

# Chapter 7

## Creativity, Intelligence, and Culture: Connections and Possibilities

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The topic of intelligence and culture is a widely studied and often highly controversial area, marked by much debate and emotion. Typically, African Americans and Hispanic Americans score lower than European Americans on a variety of measures of intelligence and ability (see Loehlin, 2000, for an overview). Group tests such as the SAT, ACT, Graduate Records Examinations, and Advanced Placement exams produce similar results (Camara & Schmidt, 1999; Morgan & Maneckshana, 1996). Some researchers argue that these measures reflect actual differences (e.g., Herrnstein & Murray, 1994; Jensen, 1998). Others point to the discrepancy between socioeconomic status and opportunities across ethnicities (Rogers, 1996; Sternberg, 1996), whereas still others argue that current ability measures do not incorporate enough aspects of intelligence (Sternberg et al., 2008).

Indeed, the Kaufman Assessment Battery for Children—Second Edition (KABC-II; Kaufman & Kaufman, 2004) is based on two current theories of intelligence (the Cattell–Horn–Carroll (CHC) theory of intelligence (McGrew, 2005) and Luria’s (1970) neuropsychological model). The KABC-II, as well as its predecessor (the K-ABC; Kaufman & Kaufman, 1983), has consistently shown the smallest differences in test scores by ethnicity of the major individual intelligence tests (Cole et al., 2009; Kaufman, 2003; Kaufman et al., 2005). Another instrument based on Luria’s theory, the Cognitive Assessment System (Naglieri & Das, 1997), also shows small differences by ethnicity (Naglieri et al., 2005).

Although group mean differences are certainly relevant to the discussion, there are other, more psychometric approaches that offer a more sophisticated view of the problem. The argument underlying such approaches is that, even though two groups may perform differently on an ability test, the test itself may not be in error or biased. These approaches evaluate content that may be inappropriate because it unfairly favors one group over another (for instance, sports examples may stereotypically favor males). The question then becomes whether different constructs may be measured across nominal groups by the same test. A test may

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measure verbal ability in European Americans, for example, but may be measuring something quite different in a Hispanic–American population (Reynolds et al., 1999; Reynolds, 2000).

## Creativity in Intelligence Theory

Creativity, despite its growing connection with intelligence theory, is not represented on any major IQ test. Guilford (1967, 1988) pioneered this connection by integrating creativity into a larger framework of intelligence. His Structure of Intellect model organized human cognition along three dimensions. The first dimension was called “operations” and simply meant the type of mental effort required for any kind of task. The second dimension, “content,” referred to the general subject area. The third dimension, “product,” represented the actual products that might result from different kinds of thinking in different kinds of subject matters. With five operations, four contents, and six products, Guilford’s (1967) model had 120 different possible mental abilities.

One of Guilford’s operations is divergent production—analyzing responses to questions with no obvious, singular answer (such as “What would happen if people no longer needed sleep?”). Guilford (1967) initially described divergent production as consisting of four specific abilities: fluency, flexibility, originality, and elaboration. A common instrument used to measure divergent production is the Unusual Uses Test, where participants are asked to list all the uses of a familiar object, such as a brick. In this context, fluency is quantitative and measured by the number of responses. Flexibility is measured by the variety of different categories or concepts that are evoked. Elaboration is measured by the level of descriptiveness of each use. Originality is measured by uniqueness of a participant’s response in comparison to the responses of other participants. Modern researchers use the broader term “divergent thinking” to describe what Guilford referred to as divergent production.

Many subsequent theories of intelligence incorporated creativity-related abilities into their structures. Two examples of this class of theory are the CHC and Luria’s (1970) model. CHC theory is a combination of the Cattell–Horn theory of fluid and crystallized intelligence (Horn & Cattell, 1966; Horn & Hofer, 1992; Horn & Noll, 1997) and Carroll’s Three-Stratum Theory (1993). The CHC model proposes ten different broad factors of intelligence. One of them is *Glr* (long-term storage and retrieval), which includes creativity/originality as a component. Specific components of *Glr* and their relationship to creativity are discussed in more detail in A.S. Kaufman and N.L. Kaufman (2008) Luria’s theory is also at the heart of the PASS model (Planning, Attention, Simultaneous, and Successive; see Das et al., 1994, for an overview). It has been hypothesized that planning abilities are related to creativity (Naglieri & Kaufman, 2001).

