Investing in Creativity

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In this commentary, we first sketch out our own approach to creativity (Sternberg & Lubart, 1991b, 1992) and then compare it to the position of Eysenck as stated in his target article.

**Buy Low, Sell High**

We call our notion the *investment theory of creativity*. The basic idea is that, when making any kind of investment, including creative investment, people should "buy low and sell high." In other words, the greatest creative contributions can generally be made in areas or with ideas that at a given time are undervalued. Perhaps people in general have not yet realized the importance of certain ideas, and hence there is a potential for making significant advances. The more in favor an idea is, the less potential there is for it to appreciate in value, because the idea is already highly valued. Ideas are like securities in the sense that they can be more or less favored, and, when they are less favored but nevertheless have the potential for growth, they are of the most value with respect to creative endeavor (buy low). When people have accepted the creative idea, it comes time to move on to the next one (sell high).

In the securities markets, everyone knows that they should buy low and sell high, but few people do (Malkiel, 1985). Similarly, we argue, few people do so in the market of ideas. Why not? We believe that, in order to do so, one needs a confluence of six resources—namely, aspects of intelligence, knowledge, thinking styles, personality, motivation, and environment. These resources combine interactively to yield creative performance.

**Six Resources for Creativity**

**Intelligence**

Two main aspects of intelligence are relevant to creativity—the ability to redefine problems and the ability to think insightfully, with the latter ability often used in service of the former.

Major creative innovations often involve seeing an old problem in a new way. For example, Einstein redefined the field of physics by proposing the theory of relativity, much as Piaget redefined the field of cognitive development through his genetic-epistemological model. Three insight skills can help redefine problems (Sternberg, 1985): (a) selective encoding, used in recognizing what information in a problem is key for solving the problem or for redefining it; (b) selective combination, used to put the pieces of a puzzle together when it is not at all obvious how they can be interlocked; and (c) selective comparison, used to recognize the relevance of old information for the solution of a new problem, when the relevance of this information is not obvious.

**Knowledge**

In order to make a creative contribution to a field of knowledge, one must, of course, have knowledge of that field. Otherwise, one risks rediscovering what is already known. Without knowledge of the field, it is also difficult for an individual to assess the problems in the field and to judge which are important. But, knowledge can be a double-edged sword, simply because with knowledge often comes entrenchment, or tunnel-vision, as it is sometimes called. One can lose the ability to see things from a new perspective. For example, Frensch and Sternberg (1989) showed that, when the deep structure of a task (in this case, the game of bridge) is changed, experts are hurt more than novices in their ability to play the game. Thus, the acquisition of expertise can actually interfere with rather than facilitate creativity if one loses the flexibility to see problems in new ways.

**Thinking Styles**

Thinking styles are the ways in which people choose to use or exploit their intelligence as well as their knowledge. Thus, thinking styles concern not abilities but how these abilities and the knowledge acquired through them are used in day-to-day interactions with the environment. We draw on the theory of mental self-government (Sternberg, 1988a) in our explication of styles.

Creative people are likely to be those with a legislative proclivity. A legislative individual is someone who enjoys formulating problems and creating new systems of rules and new ways of seeing things. Such a person is in contrast to an individual with an executive style: someone who likes implementing the systems, rules, and tasks of others. Both differ from an individual with
a judicial style: someone who enjoys evaluating people, things, and rules. Thus, the creative person not only has the ability to see things in new ways but likes to do so. The creative person is also likely to have a global—not just a local—perspective on problems. Seeing the forest despite all the trees is the mark of creative endeavor.

**Personality**

Creative people seem to share certain personality attributes. Although one can probably be creative in the short term without these attributes, long-term creativity requires most of them.

The first of the attributes is tolerance of ambiguity (Barron & Harrington, 1981). In most creative endeavors, there is a period of time during which an individual is groping—trying to figure out what the pieces of the puzzle are, how to put them together, how to relate them to what is already known. During this period, an individual is likely to feel anxiety over nonclosure on a solution. A creative person is willing to tolerate this anxiety long enough to reach an optimal or near-optimal solution.

