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Creativity across cultures: A comparison of cognitive creativity to creative achievement between the United States and India

Smit Shah
University of North Florida

CREATIVITY ACROSS CULTURES: A COMPARISON OF COGNITIVE CREATIVITY AND CREATIVE ACHIEVEMENT BETWEEN THE UNITED STATES AND INDIA

by

Smit S. Shah

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Certificate of Approval

The thesis of Smit Shah is approved: (Date)

_____ _____
Dr. Dominik Güss

_____ _____
Dr. Afesa Adams

Accepted for the Psychology Department:

_____ _____
Dr. Michael Toglia
Chair

Accepted for the College of Arts and Sciences:

_____ _____
Dr. Barbara Hetrick
Dean

Accepted for the University:

_____ _____
Dr. Len Roberson
Dean of The Graduate School

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Abstract

Creativity is a topic that is relevant to everyday life. Research in this area has mainly focused on comparing creativity in work contexts and between Eastern and Western conceptualizations. The current study was designed to measure differences in creativity between students in the United States and India by comparing a measure of cognitive creativity, the Abbreviated Torrance Test for Adults, to a measure of creative achievement, the Creative Achievement Questionnaire. The results from a linear regression showed that the Abbreviated Torrance Test for Adults was predictive of the Creative Achievement Questionnaire in the United States, but not in India. Results from independent samples t-tests showed that participants from the United States scored significantly higher on the Abbreviated Torrance Test for Adults than participants from India. Independent samples t-tests further showed that participants from India scored significantly higher on originality domain of the Abbreviated Torrance Test for Adults than participants from the United States. Independent samples t-tests showed there was no significant difference between the two countries in terms of overall creative achievement. However, participants in the United States scored significantly higher in the domain of creative writing, and marginally higher in the domain of music. Participants from India scored significantly higher in the domain of culinary arts. Part of the explanation for the results revolves around the idea that the Abbreviated Torrance Test for Adults is western-centric test. There is a need for a creativity test that takes into account Eastern conceptualizations of creativity. Based on the results the researcher recommends staying away from overgeneralizing East/West dichotomies, instead shifting the focus towards the uniqueness of individual cultures.

Keywords: creativity, culture, achievement, eastern culture, innovation, novelty

Creativity Across Cultures

Creativity is a topic that is relevant to everyday life. People use it at work to develop innovative new products, on the road navigating traffic, or even when trying to save money. Human beings have the capacity to be creative or perform creative tasks with novel outputs. Different aspects of creativity are valued by different cultures; Eastern cultures value appropriateness over novelty and vice-versa for Western cultures (Morris & Leung, 2010). A recent study on creativity comparing the United States, a Western culture, and Iran, an Eastern culture, showed that the United States scored significantly higher than Iran on the Abbreviated Torrance Test for Adults (Kharkhurin et al., 2008). Many tests of creativity directly measure novelty or originality as a subscale or aspect of the test, however only some measure appropriateness and often in very indirect ways (Goff & Torrance, 2002). The Abbreviated Torrance Test for Adults is an example of such a test. If this is the case, then can creativity be accurately measured and related to creative outcomes in Eastern cultures? Would average creativity still be higher in the United States if another Eastern culture were used as a comparison group? Is the conceptualization of East vs. West an overgeneralization or a helpful dichotomy? These are some of the questions addressed in the present study.

Creativity

Defining creativity

In order to study creativity, one must first define the concept. Creativity is a complex and not fully understood phenomenon. The problem lies with attempting to

define the phenomenon so that it is broad enough to cover other qualities that might fall under it, but specific enough so that it can be readily observed and measured. While there are many definitions for creativity in the field, the following definition was chosen for this study: Creativity can be defined as a quality attributed to a person or a process that frequently produces a novel and appropriate solution to a problem (Mayer, 1999).

There are many definitions of creativity in the field, however this particular definition was chosen for two reasons. First, creativity can be attributed to a person or a process that has a product. The person perspective focuses on the personality profiles of creative geniuses compared with those less gifted individuals (Feist, 1998). Creativity is assumed to be a process in which simultaneous activation of different and often unrelated ideas or categories develop a new plane on which original and novel ideas could be generated (Kharkhurin et al., 2008). The product perspective is an examination of when and why certain outputs are creative (Simonton, 2003). Second, the definition signifies the importance of both novelty and appropriateness. The distinction is particularly important when considering how creativity is viewed in other cultures or communities.

Although all people may have similar general cognitive capacities for creativity, they are not developed nor exercised uniformly across individuals. Therefore, creativity is a matter of cognitive processes at the individual level as well as social factors that go beyond the individual level. Creativity should not be decontextualized because of this. Creativity takes place within, is constituted and influenced by, and has consequences for a social context (Westwood & Low, 2003). Social context can be as broad as an overall culture of a nation, but it can also be narrow like the socioeconomic status of one's neighborhood. Either way, one cannot remove the influences of the environment on creativity because the

process is partly reactionary. It is partly reactionary in the sense that there is generally something in the situation or microenvironment that cues associations. For example, if one takes the same route home from work everyday and is always stuck in traffic, it would be considered creative to think of an alternative route home. This act of creation is simply a reaction to the environment. However, it is also important to note that individual factors such as patience, uncertainty avoidance, and cognitive flexibility can influence creativity as well (De Dreu, 2010). To continue with the traffic example, if one has more patience than others then they will not waste the effort in creatively navigating the traffic. If one were highly avoidant of uncertain situations then they would rather remain in traffic rather than attempt a new route where they would not know the traffic situation. If one were high on cognitive flexibility then they would likely think of multiple alternative routes that they might be able to take.

