de" to his name, wearing luxurious clothes, buying things that he could not afford and talking too much. Finally, Storr interpreted Balzac's creating his pieces through working excessively as producing creatively to be protected from underlying depression.

Weisberg (1994) analyzed the career of Robert Schuman, who was considered to have BD, to examine the relationship between mood and productivity. A strong positive relationship was found between his mood swings and the number of his composition. In his most productive years, there were 25 compositions in 1840, 28 compositions in 1849, and 16 compositions in 1851. It was determined that he suffered from hypomania in those years and when he was depressed, he composed very little. However, when experts evaluated his works in terms of their quality, they did not report any significant difference between hypomanic and depressive periods. Although the number of his compositions increased in hypomanic periods, nonsignificant difference between qualities of these works did not support the proposition that mania enhanced creativity.

McDermott (2001) examined the relationship between periodicity and mood swings in Emily Dickinson's work. Only the poems that she wrote between the ages of 28 and 35 were taken into evaluation. The author partitioned those eight years into two periods with four years in each. It was seen that more productive work was created in the spring and summer months of the first four-year period, whereas the number decreased in the autumn and winter months. Since Dickinson experienced the most suffering, distressing deaths in winter months, it was stated that her thoughts on death also increased during that period. This situation was interrupted by an emotional crisis which she experienced in the beginning of the second period. She named this period as "Terror" during which her creativity was fired, and she wrote intensely. It was also known that her grandfather suffered from mood swings; his very active, energetic periods were followed by depressive periods. Therefore, it was considered that Dickinson suffered from BD in regard to periodical, seasonal changes in her productivity and her family history.

In another biographical study, Holm-Hadulla and his colleagues (2010) examined Goethe's works, letters and texts which were written by people close to him. Although several psychiatrists diagnosed him as having "*manic-depressive psychosis*", "*schizophrenic-type psychotic disorder*", and "*cyclical psychopathy*", Holm-Hadulla and his colleagues indicated that Goethe never suffered from schizophrenic symptoms, and especially in his creative periods, he never had manic symptoms. Goethe described several depressive periods during which he did not get pleasure out of life, felt hopeless, lost his interest and motivation, and had somatic complaints; hence dysthymia was considered as a proper diagnosis. In addition to dysthymic mood, the presence of creative and productive periods was also suggestive of BD-II disorder. In light of the information in his autobiography, although he never described hypomanic-like symptoms before starting to write a novel or while he was writing, his major depressive periods began at an earlier age (when he was 14). He suffered from many depressive periods. Besides, his recurrent suicidal thoughts and the presence of periods during which his productivity was increased and his thoughts were accelerated were suggestive of BD-II diagnosis.