Sternberg’s theory of successful intelligence includes creative abilities as one of three essential components, along with analytical and practical abilities. Although not currently used in a major IQ test, this theory is the basis for exciting work in

college admissions. Sternberg and his colleagues at Tufts University are adding explicit assessment of creativity as a nonrequired component of college admittance. His measures of successful intelligence (including creativity) predict college success more accurately than standard admissions tests do, and differences by ethnicity are significantly reduced (Stemler et al., 2006; Sternberg, 2006; Sternberg & the Rainbow Project Collaborators, 2006).

## Creativity and IQ Tests

Regardless of whether creativity plays a role in theoretical conceptions of intelligence, it does not play a role in traditional measures of intelligence. How does creativity relate to traditional measures of intelligence? Most researchers who study creativity and intelligence use tests of divergent thinking (such as the Torrance Tests of Creative Thinking [TTCT; Torrance, 1966, 1974] and other divergent-thinking measures) or other similarly scored paper-and-pencil tests. Generally, such paper-and-pencil measures are significantly associated with psychometric measures of intelligence and are especially associated with verbally oriented measures. This relationship, however, is not a particularly strong one (see Barron & Harrington, 1981; Kim, 2005).

In most of these studies, the correlation between divergent thinking and IQ is maintained up to a certain level of performance on a traditional individual intelligence test. Researchers pursuing this traditional work have argued that there is a “threshold effect,” in which creative potential and psychometric intelligence are positively correlated up to an IQ of approximately 120. In people with higher IQs, the two constructs show little relationship (e.g., Fuchs-Beauchamp et al., 1993; Getzels & Jackson, 1962).

More recently, however, the threshold theory has come under fire. Comparing measures of fluid intelligence and creativity (as measured through divergent-thinking tests), Preckel, Holling, and Weise (2006) found modest correlations across all levels of intellectual abilities. Along similar lines, a 21-study meta-analysis by Kim (2005) showed virtually no support for the threshold theory, with very small positive correlations found between measures of ability and measures of creativity and divergent thinking.

Notably, almost none of these studies involved traditional, individually administered intelligence tests. Much of the research covered by Kim (2005) was more than 30 years old and had therefore been conducted with IQ tests that do not reflect current IQ theory. In addition, most of the studies used group IQ tests. Although group IQ tests serve a strong purpose in research, they are not used by most school psychologists for psychoeducational assessment (Kaufman & Lichtenberger, 2006). One of the few studies to use an individually administered, modern IQ test was conducted by Sligh, Conners, and Roskos-Ewoldsen (2005), who used the Kaufman Adolescent and Adult Intelligence Test (Kaufman & Kaufman, 1993). This instrument is based on Horn’s (1989) revision and expansion of the Cattell–Horn Gf-Gc theory (Horn & Cattell, 1966). Sligh et al. delved deeper into

the intelligence–creativity relationship than traditional threshold theory research had by specifically examining the relationship between a measure of actual creative innovation and *Gf* (fluid intelligence, which measures a person’s ability to adapt and be flexible in new situations) and *Gc* (crystallized intelligence, which measures knowledge acquired from formal schooling and acculturation). A measure of creative innovation had participants create and modify inventions. Sligh et al. found that *Gc* showed the same moderate and positive relationship to composite creativity as had past studies (mentioned above). In contrast, *Gf* showed the *opposite* pattern. *Gf* and composite creativity were significantly correlated for the high IQ group, but they were not significantly correlated for people with average IQs.

Sligh et al.’s (2005) results and the mixed findings on the threshold hypothesis indicate that supplementing traditional intelligence tests with measures of creativity may provide unique information about an individual. Creativity is not simply an inherent part of traditional intelligence. Levels and types of cognitive abilities differ in the ways they are associated with measures of creativity.

I now explore findings about how selected ethnicities and cultures compare on measures of creativity.

## Creativity Across Cultures

### *Hispanic–American and Hispanic*

Studies of creativity in Hispanic Americans and European Americans tend to arrive at different results depending on whether the measure of creativity is verbal or nonverbal. For example, Argulewicz and Kush (1984) found that European Americans scored higher than Hispanic Americans on three of four TTCT Verbal (English) forms but found no significant differences on the Figural forms. (The TTCT has been translated into Spanish, among many other languages, and has been shown to have construct validity in many Hispanic cultures; see Wechsler, 2006, for example.)

