

# The Paradoxical Nature of Academic Measures and Creativity

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## Abstract

This study investigates the relationship between high stakes college admissions tests and creativity. One hundred eighteen college students majoring in education were given the Epstein Creativity Competencies Inventory (ECC-I). We examined the total creativity competency score as well as the four different skill areas: Preserves new Ideas; Seeks Challenges; Broadens Skills and Knowledge; and Changes Physical and Social Environment. The students' ACT and SAT scores were compared with their scores on the ECC-I. Results indicate that students with lower ACT scores, scored higher overall on the creativity survey than students with high ACT scores. There was a negative correlation between the students Capturing creativity scores and their SAT scores. This indicates that students with higher SATs rated themselves lower in paying attention to and preserving new ideas; that is, capturing new ideas as they occur. There is a need in our society for innovative and creative thinkers, however, American colleges and universities are still predicting the ability to succeed in college with traditional measures.

## Keywords

Creativity, ACT, SAT, College Admissions

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## 1. Introduction

A recent IBM poll of 1500 chief executive officers identified creativity as the number one “leadership competency” of the future (Bronson & Merryman, 2010), yet there is a growing concern that our students are losing their creative abilities as they move through the continuum of educational experiences in the United States. As students enter schools, they come to an environment of increasingly high accountability measured through high stakes tests. This trend continues through college admission requirements. The current generation of students leaving American high schools is the first to experience their entire academic careers in this environment.

The Scholastic Aptitude Test (SAT) and American College Testing (ACT) are gatekeepers of college admission and considered the predictive measure of academic ability. Students who do poorly on them are labeled, whether by college admissions, or their own perceptions, as failures. Global markets seek highly creative thinkers. This paradoxical relationship between measures of academic success and global demands for leadership competency leads to speculation about the need for reform in college admissions.

As demands for creativity increase from business leaders, there is evidence that creativity is decreasing in the American population. Speculation that the accountability requirements for academic success influence the development of creative thinking may be a concern for the future. Few would argue that the current accountability system has influenced instructional approaches and reward systems in classrooms, yet little research on the relationship of accountability testing and creative thinking is available. The purpose of this study was to determine if there is a relationship between creativity and high stakes college admission tests.

## Creativity

Creativity has been researched for more than fifty years. There are many reviews of creativity literature and research (Anderson, 1959a, 1959b; Glover, Ronning, & Reynolds, 1989; Isaksen, 1987; Isaksen, Murdock, Firestien, & Treffinger, 1993; Grønhaug & Kaufmann, 1988; Runco, 2006; Saracho, 2002; Sternberg, 2006; Taylor & Getzels, 1975; Welsch, 1975). Yet there is disagreement among these researchers as to what creativity is and how it develops (Lynch & Harris, 2001). According to Webster (2013) creativity is defined as the ability to produce something new through imaginative skill, whether a new solution to a problem, a new method or device, or a new artistic object or form. The term generally refers to a richness of ideas and originality of thinking, imagination, resourcefulness, inspiration and ingenuity.

According to Epstein (1980) creativity is a natural category and any single definition would be imprecise. He claims creativity is not a good category for scientific analysis but that researchers can identify controlling variables that are indicators of creative thinking. Epstein's (1991, 1996, 1999) and Epstein, Kaminaka, Phan, & Uda, (2013) work on development of creativity identifies two generative mechanisms that he proposes support or inhibit creativity. One mechanism that affects creativity is the educational environment. The second generative mechanism to develop and sustain creativity requires intentional teaching of a set of competencies, particular skills and abilities that underlie successful performance. These include: 1) Capturing—related to capture and preserving ideas that occur to you; 2) Challenging—Challenge and failure helps stimulate new ideas. Analysis of failure provides opportunity for growth; 3) Broadening—learning new things, intellectual curiosity; and 4) Surrounding—exposure to novel or ambiguous stimuli. Epstein's Generativity theory provides a theoretical framework for identifying variables to support creativity analysis.

