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As manifested in clinicians' passionate inquiries, the possible link between mental health issues and the creative mind has long been a contentious topic in psychopathology（cf. Silvia & Kaufman, 2010）. Is it plausible that creative people, regardless of their job market, are more likely to suffer from mental health disorders? Or, do people with psychological issues tend to be more creative? If that is the case, how can we explain this relationship clearly? Such questions have been contested since the 1990s. Surprisingly, recent reviews have discussed that contradictory positions exist within the field, in that creativity and mental illness are no more than unrelated（Schlesinger, 2009）, basically unrelated（Sawyer, 2006; Weisberg, 2006）, and deeply entwined（Kottler, 2005; Nettle, 2002）.

The backscene of this research controversy is that the topic itself is one of the few scientific domains driven by popular books and the media（Silvia & Kaufman, 2010）. Movies alone abound with tortured painters, narcissistic architects, depressed poets, and drug-addicted musicians, which all contribute to the stereotypical image of creativity and psychopathology.

The purpose of this paper is to examine the possible relationship between mental illness and creativity. In particular, the paper will explore the relationship between bipolar disorder, schizophrenia, and people in creative job fields（e.g., writers, painters, and musicians）.

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Creativity and Intelligence

In order to analyze the relationship between creativity and psychopathology, it is first critical that we look at the definition of creativity. Specifically, referring to the context of human intelligence is of value because measuring creativity has been associated with measuring intelligence, involving one aspect of intelligence quotient（IQ）.

Generally speaking, the history of measuring intelligence developed using instruments such as the Wechsler, or Stanford Binet scales of intelligence. The WAIS-IV（Wechsler Adult Intelligence Scale 4th Edition）criteria include Verbal IQ measures（i.e., verbal comprehension and working memory）, and Performance IQ measures（i.e., perceptual organization and processing speed）. Nevertheless, measuring creativity is a complex process and often involves *convergent versus divergent* thinking. An example of *convergent* thinking is a multiple choice test where a person selects the best answer from several answer choices. In contrast, *divergent* thinking involves thinking outside the box and generating as many answers as possible. One assessment of this type of divergent thinking or creativity is the "Uses Test," which asks an individual to name a hundred different uses for a tin can.

Given the complexity of measurement, creativity has

been defined as "the interaction of aptitude, process and environment which results in novel, useful products with a social context (Plucker et al., 2004). In other words, creativity is the interplay between ability and process by which an individual or group produces an outcome that is both novel and useful as defined within some social context (Plucker et al., 2004). Thus, it is noteworthy that social values are more or less reflected in the connotation of creativity. Social context to some degree determines the individual ability and what is favorably evaluated as a creative skill.

Different Types of Creativity

To scrutinize the connotation of creativity further, there are different types of creativity to consider. According to Kaufman and Beghetto (2009), there are "Little-C," "Mini-C," "Pro-C," and "Big-C" types, none of which are superior than the others. As Figure 1 illustrates, it is critical that Kaufman and Beghetto (2009) postulated that creativity is not necessarily limited to someone's artistic traits. In other words, as "Little-C" indicates, finding a solution and framing a problem is also part of everyday creativity. Accordingly, as "Pro-C" suggests, any expertise for solution and professional and effortful progression can be conceptualized as creativity. Finally, as "Mini-C" shows, creativity includes one's interpretation about experiences. Namely, creativity includes one's subjective meaning about any experience.

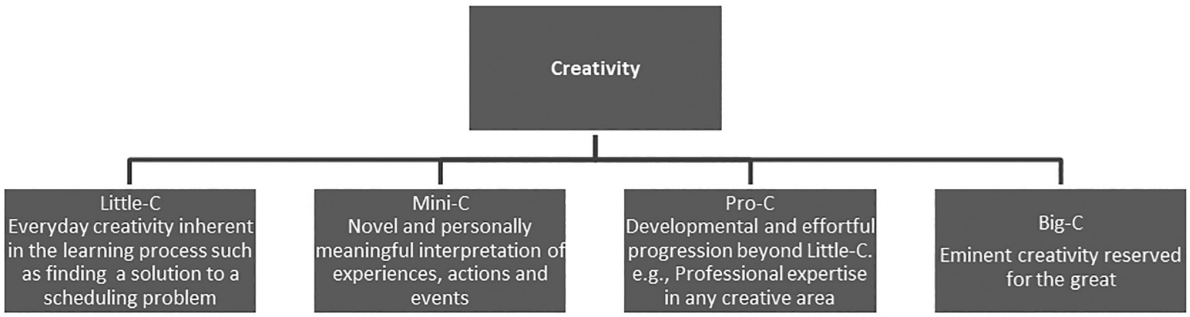

Figure 1. Four different types of creativity (Kaufman & Beghetto, 2009)

