Intelligence, Wisdom, and Creativity: Three is Better Than One

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Theory, assessment, and instruction in the field of human abilities have tended to emphasize intelligence at the expense of wisdom and creativity. Were these three abilities indistinguishable, such an emphasis would be understandable and acceptable. But a review of the literature as well as data I have recently collected suggest that the three abilities are distinguishable, and that there are important differences among them. Moreover, present measurements and instruction even of intelligence are to a much narrower operationalization of the construct than would be ideal. It is argued that educational psychologists and others need to give more serious attention to all three of these constructs and their interrelationships.

What do we mean when we say that “Einstein was intelligent,” or that “Solomon was wise,” or that “da Vinci was creative?” Or, to take some more mundane examples, what does it mean to say that “John may be intelligent but he just isn’t creative,” or “If only the president’s wisdom matched his intelligence, we might have averted this mess,” or “My grandfather, a self-educated man, might not have done well on intelligence tests, but he had more wisdom than all Harvard professors combined.”

In each of these statements, some assertion is made about a person’s intellectual abilities. Clearly, the intention is to make a different statement about each of these people. Indeed, we know that although Einstein, Solomon, and da Vinci are all renowned for their extraordinary mental feats, the nature of these feats differs in every case, and so do the abilities that gave rise to them. But what are intelligence, wisdom, and creativity, and how do they differ? Furthermore, do wisdom and creativity even differ from intelligence in a way that makes it possible reliably to distinguish them from intelligence?

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I argue here that wisdom and creativity do differ in kind from intelligence, and that our preoccupation with the nature, measurement, and training of intelligence to the exclusion of wisdom and creativity is a mistake. There are several reasons why it is important to study wisdom and creativity as well as intelligence, and to distinguish each of these constructs from the other.

First, although our society is preoccupied with the measurement of intelligence to predict future success, major contributions to virtually all fields of endeavor seem to derive primarily from creative enterprise. During the school years, it may well be the children with high levels of intelligence that stand out. The tasks required in school and the values of the society place a premium on rapid learning time, good reasoning, competent problem solving, and many of the other skills that contribute to what we refer to as intelligence. But in the remaining three-quarters of peoples' lives, it appears to be creativity rather than intelligence that distinguishes the exceptional performers from the more mundane. If one examines the contributions of the truly distinguished, and even of those who do not reach the ranks of Mozart, Picasso, Hemingway, and so on, one finds that what sets these individuals apart from the others is their creativity, not merely their intelligence.

An interesting example of the difference between intelligence and creativity is provided by the recent film, *Amadeus*. This film portrays the competition between Mozart and Salieri for recognition of their musical accomplishments. Both men are obviously intelligent. Had one given each of them a standard intelligence test suitable for the times, it is unlikely that the test scores would much have distinguished their relative levels of musical expertise. But Mozart was far more creative than Salieri, and in the long run, this difference has been easily recognized. The difference can be seen in any other field of endeavor as well. In my own field of psychology, for example, there are any number of psychologists who are universally considered to be bright in the sense of having high levels of intelligence, but for some of them, one often hears the question asked, “How can someone be so intelligent and yet so uncreative?” Indeed, there are a few cases in which the most outstanding feature of the individual seems to be his IQ or Scholastic Aptitude Test scores. High test scores seem to be these people's last distinguished accomplishment!

This pattern of abilities is dramatically illustrated in Ruth Feldman's (1982) book, *Whatever Happened to the Quiz Kids?* The Quiz Kids, as children, impressed the world with their unusual feats of learning and recall. It seemed hard to believe that young children could be so smart. Indeed, Feldman reports that all have very high IQs. Yet, in reading their biographies, one cannot help but be struck by how much less creative they were than they were intelligent. Certainly, their creative performances in their later lives have nowhere near matched their intelligent performances in their earlier lives.
Second, it becomes clear merely by looking at the historical record that in many walks of life, intelligence without wisdom is not enough, and indeed, can be a dangerous thing. Nowhere is this more evident than in the field of government. No one would question the intelligence of most of our recent presidents. For example, take one president from each of the major political parties, John Kennedy and Richard Nixon. These men showed no lack of intelligence, in the traditional sense. Yet, each made certain decisions that from almost any point of view were unwise. In the case of Kennedy, the decision to invade the Bay of Pigs was certainly an unwise one, resulting in one of the major fiascoes of the Kennedy administration. In the case of Nixon, the decision to engage in progressive cover-up of the Watergate burglary resulted in a fiasco that led to Nixon's ultimate resignation. Throughout the history of our country and others, it is easy to point to unwise decisions made by intelligent men. Most recently, the decision of Ronald Reagan to visit the cemetery at Bitberg, where Nazi SS officers are buried, was considered an unwise one by many people acquainted with it.

