

Intelligence, Creativity, and Wisdom: Assessments of Abilities for the 21st Century

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Main Message

- Current tests used for assessing abilities are narrow and do an injustice to certain groups
- We can create and have created broader, more equitable, better assessments

Organization of Talk

- Context
- Theory of Successful Intelligence
- The Rainbow Project
- The Tufts Kaleidoscope Project
- Related Projects
- Conclusions

Theoretical Background:

The Augmented Theory of Successful Intelligence

Students are **SUCCESSFULLY INTELLIGENT**, according to the theory, when they have the abilities to succeed in life according to their own standards within their sociocultural context, by:

1. *Recognizing and capitalizing on strengths;*
2. *Recognizing and correcting or compensating for weaknesses.*

Theoretical Background

Capitalization and compensation enable people to balance:

1. *Adaptation* to existing environments;
2. *Shaping* environments to improve them;
3. *Selecting* new environments.

Theoretical Background

Via:

- Analytical abilities
- Creative abilities
- Practical abilities
- Wisdom-based abilities

Theoretical Background

Analytical skills are evoked when we

- analyze
- compare and contrast
- evaluate
- explain
- judge
- critique

Theoretical Background

Creative skills are evoked when we:

- create
- design
- invent
- imagine
- suppose

Theoretical Background

Practical skills are evoked when we:

- use
- apply
- implement
- employ
- contextualize

Theoretical Background

Wisdom-based skills are invoked when we:

- balance intrapersonal, interpersonal, and extra-personal interests
- over the long and short terms
- through the infusion of positive ethical values
- in search of a common good



Project RAINBOW

The Rainbow Project: A Plan for Augmentation of the SAT

Robert J. Sternberg
And the Collaborators of the Rainbow Project

Overarching Goal

- To develop a battery assessing analytical, creative, and practical intellectual skills that is reliable and construct valid, increasing prediction of academic and life performance beyond that obtained from conventional “*g*-based” measures

Method: Materials

- Outcome Variable (the criterion)
 - College GPA
- Baseline Materials
 - SAT-Verbal
 - SAT-Math
 - SAT-Total
 - ACT or PSAT scores if SAT scores were not available

Method: Materials

Analytical

15 multiple choice items

- Including verbal, quantitative, and figural content
- 4 response options per item

Method: Materials

Practical

15 multiple choice items

Including verbal, quantitative, and figural

- 4 response options per item

Performance tasks – Tacit-knowledge inventories

- College Life (15 vignettes)
- General Workplace/Common Sense (15 vignettes)
- Everyday Situational Judgment - Movies (7 vignettes)

Vignette Sample Item

College Life Tacit-Knowledge Inventory

1	2	3	4	5	6	7
Not at all			Neither			Extremely
Characteristic			Characteristic nor			Characteristic
			Uncharacteristic			

You are enrolled in a large introductory lecture course. Requirements consist of three term-time exams and a final. Please indicate how characteristic it is of your behavior to spend time doing the following, if your goal is getting an A in the course.

- ___ Attending class regularly.
- ___ Attending optional weekly review sessions, if there are any, with the T.A.
- ___ Reading assigned text chapters thoroughly.
- ___ Taking comprehensive class notes.
- ___ Speaking with the Professor after class and during office hours.
- ___ Talking to students who took the course last year.
- ___ Studying regularly instead of cramming in the night before exams.
- ___ Doing the extra credit or optional reading assignments.
- ___ Skimming the required reading in the morning before class.

Vignette Sample Item

General Workplace/Common Sense Tacit-Knowledge Inventory

1	2	3	4	5	6	7
Extremely	Very	Somewhat	Neither	Somewhat	Very	Extremely
Bad	Bad	Bad	Nor Good	Good	Good	Good

You've been assigned to work on a project for a day with a fellow employee whom you really dislike. He is rude, lazy, and rarely does a proper job. What would be the best thing for you to do?

- Tell the worker that you think he is worthless.
- Warn the worker that, if he is not "on his toes" today, you will complain to the supervisor.
- Avoid all conversation and eye contact with the other worker.
- Be polite to the other worker and try to maintain as business-like a manner as possible so that hopefully he will follow your example for the day.
- Tell your supervisor that you refuse to work with this man.
- The project is going to be impossible to accomplish with this worker, so you may as well not even try--you can always blame your bad work partner.
- See if you can convince one of your friends to take your place and work with this employee.
- Demand a raise from your supervisor; you should not have to tolerate these conditions.

Everyday Situational Judgment - Movies

- Examinees see seven digitized movies depicting various real-life situations that college students confront or may confront:
 - The Party: Entering a party where one does not know anyone
 - A Fair Portion: Discussing shares of rental payments for a flat
 - Professor's Dilemma: Asking for a letter of recommendation from a professor who does not know you very well

Everyday Situational Judgment – Movies, Contd.

