

## Personality and Creativity

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### Abstract

Personality plays an important role in the creative process. The search for the 'creative personality' has a long history, and psychologists have converged on the personality dimension of Openness/Intellect as the most important trait predictor of creative achievement. High levels of Openness/Intellect are associated with an increased tendency toward cognitive exploration, supported by divergent thinking, implicit learning, working memory, and decreased latent inhibition. Collectively, variation in these cognitive processes helps to explain the link between personality and creativity.

Creativity is commonly defined as the generation of mental products (e.g., ideas, mathematical formulas, music, visual art, behaviors, technological innovations, etc.) that are both novel and contextually valuable (Runco, 2004; Sternberg and Lubart, 1999). Creative individuals are those who demonstrate an aptitude for generating such creative products. The study of the 'creative personality' has a long scientific history, with researchers attempting to identify the key psychological characteristics that differentiate highly creative individuals from their less creative counterparts.

### History of Research on Creativity and Personality

The scientific study of the creative personality began in late-nineteenth century England with Francis Galton's attempts to understand the heritability of genius. Galton, a cousin of Charles Darwin, observed that prominent families tended to produce a large number of eminent individuals, suggesting to him that intellectual and creative abilities were directly inherited from one's parents and ancestors (Galton, 1869). Galton argued that creative individuals were distinguished by their greater intellectual capacity, which he thought was dependent upon underlying biological differences. No clear differentiation between creativity and intelligence was made at the time, as both were considered to be aspects of the broader dimension of 'genius' or 'eminence.'

Lewis Terman continued Galton's research tradition in America during the 1920s. Like Galton, Terman believed that creative genius was driven by biological factors that produced intellectual superiority. Superior intelligence was thus regarded as the primary factor in predicting creative achievement. Terman tested this hypothesis with a longitudinal study of 1300 intellectually gifted children, all of whom were identified as high scorers on one of the first modern IQ tests, the Stanford-Binet Intelligence Scales (Terman, 1925). As the study progressed, however, Terman observed that only a small fraction of the sample of intellectually gifted children ended up producing significant creative accomplishments as adults (Terman and Oden, 1959). Terman concluded that creative achievement must depend on factors beyond intelligence.

In his 1950 presidential address to the American Psychological Association, J.P. Guilford argued that the study of

creativity had been largely neglected by psychologists but was of critical importance (Guilford, 1950). Recognizing that intelligence tests did not account for differences in creative achievement, Guilford argued that a broader range of personality characteristics needed to be considered in order to identify creative individuals. He also suggested that creativity is related to 'divergent thinking,' a pattern of thought in which multiple alternative possibilities are generated, in contrast to 'convergent thinking,' which attempts to identify a single correct solution to a problem (Guilford, 1967). Guilford's research helped to advance the psychometric assessment of creativity as distinct from what is captured by traditional intelligence tests.

Although the psychometric assessment of creativity did not fully emerge prior to Guilford's work, creativity was still regarded as an important process in many theories of personality function. Sigmund Freud believed that creativity involved the sublimation of repressed sexual desires into products of the imagination (Freud, 1908). Carl Jung argued that creativity is driven by powerful unconscious forces that can overwhelm the conscious will of the creative artist who experiences them (Jung, 1933). Alfred Adler regarded creativity as central to an individual's ability to take control of his or her life and transform it for the better (Adler, 1927). Otto Rank viewed creativity as an adaptive process of 'unlearning' socially prescribed beliefs and behavioral patterns, with neurosis reflecting the failure to adapt creatively to life (Rank, 1932). George Kelly suggested that creativity involves the temporary loosening of one's conceptual system, which is then reformed around a novel idea that seems promising (Kelly, 1955). Abraham Maslow regarded creativity as a central component of healthy psychological development and personal growth, naturally emerging from a self-actualizing individual's engagement with the world (Maslow, 1962). Carl Rogers also regarded creativity as a natural human process, emphasizing that it is disrupted when the individual feels threatened, flourishing only under conditions of psychological safety (Rogers, 1961). B.F. Skinner, meanwhile, attributed creativity to the accidental 'mutation' of previously learned behavioral patterns, which are only preserved if they are reinforced by the environment (Skinner, 1970).

Since Guilford's call to scientific action, a large number of personality psychologists have examined the character traits associated with creative achievement, both by examining

creativity in the normal population and by studying the personalities of highly eminent creative people. Some of the personality traits that are most commonly associated with creativity include greater aesthetic sensitivity, broad interests, attraction to complexity, independence of judgment, autonomy and self-direction, tolerance of ambiguity, and a clear sense of one's self as 'creative' (Barron and Harrington, 1981). Many of these characteristics are captured in the 'creative personality scale,' which was designed to assess the personality traits that most clearly distinguish creative individuals from less creative ones (Gough, 1979).

