

Conceptualizing Creativity: General and Cultural Biases in Gough's Creative Personality Scale

ABSTRACT

This study analyzes the validity of Gough's Creative Personality Scale (CPS) for the Adjective Check List (ACL) by using 1773 Swiss, South Korean, and Mainland Chinese students as a sample. Four sources of potential bias were identified in Gough's CPS, two of which are general and two cultural in nature. The two general biases were investigated by conducting correlation analyses and evaluating alternative scoring methods for the CPS. As a result of the first bias, checking a large number of adjectives was found to be more important for achieving a high score than checking the relevant ones. Due to the second bias, the CPS score mostly depends on the number of positive adjectives checked while negative items have little impact. The two cultural biases were analyzed using an implicit version of the CPS (iCPS) and factor analysis. The latter revealed three different clusters of creativity type: exploratory-type, socially responsible-type, and intellectual-type creativity. Based on cultural background, they are all weighted differently, causing a potential experiential bias in the CPS. Findings indicate that in South Korea and Mainland China socially responsible-type creativity dominates whereas in Switzerland exploratory-type creativity prevails. Findings from the iCPS suggest the second cultural bias, the socially desirable responding bias arising from differences in responding styles among the three cultures.

Keywords: Creative Personality Scale, cross-cultural creativity research, implicit and explicit creativity research.

Creativity is considered to be one of the most defining of human capacities. Complex in nature, it finds expression in many human endeavors, from art and business to architecture and technology. Creativity is shaped by external forces such as culture as well as internal forces such as personality and can generally be evaluated and described through either explicit or implicit theories (Runco, 1999; Sternberg, 1985). Explicit theories are often based on empirically tested hypotheses, which are analyzed by means of creativity tests such as Gough's (1979) Creative Personality Scale (CPS) (Runco, 2014).

Major impediments to the study of explicit theories, however, are the difficulty of defining creativity (Sternberg, 1999) and the problem of agreeing on criteria for measuring creativity (Batey & Furnham, 2006). Such criteria, even the two most widely accepted ones, "novelty" and "usefulness," depend on who is to judge them (Runco & Jaeger, 2012). What is acknowledged to be a novelty in one culture may not be seen as one in another. In Western societies, "novelty" is often associated with radical change and categorically new and different ideas, whereas in Asian countries "novelty" also refers to continuous incremental improvement, modification, and adaptation (Puccio & Chimento, 2001). Consequently, the reliability of creativity tests used to articulate explicit theories is increasingly being questioned, especially when applied across different cultures (Kim, 2006; Piffer, 2012).

Implicit theory of creativity can somewhat mitigate the aforementioned drawbacks of explicit theories. The difficulty in defining creativity, for instance, is not an area of concern for implicit theories. Runco (1999) noted that "implicit theories allow us to judge creative behavior even if we cannot define creativity" (p. 28). Implicit theories need to be discovered rather than invented because they measure internalized psychological constructs that are commonly held by laypeople such as teachers, students, or parents (Sternberg, 1985; Runco, 2014). Implicit theories are valuable because ideas about what constitutes creativity shape

expectations, which in turn lead to actual behavior (Runco, 2014). According to Rudowicz (2003), most studies on implicit theories of creativity have either focused on creative individuals (personality characteristics that describe a creative individual) or the conceptualization of creativity (what laypeople perceive creativity to be).

This study aims to synthesize advantages of explicit and implicit theories. Personality characteristics indicative of creative individuals in Switzerland, South Korea, and Mainland China are identified using an implicit version of Gough's CPS and compared to results obtained from a traditional, explicit application of the scale. The contribution of this study to creativity research is twofold. First, it investigates the reliability of the CPS as a measure of creativity, in general and across cultures. Second, it helps to better conceptualize creativity in Switzerland, South Korea, and Mainland China.

CROSS-CULTURAL CREATIVITY RESEARCH

Most cross-cultural creativity research relies on the application of creativity assessments that empirically validate existing explicit theories (Shalley & Zhou, 2008). Gough's CPS is a prominent and frequently used example of such a creativity assessment (Zampetakis, 2010). The scale is based on previous studies that have identified a set of specific core personality traits (e.g., "wide interests," "self-confidence," or "intuition") held to be indicative of creative performance (see Oldham & Cummings, 1996). The CPS contains 18 positive and 12 negative items, which were empirically derived from the Adjective Check List (ACL; Gough & Heilbrun, 1965), an assessment device consisting of 300 adjectives intended to identify common psychological traits. Gough (1979) used correlations of individual ACL items with creativity ratings from different sources across various domains to select the 30 CPS adjectives.

In the last few years, however, scholars have increasingly acknowledged that creativity tests developed in a particular cultural context may have limited application in other cultures (Choe, 2006; Rudowicz, 2003). Creativity assessments often have an experiential bias that systematically favors cultures where individuals have standards, norms, values, and experiences similar to individuals living in the cultural context in which a particular test was developed (see Runco, 2014). The definition of implicit theories as internalized psychological constructs implies that they are dependent on the *zeitgeist*, which is defined as "the attitudes and values that are shared at a particular time in a particular place" (Runco, 2014, p. 261). As a result, implicit theories can help to evaluate differences in standards, norms, values, and experiences between individuals across cultures to develop socially valid techniques for instrument design (Lim & Plucker, 2001; Plucker & Runco, 1998).

Implicit personality characteristics frequently applied to describe a creative person in Western studies include "curious," "imaginative," "independent," "inventive," "original," "wide interests," "non-conformist," "individualistic," "confident," "assertive," "daring," "artistic," and "sense of humor" (see Rudowicz, 2003; Runco, 2014). Comparing these findings to Eastern studies, Rudowicz (2003) reported many similarities but also summarized a number of differences worth noting. First of all, characteristics relating to "sense of humor" and "artistic" were absent or almost non-existent in Hong Kong, Mainland China, and Taiwan. Second, the Hong Kong sample included attributes such as "inspires people," "makes a contribution to the progress of society," and "is appreciated by others."