One need not look to national government to observe the difference between intelligence and wisdom. Almost all of us know at least one person who, though not exceptionally intelligent in any traditional sense, shows the wisdom that traditional notions of intelligence simply do not encompass. Even modern, broader conceptions of intelligence, including my own (Sternberg, 1985a), do not seem fully to encompass our notions of what it is that makes a person wise, and what distinguishes this person from one who is merely intelligent.

In sum, then, our understanding of human mental capabilities is going to be limited so long as we remain preoccupied with intelligence to the exclusion of wisdom and creativity. Certainly, the time has come to understand all three of these psychological dimensions and the ways in which they interrelate. But just how should we go about doing this, and how does what we need to do differ from what has already been done?

Intelligence, wisdom, and creativity have each been studied in their own right, but not in ways that make them easy to compare. Most often, they have been studied by different investigators using different methods of research to study different populations of people. As a result, it has been difficult to ascertain what bearing a study of one of these attributes has had on the study of another. The amount of theory and research on each of these attributes also differs widely. There are innumerable studies of intelligence, many studies of creativity, but relatively few studies of wisdom. Might it be possible to study intelligence, wisdom, and creativity in a way that would help illuminate their interrelationship? In a series of investigations, I attempted to do just that.

The studies I describe seek to discover people's conceptions, or implicit theories, of the nature and interrelationship of intelligence, wisdom, and cre-
ativity (Sternberg, 1985b). Such studies expand on the previous work of Sternberg, Conway, Ketron, and Bernstein (1981) on intelligence, academic intelligence, and social intelligence, of Ford (1986) on social intelligence, and of Yussen and Kane (1985) on intellectual development. The studies address questions such as (a) How do we conceive of intelligence, wisdom, and creativity? (b) Are these conceptions the same regardless of field of endeavor? (c) How are these conceptions interrelated? (d) Are these conceptions related to scores on "objective" tests? (e) Do people use these conceptions in their everyday evaluations of themselves and others?

THE INTERRELATIONS OF INTELLIGENCE, WISDOM, AND CREATIVITY

I began by sending questionnaires to professors of art, business, philosophy, and physics. The questionnaire asked these individuals to list behaviors that were characteristic of people who were highly intelligent, wise, or creative in their respective fields of endeavor. A comparable questionnaire was given to laypersons—people from the New Haven area who answered an advertisement in a local newspaper. The number of individuals responding averaged 25 per group. The number of behaviors listed averaged 131 for each of the three attributes of intelligence, wisdom, and creativity, so that the listing procedure generated quite a large number as well as variety of behaviors for each attribute.

A new questionnaire was then sent out to different people within the same subject population. These "new" people were asked to rate how characteristic each of the set of behaviors was of an ideally intelligent, wise, or creative individual in their respective groups. The scale used ranged from extremely uncharacteristic (1) to extremely characteristic (9). The average number of subjects per group was 65, and all subjects provided all three ratings (for intelligence, wisdom, and creativity), although in different orders. For example, some of the people would provide ratings for intelligence first, some would provide intelligence ratings second, and some would provide intelligence ratings last. The ratings obtained in each of the groups proved to be highly reliable, meaning that there was substantial agreement among the members of the various groups as to what constituted intelligent, wise, or creative behavior.

The various ratings were intercorrelated in order to determine how related people in each of the groups thought intelligence, wisdom, and creativity to be. Three findings of particular interest emerged from these intercorrelations.

