

INTRODUCTION TO CREATIVITY

What does it mean to be creative? Some might say thinking outside the box; others might argue it's having a good imagination, and still others might suggest creativity is a synergy that can be tapped through brainstorming. We take an empirical, psychological approach to this question. One of the first things we want to do is to define what we believe creativity is.

We are starting off with a definition for creativity because so many studies on creativity do *not* define the construct. Plucker, Beghetto, and Dow (2004) selected 90 different articles that either appeared in the two top creativity journals or articles in a different peer-reviewed journal with the word “creativity” in the title. Of these papers, only 38 percent explicitly defined what creativity was. For the purpose of this book, we will use the definition proposed by Plucker et al. (2004):

“Creativity is the interaction among aptitude, process, and environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context” (p. 90).

Through this book, we may refer to a creative person, the creative process, a creative environment, or a creative product. We will discuss in this book how a product is determined to be new and/or useful and appropriate, who are the best judges, and what ratings may stand the test of time. We will also discuss ways of identifying creative people, either for guidance or admission to a program or school.

DON'T FORGET

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As we will discuss, creativity is a key component of human cognition that is related yet distinct from the construct of intelligence. A school psychologist who is presenting a complete perspective on an individual's abilities may wish to include creativity as part of this assessment.

However, it is often difficult to find or to decipher creativity assessments. They may seem like “pop” psychology, they may lack the standard psychometric information that is present in IQ tests, and they may require resources that a typical school psychologist may not possess (for example, access to five expert poets). We are writing this book to gather all as many resources as possible together so that you can make your own judgment about the best creativity assessments. There is no one perfect test for creativity, and we won't even always agree on the best possible measures. But we believe that after reading this book, you will be able to select a method for assessing creativity that best fits whatever situations, groups of people, and programs you may encounter.

A BRIEF OVERVIEW OF THE STUDY OF CREATIVITY

One way of organizing creativity research is the “Four P” model, which distinguishes the creative person, process, product, and press (i.e., environment) (Rhodes, 1961). We will use this model as a way of briefly highlighting theories and research that will be helpful background material in reading this book. We want to emphasize that this overview is just a highlight; there are numerous books devoted to the study of creativity. For recent books that give more detailed information about these ideas, we would recommend Piirto (2004), Runco (2006), Sawyer (2006), Simonton (2004), Sternberg (2003), and Weisberg (2006), as well

as edited volumes such as Dorfman, Locher, and Martindale (2006), Kaufman and Baer (2005, 2006), Kaufman and Sternberg (2006), Sternberg (1999a), and Sternberg, Grigorenko, and Singer (2004). We emphasize that we have only mentioned a handful out of many possible books, with a focus on recent works.

The Creative Person

Studies of the creative person may look at individual characteristics of the creator. These areas may include personality, motivation, intelligence, thinking styles, emotional intelligence, or knowledge (e.g., Baer & Kaufman, 2005; Sternberg & Lubart, 1995). Sternberg and Lubart (1995), in their Investment Theory, proposed that creative thinkers are like good investors—they buy low and sell high, or invest time and energy in currently unpopular ideas that have great potential for solving different types of problems. Investors do so in the world of finance, whereas creative people use ideas as currency.

Another theory that focuses on the creative person (and, as we will see later, also deals with creative environments) is Amabile's (1983, 1996) componential model of creativity. This theory proposed that three variables were needed for creativity to occur: domain-relevant skills, creativity-relevant skills, and task motivation. Domain-relevant skills include knowledge, technical skills, and specialized talents that individuals might possess that are important in particular domains, but not in others. If you're going to be a creative doctor, according to this theory, you would need to know medicine, but that medical knowledge might be of little use to someone who wanted to be a creative composer of music. Creativity-relevant skills are personal factors that are associated with creativity more generally, across many or all domains, such as tolerance for ambiguity, self-discipline, and a willingness to take appropriate risks. If one focuses on the individual person as possessor of such skills, the emphasis is on the person, but if one's focus is on the

underlying cognitive skill, then the emphasis is on the process itself rather than the person possessing it.