Niu and Sternberg (2002) ascribe the differences in Eastern and Western personality characteristics to distinct worldviews normally held by people living in the respective societies. The primary determinant of this difference lies in each society's cultural orientation with respect to the two opposing value systems, individualism and collectivism (Niu & Sternberg, 2003; Chan & Chan, 1999). The value of creativity in the West, for instance, is primarily for personal success whereas in Asia the value of creativity lies in the social and moral contribution a person can bring to society (Rudowicz & Yue, 2000; Niu & Sternberg, 2006). The discussion section of this paper provides further interpretation of the impact the distinct worldviews have on the conception of creativity.

SELF-REPORT INVENTORIES

To investigate creative personality, self-report inventories seem to be one of the most frequently used methods (McDonald, 2008). Researchers use scales such as Gough's CPS to articulate and validate explicit theories. Self-report inventories often ask participants to indicate how well each item of a questionnaire describes them or to what extent they agree with each item. Administering self-report inventories is common because they represent a relatively quick way to collect a vast amount of data and scoring them is straightforward (McDonald, 2008).

On the other hand, a major issue with self-report inventories lays in the method's susceptibility to responding biases, described by Paulhus as "a systematic tendency to respond to a range of questionnaire items on some basis other than the specific item content (i.e., what the items were designed to measure)" (Paulhus, 1991, p. 17). The three most common responding biases in self-report inventories are "acquiescent responding" (answering without consideration of the actual question), "extreme responding" (giving extreme ratings on scales), and "socially desirable responding" (tendency to respond in a way that presents oneself in a favorable light) (McDonald, 2008).

The socially desirable responding bias is particularly interesting in the context of this study since it is, as the name suggests, dependent on social or cultural environment. Lalwani, Shavitt, and Johnson (2006) list a large number of scholarly papers holding that individuals from collectivistic cultures engage in socially desirable responding due to their cultures' emphasis on maintaining harmonious relationships and a need for social approval. Individuals from individualistic cultures, on the other hand, engage in socially desirable responding out of a strong desire to be better than and different from others and consequently have overly positive and unrealistic views of themselves.

INFORMANT RATINGS

In implicit creativity research, a frequently used method is informant rating as an alternative to self-rating. Instead of asking participants to indicate how well each item of a questionnaire describes them, informant ratings ask how well each item describes someone else (e.g., creative adults or children). Questionnaires are either constructed using open-ended questions or a set of selected items. Runco (1984, 1989), for instance, used the 300 adjectives of the ACL to investigate what parents and teachers perceive to be the characteristics of a creative child.

Vazire and Carlson (2011) argued that informant ratings can sometimes provide more accurate information about aspects of an individual's personality than self-report inventories. Especially in situations where participants have to report on very desirable or undesirable personality traits, informant ratings can provide more realistic results. The reason for this is that, compared to self-report inventories, the socially desirable responding bias does not influence informant ratings since participants do not report on themselves (McDonald, 2008). Other biases such as the acquiescent responding bias or the extreme responding bias, however, can influence informant ratings as much as self-report inventories (McCrae and Weiss, 2007).

METHOD PARTICIPANTS

The 1773 subjects were students from the German-speaking region of Switzerland (1056), South Korea (337), and Mainland China (380), in the following referred to as Switzerland, Korea, and China. The three countries chosen represent individuals from a more individualistically oriented and more collectivistically oriented cultures, the most widely recognized and studied value difference in cross-cultural creativity research (Runco, 2014). Switzerland ranks rather highly in terms of individualism while Korea and China are considered to be more collectivist (Hofstede, 2001; House, Hanges, Javidan, Dorfman, & Gupta, 2004; Trompenaars & Hampden-Turner, 1998).

Data were collected at three universities, Zurich University of Applied Sciences in Switzerland, Hanyang University in South Korea, and the University of Nottingham Ningbo China, which are all partner universities and thus at a similar academic level. The following sample differences need mentioning: The Swiss sample consists of 729 (69%) women and 327 (31%) men, the Korean sample of 260 (77%) women and 77 (23%) men, and the Chinese sample of 201 (53%) women and 179 (47%) men. The Swiss sample is relatively evenly distributed across different disciplines (business 19%; social sciences 17%; humanities 16%; medicine 14%; engineering 13%) whereas in Korea the sample predominantly consists of medical students (41%). In China, the large majority are business (35%) and engineering (30%) students. The weighted average age is 25 in Switzerland, 23 in Korea, and 22 in China.

For the purposes of this study the differences between men and women or between fields of study were largely disregarded. The authors are aware that adjusting for gender (see Runco, Cramond, & Pagnani, 2010) and discipline (see Runco, 2014) would have led to minor changes in the scores. However, this study aims to examine the reliability of the scale, not provide in-depth country estimates.

PROCEDURE

German, Korean, and Chinese versions of Gough's creativity test were adapted from existing translations (Dow, 2003; Werlen, 1996) or created by two translators, who compared their versions until agreeing on the best translation. The adjective "affected" was replaced by "artificial" before translating the original scale, which is in line with more recent applications of the CPS (e.g., Oldham & Cummings, 1996; Zampetakis, 2010). Due to the similarity of the two adjectives "commonplace" and "conventional," especially in the Korean language, the two adjectives were combined in our survey (i.e., "commonplace/conventional"). Subjects were randomly approached and volunteered to participate in this study; no credit or any other incentives were offered. Since no definition of creativity was supplied to them, students had to rely on their own subjective interpretation of the construct.

MEASURES

Gough's CPS was utilized to measure the students' creativity. Our scale consisted of 18 adjectives with positive and 11 adjectives with negative associations to creativity. The positively associated adjectives were "capable," "clever," "confident," "egotistical," "humorous," "individualistic," "informal," "insightful," "intelligent," "interests wide," "inventive," "original," "reflective," "resourceful," "self-confident," "sexy," "snobish," and "unconventional"; the negatively associated adjectives were "artificial," "cautious," "commonplace/conventional," "conservative," "dissatisfied," "honest," "interests narrow," "mannerly," "sincere," "submissive," and "suspicious." These adjectives are hereinafter referred to as "positive" or "negative" adjectives, depending on whether they are positively or negatively associated with creativity according to Gough's scale. For scoring purposes, Gough's original scoring method and two alternative methods (Scoring Methods 1 and 2) were applied. The methods are described later in this paper. Reported reliability coefficients for the CPS are usually between 0.80 and 0.63 (Zampetakis, 2010). Coefficient alpha (for the 29 items) for the present study was 0.63 overall. For individual samples, coefficients were 0.56 (Switzerland), 0.59 (Korea), and 0.63 (China).