First, I found that, in general, intelligence and wisdom are perceived as most closely related (median $r = .68$), intelligence and creativity as next most
closely related (median $r = .55$), and wisdom and creativity as least related (median $r = .27$). The only departure from this pattern was for philosophers, for whom intelligence and creativity were more highly related ($r = .56$) than were intelligence and wisdom ($r = .42$).

Second, all of the interrelationships were positive, meaning that higher amounts of intelligence were associated with higher amounts of wisdom, higher amounts of wisdom with higher amounts of creativity, and higher amounts of intelligence with higher amounts of creativity. There was one exception to this trend, however: The business professors saw greater amounts of wisdom as associated with lesser amounts of creativity ($r = -.24$). In other words, in business, the wiser people are seen as less creative, and vice versa.

Third, there were some interesting differences in magnitudes of interrelations across the groups. Members of all groups saw intelligence and wisdom as fairly highly related. But for professors in the fields of art and physics, as well as for laypersons, the relations were very substantial ($rs = .78, .68, .75$, respectively). For business professors, the relation was a bit weaker ($r = .51$), and for professors of philosophy, the relation was still weaker ($r = .42$). The art, philosophy, and physics professors all saw intelligence and creativity as highly related ($rs = .55, .56, .64$, respectively), but the business professors and laypersons saw them as only weakly related ($rs = .29, .33$, respectively). Moreover, the relation between creativity and wisdom reached moderate levels for the art professors and philosophy professors ($rs = .48, .37$, respectively) but was low for the other groups, and as mentioned earlier was actually negative for the business group.

These patterns of correlations tell us something about the interrelations of intelligence, wisdom, and creativity, but they do not tell us much about the attributes themselves. A second study was designed to say something about the internal structure of each attribute.

THE NATURE OF INTELLIGENCE, WISDOM, AND CREATIVITY

In the second study, forty college students were asked to sort 3 sets of 40 behaviors into as many or as few piles as they wished on the basis of which behaviors are "likely to be found together" in a person. These behaviors were from the listings for intelligence, wisdom, and creativity, respectively, from the first study. Only the top forty behaviors (i.e., behaviors rated by layperson as highly characteristic of ideally intelligent, wise, or creative individuals) were used in each sorting task. Different subjects did the sortings for intelligence, wisdom, and creativity in different orders.

A method of data analysis called nonmetric multidimensional scaling was
used to analyze the sortings. This method enables one to determine the latent structure in a set of sorting and rating data. Latent structures were determined for each of the three attributes. The scalings provided excellent fits, statistically, to the data.

The solution for intelligence yielded six basic elements in people's conceptions of intelligence (Stress, Formula 1 = .15, $R^2 = .82$). These basic elements were the following:

1. **Practical problem-solving ability** (e.g., tends to see attainable goals and accomplish them; has the ability to change directions and use another procedure; is able to apply knowledge to particular problems).
2. **Verbal ability** (e.g., can converse on almost any topic; has demonstrated a good vocabulary; has a good command of language).
3. **Intellectual balance and integration** (e.g., has the ability to recognize similarities and differences; listens to all sides of an issue; is able to grasp abstract ideas and focus attention on those ideas).
4. **Goal orientation and attainment** (e.g., tends to obtain and use information for specific purposes; possesses ability for high achievement; is motivated by goals).
5. **Contextual intelligence** (e.g., learns and remembers and gains information from past mistakes and successes; has the ability to understand and interpret his or her environment; knows what's going on in the world).
6. **Fluent thought** (e.g., has a thorough grasp of mathematics and has good spatial ability; has a high IQ level; thinks quickly).

The multidimensional scaling for wisdom also revealed six basic elements in people's conceptions of wisdom (Stress, Formula 1 = .08, $R^2 = .93$):

1. **Reasoning ability** (e.g., has the unique ability to look at a problem or situation and solve it; has good problem-solving ability; has a logical mind).
2. **Sagacity** (e.g., considers advice; understands people through dealing with a variety of people; feels he or she can always learn from other people; is fair).
3. **Learning from ideas and environment** (e.g., attaches importance to ideas; is perceptive; learns from other people's mistakes).
4. **Judgment** (e.g., acts within own physical and intellectual limitations; is sensible; has good judgment at all times; thinks before acting or making decisions).
5. **Expeditious use of information** (e.g., is experienced; seeks out information, especially details; learns, remembers, and gains information from past mistakes or successes).
6. **Perspicacity** (e.g., can offer solutions that are on the side of right and
truth; is able to see through things—"read between the lines"; has the ability to understand and interpret his or her environment).

