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The Profiles of Creative Potential and Personality Characteristics of Adult Professionals

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Using 5 divergent thinking indices of the Torrance Tests of Creative Thinking and the Myers-Briggs Type Indicator, this study examined the creative profiles of 236 adult professionals and relationships between their creative characteristics and personality types. All these adults were in their middle or late stage of professional development in business, public service, journalism, or a similar profession. Distinctive profiles of creative and personality characteristics were found as a function of the domain. For example, the adults in business, journalism, and law had strength in fluency and a weakness in resistance to premature closure; those in medicine, and research and education showed strength in originality and a weakness in abstractness of titles. Those in business were mostly either an ESTJ or ISTJ type had lower levels of creativity than other professionals. Across the domains, the adults preferring intuition in perceiving information had higher creative potential than those preferring sensing. Domains were significant predictors of most of the tested creativity, even over and above the personality types. Overall, this study supported that creative potential, personality types, and domains are intertwined although further explorations are needed to identify causality among them.

CREATIVE PEOPLE AND CREATIVE PERSONALITY

Despite demands on creativity for national growth and welfare, the concept of creativity is too complicated to define. Of many suggested venues to examine creativity and/or creative potential, and the well-known four Ps (person, process, product/performance, and press) approach (Rhodes, 1961) is upmost cited in understanding the concept. Among the four Ps, person and product/performance have been centered in many studies supporting that creativity is represented as a general ability or a personality trait demonstrated by people who produce and perform something new and useful (Batey, 2012; Kampylis & Valtanen, 2010; Simonton, 1994; Runco & Jaeger, 2012; for summary and discussion). Research using the Torrance Tests of Creative Thinking (TTCT), a most referenced test in creativity research, has also proved that children with greater creative potential are likely to have higher levels of creative performance and achievement in adulthood (see Cramond, 1994; Cramond, Matthews-Morgan, Bandalos, & Zuo, 2005).

Creative personality is often referred to as an indication of creative potential in general. Research regarding the implicit theory of creativity (Chan & Chan, 1999; Lim & Plucker, 2001; Pavlovic, Maksic, & Bodroza, 2013; Rudowicz & Hui, 1997; Rudowicz & Yue, 2000; Runco, 1990; Runco, Johnson, & Bear, 1993; Sternberg, 1985, 1987) compiles a list of creative personality perceived by laypersons across different cultures. Examples include being open-minded, intrinsically motivated, passionate, energetic, original, curious, expressive, imaginative, perseverant, independent, and deviant; and having a long attention span, divergent thinking, problem solving ability, and logical and scientific thinking ability. Researchers also reported that creative people are able to balance conflicting characteristics that are incompatible (e.g., flexibility vs. logical thinking, risk-taking vs. commitment to task, escaping entrenchment vs. finding order) in nature (Cropley & Cropley, 2011; Davis, Rimm, & Siegle, 2011; Starko, 2005). All these personality characteristics are deemed contributing factors to creative outcomes regardless of domains.

Should creativity be seen as a domain-general ability or a personality characteristic, one single measure based on divergent thinking or ideational fluency may be able to explain a large part of one’s creative potential. Torrance’s (1966, 1974) belief in creativity and a wide array of

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creative personality characteristics documented in literature conjecture that creativity is an intrapersonal attribute, rather than a social product. However, since the 1990s, researchers have been highly aware of the idiosyncratic nature of creativity and involved domains and/or tasks within the domains in creativity research. They asserted that creativity incorporates more than a divergent thinking ability or an ideational fluency (Baer, 2012; Han & Marvin, 2002; Hong & Milgram, 2010; Runcoc & Acar, 2012) and suggested the domain general versus specific aspects of creativity (Hong & Milgram, 2010; Makel & Plucker, 2008; Sternberg, 2005). The domain specific approach limits the scope of creative processes and products, although it may enable to explain creativity to be something real (Baer, 2012).

**DOMAINS, CREATIVE CHARACTERISTICS, AND PERSONALITY**

A growing interest in domain-based creativity and/or creative personality characteristics leads to increased awareness of the needs of various domains. Creativity has been typically considered to appear in a few domains, such as art, music, dance, and writing (Barbort & Lubart, 2012; Kaufman, 2002; Rostan, 2010). As creativity and innovation are credited for industrial, organizational, and national as well as individual wellbeing today (Agars, Kaufman, & Locke, 2008), creativity is not only the product of artistic areas but also emerges in domains (e.g., math, science, engineering, etc.) that produce useful and appropriate outcomes for people’s daily lives.