The third component in Amabile's model singles out one's motivation toward the task at hand. Intrinsic motivation—being driven by enjoyment of a task—is more associated with creativity than extrinsic motivation, or being driven by external rewards such as money or praise. A preference or need for a particular kind of motivation can be either domain-specific or domain-general. Someone might find learning and thinking about many different kinds of ideas very intrinsically motivating and need no outside reward to undertake such wide-ranging studies, or, on the other hand, someone might lack intrinsic motivation to do these things and might need extrinsic rewards to do any such studying. Either way, this would represent a very general intrinsic or extrinsic orientation toward motivation. But it is also common for someone to have a great deal of intrinsic motivation when it comes to some things, such as writing poetry, but it might require a great deal of extrinsic motivation in the form of rewards or anticipated evaluation

DON'T FORGET

Intrinsic motivation—doing something because it is interesting or inherently rewarding to do—is more associated with creativity than extrinsic motivation—doing something either to earn an external reward (such as money or praise) or because one is concerned about how one's work will be evaluated. A preference for a particular kind of motivation can be either domain-specific or domain-general.

to get that same person to think about doing something like a science project. It is also true that sometimes motivation can be thought of as something an individual possesses, whereas other times it's more the other way around: the environment (press) "possesses" the person, making either intrinsic or extrinsic motivation much more salient, at least temporarily.

Many of the methods described in the chapters of this book focus on the assessment

of the creativity of individuals. For example, there are various methods of self-assessment and assessment by others that emphasize how creative a person is, either generally or in particular domains. (See Rapid Reference 1.1.)

Rapid Reference 1.1

The Four P's of Creativity

Person
Process
Press (Environment)
Product

The Creative Process

The creative process is the actual experience of being creative. One popular conception is the idea of flow, or optimal experience, which refers to the sensations and feelings that come when an individual is intensely engaged in an activity (Csikszentmihalyi, 1996). One could experience flow in anything from rock climbing to playing the piano. An individual must feel like his or her abilities are a match for the potential challenges of the situation to enter the flow state. Early work on flow asked participants to wear electronic paging devices. The study participants were then beeped at random times (during the day, not at three in the morning) and asked to fill out forms that asked what they were doing and how they were feeling (Graef, Csikszentmihalyi, & Gianino, 1983; Larson & Csikszentmihalyi, 1983; Prescott, Csikszentmihalyi, & Graef, 1981). Later work revolved around interviews with acclaimed people, many known for being creative (Csikszentmihalyi, 1996; Perry, 1999).

Another way of considering the creative process is found in

DON'T FORGET

Flow is the experience of being intensely engaged in an activity. Someone could experience flow from a creative activity, such as playing the guitar or writing a computer program, or from a physical activity, such as rock climbing.

the Geneplore Model (Finke, Ward, & Smith, 1996). This framework has two phases—generative and exploratory. Generation, the “novel” part, is generating many different ideas in which a mental representation is formed of a possible creative solution. In the generative phase someone constructs a preinventive structure, or a mental representation of a possible creative solution. Exploration refers to evaluating these possible options and choosing the best one (or ones). There may be several cycles before a creative work is produced.

Many assessments focus on creativity-relevant skills or processes, such as the Torrance Tests of Creative Thinking and other measures of divergent thinking. The ability to find similarities among seemingly disparate words, as measured by the Remote Associates Test, is another example of a creativity assessment technique that focuses on processes. As with assessments of persons, assessments of skills or processes can look at creativity-relevant thinking skills more generally, or they can instead focus on skills that may be important only in particular domains. The most widely used divergent-thinking tests, for example, are the Torrance Tests of Creative Thinking, which assess divergent-thinking skill generally via two different versions, one verbal and the other figural.

The Creative Press

The third “P,” press, can refer to either home or work environment. Amabile (1996) has done many studies that consider the importance for creativity of intrinsic motivation, or being driven by a passion for the activity. People who enjoy the job at hand will generally also be more creative. Amabile and Gryskiewicz (1989) identify eight aspects of the work environment that stimulate creativity: adequate freedom, challenging work, appropriate resources, a supportive supervisor, diverse and communicative coworkers, recognition, a sense of cooperation, and an organization that supports creativity. They also list four aspects that restrain creativity: time pressure, too much evaluation, an

emphasis on keeping the status quo, and too much organizational politics. Studies of the creative press (or environment) are often designed to determine how the context in which one works or studies may be modified to encourage people to be more creative.