The multidimensional scaling for creativity also yielded six major elements (Stress, Formula 1 = .14, $R^2 = .87$):

1. **Lack of conventionality** (e.g., makes up rules as he or she goes along; has a free spirit; is unorthodox).
2. **Integration and intellectuality** (e.g., makes connections and distinctions between ideas and things; has the ability to recognize similarities and differences; is able to put old information, theories, etc., together in a new way).
3. **Aesthetic taste and imagination** (e.g., has an appreciation of art, music, etc.; can write, draw, compose music; has good taste).
4. **Decisional skill and flexibility** (e.g., follows his or her gut feelings in making decisions after weighing the pros and cons; has the ability to change directions and use another procedure).
5. **Perspicacity** (e.g., questions societal norms, truisms, assumptions; is willing to take a stand).
6. **Drive for accomplishment and recognition** (e.g., is motivated by goals; likes to be complimented on his or her work; is energetic).

This study provided a good sense of just what people mean by the terms: intelligence, wisdom, and creativity. But do the ways in which people use these terms correspond at all to the kinds of things that have been and can be measured by conventional kinds of tests? In other words, do people's conceptions of intelligence, wisdom, and creativity correspond in any way to scientific notions as operationalized in psychometric tests? The next study was designed to answer this question.

**PEOPLE'S CONCEPTIONS AS A BASIS FOR MEASURING INTELLIGENCE, WISDOM, AND CREATIVITY**

Can people's conceptions of intelligence, wisdom, and creativity serve as a basis for the measurement of these attributes, and, if so, do these measurements relate to more traditional measures? A third study addressed this question. Thirty New Haven area adults were administered four psychometric tests: two measuring cognitive intelligence as it is traditionally defined and two of them measuring social intelligence. Psychometric tests of creativity were not employed because of the view of the investigator, as well as of many others in the field, that such tests capture, at best, only the most trivial as-
pects of creativity. In addition, participants in the study were asked to fill out all three of the questionnaires from the first study—those for intelligence, wisdom, and creativity—as they pertained to themselves (rather than as they pertained to an ideal individual). The same participants filled out the three questionnaires in varied order. Only those questionnaire items were retained that had been shown in the first study to provide accurate measurement of each of the constructs. Subjects rated their answers on a scale ranging from behavior that was extremely uncharacteristic of the individual (1) to behavior that was extremely characteristic (9). Participants were given as long as they needed to complete the questionnaires.

Questionnaires were scored by correlating each subject's response pattern on each questionnaire (intelligence, wisdom, and creativity) with the "prototype" questionnaire obtained from the laypersons in the first study. The prototype contained the set of ratings for the hypothetical ideal individual, with respect to either intelligence, wisdom, or creativity. Thus, the correlation measured the degree of resemblance between the actual individual in this experiment and the hypothetical ideal individual emerging from the first study. A higher correlation indicated greater correspondence to the hypothetical ideal, whereas a lower correlation indicated a lesser correspondence to the ideal. A negative correlation would indicate an inverse relationship, for example, that subjects who described themselves behaviorally as more intelligent than the typical individual actually did worse than the typical individual on the standard measures of intelligence.

