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Nuances of Domain and Mood

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The nature of the relationship between creativity and personality is one of the core issues at the heart of creativity research. It is a rare topic that can both inspire a kneejerk, obvious response (such as "Openness to experience is related to creativity," a near-universal finding) (see J.C. Kaufman 2016) yet also present intricacies and debates such that the topic warrants a full handbook. A scan of the table of contents of this book gives a hint of the scope of this issue. In this chapter we tackle two related areas that play into the larger creativity–personality connection: creativity domain and mood.

Creativity Domains: A Brief Prologue

The question of whether creativity is domain general or specific has important implications for how it may or may not relate to a given construct. The domain-general view suggests that creativity is consistent across domains such that an individual who is creative in one domain will be creative in all domains (Plucker 1998). The domain-specific view suggests that creativity in one domain is independent of creativity in another (Baer 1998). These disparate approaches have converged in recent years to recognize the importance of both ends of the spectrum and the role that measurement plays (J.C. Kaufman, Glăveanu, & Baer in press). For example, studies of creative products tend to find domain-specific results, whereas studies using self-assessments tend to yield domain-general interpretations (Plucker & Makel 2010). Several theories (Baer & J.C. Kaufman 2005; Plucker & Beghetto 2004) have been developed to reconcile these views and suggest ways in which creativity contains both domain-general and domain-specific elements.

One such model, the *Amusement Park Theoretical (APT) Model of Creativity* (Baer & J.C. Kaufman 2005; J.C. Kaufman & Baer 2004, 2005, 2006), suggests that there are general requirements for all creative behavior, but creative outcomes require domain-relevant skills and characteristics. The model (which uses the analogy of an amusement park) moves from being very general to very specific across four levels. The first level of the model, *initial requirements*, states that certain criteria in intelligence, motivation, and the environment must be met in order to produce any creative work. For example, a person must be motivated to engage in creative behavior in order to successfully create in any domain.

The second level of the model, *general thematic area*, relates to the broader areas in which one might be creative (e.g., everyday life, scholarship, performance, math/science, and art) (J.C. Kaufman 2012). Creativity in the arts may require greater emotional intelligence, whereas this may not be true for creativity in the sciences (Baer & J.C. Kaufman 2005; see also Dostál, Plháková, & Záškodná 2015). The third level, *domains*, distinguishes between the diverse applications within a thematic area. Within the general thematic area of the arts there may be many different domains, such as visual arts and music. All forms of visual art rely on skills in composition of form, whereas this would not be required for creativity in music. The final level of the model, *microdomains*, is task specific. Within the visual arts domain, the ability to mix paints would typically be necessary to produce creative oil paintings but not metal sculptures.

Personality and Domain-Specific Creativity

The relationship between personality traits and creative performance in general, as well as in different domains, has received much attention (Amabile 1996). Most research investigating the association between personality and creativity has used one of two major models of personality: *Eysenck's supertraits* (Eysenck & Eysenck 1976, 1985) or the *five-factor model (FFM) of personality* (Costa & McCrae 1992).

Eysenck's Supertraits

According to Eysenck and Eysenck (1985), personality is based on innate genetic factors and can be described in terms of three orthogonal dimensions, or supertraits: extraversion, neuroticism, and psychoticism. The dimension of extraversion (versus introversion) reflects individual differences in cortical arousal, wherein people high in extraversion (opposed to introversion) have a habitually low level of cortical arousal, which makes them less sensitive to sensory stimuli (Gale 1983; Geen 1984; Geen, McCown, & Broyles 1985). In order to maintain an optimal level of stimulation, extroverts will seek out exciting activities, whereas introverts (who have a higher level of cortical arousal and are therefore more sensitive to sensory stimuli) will avoid such activities. Therefore, people high in extraversion have a tendency to be "sociable, lively, active, assertive, sensation seeking, carefree, dominant, surgent, and venturesome" (Eysenck & Eysenck 1985, p. 15). Neuroticism (versus emotional stability) reflects individual differences in the activation threshold of the sympathetic nervous system, which is responsible for the fight-or-flight response to threat. People high in neuroticism have a low activation threshold, which causes them to experience negative affect in the face of minor stressors, whereas highly emotionally stable people, who have a high activation threshold, are able to experience negative affect only in the face of very major stressors. Therefore, high neuroticism is associated with feeling "anxious, depressed, guilt