To measure the subjects' implicit perception of creativity, we developed an implicit version of the CPS, hereinafter referred to as the *Implicit Creative Personality Scale (iCPS)*. The iCPS uses the same 18 positive and 11 negative adjectives as the CPS but linked to a different question. Instead of asking students to "please indicate which of the following adjectives best describe yourself" as in the CPS, we asked students to "please indicate which of the following adjectives best describe a creative person." While the traditional application of the CPS is a self-report inventory, the iCPS becomes, in essence, an informant-rating inventory due to the new question.

The iCPS was utilized to evaluate implicit knowledge of creativity in three distinctive ways. First, a frequency analysis of the iCPS adjectives checked by subjects in each culture was conducted and compared with rank correlation. Second, factor analysis of iCPS adjectives was performed with a focus on whether the Swiss concept of creativity can be applied to the Korean and Chinese samples. Third, an iCPS score was assigned to subjects, following the same scoring procedure as for the CPS, described later in this paper. iCPS coefficient alpha (for the 29 items) for the present study was 0.59 overall. For the individual samples, the coefficients were 0.59 (Switzerland), 0.66 (Korea), and 0.64 (China).

For scoring purposes, Gough's original computation method was used, according to which one point was assigned each time a positive adjective was checked while one point was subtracted for each negative item. Due to the minor adjustments made to the CPS (combining "commonplace" and "conventional"), the score has a theoretical range of -11 to $+18$ instead of the original range of -12 to $+18$.

Analysis of both the CPS and iCPS scores indicated two general biases (General Bias 1 and General Bias 2) in the CPS. First, checking a large number of adjectives appears to be more important for achieving a high score than checking the relevant ones. Second, the CPS score mostly depends on the number of positive adjectives checked while negative items have little impact. To study the impact of the two biases on the final creativity score and to suggest solutions to mitigate the effect of the two biases, we assessed two alternative computation methods for the CPS.

First, to create a score that is not influenced by the number of positive and negative items, we used percentages instead of absolute numbers. "pos" and "neg" refer to the number of positive and negative adjectives checked:

$$\text{CPS-P} = \frac{\text{pos}}{n_{\text{pos}}} - \frac{\text{neg}}{n_{\text{neg}}} \quad (1)$$

This score is labeled CPS-P and has a range of -100% to $+100\%$ (or -1 to $+1$ if we do not use percentages). A person who checks every adjective would receive a score of 0 (100% positive—100% negative). However, this computation gives more weight to negative than to positive adjectives: A person who checks one positive and one negative adjective would receive a slightly negative score ($1/18$ — $1/11$).

In an attempt to counteract the higher weighting of negative adjectives and provide a score that gives equal weight to positive and negative adjectives, we used a quotient:

$$\text{CPS-Q} = \frac{\text{pos}}{\text{pos} + \text{neg}} \quad (2)$$

Using this computation method, a person who checks as many positive items as negative items would always receive a score of 50% (or 0.5). The score is labeled CPS-Q and ranges between 0% and 100% for people who check only negative or only positive adjectives, respectively, regardless of how many adjectives they have checked in total. The difference between Equations 1 and 2 is that Equation 1 computes percentages relative to the items available while Equation 2 computes percentages relative to the items selected. Results of applying the different scores are indicated in Tables 1 and 2 later in this paper.

Finally, in order to compare the factorial structure in the different samples, procrustean rotation was performed on the Chinese and Korean factor solutions in order to arrive at a rotation that would be as close as possible to the Swiss factor structure (Lorenzo-Seva & ten Berge, 2006). As a measure of similarity between the factor structures, Tucker's coefficient of congruence, r_c , was computed (Tucker, 1951). We interpreted the coefficient according to Lorenzo-Seva and ten Berge (2006), with a value of between 0.85 and 0.94 indicating "fair similarity" and values of above 0.95 indicating "equality."

RESULTS

Utilizing the CPS with Gough's traditional computation method (see Table 1 below), revealed that both Asian samples have significantly lower creativity scores than the Swiss sample (Switzerland, $M = 4.16$; Korea, $M = 1.17$; China, $M = 1.37$). To investigate whether this means that Korean and Chinese students are less creative than Swiss students, we analyzed the CPS results at a deeper level and identified two sources of potential bias in the scale, both of which are explained in the section General Biases in the CPS.

Results from the iCPS scores, which measure implicit knowledge of creativity, reveal a comparable pattern in the results from the traditional CPS. Both Asian samples achieved significantly lower implicit creativity scores than the Swiss sample (see Table 2 below). However, the gaps between the three countries for the iCPS scores were considerably narrower (Switzerland, $M = 8.33$; Korea, $M = 6.88$; China, $M = 7.14$) than for CPS scores (Switzerland, $M = 4.16$; Korea, $M = 1.17$; China, $M = 1.37$). The difference in percentage between the Swiss CPS score ($M = 4.17$) and the Korean CPS score ($M = 1.17$), for instance, was 71.9% while the difference between the Swiss iCPS score ($M = 8.33$) and the Korean iCPS score ($M = 6.88$) was merely 17.4%.