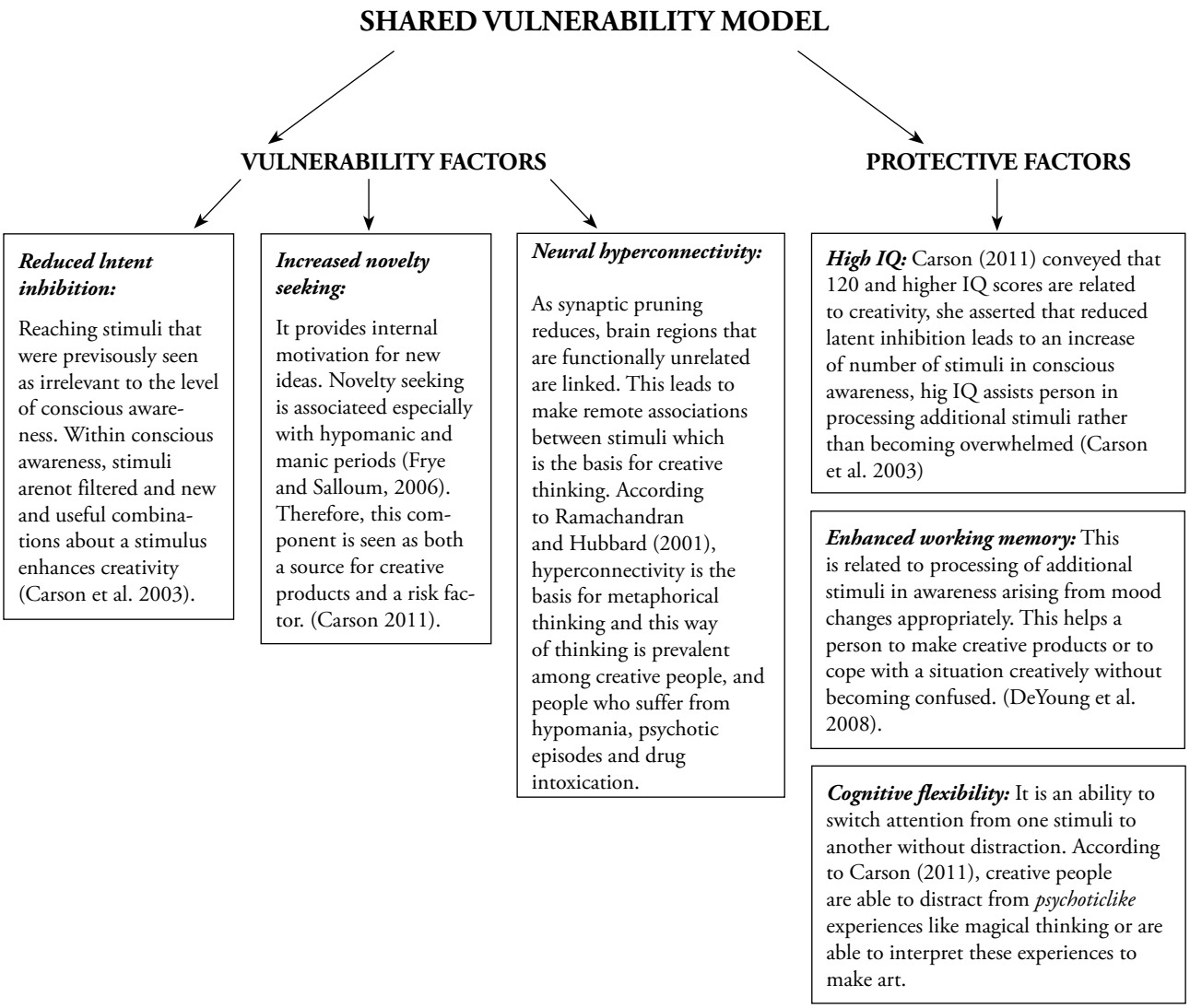
A new approach addressing the association between creativity and psychopathology: Shared Vulnerability Model

As Montaigne stated in his saying above, are creativity and insanity close neighbors? The "Shared Vulnerability Model" which includes propositions that may answer this question is formed by Shelly Carson (2011). This model is based on the proposition that not only creativity by itself but also the relationship between creativity and such disorders like schizophrenia (Gershon et al. 1988, Berrettini 2000), mood disorders (Jamison 1989, Post 1994) or alcohol dependence (Kendler et al. 1993) is heritable. Carson (2011) has proposed that creative processes are related to common genes among these disorders and that some genes may suppress the emergence of mental disorder.

The Shared Vulnerability Model defines the imbalance of neurotransmitters (dopamine and serotonin) in the prefrontal and subcortical regions of the brain, and genetic differences as vulnerability factors. These factors which are common for psychopathology and creativity make an individual inclined to process a material at much lower levels than "conscious awareness". Protective cognitive factors play a role in the control and in the management of this enhanced attention. In other words, protective factors help the individual to control bizarre or unusual thoughts metacognitively, and to produce creative things from them (Table 1).

Overall, according to the Shared Vulnerability Model, biological vulnerability enables stimuli to be processed at altered states of consciousness together with other vulnerability

Tablo 1. Shared vulnerability model



factors (reduced latent inhibition, enhanced novelty seeking, and neural hyperconnectivity). The interaction between vulnerability factors and protective factors like high IQ and cognitive flexibility not only enhances creativity but also helps to preserve mental health or maybe prevent the psychopathological state from becoming more serious.