The Link Between Mental Health Issues and Genius/Creativity

Related to creativity, some scholars have investigated the possible relationship between mental illness and genius. According to Aamodt (2007), however, no such relationship between the two exists. However, psychosis and schizophrenia are reportedly correlated with lower IQ. Regarding the myth of the genius serial killer[1], perpetuated by films such as *Silence of the Lambs*, one study involving 174 serial killers evidenced an inverse relationship between being a serial killer and IQ level (median 93.5; mean 98.7; Aamodt, 2007). Likewise, on the relationship between IQ and suicide rate among a random sample of soldiers, it was discussed that IQ and suicide rates are inversely related. The higher the IQ, the greater the coping resources or resilience. Another study found that men with the lowest IQ were nine times as likely to commit suicide as those with the highest IQ (Batty et al., 2010).

Concerning mental illness and creativity, some research has evidenced a correlation between the two (cf. Silvia & Kaufman, 2010). In other words, a higher incidence of bipolar disorder has been found among highly creative individuals, although it is

1 Leistedt and Paul (2014) talk about the "elite psychopath" in fiction, an individual with "exaggerated levels of intelligence, sophisticated manners, and cunning, sometimes up to superhuman and supermediatized levels" (p. 168). They give as an example Hannibal Lecter in *Silence of the Lambs*.

important to note that a correlation is not a causation.

Historically speaking, a shift occurred in the research field beginning in the 1970s, when research demonstrated a connection between high creativity and mental illness, especially bipolar disorders. Research questions have included whether people in creative occupations are more likely to have a mental disorder than individuals in other occupations. Are relatives of creative individuals more creative, or more frequently mentally ill? Advances in technology have also allowed scientists to use tools, such as fMRI, to study the more and less active areas of the brains of creative and seriously mentally ill individuals. Genomic research advances have also permitted scientists to study which genes are associated with serious mental illness.

A Popular Idea: "There Should be a Relationship"

A certain correlation between psychopathology and creativity is an issue of interest. It is believed that those who have high levels of accomplishment in the arts have mood disorders, especially bipolar disorder (Butcher et al., 2010). Jamison (1993) has shown that bipolar disorder occurs with alarming frequency in poets, writers, composers, and artists (see Figure 2), offering examples of a number of famous creative individuals and how their periods of productivity co-vary with the manic, or hypomanic, and depressive phases of their illness. In other words, they tend to go through periods of intense creative productivity during manic phases, as well as unproductive periods when clinically depressed. According to Butcher et al. (2010), one possible hypothesis to explain this relationship between bipolar disorder and creativity is that mania or hypomania facilitates the creative process, and/or intense negative emotional experiences of depression provide material for creative activity.

The Myth of the Genius/Creativity and Mental Disorder Link

As stated earlier, there are some researchers who argue in favor of a relationship between creativity and mental disorders. In particular, three researchers tend

