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The Theory of Successful Intell

Robert J. Ster

Tufts University,Med

Abstract

This article presents a theory of successful intelligence. The theory is substantially broader than convention
intelligence. It defines intelligence in terms of the ability to achieve one's goals in life, within one's sociocultural
article is divided into four major parts. The article opens with a consideration of the nature of intelligence. The
measurement of intelligence. Next it discusses how people can be intelligent but foolish. Finally it draws con

Keywords: Successful inteligence; analytical intelligence; creative intelligence; pratical intelligence.

La Teoría de Inteligencia Exitosa

Compendio

Este artículo presenta una teoría de Inteligencia exitosa. La teoría es substancialmente más ancha que la teorías co
de inteligencia. Define inteligencia por lo que se refiere a la habilidad de lograr las metas de uno en la vi
contexto sociocultural de uno. El artículo es dividido en cuatro partes. El artículo abre con una conside
naturaleza de inteligencia. Entonces discute una medida de inteligencia. Luego discute cómo las persona
inteligentes pero ingenuas. Finalmente, dibuja las conclusiones.

Palabras-clave: Inteligencia exitosa; inteligencia analítica; inteligencia criativa; inteligencia prática.

Conventional views of intelligence favor individuals who are strong in memory and analytical abilities (e.g., Carroll, 1993; Cattell, 1971; Jensen, 1998). They disfavor most other individuals. The result is that individuals who may have the talents to succeed in life may be labeled as *unintelligent*, whereas some of those labeled as *intelligent* may be less endowed with such talents. This article presents a broader theory of intelligence that is more encompassing, but that is nevertheless rigorously validated. The theory is the theory of successful intelligence (Sternberg, 1997).

The history of the theory presented here has been documented, to some extent, in two earlier theoretical articles (Sternberg, 1980b, 1984). In the first article (Sternberg, 1980b) a theory of components of intelligence was presented. The article made the argument arguing that intelligence could be understood in terms of a set of elementary information-processing components that contributed to people's intelligence and individual differences in it. In the second article (Sternberg, 1984) the theory was expanded to include not just the analytical aspect of intelligence, which had been the emphasis of the earlier article, but the creative and practical

here is somewhat more elaborate
(Sternberg, 1997, 1998a, 1999c)
intelligence. According to this def
intelligence is: 1) the ability to achieve c
one's sociocultural context; 2) by capita
correcting or compensating for weaknes
to, shape, and select environments; and, 4
of analytical, creative, and practical ab

Consider first Item 1. Intelligence
meaningful and coherent set of goals, a
dispositions to reach those goals. One
be a statesperson, another, a scientist, ar
Others may decide on careers in athlet
acting, or whatever. The question typica
goals individuals have chosen, but rath
have done so that they can realize those
way. Thus, this item actually includ
identifying meaningful goals; b) coord
meaningful way so that they form a coh
is seeking in life; and, c) moving a sul
the path toward reaching those goals.

everything or bad at everything. People who are the positive intellectual leaders of society have identified their strengths and weaknesses, and have found ways to work effectively within that pattern of abilities.

There is no single way to succeed in a job that works for everyone. For example, some lawyers are successful by virtue of their very strong analytical skills. They may never argue in a courtroom, but they can put together an airtight legal argument. Another lawyer may have a commanding presence in the courtroom, but be less powerful analytically. The legal profession in the United Kingdom recognizes this distinction by having separate roles for the solicitor and the barrister. In the United States, successful lawyers find different specializations that allow them to make the best use of their talents. Unsuccessful lawyers may actually attempt to capitalize on weaknesses, for example, litigating cases when their legal talent lies elsewhere.

This same general principle applies in any profession. Consider, for example, teaching. Educators often try to distinguish characteristics of expert teachers (see Sternberg & Williams, 2001), and indeed, they have distinguished some such characteristics. But the truth is that teachers can excel in many different ways. Some teachers are better in giving large lectures; others in small seminars; others in one-on-one mentoring. There is no one formula that works for every teacher. Good teachers figure out their strengths and try to arrange their teaching so that they can capitalize on their strengths and at the same time either compensate for or correct their weaknesses. Team teaching is one way of doing so, in that one teacher can compensate for what the other does not do well.

Item 3 recognizes that intelligence broadly defined refers to more than just "adapting to the environment," which is the mainstay of conventional definitions of intelligence. The theory of successful intelligence distinguishes among adapting, shaping, and selecting.