Studies using only nonverbal assessments have typically found no differences (e.g., Argulewicz et al., 1982) between European Americans and Hispanic Americans or have shown that bilingual Hispanic Americans have a slight advantage in the nonverbal domain (Kessler & Quinn, 1987; Price-Williams & Ramirez, 1977). However, low-income Hispanic–American elementary students scored below the norms on the TTCT (Mitchell, 1988), and teachers rated European American students as being more creative than Hispanic–American students, with highly acculturated Hispanic Americans receiving higher marks than less acculturated Hispanic Americans (Masten et al., 1999).

Some researchers found that European–American parents had more favorable perceptions of creativity than Hispanic–American parents did (Strom & Johnson, 1989; Strom et al., 1992). However, they also found that Hispanic–American

parents were more likely to engage in play activities with their children and valued play more than European–American parents did (Strom & Johnson, 1989). Make-believe play can be a valuable component of a child’s developing imagination (Singer & Singer, 1990).

### *Eastern vs. Western Cultures*

Studies of the TTCT often show Western cultures outperforming Eastern cultures. Jellen and Urban (1989) administered a measure of creative thinking and drawing to children from several different countries and found that, in general, Western countries (such as Germany, England, and the United States) scored higher than Eastern countries (such as China and India). American college students scored higher on the TTCT than Japanese college students in one study (Saeki et al., 2001), and Americans from five different age groups scored higher than similar individuals from Hong Kong (Jaquish & Ripple, 1984). Zha, Walczyk, and Griffith-Ross (2006) found that although Chinese graduate students outperformed their American counterparts on the GRE, American graduate students scored higher on four out of five measures of divergent thinking. School children in Hong Kong scored higher on the Figural form of the TTCT than their counterparts in Taiwan, Singapore, and America, but lower than German children. On the Verbal form, the results were in the opposite order (Rudowicz et al., 1995).

Self-report and self-assessments tend to show fewer differences than are found on psychometric tests. Plucker, Runco, and Lim (2006) found no difference in creative potential (as measured by the Runco Ideational Behavior Scale; Runco et al., 2001) between Korean students and American students. Similarly, Lim and Plucker (2001) found that Koreans and Americans hold very similar concepts about the nature of creativity. Malaysian students scored higher than American, Indian, and Hungarian students on one self-report measure of creativity, but American students scored higher than Malaysian students on a different self-report measure (Palaniappan, 1996).

According to both American and Chinese raters in one study, artwork produced by American college students was more creative than art produced by Chinese students (Niu & Sternberg, 2001). Yet a similar study that compared American and Chinese drawings of geometric shapes found that the two groups were rated similarly for creativity by both American and Chinese raters (Chen et al., 2002). In both studies, American and Chinese judges tended to agree on which products were creative and which were not, although Niu and Sternberg (2001) found that the Chinese judges tended to give higher scores than their American counterparts. There were no differences between Chinese and British school children in terms of rated artwork, except for the higher ratings earned by Chinese children who attended a weekend art school (Cox et al., 1998). Another study found that Japanese children produced drawings that received higher rating than drawings by British children did (Cox et al., 2001).

Differences in styles and values in Eastern and Western cultures may explain some of the findings that Western individuals receive higher scores on creativity assessments. Li (1997) proposed a horizontal and vertical tradition of creativity. Horizontal traditions, which are favored by Western cultures, tend toward changing and modifying pre-existing structures. In vertical traditions, however, the nature of the work is much more constrained and consistent with past work. A piece's worth is more dependent on how well the artist is able to capture his or her subject matter (Li, 1997). This theory is consistent with the idea that, whereas both Eastern and Western cultures value the effectiveness of a piece of creativity, the West values the novelty of a piece much more than the East does. Of much more interest to the East is whether a piece is authentic—"a reflection of an individual's own values and beliefs" (Averill et al., 2001, p. 172).

Why does this difference occur between East and West? One answer may lie in the theory of interdependence vs. independence. This theory argues that Northern Americans and Western Europeans see themselves as independent and that their motivations and goals follow accordingly. In contrast, for example, Asian cultures are more interdependent and have a higher sense of group responsibility. These cultures are motivated by different variables, such as group harmony (Markus & Kitayama, 1991).