Domains and tasks within the domains are likely to identify creative characteristics by determining levels of novelty and functionality, the two central components of creativity across various domains. Aesthetic or artistic creativity is referenced in domains of arts, music, dance, and literature, etc., with foci on novelty, originality, and aesthetic values of creative outcomes over functional appropriateness and usefulness (Piirto, 1998, 2008; Winner & Martino, 2000). In contrast, functional creativity is manifested in science, technology, engineering, math, and business (Cropley & Cropley, 2005, 2011, 2012) where many nations are eager to invest in to improve the quality of daily lives and national wellbeing (Davila, Epstein, & Shelton, 2006; Florida, 2002, 2005; Livingston, 1999; Makel & Plucker, 2008; Webb, 1995). Relevance and effectiveness take precedence over novelty in functional creativity (Cropley & Cropley, 2005, 2011, 2012) although subtle differences exist in creative characteristics within these domains. For instance, in business, novelty must not only be original but also be understandable, usable, and acceptable to laypersons so that creative outcomes turn out to be relevant and effective products (Cropley & Cropley, 2012). In math, creativity is related to mathematical problem solving skills; in engineering, it has to do with problem solving on real-life issues (Hong & Milgram, 2010).

Creative characteristics also vary by tasks within the domains. Abuhamdeh and Csikszentmihalyi (2004) reported that artists working in a representational style tended to be highly structured and relied on the constrained process of creation, while the creative process of artists working in an abstract manner was ill structured and depended on personal feelings and perceptions. Also, linear artists preferred rational, reality-based, and rigid creative process, compared to painterly artists who were improvisational, irrational, emotional, and free-associative. Differing creative behaviors were noticed according to the type of managerial tasks and situations in business (Caroff & Lubart, 2012). For managers, ability to work in a team and risk-taking were perceived to be important creative behaviors, and selective encoding, analytical thinking, and flexibility were rated as the most needed behaviors for designers.

Some creative personality traits, such as originality and curiosity, were found across different domains, however, research showed that there are distinctive cognitive and affective personality characteristics leading to creative outcomes in certain domains and/or tasks (Caroff & Lubart, 2012; Lubart & Guignard, 2004). Cassandro and Simonton (2010) identified differentiated personality and vocational inclinations in the domains of writing, philosophy, science, and academia. He found that philosophers scored the highest, writers and scholars scored in the middle, and scientists scored the lowest on topical diversity (i.e., number of themes appearing in their creative writing), which was an indication of creativity. A positive relationship was found between diversity and open-mindedness for philosophers, writers, and scholars, but not for scientists. Mieg and colleagues (2012) reported that successful inventors have personalities that are not typically found among creative people. Extraversion and openness to experience were more apparent for independent inventors than average populations; risk taking was not manifested for these inventors. A negative correlation was found between openness to experience and success as an inventor (i.e., number of patents). All these results echo that scientific forms of creativity are not likely to ask for open-mindedness than creativity in other non-scientific domains. Feist’s (1999) review concluded that as for personality characteristics, creative people in arts, science, and business are similar on the one hand, but different on the other hand. For example, social isolation, withdrawal, independence, drive, ambition, self-confidence, openness to experience, flexibility, and imagination are common personality characteristics found for creative artists and scientists. Yet, artists are more anxious, emotionally unstable, and impulsive, and have lower levels of socialization and conscientiousness than scientists. Other evidence regarding domain or task-specific creative personality characteristics included that neuroticism facilitated artistic creativity; emotional stability was noticeably found...
for creative managers and leaders (Batey & Furnham, 2006); and that performing artists showed higher levels of associative orientation, instability, and originality, but lower levels of ambition and agreeableness than managers, clerical workers, and lecturers (Martinson, 2011).

Creative personality not only varies by the domains, but also has differing effects on creative products. In Furst, Ghisletta, and Lubart’s (2012) study involving students in applied arts schools, extraversion had a negative effect on the students’ products, but openness and conscientiousness had positive effects. Davis, Kaufman, and McClure (2011) identified personality characteristics as predictors of creativity in different domains. Predictive personality characteristics included conscientiousness, emotional stability, and openness in entrepreneur; extraversion in performing arts; and openness and emotional stability in visual arts. The authors also reported that emotional stability and agreeableness were negative predictors of creativity in math and science.