TABLE 1. Results of the Different Computation Methods for the CPS Scores

| | CPS | | | CPS-P | | | CPS-Q | | |
|------------------------------------|----------|-----------|----------|----------|-----------|----------|----------|-----------|----------|
| | <i>M</i> | <i>SD</i> | <i>N</i> | <i>M</i> | <i>SD</i> | <i>N</i> | <i>M</i> | <i>SD</i> | <i>N</i> |
| Country | | | | | | | | | |
| Switzerland | 4.16 | 3.32 | 1056 | 0.11 | 0.20 | 1056 | 0.68 | 0.15 | 1056 |
| Korea | 1.17 | 3.61 | 337 | -0.09 | 0.24 | 337 | 0.54 | 0.22 | 337 |
| China | 1.37 | 3.67 | 380 | -0.06 | 0.24 | 380 | 0.54 | 0.23 | 380 |
| Gender | | | | | | | | | |
| Male | 2.92 | 3.96 | 583 | 0.03 | 0.25 | 583 | 0.62 | 0.21 | 583 |
| Female | 3.03 | 3.61 | 1190 | 0.04 | 0.23 | 1190 | 0.62 | 0.18 | 1190 |
| Number of adjectives checked (CPS) | | | | | | | | | |
| 0-5 | 0.30 | 2.06 | 243 | -0.04 | 0.15 | 243 | 0.55 | 0.31 | 243 |
| 6-10 | 1.47 | 3.07 | 703 | -0.04 | 0.22 | 703 | 0.59 | 0.19 | 703 |
| 11-15 | 4.22 | 3.25 | 601 | 0.08 | 0.23 | 601 | 0.66 | 0.13 | 601 |
| 16+ | 7.39 | 2.95 | 226 | 0.22 | 0.21 | 226 | 0.71 | 0.08 | 226 |

Note. The computational methods for the CPS-P and CPS-Q scores are described in Equations 1 and 2.

TABLE 2. Results of the Different Computation Methods for the iCPS Scores

| | iCPS | | | iCPS-P | | | iCPS-Q | | |
|------------------------------------|----------|-----------|----------|----------|-----------|----------|----------|-----------|----------|
| | <i>M</i> | <i>SD</i> | <i>N</i> | <i>M</i> | <i>SD</i> | <i>N</i> | <i>M</i> | <i>SD</i> | <i>N</i> |
| Country | | | | | | | | | |
| Switzerland | 8.33 | 3.08 | 1056 | 0.42 | 0.19 | 1056 | 0.89 | 0.12 | 1056 |
| Korea | 6.88 | 3.38 | 337 | 0.35 | 0.22 | 337 | 0.90 | 0.15 | 337 |
| China | 7.14 | 3.40 | 380 | 0.35 | 0.20 | 380 | 0.88 | 0.15 | 380 |
| Gender | | | | | | | | | |
| Male | 7.39 | 3.53 | 583 | 0.36 | 0.22 | 583 | 0.87 | 0.15 | 583 |
| Female | 8.00 | 3.12 | 1190 | 0.40 | 0.19 | 1190 | 0.90 | 0.12 | 1190 |
| Number of adjectives checked (CPS) | | | | | | | | | |
| 0–5 | 2.93 | 1.93 | 193 | 0.15 | 0.13 | 193 | 0.91 | 0.22 | 193 |
| 6–10 | 6.91 | 2.34 | 741 | 0.36 | 0.16 | 741 | 0.92 | 0.13 | 741 |
| 11–15 | 9.57 | 2.67 | 670 | 0.48 | 0.19 | 670 | 0.88 | 0.11 | 670 |
| 16+ | 10.24 | 2.62 | 169 | 0.45 | 0.20 | 169 | 0.80 | 0.08 | 169 |

Note. The computational methods for the iCPS, iCPS-P, and iCPS-Q scores follow the same scoring procedure as for the CPS, CPS-P, and CPS-Q scores.

Based on the fact that the CPS is a self-reporting inventory, which is susceptible to responding and experiential biases, while the iCPS is an informant rating inventory, which is not influenced by such biases (see McDonald, 2008), the differences in size between the gaps in the CPS and the gaps in the iCPS were able to arise due to such a responding and/or experiential bias in the scale. Both potential biases are evaluated in the section Cultural Biases of this article.

GENERAL BIASES IN THE CPS

We define general biases as those biases that occur regardless of cultural context, in other words, biases that distort the CPS even if measured within the same culture. The potential for bias in several aspects of the CPS has long been recognized (e.g., Gough, 1979; Zampetakis, 2010). In this study, we used a new approach comparing results from a self-report inventory (CPS) and an informant-rating inventory (iCPS) to provide further evidence of two such biases.

General Bias 1, resulting from a larger number of positive than of negative adjectives in the CPS scale, was identified through correlation analysis. Both the CPS scores ($r_s = 0.591, p < .001$) and the iCPS scores ($r_s = 0.656, p < .001$) were significantly correlated with the number of adjectives checked. Tables 1 and 2 below further illustrate this point by showing that the average CPS and iCPS scores increase with the number of adjectives checked (e.g., 0–5 adjectives, 6–10 adjectives, 11–15 adjectives, 16+ adjectives). This indicates that checking a large number of adjectives is more important for a high score than checking the relevant ones. A person who checks every adjective on the list would receive a creativity score of 7 (18 positive—11 negative items) and thus be rated as extremely creative compared to the average participant in this study. Our findings revealed that, on average, the Swiss subjects checked more adjectives ($M = 11.06, SD = 4.18$) than the Korean ($M = 9.68, SD = 4.58$) and the Chinese subjects ($M = 8.84, SD = 4.53$). This tendency of Swiss participants to check a large number of adjectives accounts for a considerable portion of the higher creativity scores compared to Korean and Chinese participants.

General Bias 2, the scales' strong reliance on the number of positive adjectives checked, was also identified through correlation analysis. In both the CPS and the iCPS scores, the number of positive items checked correlated very positively with the overall scores (r_s positive to CPS = 0.884; r_s positive to iCPS = 0.905, $p < .001$) while the number of negative items checked correlated slightly negatively with the overall scores (r_s negative to CPS = -0.242 ; r_s negative to iCPS = $-0.086, p < .001$). Consequently, Gough's score can be said to mostly rely on the number of positive adjectives checked while the negative items have little impact on the final score. Despite the already smaller number of negative adjectives in the CPS scale, this bias further marginalizes the impact of negative adjectives, which leverages the effect of the first bias.