Measuring creativity

Most researchers measure creativity through divergent thinking tasks. Divergent thinking is the thought process used to think of multiple solutions instead of one solution (De Dreu, 2010). One of the most widely used tests for creativity is the Torrance Test for Creative Thinking (Ball & Torrance, 1985). In fact, this particular test is so widely used that it has been translated into more than thirty-five languages and has shown longitudinal validity over a fifty-year period (Kim, 2008; Runco et al., 2010). The original Torrance Test for Creative Thinking included a Verbal and a Figural section. Since both these sections often require a considerable amount of time, Torrance suggested that a shortened version would be beneficial. Thus, the Abbreviated Torrance Test for Adults or ATTA was created. This is the test that will be used to measure creativity in this study. The coding manual for

the ATTA states that the test is reliable with a KR21 reliability coefficient of .90 (Goff & Torrance, 2002).

A test can have construct validity in measuring creativity, however if it does not relate to creative achievements in real life then it would not be considered to have external validity. If there is no external validity then the question of the test's importance should be raised. Research has shown that the Torrance Test for Creative Thinking is related to both personal and public achievements (Runco et al., 2008). For this study, the Creative Achievement Questionnaire will be used to measure creative achievement. This self-report measure has established predictive validity, convergent validity, and discriminant validity (Carson et al., 2005). This test measures creative achievement in ten domains: visual arts, writing, humor, dance, theater and film, music, invention, scientific design, culinary arts, and architectural design.

Culture

As mentioned, creativity is a matter of cognitive processes at the individual level as well as social factors. Social factors, such as culture, need to be examined in order to truly understand creativity. Culture can be defined as a dynamic system of rules established by groups in order to ensure their survival. It involves attitudes, beliefs, values, norms and behaviors shared by the group. It is communicated across generations and relatively stable over time, however it has the potential to change (Matsumoto & Juang, 2004).

Studies of cultural values

Hofstede (1980) performed a study comparing cultures scores on four dimensions of cultural values: power distance, individualism, masculinity, and uncertainty avoidance.

He standardized country scores on a scale of 100 on each dimension. He claimed that greater innovative levels are more likely in countries that are high in individualism and low on power distance (Hofstede, 1980). Hofstede's study focused on cultural-level value dimensions; it was not individually based. This means that the culture as a group tends to share certain values, however individuals can differ amongst them. While these four dimensions are not all-inclusive of the traits that people from different cultures can differ on, they provide an overview as to some of the important differences between cultures.

Another researcher in Israel named Shalom Schwartz established another set of cultural values. Schwartz conducted a study with data from forty-nine countries. From his analysis, seven types of values were identified and were structured on three dimensions. The first dimension consists of Conservatism versus Intellectual and Affective Autonomy. Conservatism is the concept of a culture placing an emphasis on the maintenance of the status quo, proprietary, and restraint of actions that might disrupt the solidarity group or the traditional order (Schwartz, 1999). Intellectual Autonomy refers to a cultural emphasis on the desirability of individuals independently pursuing own ideas and intellectual directions (Schwartz, 1999). Intellectual Autonomy is most readily linked with creativity. Affective Autonomy refers to a cultural emphasis on the desirability of individuals independently pursing positive affective experiences (Schwartz, 1999). The second dimension consists of Hierarchy versus Egalitarianism. Hierarchy refers to an emphasis on the legitimacy of unequal distribution of power, roles, and resources (Schwartz, 1999). Egalitarianism refers to an emphasis on transcendence of selfish interests in favor of voluntary commitment in promoting the welfare of others (Schwartz, 1999). The last dimension consists of Mastery versus Harmony. Mastery refers to a

cultural emphasis on getting ahead through active self-assertion (Schwartz, 1999). This includes such behaviors and motivations as ambition, success, daring and competence. Harmony is a cultural emphasis on fitting harmoniously with the environment (Schwartz, 1999).

The culture of India

Based on Hofstede's dimensions, India is a country that is high on power distance (77), low on individualism (48), average on masculinity (56), and medium low on uncertainty avoidance (40) (The Hofstede Center, 2013). Since India is low on individualism, it could be considered collectivistic, which is at the opposite spectrum of individualism. In this sense, because society is looking more for conformity and obedience to the norm, one would expect individual creativity to be lower than countries that are individualistic. However, it is important to keep in mind that creativity is most likely in a normal distribution with a bell curve shape. This means that not everyone is going to be lower or higher than everyone else, however there will be a difference in the means. India's score on uncertainty avoidance speaks volumes on how the culture could handle creativity. People generally do not feel compelled to take action-initiatives but rather settle into established roles and routines without question (The Hofstede Center, 2013). This would mean that people from India are more likely to use the persistent pathway for creativity over the flexible pathway. Under Schwartz's cultural values, India is considered to be high on Conservatism and Hierarchy and somewhere in between Harmony and Mastery (Schwartz, 1999). This means that India, as a national culture, tends to try and maintain the status quo, while accepting unequal distributions in power and resources.