In adaptation to the environment, one modifies oneself to fit an environment. The ability to adapt to the environment is important in life, and is especially important to individuals entering a new program. Most of them will be entering a new environment that is quite different from the one in which they

tanks). Clearly, adaptability is a key skill
intelligence. An intellectual leader ought
the ability to adapt to a variety of environ

In life, adaptation is not enough, howev
to be balanced with shaping. In shaping
environment to fit what one seeks
modifying oneself to fit the environment
in any field are not just adaptors; the
They recognize that they cannot change
if they want to have an impact on the
change some things. Part of success
deciding what to change, and then how

When an individual enters an institut
the individual will not only adapt to the env
it in a way that makes it a better place
Selection committees will wish to look f
of a candidate's engagement in a variety o
of the individual's having made a diffe
involvement in those activities. Shaping
kind of impact (see Sternberg, 2003a).

Sometimes, one attempts unsuccess
environment and then also fails in shapin
No matter what one does to try to make th
out, nothing in fact seems to work. In such
action may be to select another environm

Many of the greatest people in any
who started off in another field and foun
was not really the one in which they had th
Rather than spend their lives doing somet
not to match their pattern of strengths an
had the sense to find something else to d
had a contribution to make.

Item 4 points out that successful int
broader range of abilities than is typically
intellectual and academic skills. Most of
primarily or exclusively memory and ana
regard to memory, they assess the abi
recognize information. With regard to ana
measure the skills involved when one ana
contrasts, evaluates, critiques, and judges.
skills during the school years and in later l

translate strategies to solve these problems exists in any culture.

Metacomponents, or executive processes, plan what to do, monitor things as they are being done, and evaluate things after they are done. Examples of metacomponents are recognizing the existence of a problem, defining the nature of the problem, deciding on a strategy for solving the problem, monitoring the solution of the problem, and evaluating the solution after the problem is solved.

Performance components execute the instructions of the metacomponents. For example, inference is used to decide how two stimuli are related and application is used to apply what one has inferred (Sternberg, 1977). Other examples of performance components are comparison of stimuli, justification of a given response as adequate although not ideal, and actually making the response.

Knowledge-acquisition components are used to learn how to solve problems or simply to acquire declarative knowledge in the first place (Sternberg, 1985). Selective encoding is used to decide what information is relevant in the context of one's learning. Selective comparison is used to bring old information to bear on new problems. And selective combination is used to put together the selectively encoded and compared information into a single and sometimes insightful solution to a problem.

Although the same processes are used for all three aspects of intelligence universally, these processes are applied to different kinds of tasks and situations depending on whether a given problem requires analytical thinking, creative thinking, practical thinking, or a combination of these kinds of thinking. In particular, analytical thinking is invoked when components are applied to fairly familiar kinds of problems abstracted from everyday life. Creative thinking is invoked when the components are applied to relatively novel kinds of tasks or situations. Practical thinking is invoked when the components are applied to experience to adapt to, shape, and select environments. One needs creative skills and dispositions to generate ideas, analytical skills and dispositions to decide if they are good ideas, and practical skills and dispositions to implement one's ideas and to convince others of their worth (Sternberg, 1999b).

More details regarding the theory can be found in Sternberg

is not smart. Rather, one should merel
one indicator among many of a perso

The Assessment of Intelligence

Our assessments of intelligence
around the analytical, creative, and
We discuss those assessments here

Analytical Intelligence

Analytical intelligence is involved
processing components of intelligence
evaluate, judge, or compare and contras
when components are applied to relat
problems where the judgments to be ma
nature.

In some early work, it was shown
problems, such as analogies or syllog
componentially (Guyote & Sternberg,
1980b, 1983; Sternberg & Gardner, 19
1981), with response times or error rat
their underlying information-processing
of this research was to understand the
origins of individual differences in (th
human intelligence. With component
specify sources of individual differen
score such as that for "inductive rea
response times on analogies (Sternb
syllogisms (Sternberg, 1980a) were
elementary performance components.
such research is to: a) specify an inform
of task performance; b) propose a p
model, so that each information-pro
assigned a mathematical parameter com
(and another corresponding to its error
cognitive tasks administered in such a
through mathematical modeling to is
the mathematical model. In this way, i
in the solving of various kinds of probl
important individual or developmenta
performance components are used? 2)
to execute each component? 3) Ho

reasoning) (*A to C*); 4) *application,* the amount of time needed to apply the relation as inferred (and sometimes as mapped) to a new set of stimuli (*A to B to C to ?*); 5) *comparison,* the amount of time needed to compare the validity of the response options (*D1, D2, D3, D4*); 6) *justification,* the amount of time needed to justify one answer as the best of the bunch (e.g., *D1*); and 7) *preparation-response,* the amount of time needed to prepare for problems solution and to respond.

