

The Creative Individual: A New Portrait in Giftedness

*Our task—
to develop "tomorrow minds"
rather than "yesterday minds."*

A MAJOR problem facing educators is to speed up the application in education of research findings from pertinent fields. Basic research results with implications for education should be communicated so that these findings can be tested in the educational setting and incorporated if relevant and effective.¹ In this paper I will attempt to transmit some of the research findings on creativity to date.

My research interests have been in the relatively unsolved area of seeking the creative more than in the traditional area of seeking the gifted. The word "gifted," as typically used, is closely tied to the current intelligence tests, but quite different tests are usually being used in a search for the creative. As I describe this approach to others, they usually expand their meaning of the word "gifted" to include the creative. Nonetheless, some points should be made by contrasting intelligence, as measured by the traditional type of IQ tests, with creative talent.

¹In a current cooperative research project with the U.S. Office of Education, we are searching for relevant research findings from psychology and other fields that have implications for education.

The traditional intelligence tests cover only a very few of the fifty or more dimensions or characteristics of the mind discovered to date. Consequently, there may be several types of intellectually gifted other than the IQ type, even though the IQ type may be closely tied to current academic activities and to the grades that measure success in the academic world.

Several Types of Gifted

In focusing on other areas of giftedness, one should be forewarned that there may be several different types of creativity. In addition, there are probably several other types of gifted, relatively separate from the IQ type and the creative types. Other types may be found in each of the areas of planning, communication, and evaluation or decision making activities. A similar paper could be written, at least tentatively, on each of these other types of gifted. Likewise, in certain of these areas, such as the communication abilities area, where we uncovered a sizable number of different dimensions in each sub-area of reading, writing, speaking, and listening, there

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may also be several different types of giftedness.

In transmitting new research findings on the intellect, difficulties arise because 40 or more new intellectual characteristics have been discovered which have been excluded from the so-called intelligence tests. The current tendency is to classify these new characteristics downward into a lesser category called "special abilities," even though they really parallel those that were earlier incorporated into the so-called intelligence tests. The human characteristics that psychologists have been able to measure first are not necessarily the only important characteristics. Some of the remaining characteristics which had been postponed for later measurement may often be extremely important characteristics. We had just not known any way in which to measure them earlier.

To me it is highly inconsistent to conceive of the mind as being represented by a single score or even by only a handful of scores or dimensions that are present in our current intelligence tests. The brain which underlies the mind is far, far too complex to hope that all of its intellectual activities can be represented by only a single score or by only a handful of dimensions. It is an insult to the brain and human mind to allow this oversimplified viewpoint to survive.

Emerging evidence from several sources suggests that many important high level abilities are not only missing in our searches for talent but are also being largely ignored in the education and development of our youth. Let us be flexible and toy for a moment with our present situation. If a creativity index had been established first in our schools, we might now be putting forth the same type of arguments to make room to add

an intelligence type of index if it had been largely ignored to date.

Results to date indicate that creative talent is not measured well by the use of IQ tests. In our three Utah conference reports on creativity there are several indications that creativity scores and IQ scores are, at most, only lowly related. The nature of traditional intelligence tests does not directly involve the ability to create new ideas or new things. The abilities needed in sensing problems, in being flexible, and in producing new and original ideas tend to be *unrelated* or to have only low relations with the types of tests entering into current measures of intelligence.

Perhaps one reason why our society does not give much moral and tangible support to education is that persons leave the academic world and find, to some degree at least, that intellectual characteristics in which they are highly trained are not called for in the world of work as much as they expected. Contrarily, other intellectual characteristics in which they have had little training may be crucial characteristics in their part of the world of work.

Some indirect evidence that key people in school systems are not necessarily seeking for or encouraging creativity is found in the report by Frank Jex at the 1959 Utah conference. A group of high school science teachers were tested with a "creativity" battery when they enrolled for a year of graduate study. Their creativity scores were correlated with their principals' or supervisors' ratings of their over-all teaching ability, as judged during the previous year. The correlation was $-.38$. This result suggests that teachers with certain creativity characteristics may be looked upon with some disfavor in certain educational settings. A study is

needed to determine whether those teachers develop creativity traits in their students more than other teachers do.