Creative characteristics and personality seem to vary by domains. It is not known if creative characteristics and personality determine the characteristics of domains and/or vice versa. Effects can be bidirectional. Given that creative outcomes emerge not solely from individuals, but also from domains valued in the society, it is worth examining one’s creative characteristics and the domain he or she is involved in. Profiling creative strengths and weaknesses is one mode of identifying one’s creative potential (e.g., Kerr & McKay, 2013). Personality characteristics are also a good indication of creative potential (Davis et al., 2011), and depending on the domain, they could be either strengths or weaknesses in producing creative outcomes. Creative profiles consisting of one’s creative and personality characteristics would be instrumental to understand the idiosyncratic nature of creativity varying by domains (see also Cheng, Kim, & Hull, 2010).

ABOUT THIS STUDY

The purposes of this study were to identify creative profiles of 236 adult professionals and examine the relationships between their creative characteristics and personality types. This study included adults who were in their middle or late stage of career development to find differences, if possible, in their creative and personality characteristics according to their current professions.

The figural version of the TTCT (Torrance, 1966, 1974) and the MBTI (Myers, McCaulley, & Most, 1985) were used to examine creative characteristics and personality types, respectively. Researchers have been wary of using a single index score in identifying individuals’ creative potential. Runco and Acar (2012) asserted that measures of divergent thinking are reliable and reasonably valid for certain performance criteria, however, they are not synonymous with creativity per se but, rather, the estimates of creative potential for problem solving which leads to originality. This study used the subscores of the TTCT to identify one’s strengths and weaknesses for divergent thinking-based creative characteristics. MBTI was used because it is one of the most referenced psychological measures based on individuals’ preferred types for perception and judgment.

Given that creativity is a multifaceted concept manifested in different forms and levels, this study hypothesized distinctive creative profiles according to the domains. The following questions were inquired for this study: (a) Are there differences in adults’ creative characteristics according to their professional domains? (b) Do these adults differ in personality types according to the domains? (c) Do creative characteristics differ by personality types? (d) Are these creative characteristics predicted by domains?

METHOD

Participants

Two hundred and thirty-six adults who had attended a 15-week creativity-training program, the Creativity Development and Academy (CDNA), from years 2009–2013 participated in this study. CDNA is an educational program designed for high-ranking professionals who are interested in creativity and creative management. It consists of 15-week courses regarding creativity related topics in education, business, engineering, arts, and leadership. The courses are held twice yearly in spring and fall and taught by creativity experts in various fields. Each cohort consists of 25–35 adult professionals.

All these 236 participants either volunteered or were recommended to participate in the CDNA as accomplished professionals in business (72.8%), public service (14.0%), journalism (4.7%), research and/or education (3.4%), law (2.6%), arts (1.7%), and medicine (0.9%). Overwhelmingly, men outnumbered women (91.1% vs. 8.9%) and about two-thirds of them were in their 40s (62.3%), followed by 29.7% in their 50s, 5.1% in their 30s, and 3.0% in their 60s and above, with a mean age of 48. Almost all the participants were college graduates (99.2%) including 36.9% holding Master’s and 15.7% doctorate degrees.

Materials

The figural form of the TTCT (Torrance, 1966, 1974) and the MBTI (Myers et al., 1985) were used for this study. TTCT is one of the most referenced and used creativity measures with reportedly reasonable validity and reliability (Cramond, 1994; Cramond et al., 2005; Davis, 1997; Plucker, 1999). It measures individuals’ creative potential based on factors related to divergent thinking abilities, such as fluency, originality, elaboration, abstractness of titles, and resistance to premature closure, and 13 additional creative strengths, which yield a creativity index score (see Cramond, 1994; Cramond et al., 2005 for details). Torrance (1974) asserted that individuals
with high scores on the TTCT are likely to increase their chances to behave creatively. In this study, five divergent thinking indices were used to identify creative characteristics indicating individual strengths and weaknesses for the divergent thinking-based creative potential.

MBTI is one of the well-known personality measures generating 16 distinctive personality types based on individuals’ preferences to use their perception and judgment. Four dichotomies representing a location of the individual’s source of energy, whether in the outer world or inner world (extraversion vs. introversion), and a mode to perceive information (sensing vs. intuition), make decisions (thinking vs. feeling), and manipulate or structure information (judging vs. perceiving) identify the individual’s preference for perception and judgment. Research showed that factors consisting of these 16 personality types were significantly correlated with creativity measures, including the TTCT (see Carne & Kirton, 1982; Cheng et al., 2010).