feelings, low self-esteem, tense, irrational, shy, moody, and emotional" (Eysenck & Eysenck 1985, p. 15). Psychoticism (versus impulse control) has been attributed to individual differences in gonadal hormones (most often testosterone), but this theory lacks empirical support (see Reuter et al. 2005). People high in psychoticism tend to be "aggressive, cold, egocentric, impersonal, impulsive, antisocial, unempathetic, creative, and tough-minded" (Eysenck, 1993, p. 155). Eysenck (1993, 1995) argues that individual differences in creativity are the result of variation in the trait psychoticism.

Eysenck's (1993, 1995) assertion that psychoticism is the basis for creative thought is based on the notion that the biological foundations of personality also influence cognitive style and is supported by evidence linking creativity to psychopathology. He asserted that the unusual ideation (i.e., originality) characteristic of creative individuals is the result of overinclusive thinking or "loose" associative networks, also commonly found in those with certain types of psychopathology, such as schizophrenia. He further suggested that this is so because psychopathology is not categorical but rather reflects extreme variants of underlying personality traits. Therefore, certain types of psychopathology (e.g., schizophrenia) lie on the extreme end of the personality dimension of psychoticism, and creative individuals close enough on the spectrum experience the same abnormality in thought but do not suffer psychosis (possibly due to protective factors). Indeed, creativity has been found to be associated with schizotypy, which is characterized by a set of symptoms (e.g., unusual perceptual experiences, magical thinking, and impulsive nonconformity) that may be indicative of a predisposition to schizophrenia but does not represent a clinically significant disorder (Carson 2014) in a variety of studies (Batey & Furnham 2008; Nettle 2006; Preti & Vellante 2007).

However, schizotypy scales do not distinguish psychoticism from neuroticism (Eysenck 1993), and studies using the Eysenck Personality Questionnaire (EPQ) (Eysenck & Eysenck 1975) to assess psychoticism directly have been inconclusive, in that psychoticism is not always found to relate to creativity, and inconsistent with Eysenck's (1993) theory, extraversion and neuroticism have also emerged as associates of creativity in some studies (Acar & Runco 2012; Batey & Furnham 2006).

Based on a comprehensive review, Batey and Furnham (2006) suggest that inconsistent results in investigations of creativity and Eysenck's supertraits may be due to domain differences. Although the relation of psychoticism to creativity has been inconclusive, with some studies reporting significant associations (Feist 1998; Merten & Fischer 1999; Stavridou & Furnham 1996; Woody & Claridge 1977) and others reporting mixed results (Kline & Cooper 1986) or no correlation (Martindale & Dailey 1996; Sen & Hagtvet 1993), no domain differences have been reported. A recent meta-analysis (Acar & Runco 2012) of studies investigating psychoticism's relation to creativity demonstrated a small overall effect but not significant heterogeneity in creative domain (arts, science, writing, and general). An earlier meta-analysis of creativity and different personality measures found that both artists and