## 2. Predictive Measures of Academic Success

The SAT and ACT are the most common high stakes test used for admission to institutions of higher education. The SAT was launched in 1926 as a variant of an intelligence test used in World War I to place soldiers and sailors. Harvard adopted it in 1934. The University of California in 1968 began requiring applicants to submit SAT scores as a way to screen out lower achievers. The ACT was launched in the summer of 1956 and ACT Program was founded by Ted McCarrel and E. F. Lindquist. Lindquist suggests that there was a need for a new regional or national test for college-bound high school students, for several reasons: 1) the SAT is used primarily by selective colleges in the northeastern US, but not by most public institutions as well as by universities in other regions of the country; 2) the new test should be used not just for admissions but placement as well; and 3) the test should primarily be useful as an indicator of academic preparation (US Department of Education, 2012). The ACT is an achievement test, measuring what a student has learned in school. The SAT is more of an aptitude test, testing reasoning and verbal abilities. In 2012 about 1.7 million students took the SAT, and about 1.8 million took the faster-growing ACT (Coy, 2013).

American education policymakers want future Americans to be globally competitive, to out-innovate others, and to become job-creating entrepreneurs (Zhou, 2012) yet the academic success indicators are based on conformity and parrot-like responses to questions on standardized tests with questionable application to future global demands. This paradox of creative thinking and indicators of academic success has been identified as Doublethink. Doublethink is "to hold simultaneously two opinions which canceled out, knowing them to be contradictory and believing in both of them," according to George Orwell, who coined the phrase in his novel 1984.

(Zhou, 2012). In this lies the paradox of current predictive measures of academic success and global leadership requirements of creativity.

### 3. Methodology

#### 3.1. Instruments

The instruments used in this study are the Epstein Creativity Competencies, the ACT and SAT tests. The Epstein Creativity Competencies Inventory (ECCI-i) yields an overall Creativity Score (%) and then 4 different skill areas within the Creativity domain (%s). For each statement (1 - 28 items), the examinee gives a rating between agree and disagree on a 5 point scale.

In two studies with a total of over 300 participants, the Epstein Creativity Competencies Inventory for Individuals (ECCI-i) was shown to be a reliable measuring instrument. In the first of these studies, the test was also shown to be a valid predictor of two measures of creative expression. The test is derived from empirical research on the creative process in individuals, which suggests that creative expression can be accelerated through the strengthening of any of 4 measurable, trainable competencies: capturing (preserving new ideas as they occur), challenging (taking on difficult tasks), broadening (seeking knowledge and skills outside one's current areas of expertise), and surrounding (seeking out new stimuli or combinations of stimuli). In the second study, training such competencies improved test scores and led to a significant increase in creative output (Epstein, Schmidt, & Warfel, 2008).

#### 3.2. Sample

One hundred and eighteen undergraduate students with declared education majors ranging from freshmen to senior classification enrolled in a private liberal arts college in the Southeastern region of the United States responded to the invitation to participate in this study. Twelve percent of the sample was comprised of students who possessed an Associate's Degree.

Participation was voluntary and there was no compensation. Students were from twenty different states and one foreign country although the majority (60%) were from Florida. Ninety five percent of students were Caucasian, 1% African American 2% Hispanic, and 3% identified themselves as Other American Indian, Alaska Native, Asian or Pacific Islander. Participants included 106 females and 12 males. The high percentages of Caucasian females are reflective of the nature of teacher education programs offering an Elementary Education major.

Most participants in this study had attended public schools (80%) while a small percentage attended private schools. Nine percent of students indicated that they attended both public and private schools. As far as family income, there was a wide variation of responses. Twelve percent reported an income of \$20,000 or less, 32% reported a family income between \$20,000 to 49,999. In the middle income level, most participants (54%) reported a family income between \$50 - 99,999 and at the next highest income level 100 - 150,000, 16% of participants reported this level and 7% of participants reported a family income at the \$150,000+ level.

#### 3.3. Procedures

Participants were assigned numerical identifiers. The ECCI-i was administered through the Robert Epstein website at <http://drrobertepstein.com/index.php/tests/boost-creativity> and analyzed through Epstein's creativity center. ACT and SAT scores were retrieved from admission applications from the participants.