Studies of reasoning need not use artificial formats. In a more recent study, and a colleague and I looked at predictions for everyday kinds of situations, such as when milk will spoil (Sternberg & Kalmar, 1997). In this study, the investigators looked at both predictions and postdictions (hypotheses about the past where information about the past is unknown) and found that postdictions took longer to make than did predictions.

Research on the components of human intelligence yielded some interesting results. Consider some examples. First, execution of early components (e.g., inference and mapping) tends exhaustively to consider the attributes of the stimuli, whereas execution of later components (e.g., application) tends to consider the attributes of the stimuli in self-terminating fashion, with only those attributes processed that are essential for reaching a solution (Sternberg, 1977). Second, in a study of the development of figural analogical reasoning, it was found that although children generally became quicker in information processing with age, not all components were executed more rapidly with age (Sternberg & Rifkin, 1979). The encoding component first showed a decrease in component time with age and then an increase. Apparently, older children realized that their best strategy was to spend more time in encoding the terms of a problem so that they later would be able to spend less time in operating on these encodings. A related, third finding was that better reasoners tend to spend relatively more time than do poorer reasoners in global, up-front metacomponential planning, when they solve difficult reasoning problems. Poorer reasoners, on the other hand, tend to spend relatively more time in local planning (Sternberg, 1981). Presumably, the better reasoners recognize that it is better to invest more time up front so as to be able to process a problem more efficiently later on. Fourth, it also was found in a study of the development of verbal analogical reasoning

multiple sources of individual and develop
The three main sources were in know
components, use of context clues, and
variables. For example, in the sentence, "
east and sets in the west," the know
component of selective comparison is u
knowledge about a known concept, the s
word (neologism) in the sentence, "*blen*."
appear in the sentence, such as the fact that
that it sets, and the information about when
mediating variable is that the information
presentation of the unknown word.

We did research such as that described
believed that conventional psychometric
incorrectly attributed individual and develo
For example, a verbal analogies test that
surface to measure verbal reasoning mig
primarily vocabulary and general infor
1977). In fact, in some populations, reason
a source of individual or developmental di
if researchers then look at the sources
differences in vocabulary, they would nee
the differences in knowledge did not co
Some children had much more fre
opportunities to learn word meanings than

In the componential-analysis work
correlations were computed between co
individuals and scores on tests of c
psychometric abilities. First, in the st
reasoning (Sternberg, 1977; Sternberg
1983), it was found that although in
application, comparison, and justification
with such tests, the highest correlation typ
preparation-response component. This res
first, because this component was estimat
constant in the predictive regression equati
up giving birth to the concept of the meta
order processes used to plan, monitor,
performance. It was also found, second,
obtained for all the components sho
discriminant validation: They tended to

ar-syllogistic reasoning not only in terms of the fit of response-time or error data to the predictions of the alternative models, but also in terms of the correlations of component scores with psychometric tests of verbal and spatial abilities (Sternberg, 1980a). Fifth and finally, it was found that there were individual differences in strategies in solving linear syllogisms, whereby some people used a largely linguistic model, others a largely spatial model, and most the proposed linguistic-spatial mixed model. Thus, sometimes, less than perfect fit of a proposed model to group data may reflect individual differences in strategies among participants.

Creative Intelligence

Intelligence tests contain a range of problems, some of them more novel than others. In some of the componential work we have shown that when one goes beyond the range of unconventionality of the conventional tests of intelligence, one starts to tap sources of individual differences measured little or not at all by the tests. According to the theory of successful intelligence, (creative) intelligence is particularly well measured by problems assessing how well an individual can cope with relative novelty. Thus it is important to include in a battery of tests problems that are relatively novel in nature.

We presented 80 individuals with novel kinds of reasoning problems that had a single best answer. For example, they might be told that some objects are green and others blue; but still other objects might be grue, meaning green until the year 2000 and blue thereafter, or bleen, meaning blue until the year 2000 and green thereafter. Or they might be told of four kinds of people on the planet Kyron, *blens*, who are born young and die young; *kwefs*, who are born old and die old; *balts*, who are born young and die old; and *prosses*, who are born old and die young (Sternberg, 1982; Tetewsky & Sternberg, 1986). Their task was to predict future states from past states, given incomplete information. In another set of studies, 60 people were given more conventional kinds of inductive reasoning problems, such as analogies, series completions, and classifications, but were told to solve them. But the problems had premises preceding them that were either conventional (dancers wear shoes) or novel (dancers eat shoes). The participants had to solve the problems as though the counterfactuals were true (Sternberg

bleen task mentioned above, the in
component requiring people to swit
green-blue thinking to *grue-bleen* thin
green-blue thinking again was a partic
the ability to cope with novelty.