The second of the attributes is willingness to surmount obstacles and to persevere (Golann, 1963). Confronting obstacles is almost a certainty in creative endeavors because most such endeavors threaten some kind of established and entrenched interest. Unless a person learns to face and conquer adversity, it will be difficult for the person to make creative contributions over the long term.

The third attribute is willingness to grow (McCrae, 1987). When a person has a creative idea and is able to have others accept it, the person may be highly rewarded for the idea. It then becomes difficult to move on to still other ideas, because the rewards are so great. But creative people not only buy low, but sell high—they move on when they have won acceptance of their idea, rather than pursuing it to the point of clearly diminishing returns.

The fourth attribute is sensible risk-taking (McClelland, 1956). As is true in finance, to gain a major return, one needs to take risks. Highly creative ideas are rarely safe, and a person who is not willing to fall flat on his or her face every once in a while is unlikely to make major creative contributions.

The fifth and last attribute is belief in oneself (Barron & Harrington, 1981; MacKinnon, 1965). Because they go against vested interests, creative people often find themselves at points where no one seems to believe in their ideas, except for themselves. If, however, they do not believe in themselves, then almost certainly their ideas will go nowhere, because there will be no one to push them.

**Motivation**

Like Amabile (1983), we believe that intrinsic motivation is one key to creative contributions. We also emphasize the importance of the motivation being task focused, as opposed to being focused largely or exclusively on the goals to which accomplishment of the task may lead. People have been found to do their best work when they do work they really love.

**Environment**

Last, people will be most creative if they are placed in an environment that fosters, accepts, and actively rewards creative ideation. Many environments, especially those of schools, do not do so (Stemberg & Lubart, 1991a). Rather, creative ideas are seen as not fitting in with the way things are done and are often suppressed, whether subtly or not. The environment also needs to be compatible with the kind of creativity one has to offer (Lubart, 1990). There is no absolute standard for what constitutes creative work, and what might be perceived as creative in one environment might be perceived as uncreative in another. One therefore needs to find an environment that values what one has to offer.

**Comparison of the Investment View to Eysenck’s View**

We found Eysenck’s target article to be interesting, stimulating, and thoughtful. Moreover, there are notable points of similarity between our point of view and Eysenck’s. First, like Eysenck, we believe in the importance of intelligence for creativity. Indeed, we see intelligence and creativity as overlapping, although certainly not identical. Second, we further agree with the importance of knowledge and of environment, both of which are prominent in Figure 2 of the target article. Third, we emphasize the importance of relevance—in our case, through the insight operations of selective encoding and comparison. Fourth, we agree with Eysenck regarding the importance of personality in creativity, and there is even some overlap in the aspects of personality we consider with those that he considers. Eysenck heavily emphasizes personality in his article, and we believe that this emphasis is a good corrective to the overemphasis on the cognitive that one often finds (see essays in Sternberg, 1988b). Fifth, Eysenck seems to give credence to the idea of a confluence of attributes that together lead to creativity.

At the same time, there are some notable differences between our view and Eysenck’s. First, having read Eysenck’s article, we are still not clear on exactly what his theory is. The subtitle of the article is “Suggestions
for a Theory," and perhaps Eysenck is being true to the title and is putting forth only suggestions, as opposed to a full-blown theory. Yet, the title of the section, "A Theory of Creativity," seems to contradict this notion. The figure cited in this section, Figure 4, does not seem to represent a theory of creativity, and indeed the section itself discusses creativity only indirectly—concentrating instead on psychoticism, schizophrenia, and psychosis. In addition, the writing in the article is often extremely loose. For example, the section, "The Causal Chain From DNA to Creativity," really says nothing of substance about any causal chain from DNA to creativity. In order to evaluate and ultimately test a theory, the theory needs to be clearly stated, and Eysenck’s is not.

Second, we believe that the emphasis on psychoticism and also on the abnormal personality has unfortunate implications. Eysenck makes clear the distinction between psychoticism and psychosis. However, the term psychoticism carries unwanted connotations with almost everyone except adherents to Eysenck’s theory of personality, and perhaps with some of them as well. There is a long history of attempts to link creativity with mental infirmities. Of course, there is room for diversity in theory and research. But, an unfortunate outcome of this emphasis has been an association in the mind of the public—and sometimes even of the scientific community—between creativity and mental abnormality. Creativity, we believe, is already discouraged in the interest of achieving conformity. Do we wish to add to that the notion that creativity should be discouraged in the interest of retaining mental health?