Whether a person is part of an independent or interdependent culture can affect his or her personality and style. People from interdependent cultures are more likely to see themselves as fundamentally linked to others and to view themselves in the context of their social relationships (Cross & Markus, 1999). This view translates into a cognitive style; Asians were found to be more field dependent and more holistic than Americans, for example (Ji et al., 2000; Nisbett et al., 2001). People who are more field dependent tend to score lower on tests of creativity (e.g., Chadha, 1985; Noppe, 1985).

### *Asian Americans*

There are many studies that compare Asians and Europeans or Americans. Far fewer studies have compared *Asian Americans* to Americans of different ethnicities. Rostan, Pariser, and Gruber (2002) studied student artwork by Chinese–American and European–American students, with two groups in each culture: students with additional art training and classes and students with no such instruction. Each group's artwork (one drawing from life and one drawing from imagination) was assessed by both Chinese and American judges. Neither set of judges found any significant differences between cultures, only between art students versus nonart students. Pornrunroj (1992) gave the Figural form of the TTCT to Thai children and Thai–American children and found Thai children received significantly higher scores than did Thai Americans. Yoon (2005) gave the TTCT to European–American and Asian–American middle-school students (the latter being a mix of Chinese Americans, Korean Americans, Japanese Americans, and Southeastern

Asian Americans). There were no significant differences either between the European Americans and Asian Americans or between the different subgroups of Asian Americans.

### *African Americans*

Creativity researchers have discerned few differences between African Americans and European Americans. Indeed, some of the only creativity-related differences that have surfaced tend to favor African Americans. These findings have been fairly consistent regardless of the type of measurement. The TTCT and other divergent-thinking measures, with both verbal and figural forms, have been used extensively in these studies (e.g., Glover, 1976; Iscoe & Pierce-Jones, 1964; Kaltsounis, 1974; Knox & Glover, 1978; Torrance, 1971, 1973).

Other work, too, has found no differences between African Americans and European Americans. Some of the studies used questionnaires measuring creative accomplishments (Stricker et al., 2001), whereas others have looked at the ability to be trained on creativity tasks (Moreno & Hogan, 1976). Still other research has examined the development of divergent-thinking abilities in adolescents from South Africa and the United States (Ripple & Jaquish, 1982). Kaufman, Baer, and Gentile (2004) studied poems, stories, and personal narratives written by African-American and European-American eighth-grade students. There were no differences in creativity scores assigned by expert judges. Of 13 measures of giftedness, those of creativity showed some of the smallest differences between these two groups (Harty et al., 1984).

Indeed, some of the only significant differences that have emerged tend to favor African Americans. Torrance (1971, 1973) found that African-American children scored higher on the TTCT's Figural tests in fluency, flexibility, and originality than European-American children, whereas the European Americans outscored the African Americans on Figural elaboration and on all Verbal subtests. The initial sample compared African-American children in Georgia with children of higher socioeconomic status in Minnesota. When Torrance's subsequent work (1973) used European Americans also from Georgia, all differences narrowed significantly. Torrance also found that the African Americans in his sample received higher fluency and originality scores on the TTCT than did the European-American participants. Troiano and Bracken (1983) gave measures of creative thinking to three different kindergarten classes, one comprised of Dutch Americans, another of African Americans, and the third of Native Americans. They found that African Americans and Native Americans scored approximately one standard deviation higher on creative thinking, particularly in fluency, than the Dutch Americans. Kaufman (2006) asked 3,553 individuals (mostly high school and college students) to rate themselves in 56 different domains of creativity. African Americans rated themselves significantly higher than at least one other ethnicity on all factors. All ethnicities except for Asian Americans rated themselves higher than another ethnicity on at least one factor.

## African Americans, Creativity, and Personality

It has been suggested that creativity does not benefit African Americans on intelligence tests and may even hurt them (Heath, 1983). Some researchers have proposed that differences on certain IQ or achievement subtests, such as those involved in remembering the details of a story, may show larger differences between African Americans and European Americans in part because African Americans approach the task differently (Heath, 1983; see Manly et al., 1998). According to this theory, European Americans go about it as the test-makers intended—by trying to memorize as many appropriate details as possible and stick to the presented story. In contrast, African Americans may put more emphasis on telling the story creatively. Indeed, another possible negative outcome is that African Americans are penalized for creative behavior in the classroom. Baldwin (1985, 2003) asserts that teachers and other authority figures may mistake creativity in African-American students as unruly or disruptive behavior.