### Openness/Intellect and the Five-Factor Model of Personality

Although researchers in the 1950s, 1960s, and 1970s identified numerous personality traits that were associated with creativity, integrating these findings into a coherent framework proved to be difficult. In particular, the diversity of personality taxonomies and scales used by different investigators resulted in a proliferation of overlapping trait constructs with unclear boundaries. Beginning in the late 1980s, however, the five-factor model of personality emerged as an integrative taxonomy for categorizing human personality traits (Digman, 1990). According to this framework, personality varies along five broad trait dimensions: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness/Intellect (Goldberg, 1990). Studies employing the five-factor model have consistently associated greater creative abilities with higher scores on the Openness/Intellect trait dimension, using both self- and peer-rated assessments of personality (McCrae, 1987). While other traits, including high Extraversion and low Agreeableness, have also been related to creative accomplishments, these effects tend to disappear when statistically controlling for Openness/Intellect levels (e.g., King et al., 1996).

As a personality dimension, Openness/Intellect describes the extent to which an individual is prone to aesthetic absorption and cognitive exploration (DeYoung et al., 2005). The broad trait domain is comprised of the two lower-order traits of 'Openness,' which reflects aesthetic sensitivity and imaginative tendencies, and 'Intellect,' which reflects intellectual engagement and interest in abstract ideas (DeYoung et al., 2007). A strong biological basis exists for Openness/Intellect, with approximately 61% of the variance in this trait being driven by genetic factors (Jang et al., 1996). Genetic variation in the mesocortical dopamine system, which supports cognitive exploration and flexibility, has been identified as contributing to an individual's standing on this trait dimension (DeYoung et al., 2011).

### Cognitive Processes Linking Openness/Intellect with Creativity

Openness/Intellect has been associated with a number of cognitive processes that appear to support its relationship with enhanced creativity, including decreased latent inhibition and superior divergent thinking, implicit learning, and working memory performance.

### Decreased Latent Inhibition

Individuals with higher levels of Openness/Intellect have been observed to display decreased latent inhibition (Peterson and Carson, 2000). Latent inhibition describes the cognitive process by which stimuli with no apparent motivational relevance are marked as insignificant and not worthy of further attention. Those with high levels of latent inhibition have difficulty learning new associations with previously encountered objects, relying instead upon existing memories derived from previous experience. Decreased latent inhibition, on the other hand, is associated with the ability to examine familiar objects and ideas as if they were being encountered for the first time. This ability to reexamine and transform familiar meanings into novel patterns is in turn associated with higher levels of creative achievement (Carson et al., 2003).

### Divergent Thinking

Openness/Intellect is also the best personality predictor of divergent thinking (McCrae, 1987; Silvia et al., 2009). Since Guilford's seminal work on the topic, divergent thinking has been considered to be one of the core cognitive processes that support creative idea generation because it involves the proliferation of creative possibilities. Tests of divergent thinking, such as asking people to think of as many unusual uses for a familiar object as they can (Torrance, 1966), are able to predict a variety of real-world creative outcomes (Runco, 1991). Openness/Intellect appears to support the generation of novel possibilities and cognitive associations.

### Implicit Learning

The subtrait of Openness has been associated with the facilitation of implicit pattern learning (Kaufman et al., 2010). Although we learn many things using conscious, or explicit, processing, we also learn a great deal implicitly, or without conscious awareness (Reber, 1989). Implicit learning has long been theorized to play an important role in the creative process. In particular, it has been argued that creative ideas begin as implicit or unconscious representations, which need to be explicitly articulated in a symbolic form during the creative process (Policastro, 1995). Unconscious processing has indeed been identified as an important aspect of creativity, due to its predominantly divergent and associative nature (Dijksterhuis and Meurs, 2006). Implicit learning appears to facilitate the generation of creative insights during the so-called 'incubation' phase of creative problem-solving, when no conscious efforts are being made toward a solution (Dorfman et al., 1996). Higher levels of Openness thus appear to support creativity through the facilitation of implicit learning and intuitive information processing (McCrae, 1993). This heightened ability to learn implicit patterns may also facilitate the use of analogical reasoning, which supports creative idea generation (Holyoak and Thagard, 1995).

### Working Memory

The subtrait of Intellect is the only personality trait that shows consistent relationships with standard measures of

intelligence, and it has been uniquely associated with brain activity in regions that support working memory (DeYoung et al., 2009). Working memory capacity describes the amount of information that can be simultaneously apprehended by an individual, and reflects one of the core components of intelligence. Working memory capacity varies tremendously from one person to the next, with some people being able to attend to and process a much larger amount of information (Engle et al., 1999). Being able to process more information simultaneously is likely to allow a broader range of creative idea combinations to emerge into consciousness (Campbell, 1960).

It should be pointed out that although an individual's Openness/Intellect scores can predict creative achievement beyond the effects of intelligence alone, there is still a significant positive relationship between intellectual ability and creative achievement. According to the threshold hypothesis, however, the relationship between intelligence and creativity tends to drop substantially once a critical level of intelligence is reached (an IQ of approximately 120; Batey and Furnham, 2006).