In this study, four subscores (ST, SF, NF, and NT), indicating preferences for sensing (S), intuition (N), thinking (T), and feeling (F), as well as the 16 personality types were computed and used for analysis. The subscores represent four orienting functions (or processes) that lead to consistency in human behaviors (Jung, 1971). Sensing and intuition are called irrational functions that operate with no predetermined directions; thinking and feeling are rational functions acting on ration. Therefore, higher scores on sensing and intuition conjecture greater dependence on irrational processes (e.g., sensual stimuli, insight, abstract and unconscious awareness), and higher scores on thinking and feeling indicate better rational and logical thinking when perceiving information and making a judgment (see Myers, 1962 for detailed information).

Procedure

Data were collected for nine cohort groups (N = 236) who had participated in the CDNA from years 2009–2013. In the first week of the program, both TTCT and MBTI were administered to the participants. Participants’ areas of profession were included as domains. They were also grouped into two according to reaction patterns to supervision that divide them into autonomous or heteronomous professional organizations (e.g., Scott, 1965). In this study, law, medicine, journalism, research, education, and arts were identified as domains of autonomous professions (N = 31), and business and public service were identified as domains of heteronomous professions (N = 204).

RESULTS

Creative Characteristics

Participants’ creative characteristics were examined using the five standardized subscores of the TTCT. Standardized mean scores of fluency, originality, abstractness of titles, elaboration, and resistance to premature closure were 93.6, 88.7, 87.3, 87.1, and 83.2, representing levels comparable to the 42nd to 43th (fluency), 35th to 36th (originality), 37th (titles), 33th (elaboration), and 35th (closure) percentiles, depending on the form of A or B of the tests.

Creative Strengths and Weaknesses

Creative strengths and weaknesses of the participants were compared to the norming sample by using the percentile ranks of the mean scores of the TTCT subscales. Strengths and weaknesses varied according to the domains of these adults. For the adults in business, journalism, and law, the highest percentile ranks were found in fluency, and the lowest percentile ranks were found in closure. The adults in medicine, research, and education showed strengths in originality and weaknesses in titles; for those in public service and arts, titles yielded the highest percentile rank, and elaboration (for those in public service) and originality (for those in arts) yielded the lowest percentile ranks. Comparisons between the professionals in the autonomous versus heteronomous domains generated a similar pattern of strengths and weaknesses between the two, showing strength in fluency and a weakness in closure (see Table 1 for detailed information).

Differences by Domains

Box’s test of equality of covariance matrices showed no statistically significant differences between the domains, Box’s M = 80.33, F(60, 1605) = 1.006, p = .465, suggesting that the covariance matrices were equal as assumed. MANOVAs revealed that Wilks’ Lambda of .78 (p = .003) was significant, and the five subscales were statistically different by domains, F(6, 228) = 1.89, p = .003, partial eta squared (ηp²) = .048. However, about 5% of multivariate variance of the five subscores was associated with the domains. Except for elaboration, F(6, 228) = 1.39, p = .219, partial ηp² = .035, F values were statistically significant for fluency, F(6, 228) = 2.53, p = .022, partial ηp² = .062, originality, F(6, 228) = 2.22, p = .043, partial ηp² = .055, abstractness of titles, F(6, 228) = 3.65, p = .002, partial ηp² = .088, and resistance to premature closure, F(6, 228) = 3.06, p = .007, partial ηp² = .075. Scheffe² tests revealed no statistically significant differences between the subscales according to the domains.

¹ In autonomous organizations, high levels of responsibility for defining and implementing goals, and setting performance standards are allowed to employees, whereas autonomy and authority granted to employees are relatively small in heteronomous organizations (see Scott, 1965 for more information).

² Due to the uneven sample size by domain, Scheffe tests were conducted (Hinkle, Wiersma, & Jurs, 2003).
When compared both autonomous and heteronomous domains, the fluency score, $t(233) = 2.44$, $p = .015$, $d = .46$, led to a statistically significant difference with a medium effect size, favoring the autonomous over heteronomous domains. Higher means were also found for the autonomous domains than the heteronomous domains on the other four subscores although the differences were not statistically significant ($p > .05$). See Table 2.