The desired pattern of results was that scores on the intelligence behavioral questionnaire would correlate substantially higher with scores on the tests of cognitive intelligence than with scores on the test of social intelligence, whereas scores on the wisdom behavioral questionnaire would correlate substantially higher with scores on the tests of social intelligence than they would with scores on the tests of cognitive intelligence. Motivating this set of predictions was the notion that wisdom comes close to being a construct of intelligence as applied to social-practical settings, whereas intelligence as measured by standard psychometric tests comes closer to being an attribute that is more strictly cognitive. The predicted pattern of results was verified. The correlations of the intelligence behavioral questionnaire with the cognitive measures (median \( r = .51 \)) were higher than with the social measures (median \( r = .18 \)), whereas the correlations of the wisdom behavioral questionnaire were higher with the social measures (median \( r = .42 \)) than with the cognitive measures (median \( r = -.08 \)). Moreover, these differences were both statistically significant and substantial. The creativity behavioral questionnaire did not correlate with either kind of test (median \( r = .10 \) for cognitive measures, .06 for social measures), as would be expected if creativity is indeed a construct that is distinct from either intelligence, on the one hand, or wisdom, on the other.
These results show that people's conceptions of intelligence, wisdom, and creativity are not merely frivolous or scientifically vacuous. Rather, they correspond fairly well to the kinds of patterns of scores that would be expected on more conventional psychometric measures. Obviously, one would not wish to test for people's intelligence, wisdom, and creativity solely on the basis of questionnaire measures that involve self-descriptions. Nevertheless, the results suggest that such measures have at least some external validity, and that the implicit theories of people that underlie the measures relate to more conventional notions, although I believe that the implicit theories go well beyond these conventional notions in their breadth and possibly their depth.

The results of this study showed that people use their implicit theories of intelligence, wisdom, and creativity in evaluating their own levels of each of these attributes. Do they, however, use these same implicit theories in evaluating the attributes of others? In other words, when given a behavioral description of someone, will people bring to bear their implicit theories in evaluating the described person's level of intelligence, wisdom, and creativity? The fourth study addressed this question.

EVALUATING THE INTELLIGENCE, WISDOM, AND CREATIVITY OF OTHERS

In the fourth and last of the series of studies, forty individuals, all of whom were New Haven area adults, were presented with 54 simulated letters of recommendation. Two typical letters would be:

GERALD
He possesses ability for high achievement.
He has the ability to grasp complex situations.
He has good problem-solving ability.
He attaches importance to well-presented ideas.

DORIS
She is motivated by goals.
She questions societal norms, truisms, and assumptions.
She thinks quickly.
She is not materialistic.
She is totally absorbed in study.

Descriptions were generated to vary predicted levels of intelligence, wisdom, and creativity. Each description was either four, five, or six sentences in length, and was paired equally often with names of males and with names of females. A given subject, however, saw a given description only once—either with a male name or with a female name. The subject's task was to rate the intelligence, wisdom, and creativity of each of the described individuals.
Ratings of the individuals were made on a 9-point scale ranging from *not at all intelligent, wise, or creative* (1) to *extremely intelligent, wise, or creative* (9). Order of ratings was varied across subjects in the study.

It was possible to obtain predicted ratings of intelligence, wisdom, and creativity by summing up the ratings of laypersons from the first study on each attribute for each subject, and then dividing by the number of attributes given for the hypothetical individual. Averages rather than sums of ratings were used because the number of behaviors was not the same for each of the descriptions.

Suppose, for example, that five behaviors were given for Susan. The predicted intelligence rating would be the average of the characteristic ratings for intelligence in the first study (plus an additive constant). The predicted wisdom rating would be the mean of the ratings for wisdom in the first study (plus an additive constant); and the same held true for predicted creativity. Thus, the closer the description of the hypothetical individual represents the ideal of the first study on each of the three attributes of intelligence, wisdom, and creativity, the higher the rating that the hypothetical individual receives in the present study.

Average ratings of the hypothetical individuals were highest for intelligence (5.8), intermediate for wisdom (5.3), and lowest for creativity (5.0). The ratings were highly reliable (median reliability = .98), meaning that there was agreement among subjects as to who was relatively more or less intelligent, wise, or creative. Intercorrelations (degree of relationship) of ratings were extremely high between intelligence and wisdom ($r = .94$), high between intelligence and creativity ($r = .69$), and moderately high between wisdom and creativity ($r = .62$). Thus, the rank order of the correlational relations was the same as that in the past studies, although in this study, intelligence and wisdom were almost indistinguishable. Use of male versus female names had no effect: The average ratings were essentially identical for given descriptions provided with male versus female names ($t < 1$), and the patterns of ratings were virtually identical (median $r = .95$), regardless of whether the described individual was listed as male or female.