- No Free Lunch: Having eaten a lunch and discovering that you do not have the money to pay for it
- The Unwanted Guest: Dealing with a friend in need of help at a time when you are just seeing your significant other for the first time in a long time
- Pressing Corporate Matter: Making a decision regarding proactive actions that can be taken before a wave of firings commences in your company
- Jerry's "Beauty-rest Sleeper": Organizing your friends to move your furniture to a new flat

Method: Materials

Creative

15 multiple choice items (STAT – Level H)

- Including verbal, quantitative, and figural
- 4 response options per item

Performance tasks

- 2 written stories
- 2 oral stories
- 3 cartoon captions

Written Stories

SHORT STORY TASK: TITLES

- “A Fifth Chance”
- “2983”
- “Beyond the Edge”
- “The Octopus’s Sneakers”
- “It’s Moving Backwards”
- “Not Enough Time”

Oral Stories

SHORT STORY TASK

The following task may at first seem somewhat novel; however, I am confident that you will have no difficulty doing it. You will be presented with several sheets of paper, each containing several images. You are to choose two of these pages and to formulate a short story for each. In order to expedite the process, rather than write out each of the stories, you will dictate them to a cassette recorder. When recording: please speak clearly; state your name; spell your name; and state the page number of each story. There is no limitation in the content of the story or the manner in which you decide to present it.

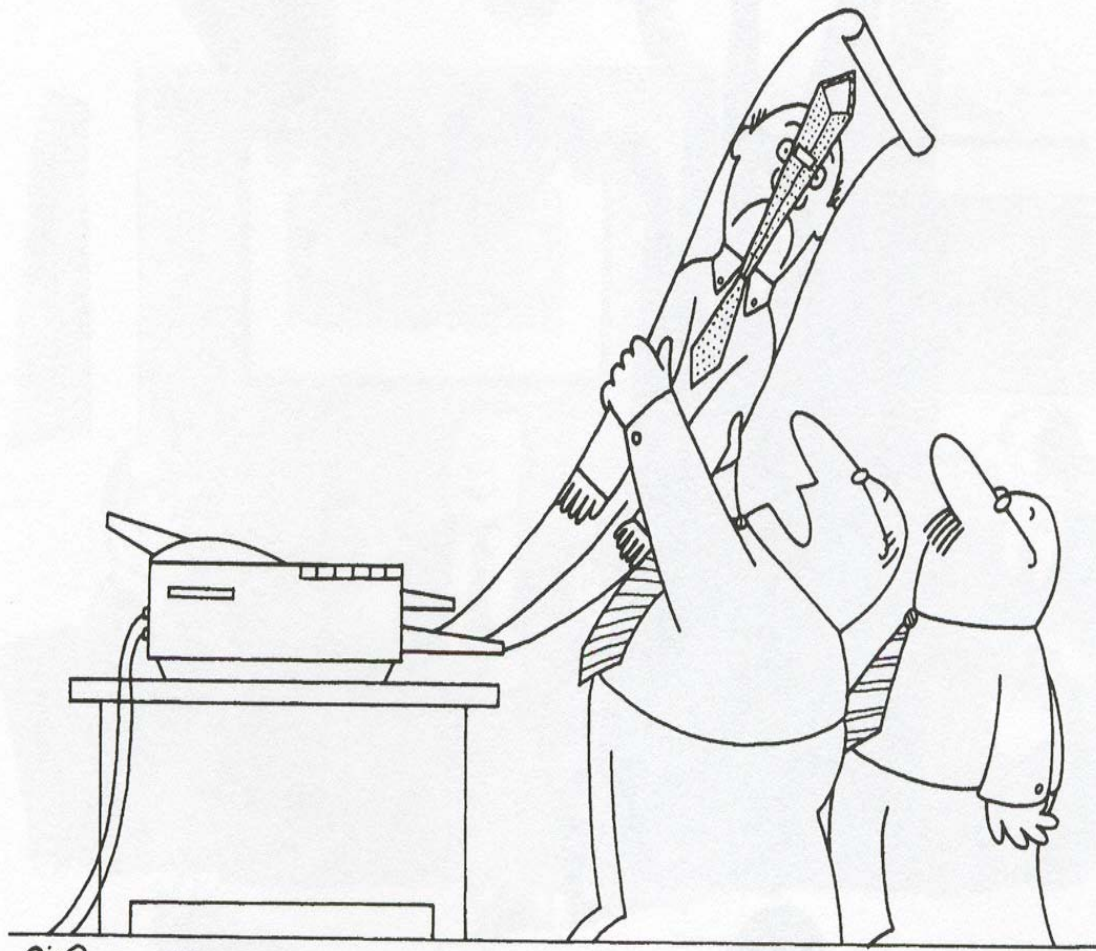
Do you have any questions?....

So, if there are no [more] questions as to what we are asking you to do, please get started.



Cartoon Titles

Examinees see five cartoons and need to provide titles for three of the five.