Practical Intelligence

Practical intelligence involves ind
abilities to the kinds of problems that
life, such as on the job or in the hom
involves applying the components of in
so as to: a) adapt to, b) shape, and, c
Adaptation is involved when one cha
environment. Shaping is involved w
environment to suit oneself. And sele
one decides to seek out another envir
match to one's needs, abilities, and d
their balance of adaptation, shaping, a
competence with which they balance a
courses of action.

Much of our work on practical in
on the concept of tacit knowledge.
construct as what one needs to kn
effectively in an environment that one
and that often is not even verbalized
Sternberg & Wagner, 1993; Sternberg
1993; Sternberg, Wagner, Williams, &
1987; Wagner & Sternberg, 1986
knowledge in the form of production
of "if-then" statements that describe p
in various kinds of everyday situations

We typically have measured tacit k
related problems that present problem
on the job. We have measured tacit kno
and adults, and among adults, for peo
occupations, such as management, sal
school administration, secretarial work
typical tacit-knowledge problem, peo
story about a problem someone face
statement in a set of statements, how
statement represents. For example,
measure of tacit knowledge for sale

with experience, but it is profiting from experience, rather than experience per se, that results in increases in scores. Some people can have been in a job for years and still have acquired relatively little tacit knowledge. Second, we also have found that subscores on tests of tacit knowledge — such as for managing oneself, managing others, and managing tasks — correlate significantly with each other. Third, scores on various tests of tacit knowledge, such as for academics and managers, are also correlated fairly substantially (at about the .5 level) with each other. Thus, fourth, tests of tacit knowledge may yield a general factor across these tests. However, fifth, scores on tacit-knowledge tests do not correlate with scores on conventional tests of intelligence, whether the measures used are single-score measures of multiple-ability batteries. Thus, any general factor from the tacit-knowledge tests is not the same as any general factor from tests of academic abilities (suggesting that neither kind of g factor is truly general, but rather, general only across a limited range of measuring instruments). Sixth, despite the lack of correlation of practical-intellectual with conventional measures, the scores on tacit-knowledge tests predict performance on the job as well as or better than do conventional psychometric intelligence tests. In one study done at the Center for Creative Leadership, we further found, seventh, that scores on our tests of tacit knowledge for management were the best single predictor of performance on a managerial simulation. In a hierarchical regression, scores on conventional tests of intelligence, personality, styles, and interpersonal orientation were entered first and scores on the test of tacit knowledge were entered last. Scores on the test of tacit knowledge were the single best predictor of managerial simulation score. Moreover, these scores also contributed significantly to the prediction even after everything else was entered first into the equation. In recent work on military leadership (Hedlund et al., 2003; Sternberg et al., 2000; Sternberg & Hedlund, 2002), it was found, eighth, that scores of 562 participants on tests of tacit knowledge for military leadership predicted ratings of leadership effectiveness, whereas scores on a conventional test of intelligence and on a tacit-knowledge test for managers did not significantly predict the ratings of effectiveness.

We also have done studies of social intelligence, which is viewed in the theory of successful intelligence as a part of

Even stronger results have been obta
study in Usenge, Kenya, near the town o
interested in school-age children's abili
indigenous environment. We devised
intelligence for adaptation to the environm
& Grigorenko, 1997; Sternberg, Noke
Okatcha, Bundy, et al., 2001). The test of p
measured children's informal tacit knowled
medicines that the villagers believe can be
types of infections. At least some of thes
to be effective and most villagers certai
efficacy, as shown by the fact that childre
their knowledge of these medicines an ave
in medicating themselves and others. Thus
these medicines constitute effective mea
of practical intelligence as defined by the
their life circumstances in their enviro
Middle-class Westerners might find it quite
or even survive in these contexts, or, fo
contexts of urban ghettos often not
comfortable homes.

We measured the Kenyan children's a
medicines, where they come from, what th
how they are dosed. Based on work we h
they expected that scores on this test woul
scores on conventional tests of intelligen
this hypothesis, we also administered to
Raven Coloured Progressive Matrices Test
of fluid or abstract-reasoning-based abil
Mill Hill Vocabulary Scale, which is a me
or formal-knowledge-based abilities. In ad
children a comparable test of vocabulary i
language. The Dholuo language is spoken
in the schools.

We did indeed find no correlation b
indigenous tacit knowledge and scores on t
But to our surprise, we found statistically sig
of the tacit-knowledge tests with the t
abilities. The correlations, however, were
words, the higher the children scored
knowledge, the lower they scored, on ave

the environments in which they will really live. Children who spend their time learning the indigenous practical knowledge of the community generally do not invest themselves heavily in doing well in school, whereas children who do well in school generally do not invest themselves as heavily in learning the indigenous knowledge — hence the negative correlations.