Environment doesn't have to mean a work environment; other research has examined home background and childhood and how these early experiences are related to creativity. Sulloway (1996) found that the first-born child was more likely to achieve power and privilege, but later-born children were more likely to be open to experience and revolutionary. This trend extends across many domains; if you examine how prominent scientists reacted when Darwin proposed his classic (and controversial) theory of natural selection, 83 percent of the people who supported the theory were later-born children, and only 17 percent were first-born (Sulloway, 1996). This birth-order effect, although statistically significant, is actually rather small, as is the parallel effect in the area of intelligence (first-borns tend to have slightly higher IQs than later-born children). These are interesting findings (and ones that have generated lots of publicity for such studies, which unlike most psychological studies are frequently reported in the popular press), but the sizes of these effects are generally so small that they are of no practical use as methods of assessing either the creativity or intelligence of individuals.

Other kinds of life events can also influence later creative productivity. Simonton (1994) reviews many studies that both demonstrate and empirically show, for example, that losing a parent before age 10 is much more common in eminent people (as opposed to non-eminent). Other disasters that are more likely to befall the well known include bouts of poverty, physical illness, and mental illness (e.g., Ludwig, 1995). How-

CAUTION

Although first-borns and latter-borns differ on some traits relevant to creativity, the differences, while statistically significant, are so small that they are of no practical use in assessing either creativity or intelligence.

ever, it is important to note that such findings should be considered carefully; it is easy for such stories of childhood trauma to be inflated for dramatic purposes (such as in a biography).

One theory that focuses on the relationship of a creator to the environment is the Systems Model proposed by Csikszentmihalyi (1996). This model considers creativity to be a byproduct of the domain (i.e., mathematics), the field (the gatekeepers, such as editors and critics), and the person. In this model, these three elements work interactively.

Creativity assessment does not often focus on the environment when assessing individuals. Evaluations of the creativity-inducing or creativity-inhibiting aspects of environments can be very important in designing school and working settings, but rarely are such environmental evaluations part of the assessment of individual creativity, except perhaps retrospectively in the biographies of famous creators.

The Creative Product

The creative product—the things people make, the ideas they express, the responses they give—will be the focus of much of this book; most creativity assessments (not all) tend to focus on a tangible product (such as a poem, a drawing, or responses to an open-ended question or problem).

In some cases, as in the method called the Consensual Assessment Technique (CAT), the focus is exclusively on the product itself. Expert judges assign creativity ratings to actual products (such as a poem or a collage). These experts tend to agree with each other on what is creative (which is why the term “consensual” is appropriate). In other cases, such as the tests of divergent thinking mentioned earlier, the product (the responses to an open-ended question that a test-taker gives) are the raw material used to infer the thinking processes and skills used by that person. One difference between product-focused assessments, such as the CAT, and process-focused assessments, such as the TTCT, is that

products are typically domain-specific; in other words, a product might be a poem, a musical composition, or a mathematical proof. The question of domain specificity versus domain generality is one of the major unresolved issues in creativity research (Are the traits, knowledge, skills, habits, or whatever else leads to creativity things that influence creativity in *all* areas, or only in limited areas?). In fact, two of this book's authors took opposing views on this issue in the only point-counterpoint pair of articles ever published in the *Creativity Research Journal* (Baer, 1998; Plucker, 1998). As with many such disputes, the truth may lie somewhere in between, as in the hierarchical APT Model of creativity, which posits both general factors that impact creativity in all areas and several levels of domain-specific factors that impact creative performance in increasingly narrow ranges of activities (Baer & Kaufman, 2005; Kaufman & Baer, 2004, 2005).

One theory of creative products is the Propulsion Model (Sternberg, Kaufman, & Pretz, 2005), which outlines eight types of possible creative contributions based on their relationship to a field. The first four contributions all stay within the framework of an existing paradigm; one example is forward incrementation, in which a product moves the field forward in a direction just a little bit (such as a modification to an existing scientific theory). The final four types of creative contributions represent attempts to reject and replace the current paradigm. One example is reinitiation, in which the creator tries to move the field to a new (as-yet-unreached) starting point and then progress from there; an example might be James Joyce's *Ulysses*. (See Rapid Reference 1.2.)