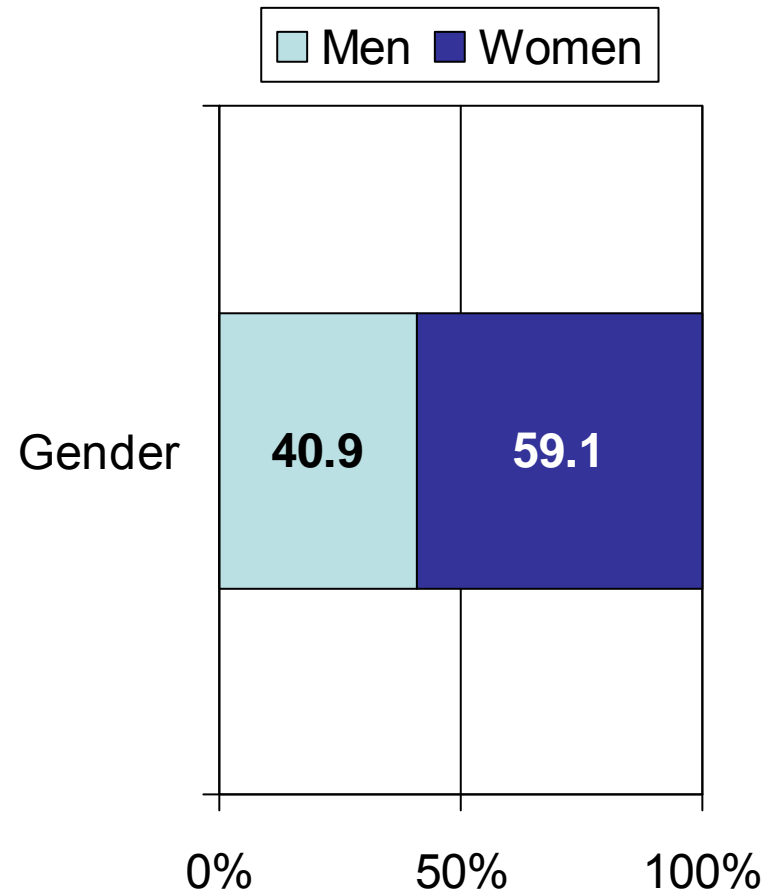
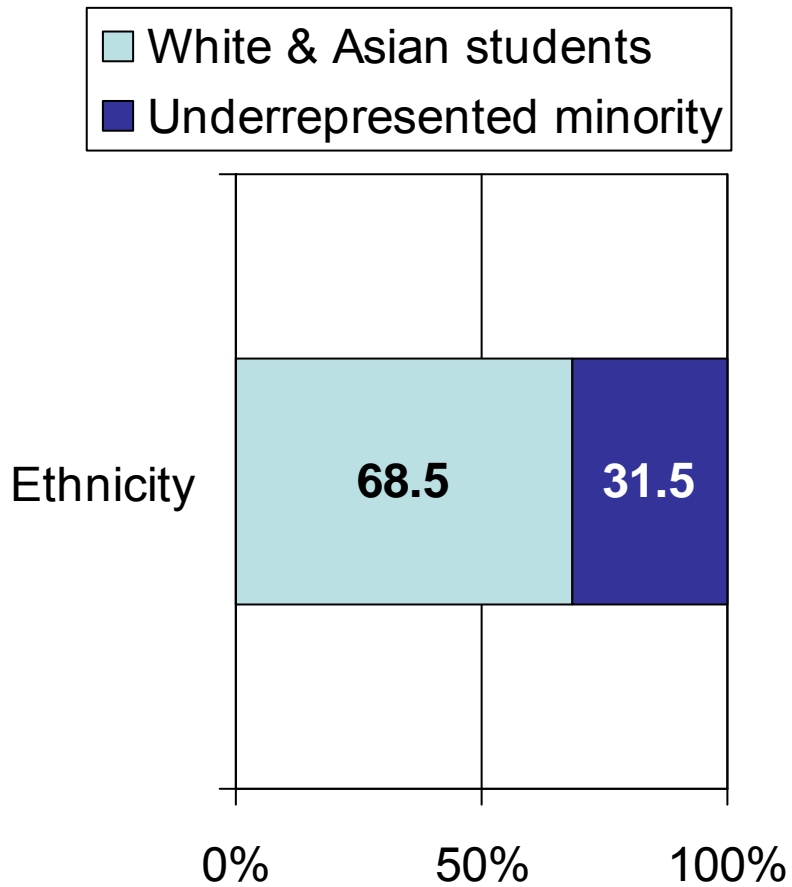


C. Bassetti

Method: Participants

- Total sample
 - Collected: $n = 1013$
 - Available for analyses: $n = 990$
 - Included in this presentation: $n = 777$
 - From 13 colleges and universities around the country

College Sample Composition



Method: Design

- Incomplete randomized design (McArdle, 1994)
- Two forms:
 1. Web-based (59% of students)
 2. Paper-Pencil (41% of students)

All tests were proctored by university officials.