Utah Creativity Conferences

My remarks on creative characteristics will be based largely on research reported in the three (1955, 1957 and 1959) University of Utah research conferences on the Identification of Creative Scientific Talent. In the three conferences, 37 different nationally-selected participants presented a total of nearly 50 reports, covering various sub-areas such as criteria of creativity, predictors of creativity, education and training of creativity, and working environments that affect creativity. NSF supported these conferences.

The main research approach to date has been to study creativity in full bloom in adults with the hope of tracing these characteristics back to their earlier budding stage. Many leads are available from this approach that could be tried on children. An alternate approach, which may be at least equally promising, is to study creativity "in its more natural state" in children before it may be curtailed, distorted, and even blotted out by various features in our world.

Ghiselin suggests that the measure of the creativeness of a product of the mind should be *the extent to which it restructures our universe of understanding*. Lacklen indicates that the Space Agency judges the creativeness of the contributions of scientists by determining *the extent of the area of science which each contribution underlies*, so that the more basic a contribution, the wider its effects. In a study of creativity on the job, Sprecher was interested in both the novelty and the value of the ideas and other products produced by scientists. In

our studies of scientists on the job, after obtaining judgments of products, judgments of processes, and over-all ratings of creativity, we found at least five separate types of contributions which, to some degree, could be called creative.

In research on the identification of creative talent, a broad approach has been emphasized, somewhat in contrast to the identification of the so-called gifted by means of a single (IQ) score. A broad coverage of intellectual, motivational, biographical, sociometric, and other personality characteristics will now be presented to illustrate the nature of creative talent and of current attempts to identify it.

Intellectual Traits in Creativity

From the research results of many workers, Guilford has evolved and listed the following intellectual characteristics as most likely to be valid measures of creative talent: originality, redefinition, adaptive flexibility, spontaneous flexibility, fluency of associations, fluency of expressions, fluency of ideas, fluency of words, elaboration, and probably some evaluation factors.

Speaking more broadly, some components of memory, cognition, evaluation, and especially convergent production and divergent production are involved in creative work. The divergent production area, largely overlooked to date in psychological measurement, is probably the most important in creative talent since it includes production of ideas in quantity and in quality, originality, flexibility, sensitivities, and redefinition abilities. Pictorial fluency may be an example of a characteristic needed more in creative work in art than in science.

Ability to sense problems is another intellectual characteristic usually included in creativity. It may also lead to motivational features. The capacity to be puzzled may be a very important characteristic. A rejection of superficial explanations and an ability to *know when you don't know* may be important in making original contributions.

Our verbal revision test is at least analogous to the manipulation, restructuring, and reworking of ideas found both in the earlier and later stages of the creative process. It is probably also related to the ability and tendency to strive for more comprehensive answers or solutions or products, another feature found in studies of creativity. Unfortunately, too few occasions in our academic programs require such strivings for higher quality or for more original and workable products.

Two response-set factors, which we have found, may measure characteristics functioning in creativity. The first one is called "*broadly diffused attention*." This type of attention has often been a part of the description of the crucial moments preceding the insight stage of the creative process. The second response-set factor is described as a "*resistance to idea reduction*." The opposite pole of willingness to reduce ideas may be valuable in creating broad new generalizations.

Other tests or test ideas that may have validity include the abilities to form and test hunches (hypotheses), to foresee consequences, to infer causes, to evaluate revisions in a product, and to be able to toss one's ideas into the arena of ideas. Our finding of a verbal originality factor leads us to hope for an analogous measure of *nonverbal originality*. Another hunch, expressed by Shockley, is that we should test how many ideas each student can manipulate at one time.

In summary, there are many relatively new and separate intellectual components in creativity. I have a hunch that many of the components of curiosity and of motivation are also intellectual in nature.