The relations between observed ratings and predicted ratings (with predictions deriving from the first study) showed excellent "fits" of the predictions to the data. In each case, the correlation between the predicted and observed values for a given attribute was extremely high (median $r = .89$). Moreover, this correlation of predicted with observed values for a given attribute (e.g., predicted values for creativity with observed values for creativity) was always higher than the correlation of predicted with observed values across attributes (median $r = .51$) (e.g., predicted values for creativity with observed values for wisdom). Thus, people not only seemed to have implicit theories of intelligence, wisdom, and creativity, but to use these implicit theories in predictable and somewhat distinguishable ways to judge others.
To summarize, people not only have implicit theories, but use these theories to evaluate others. It is possible to predict people's evaluations of others on the basis of knowledge about their implicit theories. Despite the omnipresence of standardized tests in our society, most evaluations of people's abilities are still done informally—through casual conversations, interviews, letters of recommendation, second-hand comments, and the like. Psychometric tests tell us nothing about how these informal evaluations are made. But the results of implicit-theoretical evaluations do. For this reason, it is important to know both people's implicit theories and how they use these theories.

RELATIONS OF IMPLICIT THEORIES ACROSS GROUPS

To this point, implicit theories have been discussed primarily as though they are the same from one group of people to another. Indeed, the studies described here show a high degree of overlap between implicit theories across different groups. However, there are some interesting differences as well as commonalities. Consider what some of these commonalities and differences are.

Previous research has given us some sense of the nature of intelligence, wisdom, and creativity, but different methods, instruments, subjects, and experimenters have made comparisons across these three constructs difficult. The research described here has made it possible more directly to compare the natures of the three constructs, at least as they are perceived by four groups of people. Consider each of the three constructs in turn, and what we have learned about it.

Intelligence

Laypersons. People's conceptions of intelligence overlap with, but go beyond, the skills measured by conventional intelligence tests. Thus, the problem solving (fluid ability) and verbal comprehension (crystallized ability) skills measured by intelligence tests appear most prominently in the dimensions of the derived implicit theory of intelligence. The intelligent individual is perceived to solve problems well, reason clearly, think logically, have a good vocabulary, and draw upon a large store of information—just the kinds of things conventional intelligence tests measure. But also embedded within people's conceptions of intelligence are a person's ability to balance information, to be goal-oriented and to aim for achievement of one's goals, and to show one's intelligence in worldly, as opposed to strictly academic, contexts. Thus, people in general seem to be more concerned with the
practical and worldly side of intelligence than are the creators of intelligence tests.

**Specialists.** Whereas the professors of art emphasize knowledge and the ability to use that knowledge in weighing alternative possibilities and in seeing analogies, the business professors emphasize the ability to think logically, to focus on essential aspects of a problem, and to both follow others' arguments easily and see where these arguments lead. The emphasis on assessment of argumentation in the business professors' implicit theories is far weaker in the artists' implicit theories. The philosophy professors emphasize critical and logical abilities very heavily, and especially the abilities to follow complex arguments, to find subtle mistakes in these arguments, and to generate counter-examples to invalid arguments. The philosopher's view very clearly emphasizes those aspects of logic and rationality that are essential in analyzing and creating philosophical arguments. The physicist, in contrast, places more emphasis on precise mathematical thinking, the ability to relate physical phenomena to the concepts of physics, and the ability to grasp quickly the laws of nature.

**Wisdom**

**Laypersons.** The wise individual is perceived to have much the same analytical reasoning ability that is found in the intelligent individual. But the wise person has a certain sagacity that is not necessarily found in the intelligent person: He or she listens to others, knows how to weigh advice, and can deal with a variety of different kinds of people. In seeking as much information as possible for decision making, the wise individual reads between the lines and makes use of the obviously available information. The wise individual is especially well able to make clear, sensible, and fair judgments, and in doing so, takes a long-term as well as a short-term view of the consequences of the judgments made. The wise individual is perceived to profit from the experience of others, and to learn from others' mistakes, as well as from his or her own. This individual is not afraid to change his or her mind as experience dictates, and the solutions that are offered to complex problems tend to be the right ones.