Exploratory Factor Analysis: Rainbow Tasks

	Factor 1	Factor 2	Factor 3
Oral Stories	0.57	-0.06	-0.06
Written Stories	0.79	0.01	-0.02
Cartoons	0.20	0.28	-0.08
STAT-creative	0.00	0.73	0.09
STAT-analytic	-0.06	0.80	-0.04
STAT-practical	0.03	0.81	-0.02
Movies	0.12	0.05	0.52
College Life	-0.13	0.01	1.00
Common Sense	0.12	-0.01	0.92

Promax rotation: 62.8% variance explained

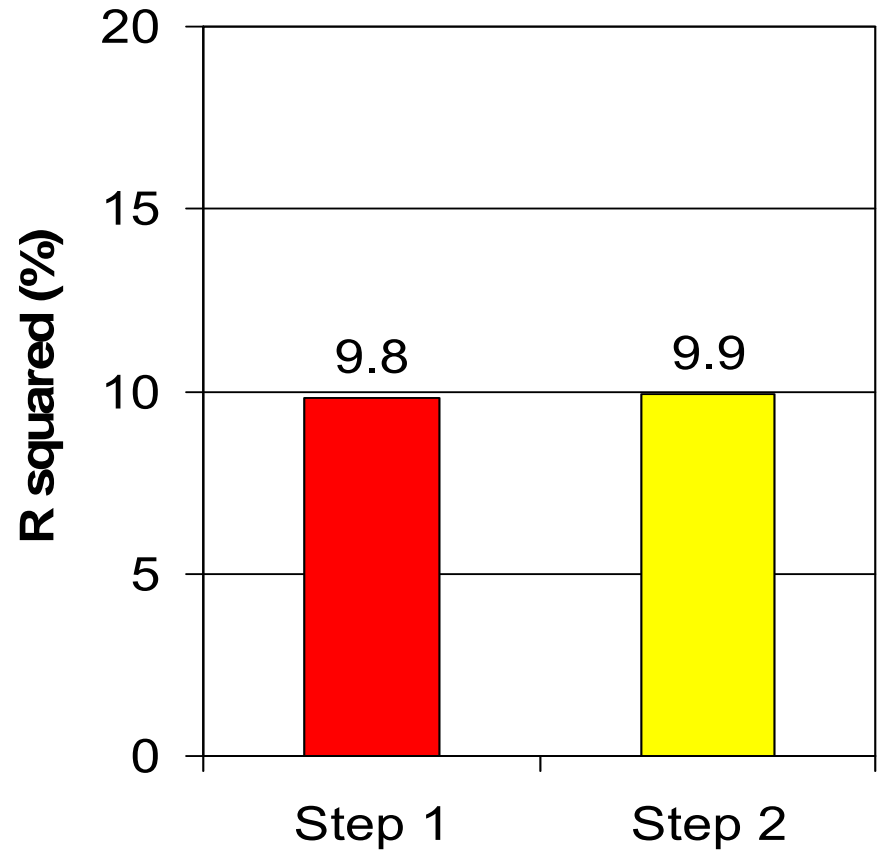
Predicting GPA: SAT + Analytical

Step 1:

SAT-Verbal, SAT-Math

Step 2:

Analytic (STAT)



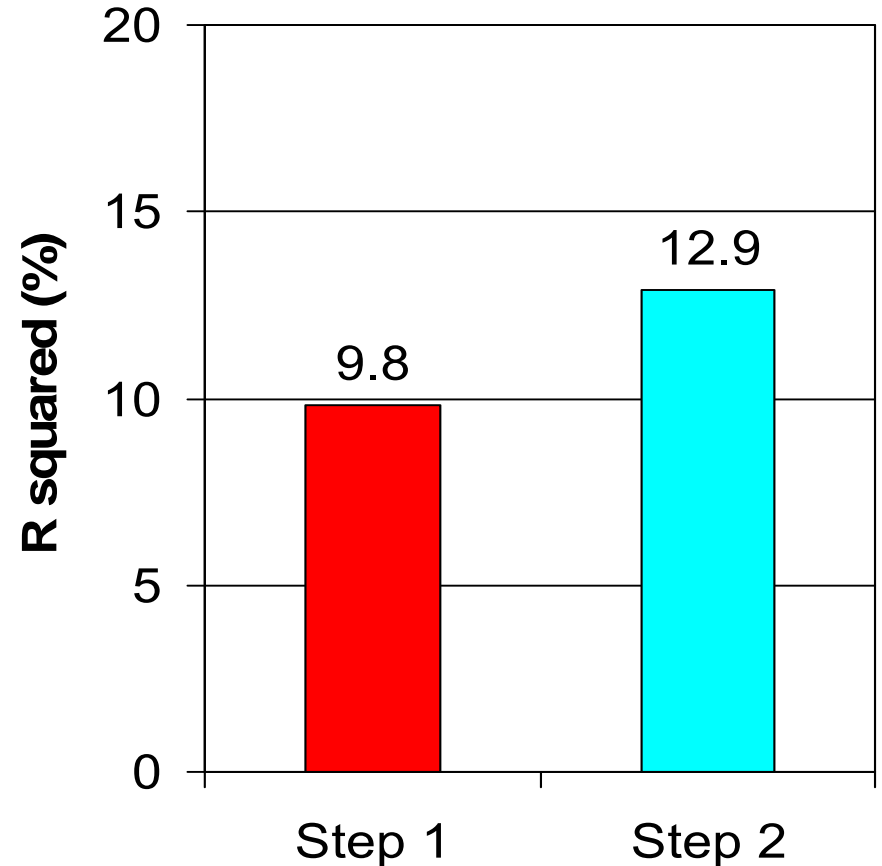
Predicting GPA: SAT + Practical

Step 1:

