Creating What You Need: Cognitive Prerequisites for Creativity in a Gifted Population

Donalee Markus, Ph.D.

Recognizable and concrete, the results of creative endeavors—from a computer program to a poem, from a sculpture to a landscape design, from a mathematical formula to a delicious variation on a cake recipe—seem to most of us wonderful and inevitable. As Jerome Bruner put it, this identifiable product "surprises, yet is familiar." (Bruner, 641) Likewise most people are sure they can identify a creative person, whether it be by the product of their endeavors (a sculpture) or a variety of personal outward attributes (the rakish beret on a sculptor's head). Unfortunately, the specific factors of what goes into the act of creation before the end product remains an abstraction to many, despite the way it has been studied. Big questions still loom. Is creativity something someone either does or doesn't have? Is creativity genetic? Learned? Is is a psychological response to a particular environment? Or a combination of unique factors? In what proportion are these factors mixed? But most importantly perhaps, can creativity be impacted and to what degree? And , in dealing with a gifted adult who has yet to live up to his or her creative potential, can one cultivate, those factors that go into helping creativity bloom? By what possible methods?

Outside of academia, common views of creativity contain a certain passivity the writer, or the thinker, or artist in thoughtful relaxed repose waiting for the spark of an idea like lightening to come: ideas are more received than worked out. It is a limiting view, for creativity is anything but inactive. As Bruner notes "the production of creative surprise demands a masterful control of the medium. It is not the product of spontaneous seizure." (Bruner, Jolly, & Sylva, 1976, p. 642)

Ignoring the active component of creativity, Edison's 95% perspiration versus 5% inspiration, can trap people in stereotypes, leading even those adults with many of the recognizable components of creativity—intelligence, passion for a particular domain—into failing to pursue new ideas and other areas of interest that could influence thinking. If they manifest one of Howard Gardner's intelligences, they miss the opportunity to let another intelligence "cross-fertilize" within their mind, losing opportunities for the bisociative act Arthur Koestler found so important for the rise of new ideas within the minds of Pythagoras, Gutenberg, and Einstein. (Koestler, Jolly, & Sylva, 1976, p. 645) For a poet's interest in art can give rise to poems that not only describe the painting of Mark Rothko but attempt to give the feel of his work. Or, as with the designer Jhane Barnes, an interest in mathematics and fractals can influence fabric design once one recognizes that mathematical component of woven material. (Hochswender, 137)

Another common way creativity is thwarted arises when people become paralyzed by the idea that they must create with a "capital C," as it has come to be noted. So everyday opportunities to practice "little c" creativity are skipped over. (Goleman, 27-28)

Fear of failure also plagues older creative individuals who get stuck in ruts, and who, from habit, stick to the safe and the tried and true. Yet risk as it has been noted over and over again, is

immensely important to creativity. In "Uncommon Genius," Denise Shekerjian's study of 40 MacArthur Award winners, she notes that all are "magnificent risk-takers." (Shekerjian, xxii)

To understand how to overcome fear and how to encourage the bisociative acts important to creativity, we need to look at the prerequisite cognitive skills that are necessary in creativity. In simplest terms, creativity is an innovative way of thinking. Teresa Amabile speaks of it as a kind of mind stew involving three main ingredients—intrinsic motivation, domain skills, and creative thinking and working skills. (Amabile, 46) Among adults, it is this last criteria that can be quite successfully exercised, and, along with practice in the skill of risk-taking and rebounding from failure, can impact individuals by providing opportunities to create what they specifically need to reach their potential.

Creative thinking and working skills involve many steps such as identifying the whole and its parts and their interrelationships; reorganizing information; identifying discrete relationships and specific criteria; searching systematically; hypothetical thought; logical inference; and process orientation.

The exercises created for *Designs For Strong Minds* are based on the work of Reuven Feuerstein and brought to a level appropriate for intelligent adults. They offer mediated learning experiences and content-free complexity which lead to exploration in the search for the exercises' solutions. The broad variety of these game-like exercises create different opportunities to challenge lacking cognitive prerequisites. They create challenge and disequilibrium so the individual is placed in situations, where, to complete an exercise, risks must be taken and ordinary conceptual frameworks—the usual way a person approaches a problem—need to be put aside so other cognitive strategies are strengthened. To do the problems requires flexibility, so that trait is given play. Mediation helps to pinpoint where the person's thinking has broken down in completing a task.