scientists exhibited greater psychoticism (as measured by the EPQ) than control individuals (Feist 1998). However, the same study found that scientists were more extraverted (as measured by the EPQ) than nonscientists, whereas this was not true for artists (opposed to nonartists). Batey and Furnham (2006) suggest that although extraversion seems to relate to divergent thinking measures, introversion is likely to be beneficial for artistic creators who need solitary time to reflect. Consistent with a relation between extraversion and divergent thinking, Martindale and Dailey (1996) found significantly positive associations between extraversion and scores on an alternative-uses test (listing as many uses as possible for a brick, a shoe, and a newspaper) and a remote-associates task, wherein the first word that came to mind for a participant when primed with a given word was rated creative if it was not in the top 10 word-association norms provided by Palermo and Jenkins (1964). Neuroticism may be important for artistic creativity because it "provides artists with the emotional sensitivity to appreciate and express ideas with emotional content" (Batey & Furnham 2006, p. 393) but is detrimental to divergent thinking, which requires defocused attention (Martindale 1999). Indeed, fluency scores on two visual creativity tasks (i.e., pattern meanings and line meanings) from the Wallach-Kogan Divergent Thinking Tests (DTs) (Wallach and Kogan 1965) demonstrated a significant inverse relationship with neuroticism in a group of university students (Stavridou & Furnham 1996). Although it is possible that domain differences are responsible for inconsistent results in studies investigating creativity's association with Eysenck's supertraits, the lack of empirical studies exploring this possibility renders it inconclusive; much more evidence for domain differences has been provided in studies using the FFM (McCrae & Costa 1987).

Five-Factor Model

Over the last two decades, most of the studies on creativity and personality have shifted focus toward the FFM of personality. The FFM includes extraversion, agreeableness, emotional stability, conscientiousness, and openness to experience (McCrae & Costa 1987). The primary FFM traits related to creativity include openness to experience, conscientiousness, and extraversion (Feist 1998; Hoff, Carlsson, & Smith 2012; McCrae 1987). Openness to experience has emerged as the strongest predictor of creativity. Agreeableness is typically unrelated or has a weak relationship with creativity. Neuroticism is its own case, as we will discuss later.

In some cases, inconsistencies in what traits predict performance depends on what creative domain is studied. For example, Feist (1998) conducted a meta-analysis examining differences in personality traits that predicted creativity by artists and scientists. He found that both groups were high in openness to experience and low in extroversion (i.e., introversion). Scientists, however, were more conscientious than were nonscientists, regardless of them being classified as creative or less creative scientists. However, artists were less conscientious

than were nonartists. Subsequent studies have also found a negative connection between arts-related creativity and conscientiousness (e.g., Lievens et al. 2002). There are also microdomain differences in how creativity is related to conscientiousness. For example, creative writers (J.C. Kaufman 2002) and contemporary dancers (Fink & Woschnjak 2011) were less conscientious than, respectively, journalists and ballet dancers.

In another study, Silvia, J.C. Kaufman, and Pretz (2009) examined latent classes of creative achievement among college students and found three classes: visual arts, performing arts, and students without any major achievements. They found that people with achievements in the performing arts were more extraverted than were people in the visual arts or those with no achievements. These studies are only a few examples of FFM traits and their relationship to creativity in specific domains.

The factor openness to experience has previously generated debate over its operationalization. Current research indicates that there are two facets (openness and intellect), with each facet being differentially related to creativity (DeYoung 2015; DeYoung, Peterson, & Higgins 2005; DeYoung, Quilty, & Peterson 2007; Nusbaum & Silvia 2011; Woo et al. 2013). Although openness and intellect are highly correlated, their relationship with creativity, intelligence, and creative domains varies. Nusbaum and Silvia (2011) examined the relationship between openness, intellect, fluid intelligence, and creativity (as measured by self-reported creative activities and accomplishments). Openness (but not intellect) predicted creativity, and intellect (but not openness) predicted fluid intelligence. S.B. Kaufman (2013) built on the openness/intellect split to develop a four-factor model. Two factors were rooted in openness (affective engagement and aesthetic engagement) and positively predicted self-reported accomplishments in the arts, as measured by the Creative Achievement Questionnaire (CAQ). Two factors were rooted in intellect (intellectual engagement and explicit cognitive ability) and were unrelated to arts achievement. The two intellect factors, however, positively predicted performance in the sciences, and affective engagement negatively predicted performance. Aesthetic engagement was unrelated to CAQ science scores.

S.B. Kaufman and colleagues (2015) also examined how intellect and openness as measured by the Big Five Aspects Scale differentially predicted performance on the CAQ. They found that openness to experience was positively related to performance in the arts (as was extraversion) after controlling for age, sex, the other four FFM traits, intelligence, and divergent thinking. Intellect was unrelated to performance in the arts. It was, however, positively related to performance in the sciences, whereas openness was unrelated to performance in the sciences.