DISCUSSION

As quoted by Rollo May (1975), although the creative process includes an "act", a physical action, it requires an ability of handling with emotional experience without over-stimulation of the body, because forming or controlling a material becomes harder when physical exuberance increases. This situation resembles mood disorders, especially mood swings of bipolar disorder, thus this necessarily leads to the search of a relationship between these two phenomena. In fact, the common result gathered from all studies and biographical evaluations shows that neither sluggishness in the depressive period nor the chaotic state during the manic period foster creative actions. Several researchers have emphasized that creative periods are unique. Jamison (1989), Richards and Kinney (1997), Mumcu (1997), Shapiro and Weisberg (1999) have demonstrated that creativity increases in hypomanic periods, whereas it is inhibited in depressive periods. According to the results of their factor analysis study, Richards and Kinney (1990) have shown that no mood symptoms are observed in the most creative periods in terms of emotional, cognitive and behavioral features, which is contradictory to Jamison's (1989) findings. Moreover, they discuss that some creative people described their most creative periods when they felt *normal*; and during these periods which were named as well-being, self-esteem, eagerness and intense feelings, the characteristics for hyperthymia are not met. Hence, Richards and

Kinney (1990) debate whether there is an intermediate area for "*real creative normality*".

It is also possible to look at the relationship between mood disorders and creativity by the differences among the content of art works. For instance, Wadeson (1980) states that the pictures of patients with unipolar depression and with bipolar disorder have different styles. She indicates that the scarcity of color in paintings of depressed people is remarkable, with the paintings including more blank spaces and even most of the figures are incomplete. Moreover, she made an interpretation that the figures were drawn with less effort. Just like the disorder, the creative manner also had the quality of a mirror image. She states that when depressed, bipolar patients drew similar pictures, however in the prodromal phase of mania, generally vivid and bright colors dominated the pictures. Likewise, when the novels of unipolar and bipolar writers were evaluated in terms of subject and theme, the way of presentation, the relationship between setting-time-character and ideological-psychological dimensions, similar characteristics can be drawn. As an example, it was argued that writers who are known to have bipolar disorder mentioned more about death, compared to their unipolar colleagues. Also, writers who are known to have unipolar depression mentioned more about other people instead of disclosing themselves and they were more likely to use words regarding cognitive processes (knowing, understanding) when compared with healthy controls (Forgeard 2008).

One of the important questions concerning the discussion about creativity and psychopathology is whether treatment inhibits creativity or not. According to the Shared Vulnerability Model, the possible treatment includes treating symptoms related to vulnerability factors, enhancing protective factors associated with creativity or improving general creativity. Some researchers suggests partial control of symptoms instead of complete neutralization, since creative people have "*altered states of consciousness*" due to their biological and cognitive vulnerabilities (Carson 2011, p.151). Hence, some authors have stated that people with BD may quit lithium treatment since s/he thinks that his/her creative potential has decreased or disappeared (Post 2000). According to Flaherty (2011), serotonergic drugs inhibit appetitive motivation which is required for creative action. Instead of these drugs, it is suggested that antidepressants which are targets for different neurotransmitter system and the ones which enhances motivation are better solutions. However, neither a systematic study investigating effects of psychotherapeutic interventions on creativity nor a study investigating the effect of psychotherapy on its relationship between BD and creativity exists in the current literature. Kristeva (1987) defines depression as a "neurophysiological disorder that is activated by imaginary declines". She states antidepressants are required to provide a neurophysiological basis for the psychotherapeutic work analyzing depressive emptiness, which is rooted from periods that are earlier than the formation of language, then creating new imaginary meanings. In this respect, as another opinion, Kohut (1971) argues that psychoanalysis enhances artistic creativity by increasing artistic potential. He also states that people who yearned to be an artist can become aware of their attitudes through psychoanalysis.