In an attempt to adjust for the two general biases, we applied different computation methods, as described in Equations 1 and 2. The difference between the CPS, CPS-P, and CPS-Q scores indicated in

Table 1 and 2 above highlights the effect of using the different scoring methods. Overall, the impact on creativity scores is most apparent with the CPS-Q (Equation 2), which adjusts for both biases. While Switzerland achieved by far the highest creativity score using the traditional CPS computation method, the relative gap in the scores of the Swiss and the two Asian samples decreased considerably in the CPS-Q (Equation 2). With regard to the Asian samples, the lead of China over Korea disappeared and the two countries achieved equal creativity scores (see Table 1, third column).

The percentage gap between the creativity score of Swiss and Korean participants decreased from 71.9% (using Scoring Method 1) to 20.6% (using Scoring Method 2). These findings support the argument that the number of adjectives checked (General Bias 1) and the tendency toward positive adjectives (General Bias 2) account for a substantial portion of the final creativity scores in Gough's scale when using the traditional scoring method.

CULTURAL BIASES

Findings of this study show that the two general biases have an impact on participants' CPS scores even when the CPS test is conducted within the same culture (see Table 1 above). The distortion of CPS results could, however, become much greater in a cross-cultural setting. Due to General Biases 1 and 2, individuals from countries with cultural orientations that encourage checking a large number of adjectives have an advantage over individuals from countries with cultural orientations that inhibit checking a large number of adjectives. Moreover, experiential bias, as well as potential cultural biases, could arise as a result of responding biases in self-reported inventories.

RESPONDING BIAS

To investigate potential responding biases in the CPS, we analyzed the frequency of the adjectives that participants checked to describe themselves (CPS). Table 3 below illustrates the frequency analysis of the CPS adjectives. Ranked among the top ten adjectives across all three cultures were "mannerly," "interest wide," "humorous," "sincere," "honest," and "cautious." Adjectives ranking among the bottom 10 were "sexy," "interest narrow," "snobbish," and "artificial." The frequency analysis showed that participants in Korea and China were much more modest in their responses than participants in Switzerland, which could be a potential reason why, on average, Korea and China checked considerably fewer adjectives than Switzerland. Considering that in all three samples participants were students from universities of a comparable educational level, it can reasonably be assumed that, objectively, all participants were intelligent and had an equal level of intelligence. Nevertheless, "intelligent" was checked by only 23% of respondents in Korea and 32% in China as compared to 61% in Switzerland. Similar results were found for "capable" (Switzerland 59%, Korea 27%, and China 44%) and "clever" (Switzerland 52%, Korea 29%, and China 31%). These differences could indicate that either Korean and Chinese students were very modest with regard to their abilities or Swiss students were overly confident, both revealing behavior of socially desirable responding (see McDonald, 2008).

EXPERIENTIAL BIAS

Applied in a cross-cultural setting, creativity assessments can have an experiential bias whenever fundamentally different values prevail between the culture in which the scale was developed and the culture in which the scale is used (see Runco, 2014). In the case of the CPS, an experiential bias might thus be said to favor individuals from individualistically oriented cultures since the selection of CPS adjectives and their assignment to the positive or negative list was conducted in the United States, a culture classified as very high in individualism (see Hofstede, 2001; House et al., 2004; Trompenaars & Hampden-Turner, 1998). To evaluate such a potential experiential bias in the CPS, a thorough examination was conducted to determine the differences in the implicit perception of creativity between the individualistically oriented Swiss sample and the two collectivistically oriented Korea and China samples.

First of all, we analyzed the frequency of iCPS adjectives checked in each culture as illustrated in Table 4 below. The adjectives "inventive," "original," and "interest wide" seem to be universally accepted as attributes describing a creative person. These adjectives ranked among the top ten across all three cultures. Correlation analysis of iCPS adjective rankings among the three countries also indicates intercultural similarities in how creativity is conceived. All three cultures showed statistically significant correlations between the iCPS adjective rankings, the highest correlation being between Switzerland and Korea ($r_s = 0.85, p < .001$), followed by the correlation between Korea and China ($r_s = 0.82, p < .001$) and between Switzerland and China ($r_s = 0.69, p < .001$).

TABLE 3. Adjectives Describing Oneself (CPS)

| Rank | Switzerland (1056) | | Korea (337) | | China (380) | |
|------|--------------------|-----|-----------------|-----|-----------------|-----|
| 1 | Mannerly | 80% | Mannerly | 72% | Mannerly | 64% |
| 2 | Interests wide | 74% | Confident | 68% | Sincere | 61% |
| 3 | Humorous | 72% | C & C* | 66% | Interests wide | 53% |
| 4 | Sincere | 72% | Cautious | 56% | Cautious | 53% |
| 5 | Honest | 67% | Interests wide | 53% | Honest | 53% |
| 6 | Reflective | 66% | Sincere | 50% | Humorous | 45% |
| 7 | Confident | 64% | Honest | 49% | Capable | 44% |
| 8 | Intelligent | 61% | Humorous | 43% | Reflective | 42% |
| 9 | Capable | 59% | Conservative | 35% | C & C* | 42% |
| 10 | Cautious | 56% | Unconventional | 35% | Insightful | 42% |
| 11 | Clever | 52% | Individualistic | 32% | Confident | 36% |
| 12 | Individualistic | 51% | Submissive | 31% | Informal | 36% |
| 13 | Self-confident | 40% | Reflective | 31% | Intelligent | 32% |
| 14 | Informal | 37% | Suspicious | 30% | Clever | 31% |
| 15 | Resourceful | 34% | Clever | 29% | Dissatisfied | 31% |
| 16 | Inventive | 33% | Capable | 27% | Inventive | 29% |
| 17 | Insightful | 32% | Egotistical | 27% | Self-confident | 26% |
| 18 | Original | 32% | Insightful | 26% | Suspicious | 24% |
| 19 | Unconventional | 25% | Resourceful | 26% | Submissive | 20% |
| 20 | Suspicious | 24% | Self-confident | 26% | Original | 19% |
| 21 | C & C* | 19% | Inventive | 24% | Sexy | 19% |
| 22 | Sexy | 15% | Informal | 24% | Egotistical | 17% |
| 23 | Egotistical | 12% | Original | 23% | Resourceful | 13% |
| 24 | Dissatisfied | 10% | Intelligent | 23% | Individualistic | 11% |
| 25 | Conservative | 9% | Snobbish | 15% | Unconventional | 11% |
| 26 | Interest narrow | 4% | Interest narrow | 13% | Interest narrow | 9% |
| 27 | Submissive | 3% | Sexy | 12% | Conservative | 9% |
| 28 | Snobbish | 1% | Dissatisfied | 11% | Artificial | 7% |
| 29 | Artificial | 1% | Artificial | 11% | Snobbish | 4% |

*C & C = Commonplace/conventional.