The Kenya study suggests that the identification of a general factor of human intelligence may tell us more about how abilities interact with patterns of schooling and especially Western patterns of schooling than it does about the structure of human abilities. In Western schooling, children typically study a variety of subject matters from an early age and thus develop skills in a variety of skill areas. This kind of schooling prepares the children to take a test of intelligence, which typically measures skills in a variety of areas. Often intelligence tests measure skills that children were expected to acquire a few years before taking the intelligence test. But as Rogoff (1990) and others have noted, this pattern of schooling is not universal and has not even been common for much of the history of humankind. Throughout history and in many places still, schooling, especially for boys, takes the form of apprenticeships in which children learn a craft from an early age. They learn what they will need to know in order to succeed in a trade, but not a lot more. They are not simultaneously engaged in tasks that require the development of the particular blend of skills measured by conventional intelligence tests. Hence it is less likely that one would observe a general factor in their scores, much as the investigators discovered in Kenya. Some years back, Vernon (1971) pointed out that the axes of a factor analysis do not necessarily reveal a latent structure of the mind but rather represent a convenient way of characterizing the organization of mental abilities. Vernon believed that there was no one "right" orientation of axes, and indeed, mathematically, an infinite number of orientations of axes can be fit to any solution in an exploratory factor analysis. Vernon's point seems perhaps to have been forgotten or at least ignored by later theorists.

We have considered each of the aspects of intelligence separately. How do they fare when they are assessed together?

All Three Aspects of Intelligence Together

figural content. Consider the content of
Verbal: Figuring out meanings of neolo
from natural contexts. Students see a no
a paragraph, and have to infer its meani
Analytical-Quantitative: Number serie
what number should come next in a
Analytical-Figural: Matrices. Students s
the lower right entry missing. They ha
options fits into the missing space
Everyday reasoning. Students are pr
everyday problems in the life of an adole
the option that best solves each p
Quantitative: Everyday math. Studen
scenarios requiring the use of math in ev
tickets for a ballgame), and have to solv
on the scenarios. 6) Practical-Figural: R
are presented with a map of an area (e.g.
and have to answer questions about
through the area depicted by the map. 7)
analogies. Students are presented with ve
by counterfactual premises (e.g., mone
have to solve the analogies as thou
premises were true. 8) Creative-Quan
operations. Students are presented with
operations, for example, *flix*, which
manipulations that differ as a function
two operands is greater than, equal to,
Participants have to use the novel num
presented math problems. 9) Creative
participants are first presented with a fig
one or more transformations; they ther
of the series to a new figure with a dif
complete the new series. 10) Analyt
requires students to analyze the use of
schools: What are the advantages and
can these be weighed to make a recomm
Essay: Give three practical solutions
currently having in your life. 12) Creati
ideal school.

Confirmatory factor analysis on the
the triarchic theory of human intellig

STAT to compare five alternative models of intelligence, again via confirmatory factor analysis. A model featuring a general factor of intelligence fit the data relatively poorly. The triarchic model, allowing for intercorrelation among the analytic, creative, and practical factors, provided the best fit to the data (Sternberg, Castejón, Prieto, Hautakami, & Grigorenko, 2001).

In a further study, we (Grigorenko & Sternberg, 2001) tested 511 Russian school children (ranging in age from 8 to 17 years) as well as 490 mothers and 328 fathers of these children. They used entirely distinct measures of analytical, creative, and practical intelligence. Consider, for example, the tests used for adults. Similar tests were used for children.

Fluid analytical intelligence was measured by two subtests of a test of nonverbal intelligence. The *Test of g: Culture Fair, Level II* (Cattell & Cattell, 1973) is a test of fluid intelligence designed to reduce, as much as possible, the influence of verbal comprehension, culture, and educational level, although no test eliminates such influences. In the first subtest, *Series*, individuals were presented with an incomplete, progressive series of figures. The participants' task was to select, from among the choices provided, the answer that best continued the series. In the *Matrices* subtest, the task was to complete the matrix presented at the left of each row.

The test of crystallized intelligence was adapted from existing traditional tests of analogies and synonyms/antonyms used in Russia. We used adaptations of Russian rather than American tests because the vocabulary used in Russia differs from that used in the USA. The first part of the test included 20 verbal analogies (KR20 = 0.83). An example is *circle—ball = square—? (a) quadrangular, (b) figure, (c) rectangular, (d) solid, (e) cube*. The second part included 30 pairs of words, and the participants' task was to specify whether the words in the pair were synonyms or antonyms (KR20 = 0.74). Examples are *latent-hidden*, and *systematic-chaotic*.