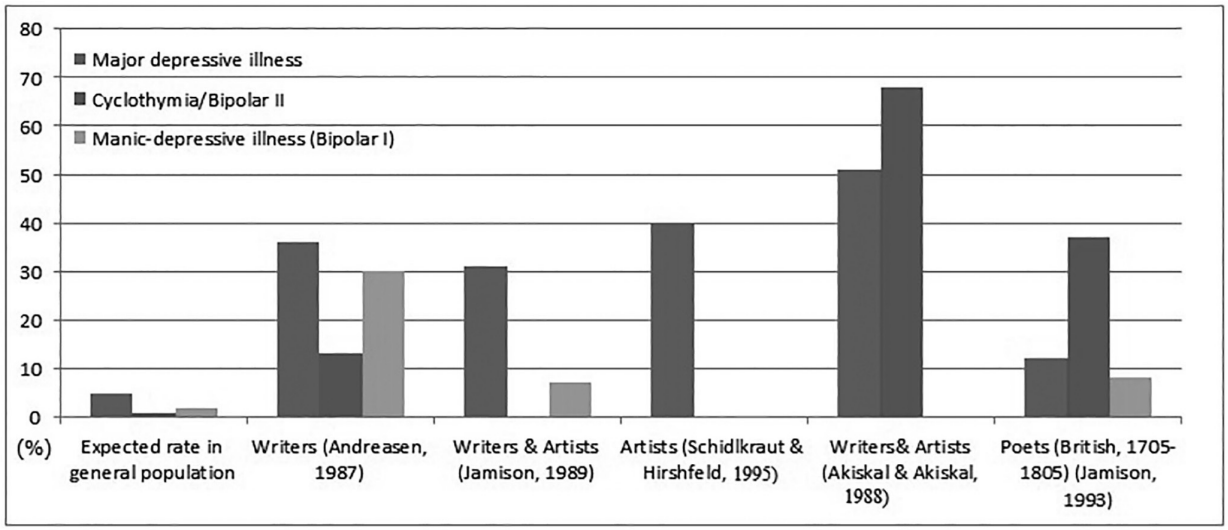

Figure 2. The rates of mood disorders in writers and artists[2]

2 In this graph, Bipolar II and Cyclothymia rates were not ascertained in Jamison (1989), and Bipolar I, Bipolar II, and Cyclothymia rates were not ascertained in Schidlkraut and Hirshfeld (1995). A full-color version may be found at: https://www.dropbox.com/sh/3i4hy7r6ckvjow6/AABbBxZp0xUHqi8Z6uqHYX06a?dl=0

to dominate this landscape, frequently appearing in psychology textbooks and in the popular press on the topic of genius/creativity and mental disorder. These researchers are Nancy Andreasen, Arnold Ludwig, and Kay Jamison, who wrote *Touched with Fire: Manic Depression and the Artistic Temperament*. Nevertheless, as Schlesinger（2009）has pointed out, these researchers have presented forceful claims with few caveats, which may mislead lay readers. In particular, Schlesinger（2009）emphasized the following research flaws in their works:

- ○Theories being presented as facts
- ○Confounding risks due to subjectivity and experimenter bias
- ○Sampling issues
- ○Handpicked vs. random samples
- ○No control group
- ○Small "N"
- ○Restriction of range
- ○Generalized results from a U.S. educated, largely White sample
- ○Reliability issues（e.g., heavy reliance on self-report）
- ○Use of idiosyncratic diagnostic criteria vs. DSM criteria
- ○Lack of significant results: inconsequential findings reported as important, which confuses readers unfamiliar with statistics
- ○Solid research findings ignored（e.g., connection between weather and depression and mood）
- ○Grouped serious and less serious mental illnesses（e.g., major depressive disorder and mania with dysthymia and hypomania, or a single, brief incident of depression）

Schlesinger's（2009）concerns seem to be legitimate in terms of the research methodology used in studies that attempt to present a correlation between mental health and creativity. However, regarding sampling issues（i.e., small samples and random sampling）, it seems that such limitations are inevitable since recruiting creative people as research candidates is by nature difficult. Additionally, it seems that the operational definition on creativity should be cautiously established by researchers in any study.

Links Between Creativity and Psychopathology: Some Affirmative Positions

In 2011, Kéri proposed a model established on evidence-based findings about creativity and psychopathology, with latent inhibition（LI）as a pivotal element. According to Kéri, healthy individuals with schizotypal personality traits display decreased LI, which may increase creativity.

Figure 3. Kéri's（2011）model, including lowered latent inhibition

As Plucker et al.（2004）defined creativity, Kéri believed that successful creative accomplishment is influenced by both individual and social factors. LI and general intellectual functions（IQ）are often considered as cornerstones of creativity, and LI is an ability of the nervous system to tune down information that was previously experienced as irrelevant（Lubow, 1989）. LI serves an important function in directing the focus of attention away from irrelevant details, and thus facilitating convergent thinking and goal-directed

behavior.

The aim of the study was to investigate the relationship between these factors in 111 Central-Eastern European volunteers recruited from the community, with evaluated individual factors including IQ, LI, and schizotypal personality traits. In addition to these measures, the size of the primary social network（e.g., relatives and friends who are in contact with each other）and the broader network（e.g., persons to whom one sends a Christmas card）were evaluated. As a result, it was suggested that unusual experiences in relation to personality traits significantly predicted real-life creative achievements. However, taking LI into account, this relationship did not retain significance. This means that LI played a pivotal role in connecting psychopathology and creativity. Further independent predictors of creativity were IQ and, most importantly, social network size. These results suggest that decreased LI, higher intellect, and stronger social support independently facilitate real-life creative accomplishment. Kéri's（2011）findings are critical in this field, especially because they demonstrate that one cannot consider the relationship between pathology and creativity alone. Further, some cognitive abilities（i.e., IQ）and cognitive tendencies（i.e., LI）play significant roles as mediator variables between psychopathology and creativity.