Collectively, the psychological processes associated with Openness/Intellect reflect the tendency to explore and revise perceptual patterns and cognitive models of the world (DeYoung, 2014). The heightened 'permeability of consciousness' associated with this personality dimension appears to play a critical role in facilitating the creative process (McCrae, 1994).

### Changes in Openness/Intellect over Time

Although Openness/Intellect has a large genetic component, it can also change over time as a result of experience. On average, scores on this trait dimension tend to rise sharply during adolescence and then begin to decline during old age (Roberts et al., 2006). It may be possible to preserve levels of Openness/Intellect into old age, however, using cognitive exercise. An intervention with older adults found that a 16-week inductive reasoning training program, which included weekly Sudoku and crossword puzzles, resulted in a significant increase in Openness/Intellect as compared to a wait-list control group (Jackson et al., 2012). Other life events, such as marriage, appear to hasten the age-related declines in this trait (Specht et al., 2011). Pharmacological interventions also appear to have an influence, with a single high dose of psilocybin producing spiritual experiences that led to increased Openness/Intellect scores being observed a full year later (MacLean et al., 2011).

It is also worth noting that modern personality theories recognize that there are substantial within-person fluctuations in personality characteristics from one situation to the next. What this suggests is that a relatively 'creative person' will not necessarily be creative at all times. A person's overall score on a standard personality test in fact represents his or her 'average' standing on a given trait dimension, which can vary depending upon the situational context (Fleeson and Gallagher, 2009). An individual's degree of Openness/Intellect, and thus his or her 'creative potential,' can therefore change substantially from one situation to another.

### Creativity and Psychopathology

Openness/Intellect is also relevant for understanding the fact that creativity has long been associated with psychopathology in the popular imagination, with a thin line separating madness from genius. Indeed, Hans Eysenck proposed that creativity is facilitated by subclinical levels of psychotic tendencies (Eysenck, 1993). In particular, he argued that although schizophrenia has often been regarded as a categorical disorder, it should more appropriately be regarded from a dimensional perspective as a spectrum of cognitive and emotional patterns that vary throughout the entire population. Recent work has confirmed that the positive symptoms of schizotypy are associated with extremely high levels of the personality trait of Openness (Edmundson et al., 2011; Piedmont et al., 2009). Excessive Openness (but not Intellect) appears to be related to an increased tendency toward magical beliefs and unusual perceptual experiences (DeYoung et al., 2012). While the ability to detect and develop novel sensory and ideational patterns is associated with enhanced creativity, it can also result in delusional thinking and a loosened grip on social reality. The extent to which Openness is associated with creativity rather than schizotypy may depend upon the individual's ability to integrate the ongoing flow of novel cognitive and sensory patterns within a coherent worldview. High levels of intelligence are in fact a protective factor against schizotypal diagnosis (David et al., 1997), suggesting that strong convergent thinking abilities are needed to 'reign in' the tendencies toward divergent thinking that are associated with very high levels of Openness. Traits related to schizotypy do not appear to predict creative success beyond the effects of Openness and Intelligence (Miller and Tal, 2007), suggesting that any of the creative benefits of schizotypy are mediated through the same processes as those associated with Openness/Intellect.

### Personality and Domain-Specific Creativity

Although Openness/Intellect is associated with creativity across a variety of domains, the importance of other personality traits appears to vary depending upon the specific domain of creative endeavor. A meta-analysis that examined the personality characteristics associated with scientific and artistic creativity found that higher levels of Openness/Intellect predicted creativity in both domains (Feist, 1998). Creative scientists, however, had substantially higher levels of Conscientiousness (the tendency to be organized and industrious), whereas creative artists displayed lower levels of Emotional Stability (the tendency to experience negative emotion). A recent study examining how scientific and artistic creativity map onto the lower-order personality traits within the five-factor model found that while higher levels of Openness were associated with creativity in artistic domains, higher levels of Intellect were associated with creativity in scientific domains (Kaufman, 2009).

An important point to take from the research on personality and creativity is that there are in fact many different varieties of 'creative personality.' While Openness/Intellect appears to be the strongest and most reliable trait predictor of creativity across different domains, creative success may also require other traits depending upon the specific field (Baer, 1998). Creative individuals are thus likely to be united by their high

levels of Openness/Intellect, but may vary broadly in terms of their other personality characteristics.

**See also:** Big Five Factor Model, Theory and Structure; Five Factor Model of Personality, Assessment of; Five Factor Model of Personality, Personality Disorder; Intelligence: Central Conceptions and Psychometric Models; Intelligence: Historical and Conceptual Perspectives; Openness to Experience; Personality, Biological Models of; Personality, Cognitive Models of; Personality, Trait Models of; Personality: Historical and Conceptual Perspectives; Schizophrenia.

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