The measure of creative intelligence also comprised two parts. The first part asked the participants to describe the world through the eyes of insects. The second part asked participants to describe who might live and what might happen on a planet called *Priumliava*. No additional information on the nature of the planet was specified. Each part of the test was scored in three different ways to yield three different scores. The first score was for originality (novelty); the second was for the

respectively, how to maintain the value of
to do when one makes a purchase and dis
one has purchased is broken, how to locat
in a time of need, and how to manage a s
received for outstanding work. Each vigne
by five choices and participants had to
Obviously, there is no one "right" answer in
Hence Grigorenko and Sternberg used t
chosen response as the keyed answer. To
response was suboptimal, this suboptimality
the researchers in subsequent analyses re
test to other predictor and criterion meas

In this study, exploratory principal-co
both children and adults yielded very simi
Both varimax and oblimin rotations yielde
creative, and practical factors for the tests.
of a different nationality (Russian), a diffe
a different method of analysis (explo
confirmatory analysis) again supported the
intelligence.

The analytical, creative, and practical t
employed were used to predict mental
among the Russian adults. Mental healt
widely used paper-and-pencil tests of dep
and physical health was measured by s
predictor of mental and physical health
intelligence measure. Analytical intelligen
creative intelligence came third. All th
prediction, however. Thus, the researchers
a theory of intelligence encompassing
provides better prediction of success in lif
comprising just the analytical element.

In a recent study supported by the Colle
& the Rainbow Project Team, 2002), we u
of tests on 1015 students at 15 differe
colleges and 2 high schools). Our goal wa
SAT, but to devise tests that would su
measuring skills that this test does not me
the multiple-choice STAT tests described
additional measures of creative skills and

Creative skills. The three additional te
1. *Cartoons*: Participants were gi

done to measure creativity (Sternberg & Lubart, 1995), which is described further below.

3. *Oral Stories*: Participants were presented with five sheets of paper, each containing a set of pictures linked by a common theme. For example, participants might receive a sheet of paper with images of a musical theme, a money theme, or a travel theme. The participant then chose one of the pages and was given 15 minutes to formulate a short story and dictate it into a cassette recorder. The dictation period was not to be more than five minutes long. The process was then repeated with another sheet of images so that each participant dictated a total of two oral stories. Six judges were trained to rate the stories for originality, complexity, emotional evocativeness, and descriptiveness.

Practical skills. The three additional tests were as follows:

1. *Everyday Situational Judgment Inventory (Movies)*. This video-based inventory presents participants with seven brief vignettes that capture problems encountered in general, everyday life, such as determining what to do when one is asked to write a letter of recommendation for someone one does not know particularly well.

2. *Common Sense Questionnaire*. This written inventory presents participants with 15 vignettes that capture problems encountered in general business-related situations, such as managing tedious tasks or handling a competitive work situation.

3. *College Life Questionnaire*. This written inventory presents participants with 15 vignettes that capture problems encountered in general college-related situations, such as handling trips to the bursar's office or dealing with a difficult roommate.

We found that our tests significantly and substantially improved upon the validity of the SAT for predicting first-year college grades (Sternberg & the Rainbow Project Collaborators, 2005; Sternberg, The Rainbow Project Collaborators, & University of Michigan Business School Project Collaborators, 2004). The test also improved equity: Using the test to admit a class would result in greater ethnic diversity than would using just the SAT or just the SAT and grade-point average. This test is now going into Phase-2 piloting, where it will be tried out on a larger sample of individuals.

Instructional Studies

formal instruction. In one condition, par
any instructional treatment. They wer
take a post-test. In a second condition, t
as an instructional condition, but
instruction, per se. In a third condit
knowledge-acquisition component p
used to decontextualize word meaning
they were taught to use context cues. I
were taught to use mediating variables.
of the theory-based formal-instr
outperformed participants in the two co
performance did not differ. In othe
instruction was better than no instructi
without formal instruction.

Creative-thinking skills also can be
has been devised for teaching them (
1996; see also Sternberg & Grigor
relevant work, the investigators divided
fourth-grade children into experiment
All children took pretests on insightful
the children received their regular sch
others received instruction on ins
instruction of whichever kind, all chil
insight skills. We found that children t
insight problems using knowledge-a
gained more from pretest to posttest
were not so taught (Davidson & Stern

Practical-intelligence skills also c
developed a program for teaching pra
aimed at middle-school students, t
students "practical intelligence for sc
doing homework, taking tests, reading
Krechevsky, Sternberg, & Okagaki, 19
Williams et al., 2002). We have eval
variety of settings (Gardner et al., 19
& Jackson, 1990) and found that student
outperform students in control groups
instruction.