#### 3.4. Analysis

Correlation analysis was used to determine the covariation between variables ACT/SAT and scores on the ECCI-i. Then Students were divided into groups based on their ACT scores. To divide students into these groups, a median split procedure was used. For the sample, the median ACT score was calculated and those that had scores above the median were put in the High ACT Group and those that had scores below the median were put into the Low ACT Group.

Within this dataset, several participants were removed from the analysis. One participant was removed because they skipped several questions on the Creativity Survey. Eight participants were removed from the analy-

sis because they were outliers based on their overall score on the creativity survey. A person was classified as an outlier if their score was above or below two standard deviations from the mean. Four of the participants had scores higher than two standard deviations above the mean and four participants had scores lower than two standard deviations below the mean. These nine participants were removed from the analysis.

#### 4. Results

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Several of the students in this study had taken both the ACT and the SAT. Of the 11 students that took both the SAT and ACT, there was a significant positive correlation between ACT scores ( $M = 21.8$ ,  $SD = 6.05$ ) and SAT scores ( $M = 1028$ ,  $SD = 175.42$ ),  $r(8) = .933$ ,  $p = .000$ .

To do a more thorough analysis of the data, students were divided into groups based on their ACT scores. To divide students into these groups, a median split procedure was used. For the sample, the median ACT score (median = 23) was calculated and those that had scores above the median were put in the High ACT Group and those that had scores at or below the median were put into the Low ACT Group. The result was that 39 participants were categorized into the Low ACT group and 27 were categorized into the High ACT group. The Low ACT group ( $M = 14.31$ ,  $SD = 3.25$ ) scored significantly higher on the capturing portion of the creativity survey than the High ACT group ( $M = 12.41$ ,  $SD = 3.41$ ),  $t(64) = 2.29$ ,  $p < .05$ .

#### 5. Discussion

Education majors with higher ACT scores generally score lower on measures of creativity. This is a concern, as teachers entering the workforce can no longer rely on a limited set of behaviors to insure academic success for students. Instruction and assessment must include alternative and flexible approaches to meet the needs of the changing population. If teachers are not capable of developing new and innovative approaches to teaching and assessment criteria, their students will be locked into a system of failure when they move into the employment arena.

There is a significant negative correlation between the SAT and the creativity Capturing category. This component of creativity addresses the ability to accept and preserve new ideas, a concept that is important for expanding and connecting concepts across creative thinking. Creative people have learned to pay attention to and then preserve some of the new ideas that occur to them (Epstein, 1999). This may be related to the current assessment system in schools that demand students memorize key facts in order to succeed on tests.

#### 6. Conclusion

In the Silent Epidemic (Bridgeland, DiIulio, & Morison, 2006) survey of 470 dropouts, over half said they left school because their classes were boring, did not relate to the real world, and were not engaging. The majority said they would have worked harder if the material was more challenging and they could realize and achieve their personal goals (College Ready, 2009). In fact, we could be losing a large number of unconventional non-conformists who are potential entrepreneurs, inventors, researchers, and other creative thinkers who are not interested in school or college. They may have been poor performers on traditional approaches and assessments, but have highly creative and intelligent capabilities that go unnoticed in school. The results from this study seem to generally support this premise.

Are high school graduates global, innovative thinkers who are ready for postsecondary education and training? A recent report states that less than 43 percent of students who took the SAT in 2013 are ready to succeed in postsecondary education (Doubleday, 2013: p. 17). Student scores have remained flat for the past 5 years and most students are not prepared enough for college. Even worse is the continuing racial disparity among test-takers' scores in the United States. Although there has been some increase in minority participation in taking the SAT, their scores have failed to reach the same gains as their White or Asian counterparts (Adams, 2013).

The disconnection between tests like the ACT and SAT and the expectations of future global leaders seems

like an issue that needs rethinking for academic success. A cursory internet search indicates there are many sites dedicated to how to pass the ACT or SAT. Our assessment systems should serve to intervene and assist students who are not making progress, not teach them how to take the test. By teaching to the test, teachers leave out much that is essential to succeed in today's society: analysis, critical thinking, and problem-solving. When teaching and assessment systems rely on sampling small sets of behavior of which we use to estimate larger domains of skills we are not encouraging creativity or thinking skills. It is time to rethink the paradoxical relationship of high stakes testing and instruction to real world demands for success.

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