India is a country of many languages. Although Hindi is the official national language, states are allowed to use their own official languages. In the state of Andra Pradesh the official language is Telegu. In the state of Kerela it is Malayalam. In the state of Gujarat, the official language is Gujarati. In 1967, the Official Languages Amendment Act was passed. This act stated that both Hindi and English would be used by the parliament, and the central government would use Hindi to communicate with Hindi-speaking states, and English to communicated to non-Hindi speaking states (Craig, 2013). The interesting aspect about modern language in India is that there is a hybridization of the language. While Hindi is an official language, there is widespread use of Hinglish, a combination of Hindi and English (Gosh & Chaudhuri, 2009). This indicates that while English is widely spoken amongst educated Indians, it is important when working with an Indian population to have materials translated into the official state language.

The culture of the United States

Based around Hofstede's cultural dimensions, the United States is considered low on power distance (41), high on individualism (91), high on masculinity (62), and medium on uncertainty avoidance (46) (The Hofstede Center, 2013). Individualist societies place value on being different from everyone else. In terms of business, everyone is competing against everyone. People have developed innovative strategies in order to stay in competition. People living in the United States are generally taught to support themselves due to individualistic tendencies of the overall culture. Based on Schwartz's values, the United States would be considered high in Hierarchy, Mastery, and Affective Autonomy (Schwartz, 1999). This means that the national culture of the United States recognizes and accepts

unequal power distributions while at the same time accepting that one can get ahead through self-assertion.

Creativity and Culture

Lubart (1999) identified four ways that a culture might influence creativity: (a) people from different cultures may have different concepts of creativity; (b) people from different cultures may use different psychological processes when they engage in creative endeavors; (c) language may influence the development of creativity; and (d) environment can either promote or reduce people's creativity. Three of these have importance to this study; language, however, is not directly examined so it will not be included.

There is a distinction between Western and Eastern conceptualizations of creativity in the literature. Morris and Leung (2010) argue that Western norms prioritize originality and novelty over usefulness and appropriateness, whereas Eastern norms prioritize usefulness and appropriateness over originality and novelty. The Western conception of creativity is primarily concerned with innovation and creating new things, whereas the Eastern conception of creativity is more dynamic, involving the reuse and reinterpretation of tradition rather than breaks in the tradition (Lubart, 1999). Research shows that Western concern has increasingly been with tangible outcomes of creativity and assessing creativity in terms of them. Eastern cultures have been less concerned with outcome or product and more with the role of creativity in providing personal fulfillment (Lubart, 1999).

It has also been argued that different cultural conceptions of creativity have roots in a culture's creation myths and religious precepts (Mason, 1988). Eastern views of time,

human action in time, and progress, tend to have a circular conception. The creative person must find ways to access insight, understanding and truth that are pre-existent, but which must be made psychologically manifest through the creative process. For example, from a Hindu perspective, creativity is a religious or spiritual process of re-revealing. Hallman (1970) states, "To create is to imitate the spiritual…to make traditional truths come alive and become operative in daily affairs." In Eastern cultures, creative thought moves in a circular fashion, re-conceptualizing traditions rather than breaking from them. Western conceptions of creativity entail a linear movement towards a new point (von Franz, 1995).

The second way that culture can influence creativity is through the different psychological processes that individuals use when engaging in creative behaviors or endeavors. This relationship is best explained through the Dual Pathway to Creativity Model (DPCM, Baas, De Dreu, & Nijstad, 2008). This model decomposes creativity into two things: creative outputs and creative processes. Creative outputs are the insights, ideas, products, and problem solutions that are both novel and useful. Within the DPCM, the authors proposed that creative outputs are a function of flexible processing of information, or cognitive flexibility. There are two types of processes, the flexible pathway and the persistent pathway. The 'flexible pathway' manifests itself in divergent thinking, using broad and inclusive cognitive categories, and relatively frequent switching among cognitive categories. In addition to flexibility, the DPCM proposes that creative outputs are also a function of cognitive persistence. The 'persistent pathway' captures the notion that creative insights and originality need more or less deliberate, focused, and structured exploration of a few cognitive categories or perspectives. Persistence manifests itself in the generation of many ideas within a few categories or in longer time on a task. The authors

argue that both pathways are emergent to the extent that an individual is mentally activated and engaged.

In fact, the DPCM offers three insights on the cultural analysis of creativity (Baas et al., 2008). First, the model offers the possibility that an individual's culture impacts the pathway to creativity that they will be inclined to take. The cultural values surrounding the person may predispose them to engage in flexible, loose processing, and to take risks and explore the unknown. Other cultural values may predispose individuals to engage in persistent, incremental, cautious and analytical processing. Second, the model highlights the importance of time. Sometimes, time limits are present in tasks and this benefits individuals inclined to engage in flexible rather than persistent processing (Baas et al., 2008). Third, the model postulates that the same level of creativity may be achieved through either flexible or persistent processing. Provided that both pathways can be engaged, it could very well be that people from Eastern cultures achieve the same level of creativity as those from Western backgrounds, but by using different pathways.

The last way that culture can influence creativity is the environment can enhance or inhibit creativity. This fits in well with the idea that creativity is an interaction of person and situation. Niu and Sternberg (2001) argue that people in Western cultures are primarily independent and focused on internal thoughts. The existential problem of the Westerner revolves around expressing oneself and becoming different from others. On the contrary, people in the Eastern cultures are primarily interdependent and focus on fitting themselves in with others. Eastern cultures place an emphasis on harmony and fitting in. This can limit people's sense of appropriateness of free expression and as a result, negatively impact originality (Ivcevic, 2009). However, it could also just mean that in

Eastern cultures, free expression is not as desired a quality as it may be in Western cultures. Individualist societies generally place value on a person's unique qualities, initiative and achievement. Collectivist cultures place more of an emphasis on consensus with the community and being in line with others (Kharkhurin et al., 2008). The distinction between individualistic and collectivistic cultures is based around the degree of subordination of an individual's personal goals to the goals of a collective group (Triandis, Leung, Villareal, & Clack, 1985). Culture can also provide the zeitgeist for creative achievement (Bhawuk, 2003). This means that based on cultural background and preferences the actual domains of creative achievement, such as music, art, or theater, are influenced.