SAT-Verbal, SAT-Math

Step 2:

Practical (STAT + Separate Tasks)



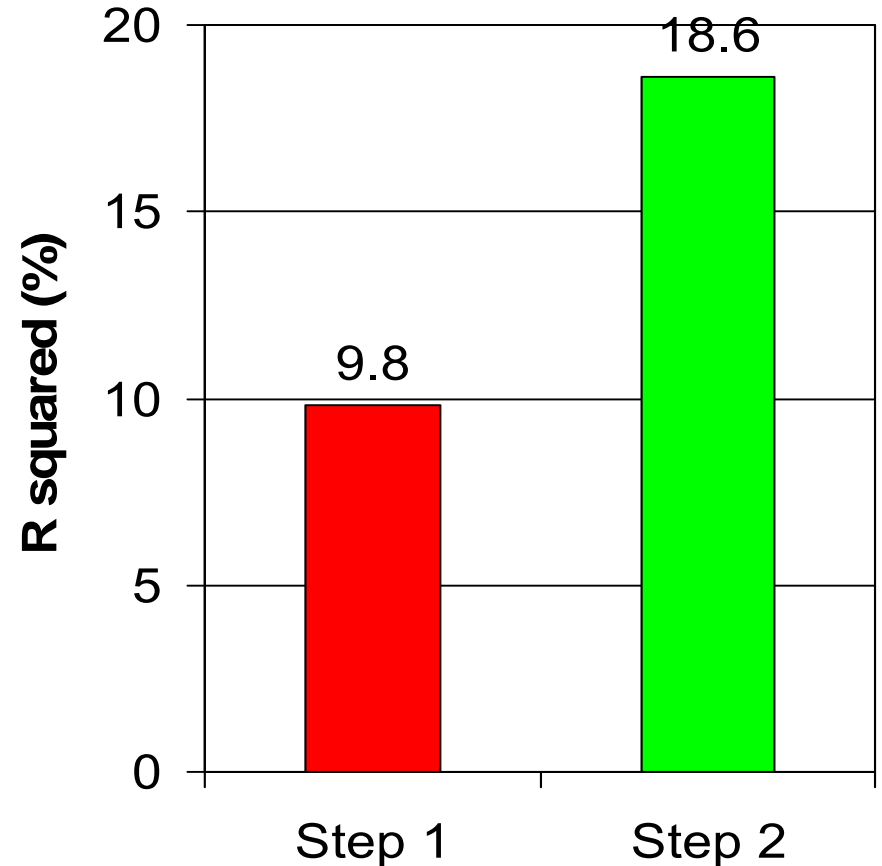
Predicting GPA: SAT + Creative

Step 1:

SAT-Verbal, SAT-Math

Step 2:

Creative (STAT + Separate Tasks)



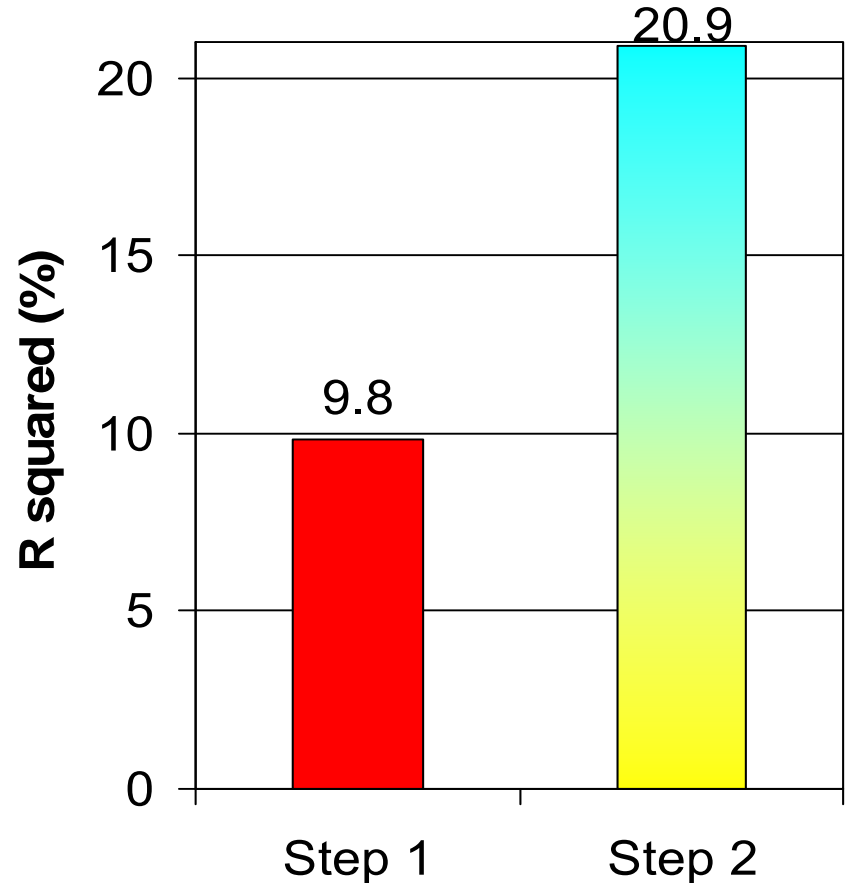
Predicting GPA: SAT + Analytic, Creative, Practical