Another recent study also examined the relationship between the three theoretical intellect framework facets or operations (think, learn, and create) (Mussel 2013) and different creativity measures, including self-reported domain-specific and behavioral measures. Mussel and colleagues (2015) had participants from two samples (undergraduate students and Amazon

MTurkers) complete the intellect scale and one of three creativity measures: self-report, the Compound Remote Associates Test (CRAT) (Bowden & Jung-Beeman 2003), or a photograph caption task. They found that create was positively related to a general self-report measure of creativity, whereas think and learn were unrelated, after controlling for general intellect scores. To assess the relationship between scores on the three operations and domain-specific creativity, the Kaufman Domains of Creativity Scale (KDOCS) (J.C. Kaufman 2012) was used. Create was the only facet positively related to artistic domains (performance and artistic) and was positively related to everyday creativity (learn was also positively related, and think was negatively related) and mechanical/science (think was positively related, and learn was negatively related). KDOCS scholarly were positively related to think and unrelated to learn or create. Performance on the two different creativity tasks (CRAT and photograph captions) was related to think and unrelated to learn. For the create facet, there appeared to be a suppressor effect present.

Openness is not the only of the five factors to show different results depending on the facet being analyzed. Reiter-Palmon, Ilies, and Kobe (2009) explored conscientiousness and creativity at a deeper level and found that a facet of being industrious/achievement-focused was positively correlated with creativity, but another facet of orderliness/dependability was negatively correlated. When analyzed simply as the larger factor of conscientiousness, however, a suppression effect occurred, and the relationship appeared to be nonexistent.

In sum, FFM personality traits are differentially related to performance across different domains. The differences between openness and intellect, with openness being related to performance in the arts and intellect being related to performance in the sciences, has indicated that openness to experience might be too general a predictor for creativity. Future research should focus on domain-specific notions of creativity and how they differentially relate to openness/intellect and other FFM traits.

The fifth factor, we have not yet discussed, is emotional stability, or neuroticism. Its relationship to creativity is complex because it closely relates to mental illness. Because this research area is so nuanced and there are edited volumes on this area (cf. J.C. Kaufman 2014; Silvia & J.C. Kaufman 2010), we limit our discussion to studies of mood and mood disorders. When discussing affective behavior, it is important to note whether one is talking about a state (a more temporary moment) versus a trait. Some have argued that the blurring of the line between state and trait in how affect relates to creativity is one reason for the extensive debate on the topic (Feist 2012). Moods and mood disorders can be either state or trait based.

The Influence of Mood on Creativity

Early research on the link between creativity and state level mood[1] focused primarily on the role of positively valenced emotions leading to a large

body of research demonstrating that positive (relative to neutral) mood states enhance creativity (for review, see Ashby, Isen, & Turken 1999). In a seminal study, Isen, Daubman, and Nowicki (1987) demonstrated that inducing positive affect in participants (by having them watch a blooper reel of old western TV shows or giving them a small bag of candy; experiments 1 and 3) increased their performance on measures of creative insight. In one experiment, a greater number of people in a positive mood state (as opposed to those in a neutral mood state) were able to correctly solve Duncker's Candle Test (Duncker 1945), wherein a person must find the correct solution to use – a match, a box of tacks, or a candle – to affix the candle to a wall. In another experiment, people in a positive mood were able to solve more moderately difficult Remote Associates Test (RAT) problems, wherein participants are asked to provide a fourth word that relates to each of three given words. Similar results have been found in a variety of contexts, including educational (Greene & Noice 1988), medical (Estrada, Isen, & Young 1997; Estrada, Young, & Isen 1994), and organizational settings (Amabile et al. 2005), suggesting that positive mood may directly influence the processes underlying creative thought.