Individuals' use of practical intel
own gain in addition to or instead of th
can be practically intelligent for thems
others. It is for this reason that wisdom

conventional framework of analytical tests based on standard psychometric models do not seem likely greatly to expand our predictive capabilities (Schmidt & Hunter, 1998).

We view intelligence as a form of developing expertise (Sternberg, 1998a, 1999a, 2003a). Indeed, some of our tests may seem more like tests of achievement or of developing expertise (see Ericsson, 1996; Howe, Davidson, & Sloboda, 1998) than of intelligence. But it can be argued that intelligence is itself a form of developing expertise — that there is no clearcut distinction between the two constructs (Sternberg, 1998a, 1999a). Indeed, all measures of intelligence, one might argue, measure a form of developing expertise.

An example of how tests of intelligence measure developing expertise emanates from work we have done in Tanzania. A study done in Tanzania (see Sternberg & Grigorenko, 1997; Sternberg, Grigorenko, et al., 2002) points out the risks of giving tests, scoring them, and interpreting the results as measures of some latent intellectual ability or abilities. We administered to 358 school children between the ages of 11 and 13 years near Bagamoyo, Tanzania, tests including a form-board classification test, a linear syllogisms test, and a Twenty Questions Test, which measure the kinds of skills required on conventional tests of intelligence. Of course, we obtained scores that they could analyze and evaluate, ranking the children in terms of their supposed general or other abilities. However, we administered the tests dynamically rather than statically (Brown & Ferrara, 1985; Budoff, 1968; Day, Engelhardt, Maxwell, & Bolig, 1997; Feuerstein, 1979; Grigorenko & Sternberg, 1998; Guthke, 1993; Haywood & Tzuriel, 1992; Lidz, 1987, 1991; Sternberg & Grigorenko, 2002a; Tzuriel, 1995; Vygotsky, 1978). Dynamic testing is like conventional static testing in that individuals are tested and inferences about their abilities made. But dynamic tests differ in that children are given some kind of feedback in order to help them improve their scores. Vygotsky (1978) suggested that the children's ability to profit from the guided instruction the children received during the testing session could serve as a measure of children's zone of proximal development (ZPD), or the difference between their developed abilities and their latent capacities. In other words, testing and instruction are treated as being of one piece rather than as being distinct processes.

they were tested again. Because the instr
lasted only about 5-10 minutes, one would
gains. Yet, on average, the gains were statis
the experimental group, and statistically
control group. In the control group, pretes
correlated at the .8 level. In the experimen
scores on the pretest showed only weak
correlations with scores on the post-test.
at about the .3 level, suggested that when te
statically to children in developing countrie
unstable and easily subject to influences of
could be that the children are not accustome
style tests, and so profit quickly even fro
instruction as to what is expected from t
more important question is not whether th
even correlated with each other, but rather
with other cognitive measures. In other w
a better predictor of transfer to other cog
the pretest score or the post-test score?
test score to be the better predictor.

Academic skills. In a first set of s
explored the question of whether conve
school systematically discriminates ag
creative and practical strengths (Sternbe
1995; Sternberg, Ferrari, Clinkenbeard, &
Sternberg, Grigorenko, Ferrari, & Cli
Motivating this work was the belief that
schools strongly tend to favor childre
memory and analytical abilities. Howe
unbalanced in other directions as well.
Grigorenko and I visited in Russia in 2
emphasis upon the development of creati
more so than on the development of ana
abilities. While on this trip, they were told
— catering to the children of Russian b
strongly emphasized practical abilities, a
who were not practically oriented were
they would be working for their classmates
oriented.

The investigators used the Sternberg
Test, as described above, in some of ou
The test was administered to 326 childre

analytical, creative, or practical instruction. For example, in the memory condition, they might be asked to describe the main tenets of a major theory of depression. In the analytical condition, they might be asked to compare and contrast two theories of depression. In the creative condition, they might be asked to formulate their own theory of depression. In the practical condition, they might be asked how they could use what they had learned about depression to help a friend who was depressed.

Students in all four instructional conditions were evaluated in terms of their performance on homework, a midterm exam, a final exam, and an independent project. Each type of work was evaluated for memory, analytical, creative, and practical quality. Thus, all students were evaluated in exactly the same way.

Our results suggested the utility of the theory of successful intelligence. This utility showed itself in several ways.

First, we observed when the students arrived at Yale that the students in the high creative and high practical groups were much more diverse in terms of racial, ethnic, socioeconomic, and educational backgrounds than were the students in the high-analytical group, suggesting that correlations of measured intelligence with status variables such as these may be reduced by using a broader conception of intelligence. Thus, the kinds of students identified as strong differed in terms of populations from which they were drawn in comparison with students identified as strong solely by analytical measures. More importantly, just by expanding the range of abilities measured, the investigators discovered intellectual strengths that might not have been apparent through a conventional test.