Hypotheses

Based on the review of the literature on creativity and cultures, several research hypotheses were postulated.

Hypothesis 1: Based on the evidence that the Torrance Test for Creative Thinking is related to personal and public achievement (Runco et al., 2008), the Abbreviated Torrance Test for Adults should be able to predict creative achievement from the Creative Achievement Questionnaire.

Hypothesis 2: Based on the findings that Western cultures put more of an emphasis on originality and novelty (Morris & Leung, 2010; Westwood & Low, 2003) than Eastern cultures it is predicted that the creativity index scores from the Abbreviated Torrance Test for Adults will be higher in the United States, a Western culture, compared to India, an Eastern culture.

Hypothesis 3: Based on the research showing the conceptualizations of the important factors of creativity between Eastern and Western cultures (Lubart, 1999; Morris & Leung, 2010; Niu & Sternberg, 2001; Westwood & Low, 2003;), originality scores from the Abbreviated Torrance Test for Adults will be higher in the United States than in India.

Hypothesis 4: If hypothesis 1 and 2 are confirmed, than it is expected that participants from the United States will have scored higher on the Creative Achievement Questionnaire than participants from India

Hypothesis 5: We expect differences in the domains of creativity that participants have achieved in between the United States and India (Bhawuk, 2003). This hypothesis is exploratory in nature since no specific predictions about the domains can be made.

Method

Participants

The participants for this study were 387 university students. There were 203 participants from the University of North Florida in the United States and 184 university students from Saurashtra University in Rajkot, India. The student's in the United States (M = 23.24, SD = 7.82) were significantly older than participants in India (M = 19.33, SD = 1.68), $t(375) = 6.48$, $p < .001$. The education levels of participants were roughly similar as both pools of participants were drawn from social science majors in their first three years of study. There were 156 females and 47 males from the University of North Florida and 101 females and 77 males from Saurashtra University.

Instruments

The Abbreviated Torrance Test for Adults (ATTA: Goff & Torrance, 2002) was used to assess creativity and the Creative Achievement Questionnaire (CAQ: Carson et al., 2005) was used to assess creative achievement. Demographic variables were added to include information on age and gender.

The Abbreviated Torrance Test for Adults or ATTA measures creativity by examining how participants respond to three verbal and figural tasks (Goff & Torrance, 2002). This test is an abbreviated version of the Torrance Test for Creative Thinking (TTCT, Torrance, 1966). There are three different activities in the ATTA. In activity 1, participants are asked to suppose a hypothetical situation and to identify potential problems they would encounter. This activity produced verbal fluency and originality scores. In activity 2, participants were presented with two incomplete figures and were asked to draw pictures with the figures. They were also asked to make the pictures as unusual as possible. This activity provides figural fluency, originality, and elaboration scores. In activity 3, participants were presented with nine triangles. They were asked to draw as many pictures or objects with the triangles that they could. This activity provided figural fluency, originality, elaboration, and flexibility scores. Participants were given three minutes to complete each of the activities. The time limit was selected from the instructional manual for the ATTA.

The ATTA is scored based off four norm-referenced abilities and 15 criterion-referenced abilities. The norm-referenced abilities are: fluency, which is the number of distinct answers generated; originality, which is the number of uncommon responses that

do not appear on a list of common answers in the manual; elaboration, which is the number of details contained within the answers; flexibility, which is the ability to process information or objects in different ways given the same stimulus. The raw score for the norm-referenced abilities is converted into a normalized scaled score. There are 15 different criterion-referenced that are scored on a three point scale of 0, 1, or 2. The criterion-referenced abilities are divided by verbal and figural responses. They are listed below in table 1.

Table 1. *Criterion-referenced abilities*

Verbal Responses (Activity 1)	Figural Responses (Activity 2/3)	
Richness/colorfulness of imagery	Openness	Unusual visualization
Emotions/feelings	Richness/colorfulness	Abstractness of titles
Future orientation	Combination/synthesis	Internal perspective
Humor	Fantasy	Movement/sound
Provocative questions	Feelings/emotions	Articulateness in telling a story

The criterion-referenced abilities and the norm-referenced abilities add up to provide a creativity index score for the participant. This score can range from 0 to 85+. Eighty-five is the highest score that the scoring accommodates for, however participants can score higher.

The Creative Achievement Questionnaire measures creative achievement in ten different domains: visual arts, music, dance, architectural design, creative writing, humor,

inventions, scientific inquiry, theater and film, and culinary arts (Carson et al., 2005). For each domain, participants could indicate that they had made 0 achievements ("I have no training or recognized talent in this area") or had some training (e.g. scored as 1: "I play one ore more musical instruments proficiently") with six other ascending levels of achievement (e.g. scored as 7: "My compositions have been critiqued in a national publication"). These scores are added to provide a score per each domain.