Some assessment techniques focus on one particular part of the creativity puzzle—the

Rapid Reference 1.2

Propulsion Model

The propulsion model of creativity considers the impact of a creative contribution to its field. This model is typically used for eminent creativity.

person, the process, the product, or the press, as noted above. Other methods consider more than one aspect of creativity, as also noted. Some approaches to assessing creativity are also clearly underwritten by particular theories of creativity, such as the divergent-production model that underlies all divergent-thinking tests. Other approaches, such as the Consensual Assessment Technique, are not tied to particular theoretical models of how creativity works. In the chapters that follow, we will point out particular theoretical commitments of some of the assessment techniques we describe when such connections are important.

ADDING CREATIVITY AS AN ASSESSMENT TOOL

We believe that creativity is a natural candidate to supplement traditional measures of ability and achievement. A growing trend among admission committees and educators is a focus on non-cognitive constructs, such as emotional intelligence, motivation, and creativity, to supplement current measures (Kyllonen, Walters, & Kaufman, 2002). Creativity is a prime candidate to be such a supplement. One reason (as we will discuss in Chapter Six) is that creativity is related to intelligence and academic ability, yet not so closely related as to not account for additional variance. Another promising reason is the reduction in gender and ethnicity differences. Finally, many facets of education have highlighted a specific interest in the measurement of creativity.

Reform efforts in school standards, for example, are showing a renewed interest in literature and creative writing (*Standards for the English/Language Arts*, 1996). More than 50 colleges have decided to offer creative writing majors in recent years (bringing the total to more than 300); this increase comes at a time when the number of English majors as a whole is decreasing (Bartlett, 2002). A survey of distinguished graduate faculty members found that creativity was considered to be one of the most important competencies deemed essential for

success in graduate school (Enright & Gitomer, 1989). Creativity was one of six non-cognitive areas that Mayer (2001) recommended as being valuable candidates for new measures, and creativity was one of five qualities singled out in a study of potential additional measures to the GRE (Walpole, Burton, Kanyi, & Jackenthal, 2001).

The fact that creativity is not assessed on current measures of ability and achievement is often cited by testing opponents as one reason why these tests are not valid or significant. Paul Houston, executive director of the American Association of School Administrators, has said, “Children today need critical thinking skills, creativity, perseverance, and integrity—qualities not measured on a standardized test” (Assessment Reform Network, 2002). In a similar vein, former U.S. Secretary of Labor Robert Reich wrote, “Many new jobs depend on creativity—on out-of-the-box thinking, originality, and flair . . . Standardized tests can’t measure these sorts of things” (Reich, 2001). Whether standardized tests can or cannot measure creativity, it is possible to measure creativity on an individual basis—and this measurement can supplement traditional measures and increase fairness in assessment.

The next chapter will focus on divergent thinking assessment, perhaps the most common form of creativity measurement. Chapter three will cover the Consensual Assessment Technique in greater detail. Chapters four and five will cover assessments by others (teachers, peers, parents) and self, respectively. Chapter six will discuss the relationship between creativity and intelligence, and chapter seven will take a look forward.

**TEST YOURSELF****1. Which of the following is NOT part of the “Four P” model?**

- (a) Process
- (b) Product
- (c) Possibility
- (d) Person

2. Which of the following is most commonly associated with creativity?

- (a) Intrinsic motivation
- (b) Extrinsic motivation
- (c) Anticipation of rewards
- (d) Anticipation of evaluation

3. The two phases of the Geneplore Model are:

- (a) buying low and selling high
- (b) intelligence and achievement
- (c) generation and exploration
- (d) intrinsic and extrinsic motivation

4. The Torrance Tests of Creative Thinking assess:

- (a) task motivation
- (b) domain-specific knowledge
- (c) artistic ability
- (d) divergent thinking

5. Levels of intrinsic motivation tend to:

- (a) be independent of the environments in which one works
- (b) vary within the same individual across different domains
- (c) be consistent within the same individual across different domains
- (d) influence intelligence more than creativity

6. “Flow” refers to:

- (a) the speed at which one works
- (b) consistency among items in a divergent-thinking test
- (c) similarities between intelligence and creativity test scores
- (d) the experience of being intensely engaged in an activity

Answers: 1. c; 2. a; 3. c; 4. d; 5. b; 6. d