In light of the findings of the research addressing creativity from different perspectives, we may say that genetic transmission is also valid for creativity, mild increases in mood nourish the creative process, and the probability of BD among creative people is higher. On the other hand, limitations of the abovementioned studies should be considered. The first and maybe the most important limitation is the absence of a certain definition of creativity. Some research has focused on artistic creativity (e.g. Mumcu 1997), while others tried to examine everyday creativity by including non-artist people in samples. Furthermore, creativity is not easily measured, and no universal measure for creativity has been created yet (it is alleged that the Torrance Creative Thinking Test is the best measure that has been developed until now). Secondly, it should be kept in mind that earlier studies were designed by qualitative research methods and were based on (auto)biographical texts and (semi)structured interviews (e.g. Trethowan 1977; Jamison 1989, 1994). Although these studies elaborated on several points: the prevalence of creativity, the experience of the creative process and the factors that had an impact on this process, it may be stated that they are limited in explaining the causality since they are self-reports. Frosch (1996) argues that retrospective or psychobiographical studies are based on the secondary or tertiary sources, and even the primary sources should be examined regarding their historical contexts; and different cultural characteristics should be taken into account. In spite of many studies that were held in the early and late periods of the 20th century, many authors share a common notion that biography-based inferences cannot be attributed to the relationship between creativity and bipolar disorder based on concrete, scientific findings; thus they are "nothing but an invalid prediction" (Rothenberg 1993, Poole 2003, Schlesinger 2004). Additionally, studies using the control group design (e.g. Andreasen 1987, Ludwig 1992, Tremblay et al. 2010) cannot go beyond reporting descriptive findings.

In conclusion, many studies indicate a relationship between creativity and bipolar disorder. Nevertheless the use of universally accepted measures including different dimensions of creativity, and larger and more homogenous samples are suggested for future studies to establish a causal relationship between these two concepts. For instance, a study with a large sample comparing creativity between healthy controls and bipolar patients with good and poor prognoses should be designed. Thus, confounding effects of indicators of poor prognosis such as use of multiple medications, and cognitive

impairment can be controlled. Today, creativity is accepted as one of the positive aspects of BD by both clinicians and creative artists (Galvez et al. 2010). Therefore, creativity may be considered during the maintenance and treatment process of BD. Also, attributions that are made by artists with BD or all patients with artistically creative qualities may be worked through. Without doubt, this will improve treatment compliance.

REFERENCES

Alloy BL, Abramson LY, Walshaw PD, et al (2006) Cognitive vulnerability to unipolar and bipolar mood disorders. J Soc Clin Psychol 25: 726-55.

Akiskal HS, Akiskal K (1988) Re-assessing the prevalence of bipolar disorders. Clinical significance and artistic creativity, J Affect Disorders 3: 29-36.

Akiskal KS, Akiskal HS (2005) The theoretical underpinnings of affective temperaments: implications for evolutionary foundations of bipolar disorder and human nature. J Affect Disorders 85: 231-9.

Akiskal HS, Mallya G (1987) Criteria for the "soft" bipolar spectrum: treatment implications. Psychopharmacol. Bull. 23: 68–73.

Akiskal KS, Savino M, Akiskal HS (2005) Temperament profiles in physicians, lawyers, managers,architects, journalists, and artists: a study in psychiatric outpatients. J Affect Disorders 85: 201-6.

Alper Y (2002) Freud'dan bugüne yaratıcı-sanatçı psikodinamiğine bakış.11th Anatolian Psychiatry Days Full Text Book

Andreasen NC, Powers S (1974) Overinclusive thinking in mania and schizophrenia.Brit J Psyhiat 125: 452-6.

Andreasen NC (1987) Creativity and mental illness: Prevalance rates in writers and their first degree relatives. Am J Psychiat 144: 1288-92.

Andreasen NC (2005) Yaratıcı beyin dehanın nörobilimi. (Çev. K. Güney) Arkadaş Yayınevi, Ankara, 2009.