Step 1:

SAT-Verbal, SAT-Math

Step 2:

All Rainbow Project Items
(STAT Analytic, Practical, Creative,
Practical Tasks,
Creative Tasks)



Predicting GPA:

All measures (practical before creative)*

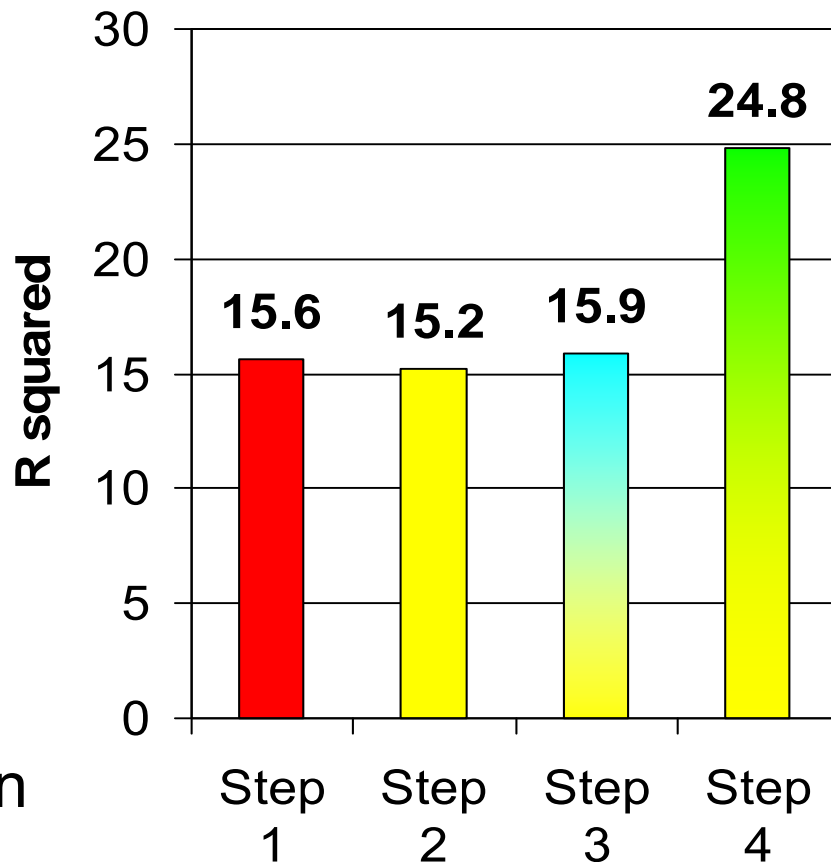
Step 1: SAT-M
SAT-V
HSGPA

Step 2: + Analytic

Step 3: + Practical

Step 4: + Creative

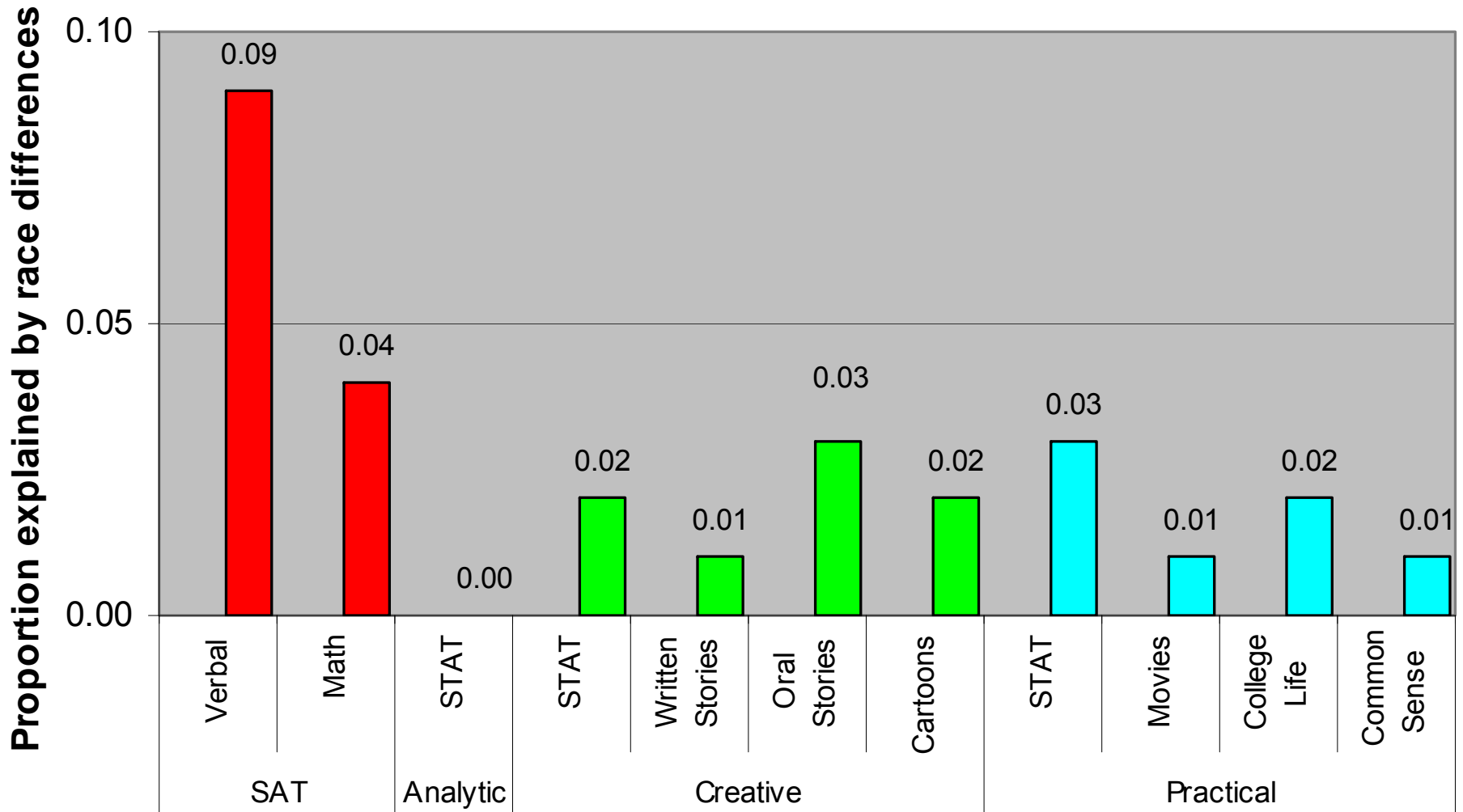
*Controlling for school quality in dependent variable



Regressions: In sum

- In the Rainbow sample,
 - Adding Rainbow measures over SAT roughly doubles prediction of college success
 - Adding Rainbow measures over SAT + High School GPA increases prediction by roughly half

Amount of Each Measure That Is Predicted by Racial / Ethnic Differences (ω^2)



Effect Sizes: Cohen's d with Whites as Reference Group

	Blacks	Latinos	Asians	Nat.Am.
• SAT-M	-0.7	-1.0	0.5	-1.0
• SAT-V	-0.7	-1.1	-0.2	-0.6
• SAT-T	-0.7	-1.1	0.0	-0.8

Effect Sizes: Cohen's d with Whites as Reference Group

	Blacks	Latinos	Asians	Nat.Am.
• STAT-A	-0.2	-0.4	0.3	-0.3
• STAT-C	-0.7	-0.5	-0.0	-1.2
• STAT-P	-0.5	-0.5	0.1	-0.7

Effect Sizes: Cohen's d with Whites as Reference Group

	Blacks	Latinos	Asians	Nat.Am.
• Movies	-0.5	-0.4	0.0	-0.8
• Common Sense	-0.9	-0.2	0.2	-0.4
• College Life	-0.7	-0.2	-0.2	0.2

Effect Sizes: Cohen's d with Whites as Reference Group

	Blacks	Latinos	Asians	Nat.Am.
• Cartoons	-0.2	-0.5	-0.2	-0.4