Procedure

Students arrived in groups of twenty to fifty students. All the students were read the informed consent out loud and asked to sign if they wished to participate. The two creativity tests and the demographic variables were combined into one test booklet. This booklet was given to each of the students participating. The students were told to complete the booklet independently and wait for instructions in proceeding with each section of the test booklet. The students were given three minutes to complete each of the three tasks for the Abbreviated Torrance Test for Adults. For the rest of the questions there was no set time limit. The instructions for the ATTA test were used from the coding booklet (Goff & Torrance, 2002). Once the students were complete with the test booklet they turned them in and were allowed to leave.

In order to perform the study in India a professional translator was hired. This translator used the translation-backtranslation process (Brislin, 1970) to translate the instructions and test booklet into Gujarati, the official language of the state of Gujarat where the city of Rajkot was located. The same procedures that were used in the United States were also used in India.

Ratings

For each country there were two independent coders for the Abbreviated Torrance Test for Adults. These raters coded the first ten participants of each test together and the subsequent ones independently. This was done to determine inter-rater reliability. The coding for the Abbreviated Torrance Test for Adults was accomplished using the Abbreviated Torrance Test for Adults manual (Goff & Torrance, 2002).

Results

Inter-rater reliability

Pearson correlations were computed to establish inter-rater reliability between the two raters. Correlations were calculated for the creativity index scores between rater 1 and 2 in each country. Correlations above .80 would be considered satisfactory. Correlations were established for each of the four norm-referenced abilities. For fluency, $r = .84$, $p < .001$, and $r = .99$, $p < .001$ for the United States and India respectively. For originality, $r = .62$, $p < .001$, and $r = .98$, $p < .001$, for the United States and India respectively. For elaboration, $r = .68$, $p < .001$ for the United States and $r = 1.00$, $p < .001$ for India. For flexibility, $r = .73$, $p < .001$ in the United States and $r = 1.00$, $p < .001$ for India. While some of these would not be considered satisfactory, the correlations for the inter-rater reliability of overall creativity scores for both countries were above that threshold with $r = .81$, $p < .001$, and $r = .99$, $p < .001$ for the United States and India respectively.

Hypothesis 1

When the two countries were taken together, there was no relationship between the ATTA and the CAQ, $r = .06$, $p = .25$. However when taking the countries separately, there

was a correlation between the ATTA and CAQ in the United States, r = .14, p = .05 but not in India, r = -.01, p = .97. In order to further examine this, a linear regression was run. The regression analysis showed that the Abbreviated Torrance Test for Adults was not a significant predictor of the Creative Achievement Questionnaire scores b = .06, $t(383)$ = 1.15, p =.25. However, since there was a correlation in the United States between the ATTA and the CAQ a linear was run with both countries taken separately. The regression analysis showed that for the United States creativity index scores on the Abbreviated Torrance Test for Adults was a significant predictor of scores on the Creative Achievement Questionnaire b = .13, $t(201)$ = 1.97, p = .05, but not for India b = -.01, $t(180)$ = -.03, p = .97.

Hypothesis 2

Since there was inter-rater reliability established between rater 1 and rater 2 on the creativity index, an overall creativity index score was created by averaging the scores for rater 1 and 2 together. An independent samples t-test showed that participants from the United States scored higher on the creativity index (M = 59.41, SD = 13.19) than participants from India (M = 49.05, SD = 14.75), $t(385)$ = 7.30, $p < .001$.

Hypothesis 3

The individual scoring items for the Abbreviated Torrance Test for Adults, the norm-referenced and criterion referenced abilities, were also analyzed to further examine the differences between the scoring of the participants with each country. Since there were already established differences in the creativity scores between the participants in the United States and India, the norm-referenced criteria were standardized by dividing the scaled scores by the overall ATTA score to create relative frequencies. Independent

samples t-tests were used to see if there were differences in the four norm-referenced creative abilities between the two countries. P-values were adjusted using the Bonferroni correction (0.05/4 = .0125) to control for possible Type 1 error. The t-tests showed that participants in the United States had greater elaboration scores than participants in India, $t(385) = 3.31$, $p < .001$, and participants in the United States scored higher on flexibility than participants in India, $t(385) = 6.39$, $p < .001$. However, participants from India scored higher on fluency than participants from the United States, $t(385) = -5.27$, $p < .001$. Also, participants from India scored higher on originality than participants from the United States, $t(385) = -8.77$, $p < .001$. These values can be seen in table 2.

Table 2. *Differences in norm-referenced ability scores between the United States and India*

Ability	Country	Mean	Std. Deviation	T score
Fluency	United States	.25	.08	-5.27*
	India	.29	.08	
Originality	United States	.26	.07	-8.77*
	India	.34	.10	
Elaboration	United States	.19	.07	3.30*
	India	.16	.10	
Flexibility	United States	.20	.07	6.39*
	India	.14	.11	