Initially, Isen and colleagues (1985) suggested that this enhanced creativity might be so because positive (as opposed to negative) material is better integrated in memory. According to associative theories of creativity, creative thought and insight are the result of forming new combinations of existing concepts in memory, with combinations of more remote, or conceptually distant, elements resulting in more creative ideas (Mednick 1962). Therefore, in accordance with mood-congruent recall, wherein individuals more easily remember information that is consistent with their current mood state (Matt, Vázquez, & Campbell 1992), more diverse and complex material is activated when a person is in a positive mood state, enhancing one's ability to combine remote concepts.

More recent explanations focus on how mood may affect a person's attentional focus, which then influences a person's ability to simultaneously attend to a larger number of conceptual elements (Fredrickson & Branigan 2005; Kasof 1997). A narrow attentional focus may allow a person to attend to a few concepts at once, limiting the number of combinations possible, whereas a broader attentional focus (i.e., defocused attention) allows for a greater number of concepts to be within the focus of attention at once, increasing the number of possible combinations (Abraham & Windmann 2007; Mendelsohn 1976). Positive moods may broaden the focus of attention, allowing a person to attend to a greater number of concepts, thereby enhancing creativity (Fredrickson 1998). This enhanced cognitive flexibility may be due to increases in dopamine projected into the prefrontal cortex (facilitating working memory) in response to such mood states (Ashby et al. 1999). These explanations, along with studies demonstrating enhanced creativity in response to positive mood, provide a strong foundation for the influence of positive moods on creativity but fail to account for instances of enhanced creativity in response to negative mood.

Studies focusing primarily on the valence factor fail to account for other motivational components of emotions, such as activation and orientation,

which may help to explain why some studies have found enhanced creativity in response to negative mood (Baas et al. 2008, 2011; Friedman, Förster, & Denzler 2007). For example, Friedman and colleagues (experiments 1 and 2) manipulated mood by asking participants to describe either a positive or negative past personal event. Participants then completed an alternative-uses task, describing as many uses as they could think of for a brick (or as many modes of transportation; experiment 2). These tasks were framed as a fun and silly task or as a serious task that had implications for the participants' cognitive functioning. Participants in a positive mood generated a roughly equivalent number of responses whether the task was framed as fun or serious, but individuals in a negative mood generated significantly greater uses when the task was framed as a serious task (as opposed to fun).

Baas and colleagues (2011) found that negative mood states (e.g., fear; study 4) can be associated with greater creativity when they are related to unsuccessful prevention regulation, that is, a lack of closure regarding a prevention goal. They asked participants to write a short essay about an event that happened to them in the past that made them feel fearful and to indicate how much the story described the successful avoidance of negative outcomes (i.e., successful prevention regulation). Participants then completed a visual-insight task (10 items from the Gestalt Completion Task [GCT]) (Ekstrom et al. 1976). Participants in fearful, angry, and happy moods performed better on the insight task than those in relieved or neutral moods, but this effect was mediated by successful prevention regulation (i.e., those who experienced closure were less creative). These studies demonstrate that the motivational components of emotions play an important part in the influence of affect on creativity.

The *feelings-as-information model* (Schwarz 2012; Schwarz & Clore 1996) offers one account of how motivation may influence the effect of negative mood on creativity. The model suggests that affective states provide people with information regarding their current situation, which helps them to make judgments and influences how they process information. A positive mood signals to the person that there are no threats present, resulting in a processing style with less focused attention and greater reliance on general knowledge structures, which might increase exploratory and risk-taking behavior. A negative mood signals threat to a person, resulting in a processing style with more vigilant attention and a greater focus on problem solving. If an individual realizes that his or her feelings are unrelated to the task at hand, it no longer has informational value and no longer influences the person's processing style (no longer influencing performance on the task). The feelings-as-information model provides a theoretical framework for the role of the motivational implications of certain moods and emotional states in creative performance. The *dual-pathway model of creativity* (DPCM) (Baas, De Dreu, & Nijstad 2008; De Dreu, Baas, & Nijstad 2008) delineates how this may interact with valence to directly influence creativity.