While there were similarities with regard to some adjectives, other adjectives appeared to be culture-specific. “Honest” (Switzerland 48%, Korea 10%, and China 18%) and “individualistic” (Switzerland 80%, Korea 12%, and China 3%), for instance, were checked more frequently in Switzerland while “dissatisfied” (Switzerland 4%, Korea 4%, and China 32%) and “reflective” (Switzerland 39%, Korea 30%, and China 71%) were specific to China. “Insightful” (Switzerland 21%, Korea 64%, and China 79%) was a key adjective for describing a creative person in both Asian samples but less dominant in Switzerland. “Informal” (Switzerland 72%, Korea 39%, and China 38%), on the other hand, was a frequently checked adjective in Switzerland but less so in Korea and China. “Confidence” (Switzerland 85%, Korea 23%, and China 66%) appears to be less common to describe a creative person in Korea than in Switzerland and China. These differences contradict the above findings of intercultural similarity in the conception of creativity by indicating a variance in perception among the three cultures.

To further investigate these contradicting results in participants’ perception of creativity, we conducted a factor analysis of adjectives describing a creative person (iCPS adjectives). This used correlation coefficients as input into a principal components analysis, followed by Varimax rotation. The adjective “conservative” had to be excluded because it had zero variance in the Chinese sample. In the Swiss sample, out of a total of seven factors, three strong and interpretable factors emerged and accounted for 12.08%, 11.28%, and 6.33% of the variance in the data, making up a total of 29.69%. These factors were labeled *exploratory-type creativity*, *socially responsible-type creativity*, and *intellectual-type creativity*. Adjectives associated with these factors are listed in Table 5. The first Swiss factor includes adjectives such as “inventive,” “original,” “resourceful,” “individualistic,” and “interest wide.” The second Swiss factor includes adjectives such as

TABLE 4. Adjectives Describing a Creative Person (iCPS)

| Rank | Switzerland (1056) | | Korea (337) | | China (380) | |
|------|--------------------|-----|-----------------|-----|-----------------|-----|
| 1 | Inventive | 87% | Inventive | 85% | Insightful | 79% |
| 2 | Original | 85% | Interests wide | 80% | Inventive | 75% |
| 3 | Interests wide | 82% | Original | 78% | Reflective | 71% |
| 4 | Individualistic | 80% | Unconventional | 68% | Original | 70% |
| 5 | Informal | 72% | Insightful | 64% | Capable | 69% |
| 6 | Resourceful | 71% | Humorous | 59% | Confident | 66% |
| 7 | Humorous | 65% | Self-confident | 57% | Interests wide | 58% |
| 8 | Intelligent | 60% | Capable | 52% | Self-confident | 58% |
| 9 | Unconventional | 58% | Resourceful | 46% | Clever | 53% |
| 10 | Confident | 58% | Clever | 43% | Intelligent | 47% |
| 11 | Capable | 58% | Informal | 39% | Resourceful | 47% |
| 12 | Clever | 57% | Intelligent | 37% | Humorous | 43% |
| 13 | Self-confident | 50% | Reflective | 30% | Informal | 38% |
| 14 | Honest | 48% | Confident | 23% | Dissatisfied | 32% |
| 15 | Reflective | 39% | Cautious | 22% | Unconventional | 31% |
| 16 | Sincere | 28% | Suspicious | 18% | Sexy | 24% |
| 17 | Insightful | 21% | Sincere | 14% | Cautious | 22% |
| 18 | Mannerly | 19% | Mannerly | 12% | Honest | 18% |
| 19 | Cautious | 10% | Individualistic | 12% | Sincere | 18% |
| 20 | Suspicious | 9% | Honest | 10% | Suspicious | 16% |
| 21 | Sexy | 8% | C & C* | 9% | Mannerly | 15% |
| 22 | Egotistical | 8% | Egotistical | 8% | Egotistical | 7% |
| 23 | C & C* | 4% | Sexy | 5% | Artificial | 3% |
| 24 | Dissatisfied | 4% | Conservative | 4% | Individualistic | 3% |
| 25 | Conservative | 2% | Submissive | 4% | C & C* | 2% |
| 26 | Artificial | 2% | Dissatisfied | 4% | Interest narrow | 2% |
| 27 | Snobbish | 1% | Artificial | 3% | Snobbish | 1% |
| 28 | Interest Narrow | 1% | Snobbish | 2% | Submissive | 1% |
| 29 | Submissive | 0% | Interest narrow | 1% | Conservative | 0% |

*C & C = Commonplace/conventional.

“sincere,” “honest,” “mannerly,” “cautious,” and “insightful.” The third Swiss factor includes adjectives such as “clever,” “capable,” “intelligent,” and “self-confident.” While not every item was a perfect match for the label assigned, we used the adjectives with the strongest loadings to assign the labels.

In both the Korean and the Chinese samples, a total of nine factors emerged. The first four factors in the Korean sample accounted for 15.56%, 11.46%, 6.49%, and 5.46% of the variance in the data, amounting to a total of 38.97% while the first three factors in the Chinese sample accounted for 15.92%, 8.75%, and 7.53% of the variance in the data, amounting to a total of 32.20%. Instead of labeling the Korean and Chinese factors and identifying the adjectives included in each factor, as had previously been done for the three strongest Swiss factors, we focused our analysis on whether the three strongest Swiss factors can be replicated in the Korean and Chinese samples—in other words, whether the Swiss concepts of creativity can be applied to the Korean and the Chinese samples.