Note. * = $p < .001$

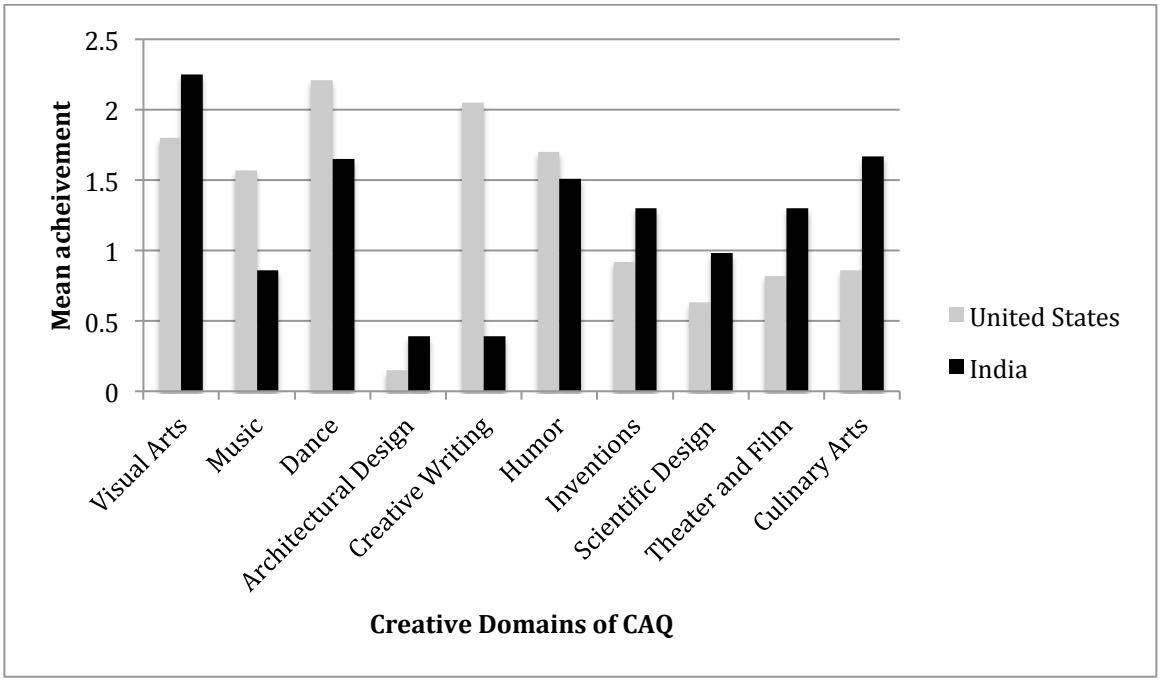
Hypothesis 4

An independent samples t-test was conducted to see if there was a difference in the Creative Achievement Questionnaire scores between the two countries. There was no significant differences between the creative achievement scores of the United States (M = 12.55, SD = 12.13) and India (M = 12.21, SD = 15.83), $t(383) = .24$, $p = .81$.

Hypothesis 5

Hypothesis five was an exploratory hypothesis to examine if there were differences in the domains that participants had achieved in between the two countries. To decrease the likelihood of Type 1 errors, the Bonferroni correction was used (.05/10 = .005). Participants in the United States scored significantly lower on culinary arts (M = .86, SD = 1.46) than participants in India (M = 1.67, SD = 3.64), $t(380) = -2.93$, $p = .004$. There were also some categories where participants from the United States scored higher than participants from India. There was a marginal significance where participants from the United States scored higher on music (M = 1.57, SD = 3.18) than participants from India (M = .86, SD = 1.46), $t(378) = 2.74$, $p = .006$. Participants from the United States scored significantly higher on creative writing scores (M = 2.05, SD = 4.42) than participants in India (M = .39, SD = 1.03), $t(380) = 4.92$, $p = .000$. Figure 1 shows the breakdown of the average score per domain for each country.

Figure 1. *Mean scores of achievement domains from the CAQ*



Discussion

The goal of this study was to investigate cultural differences in creativity between U.S. and Indian students. The first hypothesis for this study was that the creativity index scores on the ATTA would be able to predict creative achievement scores from the CAQ. This hypothesis was partially confirmed. The Torrance Test of Creative Thinking (TTCT) has been shown to predict creative achievement in the United States (Ball & Torrance, 1985; Runco et al., 2008). Since the ATTA is derived from the TTCT and is merely a shortened form, it would be expected that the ATTA should be able to predict creative achievement as well. However, when creativity index scores were regressed on creative achievement scores, it was found to not be a significant predictor of creative achievement scores. However the interesting caveat to that analysis is when the countries were taken separately, creativity index

scores were a significant predictor of creative achievement scores in the United States but not in India.

It is interesting that creativity index scores were predictive of achievement scores in the United States but not in India. One reason as to why this could be is that the ATTA, while being translated in over 35 languages (Kim, 2008), is still designed with English speaking individuals in mind. It could also be that the model for creativity used by the ATTA is Western-centric and does not take into account the nuances of Eastern creativity. As mentioned, Western cultures, such as the United States, value novelty and originality more than Eastern cultures. Originality is something that is directly measured by the ATTA whereas appropriateness, valued by Eastern cultures, is not. In this way the test is inherently biased towards people that have Western cultural values.

Another reason that the ATTA would be a predictor of CAQ in the United States but not in India refers back to the Dual Pathway for Creativity Model (Baas et al., 2008). Since participants are given a time limit of three minutes per task on the ATTA, this encourages the use of the flexible pathway. Eastern cultures tend to not do well with timed exercises because their entire notion of time is more circular in nature. There are very problems in their environment that require the pressure of a time limit in order to create or solve a problem.

The second hypothesis was that the creativity index scores were going to be higher in the United States than in India. This hypothesis was confirmed with participants in the U.S. scoring on average 10 points higher on the creativity index. There are several reasons as to why the United States scored higher than India.