**Specialists.** Implicit theories of wisdom show considerable overlap across fields of specialization. Nevertheless, there are some differences in implicit theories. Art professors emphasize insight, knowing how to balance logic and instinct, knowing how to transform creativity into concepts, and sensitivity. These aspects of wisdom would seem quite relevant in the mature appreciation and evaluation of art. Business professors emphasize maturity of judgment, understanding of the limitations of one's own actions and recommendations, knowing what one does and does not know, possession of a long-term perspective on things, knowing when not to act as well as when one
should act, acceptance of reality, good decision making, the ability to distinguish substance from style, and appreciation of the ideologies of others. These aspects of wisdom would seem particularly relevant in making and evaluating business decisions. Philosophy professors emphasize balanced judgment, nonautomatic acceptance of the “accepted” wisdom, concentration on fundamental questions, resistance to fads, looking for fundamental principles or intuitions behind a viewpoint, concern with large purposes, openness to ideas, ability to use facts correctly, avoidance of jargon, possession of a sense of where future progress is possible, unwillingness to become obsessed with a single theory, attention to both scope and detail, and a sense of justice. All of these talents would seem relevant to the construction and evaluation of philosophical arguments. Finally, physicists emphasize appreciation of the various factors that contribute to a situation, familiarization with previous work and techniques in the field, knowing if solving a problem is likely to produce important results, awareness of the important problems in the field, knowledge of the human and political elements of scientific work, contemplation, and recognition of aspects of physical phenomena that underlie the concepts of physics. These skills would seem to be helpful in attaining a deep understanding of the nature of physics and of its place both in science and in the world.

Creativity

Laypersons. Conceptions of creativity overlap with those of intelligence, but there is much less emphasis in implicit theories of creativity on analytical abilities, whether they be directed toward abstract problems or toward verbal materials. For example, the very first dimension shows a greater emphasis on nonentrenchment, or the ability and willingness to go beyond ordinary limitations of self and environment and to think and act in unconventional and even dreamlike ways. The creative individual has a certain freedom of spirit and unwillingness to be bound by the unwritten canons of society, characteristics not necessarily found in the highly intelligent individual. Implicit theories of creativity encompass a dimension of aesthetic taste and imagination that is absent in implicit theories of intelligence, and also encompass aspects of inquisitiveness and intuitiveness that do not seem to enter into the implicit theories of intelligence. Implicit theories of creativity go far beyond conventional psychometric creativity tests. A person’s ability to think of unusual uses of a brick, or to form a picture based on a geometric outline, scarcely does justice to the kind of freedom of spirit and intellect captured in people’s implicit theories of creativity.

Specialists. Implicit theories of creativity in the specialized fields were highly overlapping across fields and also overlapped highly with the implicit theories of laypersons; nevertheless, there were some differences worthy of
note. Professors of art place heavy emphasis upon imagination and originality, as well as upon an abundance of and willingness to try out new ideas. The creative artist is a risk-taker, and persists in following through on the consequences of risks. Such a person thinks metaphorically, and prefers forms of communication other than strictly verbal ones. Business professors also emphasize the ability to come up with new ideas and to explore these ideas, especially as they relate to novel business services and products. The creative individual escapes traps of conventional thinking, and can imagine a possible state that is quite different from what exists. Philosophy professors emphasize the ability to toy imaginatively with notions and combinations of ideas, and to create classifications and systematizations of knowledge that differ from the conventional ones. Creative individuals never automatically accept the "accepted," and when they have novel hunches, these hunches pay off. The creative person is particularly well able to generate insights regarding connections between seemingly unrelated issues, and to form useful analogies and explanations. The physics professors share many of these same ideas about the creative individual, but show a particular concern with inventiveness, the ability to find order in chaos, and the ability to question basic principles. The physicists emphasize creative aspects of problem solving, such as the ability to approximate solutions, the ability to find shortcuts in problem solving, and the ability to go beyond standard methods of problem solving. Finally, the physicist thinks a creative person has the ability to make discoveries by looking for reasons why things happen the way they do. Such discoveries may result from the perception of physical and other patterns that most others simply overlook.