Baldwin (2001) also analyzed a list of creative traits and abilities. These abilities included well-researched aspects, such as being open to experience or having high divergent-thinking ability, and rather theoretical aspects, such as being antiauthoritarian and having a “zany” sense of humor and a low tolerance for boredom (Clark, 1988). Many of these abilities, Baldwin (2001) reasoned, are specifically appropriate and often exhibited by African Americans. These ideas are consistent with Shade’s (1986) theory of an African-American cognitive style. Her research with cognitive style tests found that African Americans were more likely to be spontaneous, flexible, and open-minded than European Americans. In contrast, European Americans were more regulated and structured.

Such a connection between open-mindedness and creativity seems to be a natural one. Indeed, being open to new experiences has been shown to be highly correlated with creativity, regardless of the measure used. These results have been found with self-reports of creative acts (Griffin & McDermott, 1998), biographical data on creative accomplishments (King et al., 1996), studies of creative professions (Domino, 1974), analysis of participants’ daydreams (Zhiyan & Singer, 1996), creativity ratings on stories (Wolfradt & Pretz, 2001), and psychometric tests (Furnham, 1999; McCrae, 1987).

However, large empirical research studies on openness to experience and culture do not seem to bear out the arguments stated by Baldwin (1985, 2001, 2003) and Shade (1986). There generally tend to be no differences on any personality factors across cultures (e.g., Goldberg et al., 1998; Kyllonen et al., 2005; McCrae & Costa, 1997). However, Heuchert, Parker, Stumpf, and Myburgh (2000) found that White South Africans scored higher on openness to experience than Black South Africans. (However, much of this difference was in the openness-to-feelings subcomponent as opposed to the more creativity-related openness to fantasy and aesthetics sub-components.) Allik and McCrae (2004) found that people from European and European-American cultures tended to be more open to experience than people from Asian and African cultures. Schmitt, Allik, McCrae, and Benet-Martínez (2007), in a massive study of 17,837 people from 56 nations, found that participants from

South American and European countries were the most open to experience (Chile was the highest), with those from South Asian countries generally being less open to experience. Participants from African countries ranged between those two groups. Lastly, Saucier and Goldberg (2001) studied personality labels in 13 languages (including English) and found that openness to experience was the only one of the big-five traits (the others being emotional stability, extraversion, conscientiousness, and agreeableness) *not* to be found in all languages. Openness to experience, therefore, can be considered specific to Anglo cultures (Benet-Martínez & Oishi, 2008).

## Conclusions

Regardless of the nature of the specific differences between ethnicities and across cultures, the patterns are *not* the same as for intelligence. I am not arguing that any one culture is more creative or intelligent than another. Rather, I am arguing that if measures of intelligence show some differences and measures of creativity show other differences, then using *both* intelligence and creativity measures would yield more information and present both a more complete and a fairer picture of an individual than either measure alone would.

Creativity is not the only dimension that could have been selected to expand current conceptions of intelligence. The demand for and interest in noncognitive constructs is increasing in general among educators and admissions committees alike (Kyllonen et al., 2005). Similarly, one may argue that emotional intelligence, motivation, practical intelligence, or personality could all supplement measures of intelligence by offering a more varied and informative insight into an individual than is currently provided. In the world of business, these measures are already being used for both hiring and promotion (e.g., Agars & Kaufman, 2005). Many high-level businesses administer a wide battery of measures to ensure that their workers have the highest level of ability needed to succeed. Any of these constructs is likely to show different patterns across different cultures, with these patterns reflecting cultural values and principles (Hofstede, 2001).

The connection between creativity and intelligence, however, goes back to the days of Galton and Binet (Baer & Kaufman, 2006). Past research indicates that creativity and intelligence, despite the similar cognitive abilities they involve, have different patterns across cultures and ethnicities. As discussed in this chapter, the groups of people who receive the highest scores on ability measures are not necessarily the same as those who receive the highest scores on creativity measures. Work has already started on supplementing group admission tests with measures of creativity (Sternberg, 2006). It is time to continue this trend to discover the additional knowledge that can result from supplementing individual tests of ability and achievement with measures of creativity.

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