• Oral				
Stories	-0.1	-0.5	-0.5	0.5
• Written				
Stories	-0.3	-0.1	-0.2	0.0

Group Difference Analyses: In Sum

- In the Rainbow sample:
 - Rainbow measures reduce ethnic-group differences relative to the SAT alone
 - The new measures reduce differences because different ethnic groups show different average patterns
 - Differences are not eliminated, however

The Tufts Kaleidoscope Project Preliminary Results ('06-'08)

Robert J. Sternberg
and the Kaleidoscope Collaborators
Class of 2011

Goal

- Insert analytical, creative, practical as well as wisdom-based essays as part of the Tufts-specific admissions application in order to broaden the way we think about applicants
- Change categories for rating system of applicants

Tufts Admissions

- Tufts applicants complete the Common Application and (if they choose to) the Supplemental Application.
- Applications are rated on 4 dimensions:
 - Academic (AC),
 - Personal Quality (PQ),
 - Extracurricular (EX), and
 - Overall (OV).
- Final admission decision is made by a committee based on multiple criteria.

The Kaleidoscope Framework

- Kaleidoscope (Kscope) is a framework for evaluating applicants'
 - Creative (C),
 - Practical (P), and
 - Wisdom (W) skills.
- Applicants submitted optional essays.
- Admission officers were trained and asked to use a Kscope rubric to evaluate applicants.