CONCLUSION

People have implicit theories of intelligence, wisdom, and creativity, and they use these theories both in conceptualizing these attributes, and in evaluating themselves and others. In order to understand these conceptions and their use, and in order to attain some appreciation of the psychological attributes themselves, it is useful to study people's implicit theories of the nature of their minds. The time undoubtedly will come when we can go well beyond implicit theories to seek understanding of the psychological attributes of intelligence, wisdom, and creativity. Studies of implicit theories probably have their greatest use when we are just beginning to understand complex psychological attributes. In the meantime, however, it is better to seek some understanding of difficult-to-study attributes such as creativity and wisdom rather than to ignore them altogether (as has been done by so many ability theorists) or to study them in such a narrow way that their essence is lost. The studies described in this article have sought to do justice to the complexity of
these constructs rather than to ignore them altogether. When studying human abilities, three is better than one. The time has come for us to expand our field of inquiry, and to study creativity and wisdom in their own right, rather than either to ignore them in favor of intelligence, or to give them the kind of short shrift that very narrow conceptions of them generate. If we wish to understand the role of human abilities not only with respect to the individual but with respect to the society at large, we need to understand intelligence, wisdom, and creativity, both separately and under interaction.

The results summarized here have important implications for the understanding, assessment, and education of mental abilities. Consider what some of these implications are.

First, intelligence, wisdom, and creativity are three distinct, although interrelated constructs. A more nearly complete understanding of human abilities will require the same serious degree of attention to wisdom and creativity that heretofore has been reserved for intelligence. Wisdom is more closely linked to intelligence than is creativity, but differs in the emphasis reserved for it upon mature judgment, sagacity in practical situations, and use of experience in dealing with difficult everyday situations. Because of the importance of these skills to academic as well as nonacademic pursuits, researchers on human abilities ought to study it in its own right rather than assuming that an understanding of intelligence will foster an understanding of wisdom as well.

Second, my assessment devices for measuring all three of these constructs are in need of serious reconsideration and especially broadening. The construct of intelligence as measured by traditional intelligence and aptitude tests is quite a bit narrower than the construct as it is conceived of by laypersons from a variety of walks of life. In particular, more emphasis seems to be needed in our testing of practical-contextual aspects of intelligence, and of goal orientation and attainment. The field of the measurement of wisdom is in its infancy, and measures are still in need of formulation. Such measures should deal with reasoning, sagacity, learning from ideas and the environment, judgment, the expeditious use of information, and perspicacity. Finally, it is clear that the measures of creativity presently available to us measure creativity in a less meaningful (some might say—more trivial) way than would correspond to people's implicit theories of creativity. Thinking of unusual uses for a paper clip, for example, and similar tasks, would seem to draw relatively little upon the lack of conventionality, integration and intellectuality, aesthetic taste and imagination, decisional skill and flexibility, perspicacity, and drive for accomplishment and recognition that are seen as essential aspects of creativity.

Third, I need to take cognizance of the fact that in evaluating only a narrow subset of intellectual skills, I may be selecting people for various schooling and occupational endeavors with good critical facility in academic kinds
of tasks, but whose synthetic and practical facilities are open to question. Many potentially excellent contributors to a variety of fields where, for example, creativity is of the essence, may never get the opportunity to make their contributions because they do not test as well in skills that are non-central to the endeavors they would most like to pursue, and at which they would be best. Worse, some aspects of creativity, such as lack of conventionality and certain aspects of imagination, may actually be selected against because of the desire on the part of some educational institutions to socialize children into a preset mold that does not reward unusual ways of formulating, solving, and evaluating problems.

Finally, our instructional efforts need to focus on creativity and wisdom to a much greater extent than they do. At present, there is relatively little instruction of abilities at all, and the instruction there is tends to focus on relatively narrow aspects of intelligence, namely, those measured by conventional tests. For one thing, it is easier to teach specific skills needed on particular tests than to teach some more broadly defined conception of abilities. For another, we know little about how to teach these broader abilities, even if we have the motivation to do so. Research efforts are needed to foster development of instructional methods for teaching abilities in the broadest sense.

In sum, I have been content to focus my efforts on intelligence, with occasional forays into creativity. But I suggest that in order to obtain a good idea of the full richness of the mind, and in order to build upon this richness, I will have to expand my efforts beyond the domain of intelligence. In both assessment and training, three is better than one.

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