Andreasen NC (2011) A journey into chaos: Creativity and the unconscious. In: Brain, Mind and Consciousness: An International, Interdisciplinary Perspective (A.R. Singh and S.A. Singh eds.), MSM 9: 42-53.

Berretini WH (2000) Susceptibility loci for bipolar disorder: overlap with inherited vulnerability to schizophrenia. Biol Psychiat 47: 245-51.

Burch GS, Hemsley DR, Pavelis C et al (2006) Personality, creativity and latent inhibition. Eur J Personality 20:107-22.

Carson S H (2011) Creativity and psychopathology: A shared vulnerability model. Can J Psychiat 56:144-53.

Carson SH, Peterson JB, Higgins DM (2003) Decreased latent inhibition is associated with increased creative achievement in high-functioning individuals. J Pers Soc Psychol 85:499-506.

Cebeci O (2004) Psikanalitik edebiyat kuramı. İthaki, İstanbul.

DeYoung CG, Flanders JL, Peterson JB (2008) Cognitive abilities involved in insight problem solving: an individual differences model. Creativity Res J 20: 278-90.

Eysenck HJ (1993) Creativity and personality: Suggestions for a theory. Psycholog Inq 4:147–78.

Feist GJ (1998) A meta-analysis of personality in scientific and artistic creativity. Pers Soc Psychol Rev 2:290-309.

Flaherty AW (2011) Brain illness and creativity: Mechanisms and treatment risks. Can J Psychiat 56:132-43.

Fodor EM (1999) Subclinical inclination toward manic-depression and creative performance on the Remote Associates Test. Pers Indiv Differ 27:1273–83.

Forgeard M (2008) Linguistic styles of eminent writers suffering from unipolar and bipolar mood swings. Creativity Res J, 20, 81-92.

Frantom C, Sherman MF (1999) At what price art? Affective instability within a visual art population. Creativity Res J 12:15-23.

Freud, S (1915) İçgüdüler ve yazgıları. İçinde Metapsikoloji-I (çev. A. Yıldırım) İdea, İstanbul, 2012.

Frosch WA (1996) Creativity: is there a worm in the apple? J Roy Soc Med, 89, 506-8.

Furnham A, Batey M, Anand K et al (2008) Personality, hypomania, intelligence and creativity. Pers Indiv Differ 44:1060-69.

Frye MA, Salloum IM (2006) Bipolar disorder and comorbid alcoholism: prevalance rate and treatment considerations. Bipolar Disorders 8: 677-85.

Galvez JF, Thommi S, Ghaemi SN (2011) Positive aspects of mental illness: A review in bipolar disorder. J Affect Disorders 128:185-90.

Gershon ES, DeLisi LE, Hamovit J et al (1988) A controlled family study of chronic psychoses: schizophrenia and schizoaffective disorder. Arch Gen Psychiat 45:328-56.

Glazer E (2009) Rephrasing the madness and creativity debate: What is the nature of the creativity construct? Pers Indiv Differ 45:755-64.

Goodwin FK, Jamison KR (2007) Manic-depressive illness: Bipolar disorders and recurrent depression, Oxford University Press, 2nd edition.

Holm-Hadulla RM, Roussel M, Hofmann F-H (2010) Depression and creativity-The case of the german poet, scientist, and statesman J. W. Goethe. J Affect Disorders 127:43-9.

Infante JA (1995) Some reflections on phantasy and creativity (Eds. Person ES, Fonagy P, Figueira SA) In Freud's "Creative Writers and Day-Dreaming". Yale University Press, New Haven and London, 53-64.

Jacobson E (1964) Kendilik ve nesne dünyası. (Çev. S. Yazgan) Metis Yayınları, İstanbul, 2004.

Jamison KR (1989) Mood disorders and patterns of creativity in British writers and artists. Psychiatry 52:125–34.

Jamison KR (1993) Touched with fire: Manic-depressive illness and the artistic temperament. Simon and Schuster, New York..

Juda A (1949) The relationship between highest mental capacity and psychic abnormalities. Am J Psychiat 106:296-307.