Second, we found that all three ability tests — analytical, creative, and practical — significantly predicted course performance. When multiple-regression analysis was used, at least two of these ability measures contributed significantly to the prediction of each of the measures of achievement. Perhaps as a reflection of the difficulty of deemphasizing the analytical way of teaching, one of the significant predictors was always the analytical score. (However, in a replication of our study with low-income African-American students from New York, Deborah Coates of the City University of New York found a different pattern of results. Her data indicated that the practical

A follow-up study (Sternberg, Torff
1998b) examined learning of social s
third-graders and eighth-graders. The
students in a very low-income neighbo
Carolina. The 142 eighth-graders we
largely middle to upper-middle class
Maryland, and Fresno, California. In th
assigned to one of three instructional
condition, they were taught the course th
have learned had there been no interve
the course was on memory. In a seco
were taught in a way that emphasiz
thinking. In the third condition, they w
emphasized analytical, creative, and
students' performance was assessed
(through multiple-choice assessments)
creative, and practical learning (t
assessments).

As expected, students in the su
(analytical, creative, practical) condi
other students in terms of the perform
could argue that this result merely refle
taught. Nevertheless, the result sugge
these kinds of thinking succeeded. Mo
was the result that children in the s
condition outperformed the other
multiple-choice memory tests. In othe
that one's goal is just to maximize
information, teaching for successful in
rior. It enables children to capitalize o
correct or to compensate for their we
children to encode material in a variety

We have now extended these result
the middle-school and the high-school
middle-school students and 432 high sc
reading either triarchically or through
At the middle-school level, reading w
the high school level, reading was inf
mathematics, physical sciences, soc
history, foreign languages, and the arts.
who were taught triarchially substantiall
who were taught in standard ways (

The first is *unrealistic optimism* with respect to the long-term consequences of what they do. They may believe themselves to be so smart that they believe that, whatever they do, it will work out all right. They may overly trust their own intuitions, believing that their brilliance means that they can do no wrong.

The second is *egocentrism*. Many smart people have been so highly rewarded in their lives that they lose sight of the interests of others. They start to act as though the whole world revolves around them. In doing so, they often set themselves up for downfalls, as happened to both Presidents Nixon and Clinton, the former in the case of Watergate, the latter in the case of *Monicagate*.

The third characteristic is a sense of *omniscience*. Smart people typically know a lot. They get in trouble, however, when they start to think they "know it all." They may have expertise in one area, but then, start to fancy themselves experts in practically everything. At that point, they become susceptible to remarkable downfalls, because they act as experts in areas where they are not, and can make disastrous mistakes in doing so.

The fourth characteristic is a sense of *omnipotence*. Many smart people find themselves in positions of substantial power. Sometimes they lose sight of the limitations of their power, and start to act as though they are omnipotent. Several U.S. presidents as well as presidents of other countries have had this problem, leading their countries to disasters on the basis of personal whims. Many corporate chieftains have also started to think of themselves as omnipotent, unfortunately, cooking the books of their corporations at will.

The fifth characteristic is a sense of *invulnerability*. Not only do the individuals think they can do anything; they also believe they can get away with it. They believe that either they are too smart to be found out or, even if found out, they will escape any punishment for misdeeds. The result is the kind of disasters the United States has seen in the recent Enron, Worldcom, and Arthur Andersen debacles.

Conclusions

Some psychologists will believe that the theory of successful intelligence departs too much from the conventional

will be those who wish to preserve thi
theories, and those who will continue
replicates hundreds and thousands of time
ral intelligence does indeed matter for suc
of life. I agree. At the same time, I suspe
and also, that those who keep replicating e
of the past are unlikely to serve as the
leaders of the future. But only time will t
there is typically some value to replication
after the point where a point is establishe
continue to produce papers than to pro
breakthroughs.

The educational systems in many o
great emphasis on instruction and asses
two important skills: memory and, to a le
Students who are adept at these two skill
the educational system, because the abil
and achievement tests we use all largely m
processes emanating from these two kind
problem, however, namely, that children
in other kinds of skills may be shortcha
These children might learn and test wel
given an opportunity to play to their stren
weaknesses.

Our societies can create closed system
certain types of children and that disad
Children who excel in memory and ana
end up doing well on ability tests and ac
hence find the doors of opportunity ope
who excel in other abilities may end up
tests, and find the doors shut. By trea
alternative patterns of abilities as lose
creating harmful self-fulfilling proph
thing no society needs. What societie
conception of intelligence. The the
intelligence provides one such concep

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