Designs for Strong Minds is a series of content-free, paper and pencil exercises that use an array of dots, complex figures, geometric designs and patterns to help individuals become aware of their thought process so that they can reorganize and experiment with alternate approaches to problem solving. These hierarchially organized exercises challenge the participant to see new relationships because they focus on the process of problem solving rather than on the answer or product. The individual is presented with a variety of exercises in each set of instruments that address a specific cognitive skill. Presently there are 18 instruments, each contains thirty—six or more pages of opportunities to rehearse new skills and make them habitual.

Many of the problems require rotating information. In solving some, for instance, a person needs to look closely for the relationship between dots. The figures that can be constructed from the dots rotate and overlap. Ability to isolate clues and to look for details is called for, which especially helps those who are impulsive. (see Figure 1) Some of the analytical perception exercises necessitate looking at the way distinct pieces interrelate with each other. Practice in seeing the whole as well as discrete parts is necessary in order to complete the exercise. (see Figure 2) The exercises involving categories help the individuals extract salient features from disorganized data and organize it. (see Figure 3)

FIGURE 1.

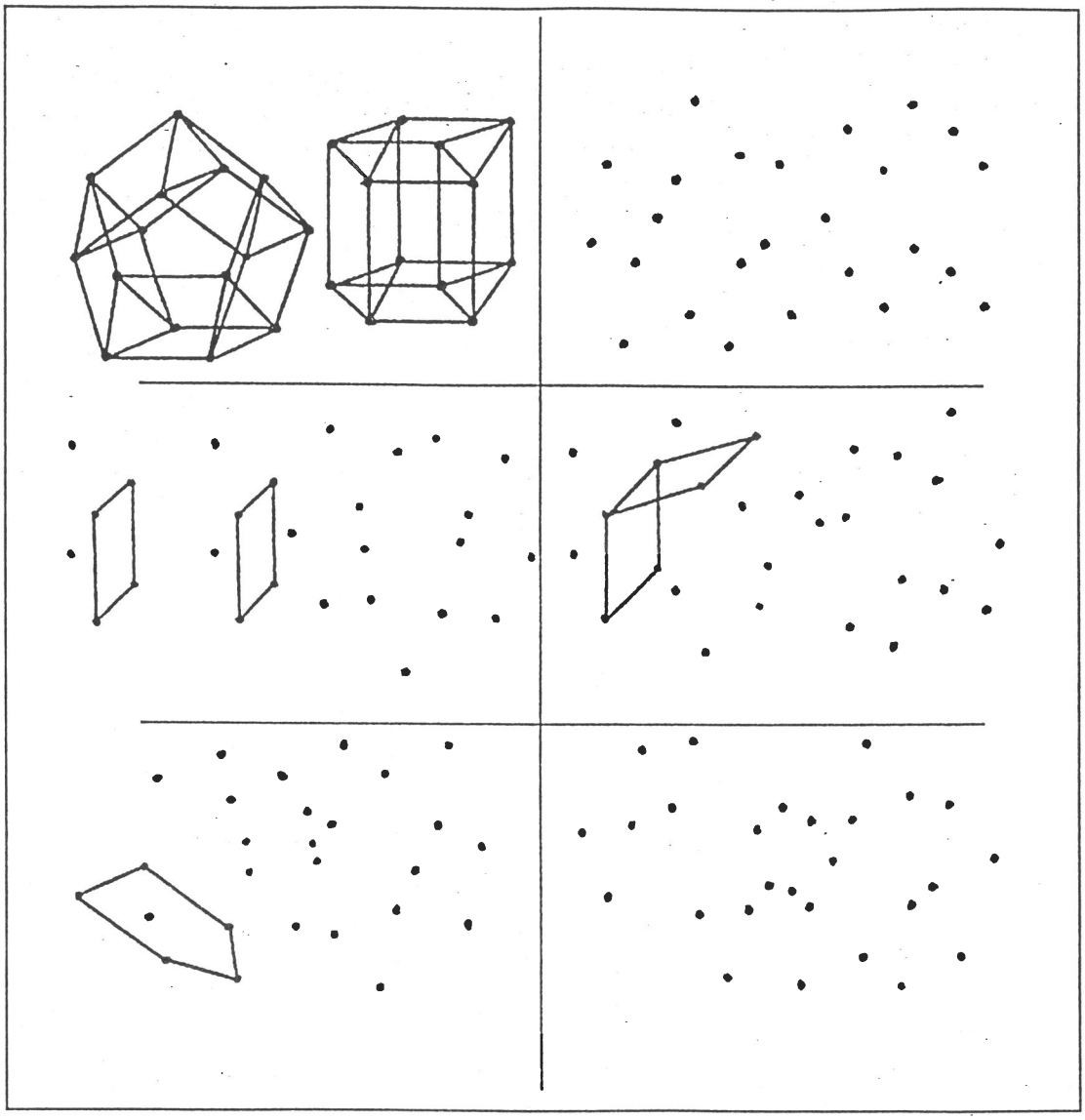
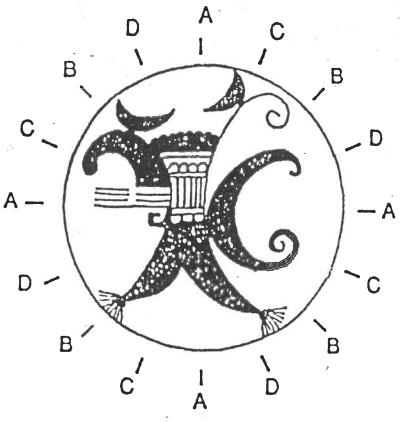