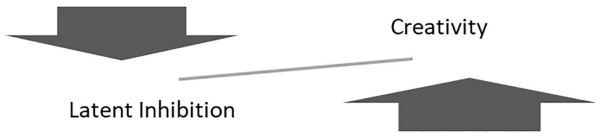

Figure 4. The seesaw model of latent inhibition and creativity

Also, upon the role of IQ in creativity, latent inhibition（LI）is the cornerstone to creativity. LI is important in filtering nonessential information, yet in terms of creativity, it is also important in generating novel and original associations and gaining intuitive insight into complex problems. There is an association with personality traits such as openness to experience and extraversion, which are marked predictors of divergent thinking and creativity.

Second, Forgeard（2008）made another investigation into what she believes is the valid relationship between mood disorder and creativity, focusing on the linguistic styles of writers. According to Forgeard（2008）, past research has shown that the styles of drawings by patients with unipolar and bipolar mood disorders significantly differ, and the bipolar cases express more positive and fewer negative emotions. In her first experiment, it was expected that prose texts by eminent writers who suffered from unipolar versus bipolar mood disorders would show this same effect. One novel per writer was analyzed, using the Linguistic Inquiry and Word Count inventory. As a result, the hypothesis was disconfirmed, but the results indicated three other differences that were then replicated in Study 2, using a second set of novels by the same authors. The results showed that:（a）bipolar writers referred to death more than unipolar writers;（b）unipolar writers referred to people other than themselves more than the control writers; and（c）unipolar writers used more words describing cognitive mechanisms（e.g., understand, know）than both other groups. It might be that the therapeutic effect of writing can explain why the unipolar and bipolar groups did not differ from controls on measures related to emotions. The interest displayed by unipolar writers in cognitive mechanisms is consistent with Verhaeghen et al.'s（2005）finding that rumination mediates the link between creativity and unipolar depression. Notably, as Kéri's（2011）study discussed, it is important to note that mediators（in this case, rumination）played an important role in the relationship between creativity and unipolar depression.

Third, the study conducted by Claridge and Blakey（2009）found another important aspect of the relationship between creativity and mental disorders. As explained earlier, divergent thinking style involves "thinking outside the box" and generating as many answers as possible rather than multiple

choice, and they found that schizotypy and affective temperament have both been linked to creativity using measures such as divergent thinking, but not in terms of creativity styles. The relationship between schizotypy and affective temperament has also not been examined directly in a creativity paradigm. In Claridge and Blakey's study, 78 university students（44 female, 34 male）completed two divergent thinking tasks and measures of schizotypy, affective temperament, and creativity styles. Positive schizotypy was correlated with creativity styles, and affective temperament was correlated with both creativity styles and divergent thinking scores. Furthermore, schizotypy and affective temperament differentially predicted divergent thinking scores and creativity styles. Their findings are important for two main reasons. First, their result can specify that divergent thinking is especially linked to both schizotypy and affective temperament. This means that one can analyze the relationship between creativity and mental disorders based on the style of thinking and not necessarily using the umbrella term of creativity. Second, as there has been an argument as to whether either schizotypy or affective temperament is more related to creativity, their findings can imply that both are viable links.

Finally, Vellante et al.'s（2011）study also confirms that the cyclothymic dimension of the bipolar spectrum is linked to creativity, and this link is likely to result from increased involvement into pleasurable activities, including creative ones. Vellante et al.（2011）mentioned that even though it was widely believed that manic-depression/bipolar disorder was linked to creativity, with affective temperaments allegedly favoring creative expression and achievement, only a few studies have empirically tested the link. Their participants included 152 undergraduate students attending preparatory courses for creative artistic professions and 152 students in areas expected to lead to a profession mostly requiring the application of the learned rules. All participants were invited to fill in the TEMPS-A（Temperament Evaluation of the Memphis, Pisa, Paris and San Diego — Auto-questionnaire）, the General Health Questionnaire（GHQ）, and the Creative Achievement Questionnaire（CAQ）. Latent class analysis（LCA）was used to investigate the links between creativity scores and measures of psychopathology. The results indicate that creative participants and controls did not differ in terms of gender（males=47%）, age（24.5 years, SD=3.8）, or socioeconomic status. Creative people scored higher than controls on the CAQ and on the cyclothymic, hyperthymic, and irritable subscales of the TEMPS-A, but not on the GHQ. Greater involvement in creative activities rather than being a creative achiever best differentiated those into the "risk for bipolar spectrum" class from the other two classes extracted by the LCA from the TEMPS-A. The study's limitations included the usage of self-report measures to evaluate both creative involvement and the risk of psychopathology, as well as the exclusive focus on artistic creativity, as these inhibit the generalizability of the findings.