We therefore prefer to view the relation between creativity and positive aspects of personality—aspects that an individual would be well-advised to develop within himself or herself. For example, perseverance in the face of obstacles and moderate risk-taking are attributes that educators can help foster in children. It is important to note that any personality aspects in an extreme form, including those we have discussed for creativity, can impair mental health. Therefore, we focus on elevated levels of certain personality attributes for creativity rather than on pathologically high levels of these same attributes.

Third, we regret what we view as Eysenck’s fairly uncritical acceptance of trivial psychometric measures of creativity as a trait. Eysenck distinguishes between the trait on the one hand and creative achievements on the other. The problem with Eysenck’s distinction is that the trait as he conceives it involves fluency and statistical rarity more than creativity. Most psychometric assessments measure behaviors that are so far removed from real creativity in a discipline that we run the risk of selecting people as “high creatives” because of a potential for trivial rather than important creative accomplishments.

Fourth, we believe that the trait notion itself is misguided as applied to creativity. As Eysenck seems to recognize in some places, the potential for creative work depends on many things. As soon as one speaks of a trait, one centers creativity in the person and conveys the notion of a fixed, static attribute rather than a Person × Situation interaction. A dynamic attribute such as creativity is not well characterized in the same ways as the traits in Eysenck’s or anyone else’s model of personality are.

Last, Eysenck makes some comments at the end of the target article about the importance of genetic linkage, without really supporting the arguments in the least. We do not deny some genetic component for creativity, but we believe that this idea should not be introduced, as it is, in the form of a few throw-away lines by a person who believes that most psychological attributes have a genetic explanation. It is important to remember that even attributes with a partially genetic basis can be developed and that creativity might well be one of those attributes. In our own theory, the attributes of creativity are susceptible to development, and a brief mention of genetics should not discourage readers from trying to develop creativity in their students, their children, and themselves.

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References
Let me say at the outset that I think Eysenck has done an excellent job of doing what he set out to do. He attempted to relate creativity to personality in a much more definitive way than has been done previously and to use the known correlates of personality to suggest a theory of creativity that would explain many of the phenomena associated with this concept.

Focus for Creativity Theory

Eysenck has had a distinguished career as a personality psychologist in the Institute of Psychiatry of the University of London. There are several ways one can approach the development of a theory of creativity. It has become traditional to consider creativity from four different viewpoints: person, process, product, and press (the environment, climate, etc.). They are sometimes referred to as the four Ps (Rhodes, 1961). Eysenck, being who he is, has chosen to begin the development of a theory of creativity with the person or personality view. This view seems to have served him well in psychiatry.

I have had a career in educational psychology. Just as it was natural and useful for Eysenck to choose to start with personality as a focus, it was natural and useful for me to begin with a process focus. An educational psychologist is concerned with the learning, thinking, teaching, problem-solving, creative, development, and other processes—even the personality processes.

The Process Focus in Tradition

I contend that Spearman (1930) had a process focus. He viewed creative thinking basically as the process of seeing or creating relations, with both conscious and subconscious processes operating. According to one of his principles, when two or more percepts or ideas are given, a person may perceive them to be in various relations (near, far, the cause of, the result of, a part of, etc.). Another principle held that, when any item and a relation to it are cognized, then the mind can generate in itself another item so related.

Ribot (1906) and others after him have emphasized the capacity of thinking by analogy as the essential, fundamental element of creative thinking. He maintained that the process of analogizing gives rise to the most unforeseen and novel combinations, but he warned that it produces in equal measure absurd combinations and very original inventions. Recognizing the nonrational aspects of creative thinking, several investigators have called attention to the exercise of discrimination or choice as a part of the creative process.

The reader will recall that Eysenck repeatedly calls attention to relevance as a criterion. Kubie (1958) conceptualized the creative thinking process as taking place in the preconscious system. The preconscious is able to scan experiences and memories, to condense, to join opposites, and to find relations at speeds impossible in the conscious system. The resulting intuitions, however, are not very precise and are subject to the primary-process type of thinking.