FIGURE 2.

ANALYTICAL PERCEPTION

The figure at the top of this page is broken into many different cross-sections. Choose the cross-sections that create a whole. Use one section from line A, B, C, and D. There are four sets. Place your answers in the space provided.



A ____ ____ ____ ____
B ____ ____ ____ ____
C ____ ____ ____ ____
D ____ ____ ____ ____

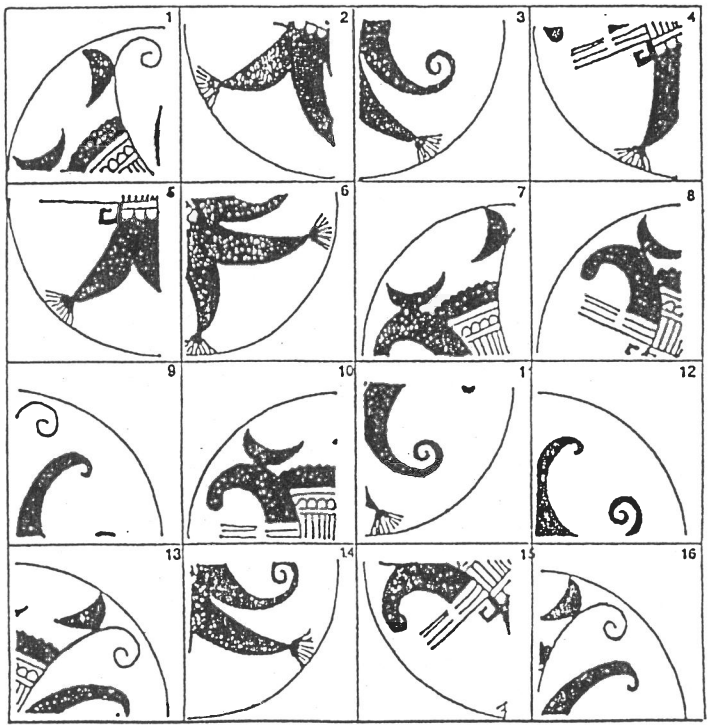
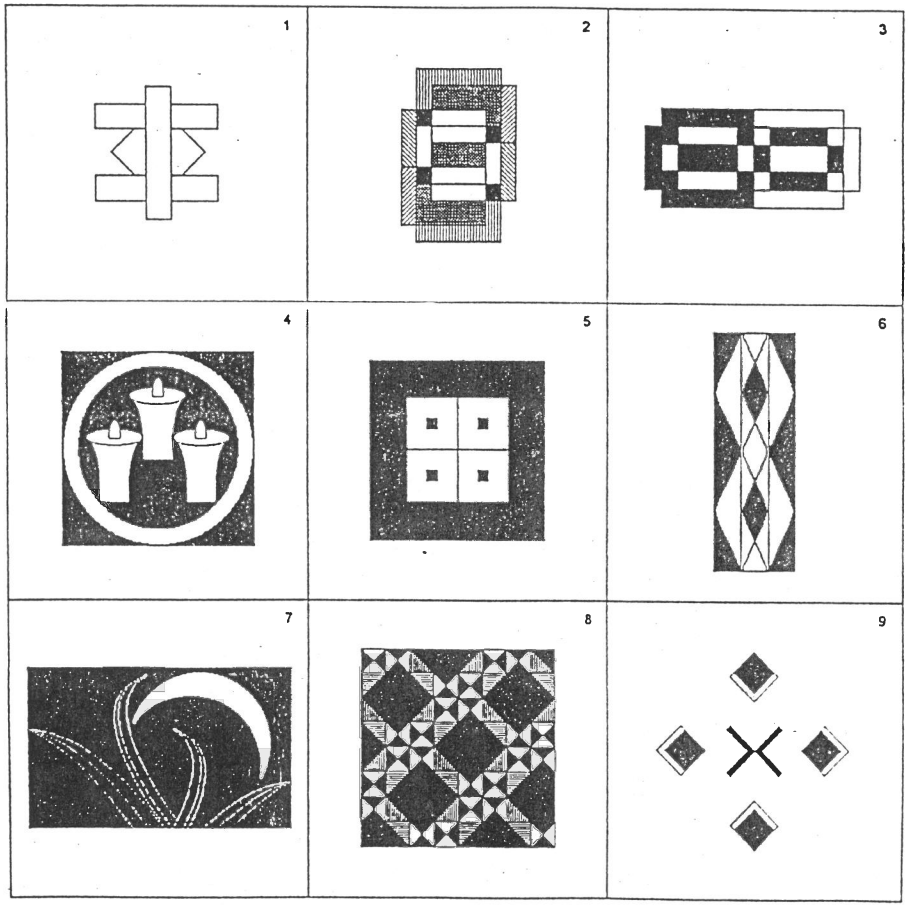


FIGURE 3.

The design on the right has a property shared by only 4 of the 9 designs below.

Objective: Determine which 4 designs reflect the property found in the design on the right. And name the property.



The work also dovetails with what is becoming known about the neurological abilities of the brain. Science is finding that even in adults neuro-pathways can be strengthened and created by actively using areas of the brain, in particular areas that are not normally used. Lists of activities that studies have shown stimulate the brain include doing puzzles and playing games. And the more neuro-pathways adults have functioning the more they can accomplish. (Schrof, 1994)

Because the Designs For Strong Minds exercises are content-free (there are no work risks or judgmental opinions at stake) and because they are game-like, they offer people a perfect opportunity to enter "flow," the state of mind Mihaly Csikszentmihalyi finds so important because of the joy it brings to our endeavors. Csikszentmihalyi (1993) says that flow more usually occurs "in a task that stretches our physical or mental abilities" (p.xii-xiv). He identifies games among the activities conducive to the concentration flow requires. Games also offer the type of control, action, predictability, and mastery that creates the antithesis of waiting for inspirational lightening. (Coleman, 1976)

Another important aspect of the exercises is that they offer practice in spatial skills and in dealing with images. The importance of "mentalese," to language, for example, is becoming more and more recognized as Steven Pinker (1994) notes in his work. Artists and writers, even Einstein, have long talked of the process of thinking imagistically. Contemporary geometricians and mathematicians also note the way thinking in terms of other dimensions and rotating images, looking at problems through other perspectives, helps them in their work. (Cole, 1993)

Henry David Thoreau suggested that individuals should "Dwell as near as possible to the channel in which your life flows." One way in which gifted adults can make good on that advice is to take an active part in creating what they need to place themselves near that channel. Exercises that help with problems of risk and with cognitive deficiencies can impact their endeavors.

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