Links Between Creativity and Psychopathology: Some Negative Positions

Thus far, several research studies that endorsed the relationship between creativity and mental disorders have been discussed. However, some qualitative and literature reviews exist that do not affirm the relationship between creativity and mental disorder.

First, Rothenberg's（1990）findings are contrary to popular and professional beliefs regarding creativity and mental disorder. After conducting 2,000 hours of interviews, Rothenberg came to the following conclusions:

- ○ There is no specific personality type associated with outstanding creativity
- ○ Creative people are not necessarily childish or erratic in human relationships, as is often thought
- ○ Creative people are not necessarily extraordinarily egotistic, rebellious, or eccentric

What is intriguing here is that Rothenberg's work is one of the very few qualitative studies conducted in this research field. Specifically, even though the focus is on typology rather than pathology, Rothenberg's (1990) finding that no personality type was associated with creativity should be taken into consideration when a researcher designs a study.

Second, Waddell (1998) conducted a literature review critically assessing the evidence for associating creativity with mental illness. MEDLINE and a secondary literature review identified 29 studies and 34 review articles on creativity and mental illness, all of which were critically evaluated and assessed. Of the 29 studies that evaluated possible associations between creativity and mental illness, 15 found no evidence to link the two, nine found positive evidence, and five had unclear findings. However, most studies used flawed methodologies with weak (case series or case control) designs. Further, there were no randomized or prospective cohort studies, and adequate criteria for determining causal association were not met. In 34 selective reviews, despite mixed evidence, many authors asserted that creativity and mental illness were positively or causally associated. There is limited scientific evidence to associate creativity with mental illness, yet Waddell (1998) mentioned that despite this, many authors promoted a connection. While her review study has not been updated, it does provide an overview of relevant articles up to 1998. As discussed in relation to Schlesinger (2009) earlier, Waddell's review also critically evaluated the quality of research methodology and found flaws. However, as mentioned, some flaws seem to be inevitable because of inherent limitations of the research, such as the aforementioned sampling issue due to the focus on creative people.

Third, Silvia and Kimbrel (2010) were skeptical about the big question as to whether creativity is related to mental illness. They stated that a link, if any, between the two is one of the most controversial topics in modern creativity research, and the possible association between anxiety and creativity has not overly been considered. Their research assessed the relationships between anxiety and depression symptom dimensions and several facets of creativity, including divergent thinking, creative self-concepts, everyday creative behaviors, and creative accomplishments. Latent variable models estimated effect sizes and their confidence intervals. Overall, measures of anxiety, depression, and social anxiety predicted little variance in creativity. Few models explained more than 3% of the variance, and the effect sizes were small and inconsistent in direction. As a conclusion, the authors mentioned that the findings from their study clearly favored the skeptical camp about whether anxiety and depression predict creativity.

Conclusion

Overall, it seems fair to conclude that the relationship between mental illness and creativity is still a contentious research topic, and thus hard to judge. As discussed, some critical reviews have stated that there are methodological flaws to several of the extant research studies that claim a link exists between creativity and mental illness. As shown, however, recent studies have attempted to overcome such issues of measuring creativity, and generally caution against popular notions of their relationships.

As discussed by Kéri (2011) and Forgeard (2008), the presence of mediator variables (e.g., latent inhibition and rumination) plays a significant role in linking creativity and mental illness. Apparently, the research question can become elaborated in the way that one's cognitive process should be explored further to deliberate creativity and mental illness. Accordingly, in relation to cognitive processes, different styles of thinking should be taken into account. As argued, it seems that the divergent thinking style makes a difference in terms of the significance of the relationship between creativity and mental illness. Future work can further investigate this cognitive process as a promising line of research.

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