This is related to the point that was brought up in regards to the first hypothesis, Western cultures tend to put more of a focus on innovations and novelty, whereas Eastern cultures place more of an emphasis on appropriateness or usefulness. The ATTA revolves around the idea of taking something and creating something unique and novel with it. This leaves the test biased towards Western cultures. While being appropriate to the task is indirectly measured through fluency, it is not something that is directly examined when grading. This again suggests that the test is very Western-centric.

Another reason why the United States might have scored higher on the creativity scores than India involves individualism and collectivism. In individualistic societies people are expected to achieve by working on their own. In collectivistic societies people are still expected to work on their own, however they have a much larger support network that is available should they require help. In a sense, people from collectivistic societies do not have to take on the burden themselves. Future research should take this into account and design studies where the ATTA is administered individually, in dyads, and in small groups in India and the United States. This would likely result in more accurate account of what creativity is like in Eastern cultures.

The third hypothesis was that based on the differences in the conceptualizations of the important aspects of creativity between Eastern and Western cultures, originality scores on the ATTA would be higher in the United States than in India. This hypothesis was not confirmed in this study. There are several explanations for this.

First, Kharkhurin and colleagues (2008) conducted a factor analysis that showed the four norm-referenced abilities in the ATTA can be divided up as measuring two separate aspects of creativity: the generative and the innovative capacity. The generative capacity refers to the ability to simultaneously generate and elaborate on various ideas. Fluency, flexibility, and elaboration fall under the generative capacity. Originality, however, falls under innovative capacity. Innovative capacity is the ability to produce a work that satisfies the requirements of novelty, appropriateness, and usefulness.

Current results show participants from the United States generally have greater generative capacities, being higher on elaboration and flexibility. Participants from India scored higher on originality and fluency. It is important to keep in mind that this is after the scores were standardized into relative frequencies based on the overall score they attained on the ATTA. This shows that the United States might have a greater generative capacity to be able to come up with ideas in different ways and then elaborate on them. In India, participants were able to develop more ideas and more original ideas than participants in the United States. This means that participants from India had a greater innovative capacity.

This has several implications. First, there is something about the culture or environment of the United States that helps foster the generative capacities of elaboration and flexibility. Second, despite India having a lower overall generative capacity, their innovativeness is roughly higher than that of the United States. In the United States people have to develop an idea, elaborate on it, and think about it in multiple different ways. Yet, they still have a lower innovativeness than people in

India, who produce more ideas but tend not to elaborate on them, nor think about them as flexibly.

The fourth hypothesis was based upon the confirmation of both hypothesis 1 and 2. Hypothesis 1 was partially confirmed while hypothesis 2 was confirmed. The fourth hypothesis however was not confirmed. T-tests showed that while participants from the United States scored higher on the creativity index than participants from India, this result did not translate into creative achievement. Participants from the United States did not achieve significantly more than participants from India. This could also mean that there are various forms of creativity, and cognitive creativity as assessed by the ATTA is simply one facet of creativity as a whole.

The fifth hypothesis was that participants from the United States and from India would have achieved in different domains of creativity. T-tests conducted on each of the domains showed that there were significant differences in the domain of creative writing where participants in the United States scored higher than their Indian counterparts. There was also a marginally significant difference in the domain of music where participants from the United States scored higher than participants from India. However, Indian participants scored significantly higher in the domain of culinary arts.

For music, participants from the United States generally out-achieved their Indian counterparts, with the average participant in the United States having played one or more musical instruments proficiently. While music is important in many cultures, the opportunities that people have to explore the musical domain may

differ. Research has shown that creative achievements are influenced by opportunities and motivation as well as cultural norms and beliefs (Cramond, 1994). In the United States many people going through secondary school have taken Band as an elective. This class teaches students about orchestral music and how to play a specific instrument. There are no such classes held by the schools in India. If a person wants to learn a musical instrument, they either have to pay for private classes or learn on their own. With the advent of the Internet many people now have access to cheap and readily accessible instructions on learning to play musical instruments. While there are still access issues with the Internet in many parts of the world, it is readily becoming more accessible all the time. This means that at some point down the road, as globalization continues, there may not be a significant difference between the two cultures.

Another domain where there was a significant difference in achievement was the creative writing domain. This domain had a very stark difference between the two countries where the average participant in the United States had not only written an original short work such as a poem or short story, but that also their work had often won an award or prize. In the United States, from an early age students are encouraged to engage in creative writing. In many classes students are even encouraged to submit their writing to newspapers, contests, anthologies, etc. In fact, creative writing has often been used as therapy as well (Fair, Connor, Albright, Wise, & Jones, 2012). In India, creative writing is not as encouraged. Although students are constantly writing in school, learning in India is based more around memorization of facts and the recitation of them.

There was also a significant difference in the creative achievement scores between the United States and India in the domain of culinary arts. In fact, the average Indian participant had at least experimented with recipes whereas the average participant from the United States had no training or experience in the field. In India, the fast food culture is not as prominent. Most people learn to cook at least a few dishes in their adolescent years. Most young girls are expected to help their mothers in preparations for lunch or dinner. This cooking knowledge is a tradition that gets passed on from parent to child. In the United States, there is what is known as 'fast food culture'. People do not like taking the time to cook when they have a cheap, available alternative at every corner.

Limitations

There are a few limitations to the present study. One of the major limitations is that the tasks were timed. As explained, time restraints can be biased towards people that have a tendency to take the flexible pathway over the persistent. If the Abbreviated Torrance Test for Adults is used in the future, it is highly recommended that the time restraints on the task either be removed or modified to allow for participants that use the persistent pathway.