Essay prompts

1. The late scholar James O. Freedman referred to libraries as "essential harbors on the voyage toward understanding ourselves." What work of fiction or non-fiction would you include in a **personal library**? Why?
2. An American adage states that "**curiosity** killed the cat." If that is correct, why do we celebrate people like Galileo, Lincoln, and Gandhi, individuals who thought about longstanding problems in new ways or who defied conventional thinking to achieve great results?
3. History's great events often turn on small moments. For example, **what if** Rosa Parks had given up her seat on that Montgomery bus in 1955? What if Pope John Paul I had not died in 1978 after a month in office? What if Gore had beaten Bush in Florida and won the 2000 U.S. Presidential Election? Using your knowledge of American or world history, choose a defining moment and imagine an alternative historical scenario if that key event had played out differently.

Essay prompts (cont.)

4. Create a short story using one of the following topics:

- a. The end of **MTV**
- b. Confessions of a Middle School **Bully**
- c. The **Professor** Disappeared
- d. The Mysterious **Lab**

5. Describe a moment in which you took a **risk** and achieved an unexpected goal. How did you persuade others to follow your lead? What lessons do you draw from this experience? You may reflect on examples from your academic, extracurricular or athletic experiences.

6. A high school curriculum does not always afford much **intellectual freedom**. Describe one of your unsatisfied intellectual passions. How might you apply this interest to serve the common good and make a difference in society?

7. Using an 8.5x11 inch sheet of paper, create an ad for a movie, design a house, make an object better, illustrate an ad for an object.

Creative Essay: “What if...”

- If the Trojans had heeded Laocoon’s advice and thrown Odysseus’ wooden horse into the sea, they would have defeated the Greeks at Troy. Aeneas would then never have had reason to flee the city, and he would never have ventured to Italy to found Rome. Without Rome, neither the Roman Republic nor a Roman Empire would have existed. Concrete, the arch, plumbing, and the sauna might never have been invented. The modern implications of Rome never having existed are indeed drastic. Lacking even concrete floors, people would resort to sleeping in the mud, and, without plumbing or saunas, they would be perpetually filthy and, generally, quite chilly. France could not have built the base of the Eiffel Tower without arches, so tourists would be unable to purchase miniature collectible Towers in Parisian convenience stores.

Good but Uncreative Essay:

“What if...”

- What if the ratification of the nineteenth amendment did not pass and women were never given the right to vote? What would life for women, like me, be like in the United States? For one thing, I probably would not be writing this essay. If women were not given their right to vote, I probably would stop going to school after this year and it would be unlikely that I would receive a college education. Without suffrage, my career options would be limited, if a career were a possibility at all. My accepted practices would be limited to staying home and taking care of the family. Rather than being equals, women would be subservient to men. I might not drive, I might not dress in the way in which I choose to, and I might not be able to live my life the way that I can in the twenty-first century.

Kscope Pilot Study : Research Questions

- How do Kscope measures relate to other application information?
 - Academic, personal quality, extracurricular activity
- How do Kscope measure relate to admissions decision?

Data - Class of 2011

- 22% of the applicants received at least one Kscope rating (Creative, Practical and Wisdom)
- **K Group**- combined C, P, W scores
 - C = only low scores
 - B = only medium scores
 - A = one high score
 - A+ = two or three high scores

Correlations between admission measures

	Creative	Practical	Wisdom	K Group
Practical	0.41*			
Wisdom	0.34*	0.32*		
Academic	0.17*	0.06	0.11	0.10*
Personal	0.18*	0.22*	0.21*	0.25*
Extracurricular	0.45*	0.44*	0.41*	0.49*
SAT-V	0.14*	0.04	0.08	0.07*
SAT-M	0.05	-0.02	0.00	0.00
GPA	0.03	0.01	0.02	0.00

Pilot Study Data

- Kscope correlates with extracurricular and personal quality, but not with conventional academic measures.
- Kscope significantly improves post-hoc prediction of admission decisions over academic and personal quality measures.
- Interviewed admission officers and students supported the Kscope framework.

Pilot Study Data

- Number of applications rose
- Bottom third of old application pool greatly diminished; many more top applicants
- Average SATs rose slightly
- African-American applications up 25%, acceptances up 30%
- Hispanic-American applications and acceptances up 15%

Pilot Study Data

- There were no significant ethnic-group differences on Kaleidoscope
- Kaleidoscope correlated weakly with a composite academic rating (.11)
- Kaleidoscope correlated moderately with rated leadership/extracurricular activities (.44)
- First-semester GPAs did not differ significantly between Kaleidoscope A's and academically comparable students admitted for other reasons

Pilot Study Data

- Kaleidoscope A's engaged in more extracurricular and leadership activities than did others
- Greater customer satisfaction
- Message to students, parents, teachers, and counselors that Tufts is looking for more than just the high-SAT, high-GPA student

Related Projects

- Choate Rosemary Hall
- University of Michigan Business School Project
- Advanced Placement Project
- Aurora Project

Conclusions

- Traditional abilities tests are narrow and limited
- Our new measures can
 - Broaden the range of skills tested for educational purposes
 - Increase predictive validity
 - Decrease ethnic-group differences
 - Increase customer satisfaction

Contact

- Please feel free to contact me at robert.sternberg@tufts.edu with any questions or comments or ideas for collaboration