Motivational and Personality Traits

In this motivation area the great need is for good measuring instruments that will demonstrate the widespread conviction that motivation is a strong component of creativity. From our communication abilities research we feel that the ability to sense ambiguities, plus effective questioning ability, are a part of curiosity. Bloom has indicated that science students who truly become involved in research work and in the research role during graduate training, tend to become productive researchers afterwards. If the creative are to be found somewhere among the productive, then in science our problem will be reduced by finding those students who truly become involved in research problems during their academic career. Analogous situations entailing student involvement could also be sought in nonscientific fields.

Other motivational characteristics suggested are intellectual persistence, liking to think, liking to manipulate and toy with ideas, need for recognition for achievement, need for variety, need for autonomy, preference for complex order and for challenges therein, tolerance of ambiguity, resistance to closing up and crystallizing things prematurely coupled with a strong need for ultimate closure, need for mastery of a problem, insatiability for intellectual ordering, and a need to improve upon currently accepted systems. High energy with vast output through disciplined work habits is usually found.

McClelland suggests that the creative person may be willing to take a calculated risk larger (though not unrealistically large) than others and that his judgment of the chance of success is actually greater than the average judgment from other persons. The creative individual presumably does not want to deal in a sheer gamble situation but rather to engage only where his own efforts may make a difference in the odds.

Younger persons with creative talent, according to Getzels' findings, have a much greater interest in unconventional careers than do their fellow students. They sense that their views are not the predominant ones of what success in adult life is. They are also more willing to be nonconforming and to be in the small minority.

From personality evidence to date, creative persons are more devoted to autonomy, more self sufficient, more independent in judgment (contrary to group agreement, if needed, to be accurate), more open to the irrational in themselves, more stable, more capable of taking greater risks in the hope for greater gains, more feminine in interests and characteristics (especially in awareness of one's impulses), more dominant and self assertive, more complex as a person, more self accepting, more resourceful and adventurous, more radical (Bohemian), more controlling of their own behavior by self concept, and possibly more emotionally sensitive, and more introverted but bold.

Nearly every time that even a brief biographical inventory has been tried on creative scientists, it has been found to have promising validity in the initial sample studied. Our research team is currently studying samples of scientists locally, in the Air Force, and in the Space Agency with this biographical approach.

This approach gets at work habits, attitudes, interests, values, family and academic history, and several personality characteristics.

Some Final Comments

Clues for spotting creative talent may be obtained by watching the reactions of others around a person. If some persons in a group appear excited, disturbed, or threatened, *perhaps* there is a creative person around whose ideas and work are being at least vaguely sensed as threatening the present scheme of things. Group behaviors which try to reduce this threat, include a developing of *sanctions against* the person and an over-organizing and building of other controls into their world, as found by Torrance. On this point the creative persons may most appreciate the necessity of a few very good rules in an organization. Contrarily, they may be most sensitive to unnecessary organizational controls or other rules that are built in by administrators or other people. The creatives may be those who try to work their way out of such needless restrictions.

As one Utah conference participant reflected upon those *rare* persons whose work had truly reshaped the world, he observed that nearly all of these individuals had eventually done their work outside of an existing organization. They were neither supervisor nor supervised. Organizations that are effective either in transmitting or implementing ideas should not automatically be assumed to be the types of organizations best suited for creative work.

Another major concern in creativity is with restrictions, inhibitions and deterrents within a person as contrasted with freedom within him. These restrictions, often self-imposed or built in through the

influence of others, can thus reduce the freedom and potentialities of a person and may even block his efforts that would otherwise lead to creative performance.

Until shown otherwise, I believe that quite different psychological processes are involved when we learn existing knowledge and systems than when we produce new ideas, new knowledge, and new systems. Education may teach people to recite the past and repeat past performances more often than to prepare them to develop new things or even to be ready for new developments by others. Too often, strong fears rather than positive abilities emerge when opportunities arise to take a new step forward, to pioneer at the frontiers. The sheer amount of education is probably not a good basis for identifying those ready to take a new step.

We should identify and develop people who can learn the past without worshipping it, who can mentally toy with and manipulate man's knowledge and ideas and products of the past, who can use the past as a springboard for future developments, and who can find and use new leads to improve upon the past. In

other words, maybe our task is to identify and develop more minds that are "tomorrow minds" than "yesterday minds."

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