One limitation revolves around the basis of being Western-centric. Generally speaking, the Western account is taken as *the* account for theories and in doing so it is easy to lose sight of alternate concepts. Theories that involve cross-cultural research should aim to modify concepts to fit singular cultures or overall human behavior. In Westwood and Low's (2003) review of the literature, they found a drastic tendency to deploy western models. They stated this leads to three different

problems. The first is a tendency to impose a universalistic interpretation on creative processes, structures and functions. The second is to promote one approach to creativity as the more desirable or effective while at the same time devaluing alternative perspectives. The third problem entails engaging in falsely amplifying, or essentializing, presumed differences and representing them in a form of simplistic and polarizing dimensions (Westwood & Low, 2003).

Another limitation to the study is that only one university system in one city in India was studied. India is a very diverse country but diverse in a different way than the United States. In terms of ethnicities and cultural backgrounds, the United States has a very heterogeneous population whereas India has a very homogeneous population. Despite having a very homogeneous population, India has a variety of different cultures within the country. Each region has its own language, style of food, and even film industries. In this sense, by collecting data from only one city in one region of India, it is difficult to generalize to all of India. It is also important to keep in mind that this study is correlational when considering the results of the study. This is also a problem in the United States, though not as drastic of one as in India, where a city like Jacksonville is different from a city like New York or San Francisco.

Another set of limitations has to do with the differences in the participants. One of the differences had to do with the average ages and the standard deviations where the participants from the United States were older and had a greater range of ages than participants in India. In India, it is typical for students to go straight from secondary education to post-secondary education rather than taking a year off or

going into the work force and then going through college. Students are at liberty to go into college after joining the workforce in the United States. At the University of North Florida there is an online system that allows students to sign up for studies in order to receive extra credit, there is no such system at Saurashtra University. In fact, the professors at Saurashtra University had to explain to the participants what psychological studies and questionnaires are. Although the instructions for filling out the creativity test were explained in detail, it could be the case that some students did not understand some of the instructions.

Another limitation is in regards to the inter-rater reliability of the ATTA. Inter-rater reliability was established in both the United States and India in regards to creativity index scores, it was below .80 for all of the norm-referenced abilities in the United States. This means that there was some disconnect between the raters in the United States on their scoring of the ATTA. Also of note is the fact that inter-rater reliability for India was above .98 for all of the norm-referenced abilities and creativity index scores. This means that the analysis on the norm-referenced abilities should be interpreted with caution.

A final limitation deals with the Creative Achievement Questionnaire. This questionnaire has many items on it that the average college aged student has not had the opportunity or time to achieve. Some domains are easier to achieve in without specialized education in the field such as culinary arts, music, and creative writing. Other domains require specific types of education in order to achieve such as architectural design, scientific design, and theater and film. Many students can

achieve in these domains in the lower level, but it would be difficult to find students who have achieved in the higher levels while attending college.

Summary

In the beginning of the study several questions were asked: can creativity be accurately measured and related to creative outcomes in Eastern cultures? Would average creativity still be higher in the United States if another Eastern culture were used as a comparison group? Is the conceptualization of East vs. West an overgeneralization or a helpful dichotomy? Based on these questions and the analysis performed, there are several key points to take away from this study. First, it appears as though on a surface level creativity can be measured in Eastern cultures, however it is not fully tapping into the richness of the differences in creativity between Eastern and Western cultures. Second, although participants in the United States scored higher on the creativity index than participants from India, some of that difference can be attributed to differences in preferred creative pathway: flexible or persistent (Baas et al., 2008). It appears as though participants from Eastern cultures are more likely to use the persistent pathway that requires more deliberate and focused attention, whereas participants from Western cultures use the flexible pathway, which allows for rapid switching between cognitive categories. The difference could also be attributed to participants in the United States having a higher generative capacity than India. The fact that there were no differences in the overall creative achievement scores shows that the Abbreviated Torrance Test for Adults does not tap into the full picture behind what drives creative achievement. While previous research has shown and predicted Western

cultures to have a greater emphasis on originality than Eastern cultures, the present study showed that participants from India scored significantly higher on originality than participants from the United States. This could mean that India is not typical of Eastern cultures. It could also mean that the narrow view of Eastern cultures in research that has typically been on China and Japan, does not generalize to all Eastern cultures. Instead of developing the dichotomy of Eastern versus Western cultures, researchers should be focusing on showing the uniqueness of each culture.

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Vita

Smit Shah was born . He was raised by his parents, Sunil and Falguni Shah. His family moved to Jacksonville, Florida in 1993. He attended Ridgeview High School where in 2007 he graduated with an International Baccalaureate diploma.

In 2007 he attended the University of Central Florida in Orlando, Florida where he received a Bachelor of Science in psychology with a minor in philosophy in 2011. While there he worked as a research assistant for several labs that conducted research in such areas as industrial organizational psychology and applied cognition. He conducted his own study on the impact of school didactic philosophies on moral cognition of children. This thesis inspired him to further pursue his interests in psychology.

After graduating, Smit pursued a Master's of Arts in General Psychology at the University of North Florida. During his graduate school career, Smit presented his research at several national and regional conferences. Smit also serves as a graduate teaching assistant for several online classes including: biopsychology, human development, and professional opportunities in the psychology major. Currently Smit works for the Florida Institute of Education where he is a graduate assistant to the senior research associate. In his free time he works as a statistical research analysis consultant.