Isen AM, Daubman KA, Nowicki GP (1987) Positive affect facilitates creative problem solving. J Pers Soc Psychol 52:1122-31.

Kendler KS, McGuire M, Gruenberg AM et al (1993) The Roscommon Family Study IV: affective illness, anxiety disorders, and alcoholism in relatives. Arch Gen Psychiat 50:952-60.

Kohut H (1971) Kendiliğin çözümlenmesi. (Çev. C Atbaşoğlu, B Büyükkal, C İşcan). Metis Yayınları, İstanbul, 2004.

Kristeva J (1987) Kara Güneş Depresyon ve Melankoli. (Çev: N. Demiryortan). BağlamYayıncılık, İstanbul, 2009.

Lester D (1993) Suicide in creative women. Nova Science Publication Inc., Commack, NY.

Levine SK (1992) Poiesis The language of psychology and the speech of the soul. Jessica Kingsley Publishers, Canada.

Lloyd-Evans R, Batey M, Furnham A (2006) Bipolar disorder and creativity: Investigating a possible link. In A. Columbus (Ed.). Advances in psychology research. Nova Press, New York.

Ludwig A (1992) Creative achievement and psychopathology: Comparison among professions. In Eminent Creativity, Everyday Creativity and Health (Mark A. Runco& Ruth Richards, Ed.s). Ablex Publishing Corporation, USA.

Ludwig AM (1994) Mental illness and creative activity in female writers. Am J Psychiat 151:1650-6.

Martindale C (1989). Personality, situation, and creativity. In J. A. Glover, R. R. Ronning & C. R. Reynolds (Eds.), Handbook of creativity: Perspectives on individual differences (pp. 211-232). Plenum Press, New York.

May R (1975) Yaratma cesareti. (Çev. A. Oysal). Metis Yayınları, İstanbul, 2007

McDermott JF (2001) Emily Dickinson revisited: A study of periodicity in her work. Am J Psychiat 158:686-90.

Mednick S (1962) The associative basis of the creative process. Psyhol Rev 69: 220-32.

Montaigne M (2006) Montaigne Denemeler Seçmeler. (Çev. S Eyüoğlu). CemYayınevi, İstanbul.

Mumcu C (1997) The relationship between artistic creativity and mood disorders. Unpublished thesis, Bakırköy Prof. Dr. Mazhar Osman Mental Health Training and Research Hospital.

Murray G, Johnson SL (2010)The clinical significance of creativity in bipolar disorder. Clin Psychol Rev 30, 712-32.

Nowakowska C, Strong CM, Santosa CM et al (2005) Temperamental commonalities and difference in euthymic mood disorder patients, creative controls, and healthy controls. J Affect Disorder 85:207-15.

Poole R (2003) 'Kind of Blue': creativity, mental disorder and jazz. Brit J Psychiat 183:194-5.

Post RM (1994) Creativity and psychopathology. A study of 291 world-famous men. Brit J Psychiat 165: 22-34.

Post RM (2000) Mood disorders: treatment of bipolar disorders. In Comprehensive Textbook of Psychiatry, 7.th Ed. (B. J. Sadock& V. A. Sadock, Eds.) Lippincott Williams & Wilkins Publishers.

Pronin E, Wegner DM (2006) Manic thinking: Independent effects of thought speed and thought content on mood. Psychol Sci17: 807-13.

Ramachandran VS, Hubbard EM (2001) Synaesthesia- a window into perception, thought and language. Journal of Consciousness Studies 8:3-34.

Richards R (1990) Everyday creativity, eminent creativity, and health: "afterview" for creativity research journal special issues on creativity and health. Creativity Res 3:300-26.

Richards R (1993) Everyday creativity, eminent creativity and psychopathology. Psychol Inq 4:212-7.

Richards R, Kinney DK (1990) Mood swings and creativity.Creativity Res J 3, 202-17.