The DPCM suggests that both the valence and activation associated with a mood are important influences on creativity. The model argues that creativity

can be enhanced through two distinct pathways: the *positive-valence pathway*, which increases cognitive flexibility, or the *negative-valence pathway*, which increases perseverance and effort. Creative outcomes depend on *activation*, which refers to "increased engagement of centrally organized promotion or prevention motivation systems to mobilize energy to sustain attention and effort toward goal related activities" (Baas et al. 2011, p. 795). Therefore, moods with high activation should typically lead to greater creativity whether they are positive (i.e., happy, excited) or negative (i.e., angry, anxious) than both deactivating positive (i.e., serene, calm) and negative (i.e., sad, depressed) moods. Although much research (see Baas et al. 2008) has demonstrated that a promotion focus (attainment of positive outcomes) increases creativity relative to a prevention focus (avoidance of negative outcomes), Baas and colleagues (2011) demonstrated that a prevention focus can result in enhanced creativity when the individual is experiencing a mood state that is activating.

Another dimension of the mood–creativity link that has received less attention is *orientation*. The orientation dimension involves taking the two other dimensions (valence and activation) and combining them on a mood circumplex and then turning the circumplex 45 degrees (Watson & Tellegen 1985). Based on the orientation dimension, some states such as boredom (a negative, deactivating state) can increase creativity because it is an approach-oriented state. The DPCM would predict boredom having no effect on creative performance because it is a deactivating state. Across three studies, Gasper and Middlewood (2014) found that approach-oriented states such as boredom increased creativity – measured by the RAT (study 1) and rating weak exemplars as belonging to a category (studies 2 and 3) – compared to avoidance-oriented states such as distress. They argued that the approach-oriented state increased associative thought because it "encourages the quest for meaning and exploration" (p. 55).

The Effects of Interpersonal Emotions and Creativity

Most of the research on mood and creativity has focused on the intrapersonal effects of emotions on creativity. There are a few studies, however, examining the interpersonal effects of emotions that draw on the *emotions as social information (EASI) model* (Van Kleef, 2009; Van Kleef, Homan, & Cheshin 2012). The EASI model argues that an emotional expression has an effect on an observer's behavior through one of two paths. The observer might infer that the situation requires a behavioral change (inferential path), or the observer's emotions or liking of the expresser changes (affective reactions path). Although both paths might affect the observer's behavior, one path is typically dominant, and the strength of the path depends on two moderators (information processing and social-relational factors), which might function alone or together.

Across multiple studies, expressions of anger have been found to increase an observer's creativity depending on the observer's ability to process information. In one study, Van Kleef, Anastasopoulou, and Nijstad (2010) had participants complete an alternative-uses task, and then they were given feedback on their performance. This feedback was presented in either an angry or a neutral emotional tone. After receiving feedback, participants completed a second alternative-uses task, which was scored for fluency, originality, and flexibility. Prior to completing the first task, participants completed the Personal Need for Structure Scale (Neuberg & Newsom, 1993), which assesses information-processing ability. In support of their predictions, Van Kleef and colleagues (2010) found that when participants received feedback in an angry tone, those high in need for structure compared with those low in need for structure had higher fluency, originality, and flexibility scores, and this effect was mediated by task engagement (time spend on task and self-reported motivation). People high in need of structure have a greater desire to process knowledge and emotional information to which they are exposed in order to understand the situation. Thus the authors inferred that the performance of the participants on the first creativity task was suboptimal, and they needed to expend greater effort on the second task.

In another set of studies, Visser and colleagues (2013) examined the effects of feedback presented in a happy or sad emotional tone on an observer's creative and analytic performance. Participants first completed two tasks: a divergent thinking task to measure creativity and a Sudoku puzzle to measure analytical thinking. After completing the first task, participants were given feedback on their performance in either a happy or sad tone. Participants then completed a second unusual-uses task and another Sudoku puzzle. Participants who received feedback in a happy emotional tone performed better on the second creativity task (more original responses), whereas people who received feedback in a sad emotional tone performed better on the second Sudoku puzzle (proportion of correct responses compared to total response). In a second study, the authors replicated the results and found that the increase in performance on the respective tasks was due to emotional contagion. That is, participants reported feeling more happiness in the happy condition and more sadness in the sad condition.