We conducted factor correlation analyses between the loadings of the three strongest Swiss factors and the factors identified in the Korean and Chinese samples. Factors with correlations of 0.40 and above are listed in Table 5. Although only Chinese Factor 1 to Swiss Factor 2 (socially responsible-type creativity) and Korean Factor 4 to Swiss Factor 3 (intellectual-type creativity) met Lorenzo-Seva and ten Berge’s (2006) criterion of “fair similarity” ($r_c > 0.85$), all cultures have factors that can be associated with exploratory-type, socially responsible-type, and intellectual-type creativity. The difference lies in the accentuation of what comes first: the first Swiss factor, exploratory-type creativity, correlates strongly with the second factor found in the Korea ($r_s = 0.69$, $p < .001$) and China ($r_s = 0.63$, $p < .001$) samples. Vice versa, the second factor found in Switzerland, socially responsible-type creativity, correlates strongly with the first factor found in

TABLE 5. The Three Strongest Swiss Factors; Items Associated with These Factors Across All Three Cultures and Correlations of Item Loadings

| | Switzerland (<i>n</i> = 1056) | Korea (<i>n</i> = 337) | China (<i>n</i> = 380) |
|---|--------------------------------|-------------------------|-------------------------|
| Factor 1 (exploratory-type creativity) | | | |
| Factor rank | 1 | 2 | 2 |
| Correlation with Swiss factor | – | .69 | .63 |
| Similarity to Swiss factor (<i>r_c</i>) | – | .73 | .67 |
| Items with loading >.40 | | | |
| Inventive | .722 | .586 | .753 |
| Original | .711 | .577 | .696 |
| Resourceful | .617 | .430 | .418 |
| Interests wide | .494 | .515 | .474 |
| Individualistic | .557 | –.009 | –.041 |
| Self-confident | .097 | .429 | .407 |
| Unconventional | .178 | .770 | .011 |
| Humorous | .260 | .573 | –.104 |
| Reflective | .185 | .179 | .598 |
| Insightful | .147 | .316 | .499 |
| Intelligent | .161 | .204 | .423 |
| Factor 2 (socially-responsible-type creativity) | | | |
| Factor rank | 2 | 1 | 1 |
| Correlation with Swiss factor | – | .70 | .79 |
| Similarity to Swiss factor (<i>r_c</i>) | – | .80 | .86 |
| Items with loading >.40 | | | |
| Sincere | .728 | .685 | .745 |
| Honest | .669 | .710 | .828 |
| Mannerly | .646 | .743 | .759 |
| Cautious | .523 | .609 | .470 |
| Insightful | .501 | .013 | –.006 |
| Confident | .245 | .739 | .098 |
| Commonplace/conventional | .275 | .579 | .331 |
| Submissive | –.002 | .477 | .043 |
| Sexy | .023 | –.004 | .441 |
| Factor 3 (intellectual-type creativity) | | | |
| Factor rank | 3 | 4 | 3 |
| Correlation with Swiss factor | – | .83 | .70 |
| Similarity to Swiss factor (<i>r_c</i>) | – | .89 | .80 |
| Items with loading >.40 | | | |
| Clever | .756 | .671 | .569 |
| Capable | .714 | .761 | .595 |
| Intelligent | .606 | .391 | .295 |
| Self-confident | .450 | .483 | .320 |
| Confident | .384 | .084 | .713 |
| Humorous | .099 | .058 | .501 |
| Informal | .058 | .086 | .456 |

Notes. As a measure of similarity between the three strongest Swiss factors Korean and Chinese samples, we computed (1) the Pearson correlation between the item loadings in each factor and (2) Tucker’s congruence coefficient after performing a procrustean rotation on the Chinese and Korean factors, as advocated by Lorenzo-Seva and ten Berge (2006). Bold values indicate a factor loading above 0.40.

the Korea ($r_s = 0.70, p < .001$) and China ($r_s = 0.79, p < .001$) samples. The third factor in the Swiss sample, intellectual-type creativity, correlates strongly with the fourth factor found in the Korean sample ($r_s = 0.83, p < .001$) and the third factor found in the Chinese ($r_s = 0.70, p < .001$) sample.

The reversed ranking of the first and second factors between the Swiss and the two Asian samples indicates that in Korea and China socially responsible-type creativity dominates people's perception of creativity while in Switzerland it is exploratory-type creativity. This is in line with findings by Rudowicz (2003) and Rudowicz and Hui (1997), who identified the importance of making a contribution to the progress of society as part of the perception of creativity held in Hong Kong, as well as with the general assumption of the Swiss being more individualistically oriented than the Koreans or the Chinese. Overall, however, it can be said that the concepts of creativity found in the Swiss sample can, to some extent, also be applied to the Korean and the Chinese samples.

Coming back to the question of whether there is an experiential bias in the cross-cultural application of the CPS or not, it is interesting that findings from the frequency analysis of iCPS adjectives and the factor analysis are contradictory. Both analyses identified similarities as well as discrepancies in the perception of creativity by the Switzerland, Korea, and China samples. Overall, however, findings indicate that the concept of creativity found in the Swiss culture, which is rather individualistically orientated, can be applied to the collectivistically oriented Korean and Chinese cultures. An experiential bias can, therefore, not be identified with certainty when applying the CPS in a collectivistic versus an individualistic culture. However, the possibility of the CPS being influenced by an experiential bias when applied in a cross-cultural setting can also not be ruled out entirely, considering the notable differences in the perception of creativity across the three samples. Utilizing the scale across other cultures with wider differences in how they perceive creativity may indeed influence the overall creativity score due to an experiential bias.