Richards R, Kinney DK (1997) Mood swings and creativity. In Eminent creativity, everyday creativity and health (M. A. Runco& R. Richards, Eds) s.137-57.

Richards R, Kinney DK, Lunde I et al (1988) Creativity in manic-depressives, cyclothmes, their normal relatives and control subjects. J Abnorm Psychol 97:281-7.

Rothenberg A (1993) Creativity: Complex and healthy. Psychol Inq 4: 217-21.

Rothenberg A (2001) Bipolar illness, creativity and treatment. Psychiat Quart 72:131-47.

Rothenberg A (2006) Creativity-the healthy muse. Medicine and Creativity 368:58-9.

Russ S (2000) An evolutionary model of creativity: Does it fit? Psychol Inq 10:359-61.

Santosa C M, Strong CM, Nowakowska C et al (2007) Enhanced creativity in bipolar disorder patients: A controlled study. J Affect Disorders 100: 31-9.

Schildkraut JJ, Hirschfeld AJ, Murphy JM (1994) Mind and mood in modern art, II: Depressive disorders, spirituality and early deaths in the abstract expressionist artists of New York School. Am J Psychiat, 151: 482-8.

Schlesinger J (2004) Creativity and mental health. Brit J Psychiat, 184:184-5.

Schuldberg D (1990) Schizotypal and hypomanic traits, creativity, and psychological health. Creativity Res J 3:218-30.

Schuldberg D (2001) Six subclinical spectrum traits in normal creativity. Creativity Res J 13:5-16.

Scott J, Stanton B, Garland A, Ferrier IN (2000) Cognitive vulnerability in patients with bipolar disorder. Psychol Med 30:467-72.

Simenova D I, Chang K D, Strong C, Ketter TA (2005) Creativity in familial bipolar disorder. J Psychiat Res 39: 623-31.

Shapiro PJ, Weisberg RW (1999) Creativity and bipolar diathesis: Common behavioral and cognitive components. Cognition and Emotion 13:741-62.

Solovay MR, Shenton ME, Holzman PS (1987) Comparative studies of thought disorder: I. Mania and schizophrenia. Arch Gen Psychiat 44:13-20.

Soygür H (1999) Sanat ve delilik. Klinik Psikiyatri 2:124-33.

Srivastava S, Childers ME, Baek JH et al (2010) Toward interaction of affective and cognitive contributors to creativity in bipolar disorders: A controlled study. J Affect Disorder 125:27-34.

Storr A (1992) Yaratma dürtüsü (Çev. İ. Babacan) Yalnız Gidiş Yayınevi Yayıncılık, İstanbul.

Strong CM, Nowakowska CM, Santosa P et al (2007) Temperament-creativity relationships in mood disorder patients, healthy controls and highly creative individuals. J Affect Disorders 100:41-8.

Teber S (2004) Melankoli. Say Yayınları, İstanbul.

Tremblay CH, Grosskopf S, Yang K (2010) Brainstorm: Occupational choice, bipolar illness and creativity. Economics and Human Biology 8, 233-41.

Trethowan WH (1977) Music and mental disorders In Music and Brain (M. Critchley&RH Herson, Eds.), s. 398-442. Heinemann, London.

Tusa J (2003) On creativity: Interviews exploring the process. Methuen, London.

Urosevic S, Abramson LY, Harmon-Jones E, Alloy LB (2008) Dysregulation of the behavioral approach system (BAS) in bipolar spectrum disorders: Review of theory and evidence. Clin Psychol Rev 28:1188-205.

Van der Gucht E, Morriss R, Lancaster G et al (2009) Psychological processes in bipolar affective disorder: negative cognitive style and reward processing. Br J Psychiatry 194:146-51.

Wadeson H (1980) Art psychotherapy. John Wiley&Sons, USA.

Weisberg RW (1994) A quasi-experimental test of the hypothesis that manic-depression increases creativity. Psychol Sci 5:361-7.

Winnicott DW (1971). Oyun ve gerçeklik. (çev. T Birkan) Metis Yayınları, İstanbul, 2007.