The studies just reported indicate that the mood–creativity link is complex and includes an interpersonal dimension. The EASI model and the corresponding studies are another intersection of mood and personality on creative performance that have a number of implications for certain domains, such as education and the workplace. A teacher or manager should consider how he or she presents feedback to a student or subordinate. This presentation strategy should be based on a number of contextual factors and the observer's personality traits. If feedback on a person's creative performance is presented in a manner that is perceived negatively, an observer might become averse to future interest in creativity (Beghetto 2014).

Mood and Domain-Specific Creativity

Mood Disorder and Creative Domains

A negative mood can easily be a passing moment – here and gone in an instant. When someone is in a poor mood as a natural trait, it can be considered a clinical or subclinical issue and be called a *mood disorder*. Mood disorders and their relationship to creativity are often studied in the context of unipolar depressive and/or bipolar disorders. Although the method of diagnosis used in studies investigating a potential relationship between creativity and mood disorders varies, most closely align with the criteria set by the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*. The fourth edition of the *DSM* (*DSM IV*) (American Psychiatric Association 1994) is the most recent version used in published studies investigating this relationship.[2] According to the *DSM IV*, *depressive disorders* (major depressive disorder and dysthymic disorder) are characterized by the occurrence of major depressive episodes, which include symptoms of depressed mood, anhedonia, weight loss or gain, loss of appetite, fatigue or loss of energy, daily sleep disturbance (hypersomnia or insomnia), and reduced ability to concentrate or think clearly. *Bipolar disorders* (bipolar disorder I and II and cyclothymic disorder) are characterized by the occurrence of manic episodes or hypomanic and major depressive episodes. Manic and hypomanic episodes include symptoms such as abnormally and persistently elevated, expansive, or irritable mood; inflated self-esteem or grandiosity; decreased need for sleep; distractibility; pressured speech; and impulsive behavior. Manic and hypomanic episodes are distinguished by severity, wherein hypomanic (opposed to manic) episodes are not severe enough to impair functioning or require hospitalization and do not have psychotic features. Although research investigating the relation of mood disorder and creativity is highly controversial (Schlesinger 2009, 2014; Silvia & J.C. Kaufman 2010), the relation of mood disorder and creativity has been found to differ by creative domain in studies investigating creativity in individuals with mood disorder and in studies investigating the prevalence of mood disorder in creative individuals.

Although relatively few studies have assessed different creative domains when investigating creativity in individuals with (as opposed to without) mood disorder, some studies have noted differential results across domains. Rybakowski and Klonowska (2011) administered the inventiveness battery of the Berlin Intelligence Structure (BIS) Test (Jäger 1982, as cited in Rybakowski & Klonowska 2011), which assesses numeric, figural, and verbal creativity, to a Spanish sample of patients with bipolar disorder and healthy control individuals. Individuals with bipolar disorder scored significantly higher than controls on the verbal subscale but not on the numeric or figural subscales of the BIS Test. Kyaga and colleagues (2011) found that individuals with bipolar disorder were overrepresented in scientific (i.e., university teachers) and particularly in

artistic (i.e., visual artists, performing artists, authors, etc.) occupations. In a subsequent study, with an extended sample, Kyaga and colleagues (2012) found that those with bipolar and unipolar disorders were overrepresented in artistic occupations (particularly as authors) but not scientific occupations.

A recent meta-analysis (Taylor 2015) of studies comparing creativity in individuals with and without mood disorder suggests that the influence of mood disorder on creativity may differ by domain. Twelve studies were included in the analysis, which assessed creativity in six domains: everyday, performance, quantitative, verbal, visual, and a composite category consisting mostly of general divergent thinking tasks. The overall effect size for the analysis was not significant, suggesting that those with mood disorder are not more (or less) creative than those without. However, follow-up analyses of the differences between creative domains demonstrated small but significant effect sizes for verbal, visual, and quantitative creativity, wherein individuals with mood disorder exhibited greater verbal and visual creativity but lesser quantitative creativity than healthy control individuals. A related line of inquiry suggests that the prevalence of mood disorder in individuals identified as creative (opposed to not) differs across creative domains.