Another interesting finding is that, when it comes to perceiving one's own creative potential, all three samples (CPS adjectives) vary. A rank correlation between the ranking of adjectives indicative of how respondents perceive themselves (CPS) and what they perceive a creative person to be (iCPS) illustrates this point. Results indicate that there is only a weak relationship between how Korean students see themselves and what they perceive a creative person to be ($r_s = 0.18, p < .001$). In China, the gap is a little narrower but still considerable ($r_s = 0.40, p < .001$) when compared to Switzerland ($r_s = 0.62, p < .001$). This finding shows that Korean and Chinese students generally do not think of themselves as possessing the attributes they assigned to creative people. The discrepancy between how Koreans and Chinese students consider a creative person to be (iCPS) and how they see themselves (CPS) can either stem from a responding bias based on the internalized Asian virtue of personal humility "I dare not call myself intelligent" (Koreans who consider themselves as intelligent: 23%, Chinese: 32%, and Swiss: 61%), or it might also originate from a genuine lack of self-esteem with regard to one's own creative potential.

DISCUSSION

The results presented here provide a number of points worth discussing. Most importantly, the CPS is not an unbiased measure of creativity, even less so beyond the cultural divide. Our analysis has shown that the CPS in its standard form favors subjects who have a tendency to check many adjectives due to the larger number of positive adjectives available. The CPS also mostly ignores the contribution of the negative adjectives in the scale. This finding is based on the fact that positive items correlated very positively whereas negative items correlated only slightly negatively with the overall score. Additionally, the analysis indicated that CPS scores could be influenced by differences in responding style across different cultures. Swiss participants had an advantage compared to Korean and Chinese subjects because, on average, Swiss subjects checked substantially more adjectives than their Asian counterparts, which we attribute to the behavior of socially desirable responding. Swiss students may have been overly positive in their response (arising from their desire to be better than others, often identified to be the case in individualistic cultures; Lalwani et al., 2006), while Korean and Chinese respondents may have been overly modest in their response (arising from individuals' adherence to social norms, often the case in collectivistic cultures; Lalwani et al., 2006).

The study also helped to better conceptualize creativity across Switzerland, South Korea, and Mainland China, highlighting two contradicting trends: one of universality and one of cultural diversity. As for the first trend, attributes describing a creative person across all three cultures were "inventive," "original," and "interest wide." Additionally, factor analysis showed that factorial structures are relatively similar across the three cultures and that the concepts of creativity derived from the Swiss sample can, to some extent, be applied to the Korean and Chinese samples. As for the second trend, this study has found some indications of differences in the perception of creativity. Attributes with the largest variation across the three cultures were "individualistic," "insightful," "confident," "reflective," "honest," "unconventional," "informal," and "dissatisfied." This difference might originate from a discrepancy between the concept of creativity as

reported in the Western literature, which often includes one's capacity for independent thinking and abstract logical reasoning, and the Eastern concept of creativity that emphasizes aspects of humaneness, wisdom, and morality. Moreover, according to the findings of the factor analysis, a socially responsible-type creativity dominates the perception of creativity in Korea and China, as opposed to the exploratory-type creativity recognized in Switzerland. In other words, the Swiss believe that creative people are proactive and task-oriented while the Korean and the Chinese expect them to be community-oriented. Our recommendation is, therefore, that any further research should seek to establish a culturally integrated approach to the concept of creativity as well as to the measurement of creative personality traits.

Finally, this study raises concerns about the objective and subjective perception of creativity common in Korea and China. Results from the rank correlation analysis between the CPS and iCPS have shown that there is a discrepancy between how the students from Korea and China see themselves as opposed to how they perceive creative individuals to be. A possible reason for this difference might be found in both countries' recent history, which is characterized by rapid technological development and hyper-industrialization. The countries' ability to tap into the creative potential of their people favored the development of innovative and useful products and processes, which in turn created economic growth. In adapting so rapidly and radically to a Western-style economic system, they also adopted a Western concept of creativity, at least to a certain extent, which is in contrast with their traditional social value system (see also Chan & Chan, 1999; Choe, 2006; Rudowicz & Hui, 1997; Rudowicz, 2003). In evaluating their own character traits, the students from Korea and China may well have been influenced by a preference for these traditional values, which could explain the discrepancy between the attributes they chose for themselves and those they chose to describe a creative person.

Several limitations to the present study should be mentioned. Most notably, the extent to which the findings in this paper can be generalized is limited by the fact that the survey was conducted in three distinct cultures and languages. Also, the findings, which concern the attributes of a creative person, are descriptive rather than explanatory in nature, a weakness well recognized in the study of implicit theories (Sternberg, 1985; Rudowicz & Yue, 2000). Further, how a particular adjective is interpreted and what meaning is associated with it may differ across the three cultures, which created further difficulties in explaining our findings. For instance, the study identified "original" as a universal attribute of a creative individual, despite the fact that recent findings have questioned the universality of originality as a criterion for creativity (Kharkhurin, 2014). The underlying meaning of "original" in each country is unclear, however. The Asian subjects may have chosen "original" because to them the word is associated with authenticity and because it reflects their values and their belief in existing ideas. The Swiss subjects, on the other hand, were more likely to associate "original" with radically new ideas (Kharkhurin, 2014). As this example shows, some level of difference in meaning is possible, despite our efforts to verify the meaning of each attribute.

In addition to the issues mentioned above, two other limitations of our study need to be mentioned. First, respondents' views of creativity were confined to the 29 adjectives derived from the CPS. This scope may have restricted respondents' conception of creativity. For example, the discrepancy between how the students from Korea and China saw themselves as opposed to how they perceived creative individuals may, at least partially, be due to the fact that the 29 adjectives of the CPS did not provide them with sufficient flexibility to allow them to cultivate their own authentic approach by combining old and new traditions, as suggested by Kharkhurin (2014). Second, a possible response order effect should be mentioned (Krosnick, 1999). The order of the sections in the questionnaire—CPS followed by iCPS—could have contributed to an order effect bias. This bias might, however, have been even bigger if the order had been reversed (i.e., general attributes followed by self-rating). Future studies may choose to randomize the order of questions.

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