Studies comparing creative individuals in the sciences and the arts suggest that mood disorder may be more prevalent in individuals exhibiting creativity in the arts[3] (Ludwig 1992, 1995; McKay & J.C. Kaufman 2014; Simonton, 2014; Simonton & Song 2009). Papworth and colleagues (Papworth & James 2003; Papworth et al. 2008) employed self-report measures of mood disorder symptoms in order to compare university students studying art with those studying science. Those studying art scored significantly higher on measures of creativity, as well as on mood disorder symptoms (although these did not reach clinical levels).

Several historiometric studies have found evidence of mental illness (often speculated to be mood disorder or depression) in poets compared with other writers (J.C. Kaufman 2001, 2003, 2005, J.C. Kaufman & Baer 2002; J.C. Kaufman & Sexton 2006) and writers compared with both other artistic professions and nonartistic professions (J.C. Kaufman 2001; Ludwig 1995; Post 1994).

One explanation for these differences in relation to creative achievement relates back to the issue of domain-relevant skills. In order to contribute creatively to a specific domain, a certain level of knowledge in that domain is necessary. However, some domains require greater mastery than others (Simonton 2010). The creative arts (i.e., visual arts, creative writing, performance) require less formal knowledge and education than the sciences to contribute creatively. Domain-relevant knowledge has been found to be a better predictor of creativity in mathematics than divergent thinking (which requires no formal training), whereas this relationship was reversed for artistic creativity (Jeon, Moon, & French 2011). So creative achievement in the arts would require less stability (than in the sciences) and therefore may be more accessible to those with mood disorder. Poets have been found to be the least likely of creators to have formal training (Simonton 1986), and Simonton and Song

(2009) found that although early mental health was positively correlated with achieved eminence in a sample of geniuses, eminent poets, dramatists, and novelists were the most likely to have mental health issues in childhood and adolescence.

Conclusion

It is tempting to give sweeping answers that aim to simplify difficult concepts, whether writing a paper, teaching a class, or talking to a reporter. Yet much of the truth boils down to "what do we mean by this concept?" If we talk about how creativity and personality relate, what do we mean by creativity? Do we mean creativity in a domain-general sense or across different domains? Do we refer to Eysenck's supertraits, the FFM, or subfacets of the FFM such as openness/intellect? If personality traits represent consistent and innate patterns of behavior and preferences, what do we do with the state-based construct of mood?

Many natural conclusions become less clear when analyzed in different ways. The question, for example, of how creativity may be associated with a positive or negative mood state may actually depend less on the mood's valence and more on whether it is activated or deactivated. At the trait level, the relationship between creativity and mood disorders may depend greatly on which creative domain is being studied.

Sometimes it is important to point out nuances, exceptions, and considerations that should be noted when analyzing a field. The connection between creativity and personality can at times feel remarkably straightforward (there are countless studies that in essence consist of a particular population taking a personality measure and a creativity measure). Moving into the details, however, one sees how patterns change by domain, how definitions of creativity and personality can shift findings, and how mood plays its own role. There is a tremendous amount of research that has been done – yet much more that awaits.

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Notes

1 Although affect, mood, and emotion can be distinguished on several factors (e.g., duration, intensity, and function), many empirical studies do not explicitly define the constructs and/or use the terms interchangeably (Beedie, Terry, & Lane 2005). Therefore, this chapter uses the terms interchangeably to describe feeling states in general.

2 The *DSM* is currently in its 5th edition. The *DSM-5* has yet to be used in studies of creativity and thus was not referenced here.

3 Taylor's (2015) meta-analysis did not detect significant heterogeneity due to the creative domain in analyses of mood disorder in creative versus noncreative individuals or dimensional measures of creativity and mood disorder.