**Personality Types**

For the sample of adult professionals, ESTJ (21.6%) and ISTJ (20.3%) were the two most preferred personality types, followed by ENTJ (8.7%), ESFJ (6.9%), ESTP (5.6%), and INTP (5.2%). Proportions of the four orienting functions were 49.8% ST, 21.2% NT, 16.5% SF, and 12.6% NF. All these results confirmed that thinking (T) was the most preferred personality factor (see Table 3 for details).

**Differences by Domains**

A cross-tabulation analysis indicated a significant difference in psychological types by domains, $\chi^2(9, N = 231) = 153.23$, $p < .001$. ESTJ and ISTJ were dominant across the domains, particularly for the adults in public service (ESTJ = 22.6%, ISTJ = 29.0%), business (ESTJ = 21.3%, ISTJ = 20.1%), and research and education (ESTJ = 37.5%, ISTJ = 37.5%).

Comparisons between the adults in the autonomous versus heteronomous domains found a statistically significant difference in proportions of the psychological types, $\chi^2(15, N = 231) = 30.64$, $p = .010$. Particularly, ISTJ was found more for those in the heteronomous domains than in the autonomous domains, and ESTJ was the leading psychological type for the adults in both domains (autonomous ESTJ = 21.5%, ISTJ = 21.5%; heteronomous ESTJ = 21.5%, ISTJ = 21.5%).

There was a statistically significant proportional difference in the four orienting functions by the domains, $\chi^2(18, N = 231) = 31.24$, $p = .027$. ST was the most preferred
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function in perceiving and judging information across the domains, and particularly for those in education and research (87.5%), public service (54.8%), law (50.0%), and business (49.1%). NT and SF were the second and third preferred types respectively, and NF was the least favored one for those in most of the domains but medicine. Yet, when compared the professionals in the autonomous versus heteronomous domains, chi-squares were not statistically significant, $\chi^2(3, N = 231) = 3.94, p = .268$, suggesting no significant difference. Preferences were given to ST by nearly half of the participants (48.4% autonomous, 50.0% heteronomous), followed by NF (22.6%), NT (19.4%), and SF (9.7%) for the adults in the autonomous domains, and NT (21.5%), SF (17.5%), and NF (11.0%) for those in the heteronomous domains.

Creative Characteristics and Personality Types

Across the five subscales of the TTCT, the adults with the ENFJ type had the highest means, ranging from the 50th to 88th percentile ranks. The INTJ typed adults had the second highest means ranked between the 43rd to 53rd percentiles. For those with the ESTJ and ISTJ types, the two most preferred personality types for the entire sample, relative strengths were found in fluency, originality, and closure, while weaknesses were found in elaboration and titles. The adults with INFJ had the lowest means across the five subscales except one on abstractness of titles (see Table 4).

Among the four orienting functions, those with NF and NT had the highest and the second highest mean percentile ranks, respectively, and NF was the least favored one for those in most of the domains but medicine. Yet, when compared the professionals in the autonomous versus heteronomous domains, chi-squares were not statistically significant, $\chi^2(3, N = 231) = 3.94, p = .268$, suggesting no significant difference. Preferences were given to ST by nearly half of the participants (48.4% autonomous, 50.0% heteronomous), followed by NF (22.6%), NT (19.4%), and SF (9.7%) for the adults in the autonomous domains, and NT (21.5%), SF (17.5%), and NF (11.0%) for those in the heteronomous domains.

Differences by Personality Types

To find if the creative characteristics of our sample were different according to their personality types, a multivariate analysis of variance (MANOVA) was performed entering the five divergent thinking indices as dependent variables, and the 16 personality types and four orienting functions as independent variables. The $F$ value for Box’s test of equality of covariance matrices was statistically significant for the 16 personality types, $F(180, 7786) = 1.21, p = .033$, which rejected the homogeneity hypothesis, although it was not statistically significant for the four orienting functions, $F(45, 40265) = 1.34, p = .063$. Thus, the variances and covariances among the five subscale scores were different for the 16 personality types, but not for the four orienting

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**TABLE 4**

<table>
<thead>
<tr>
<th>First PR</th>
<th>Second PR</th>
<th>Third PR</th>
<th>Fourth PR</th>
<th>Fifth PR</th>
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<td>Originality 35.5</td>
<td>Closure 34.5</td>
<td>Elaboration 33.5</td>
</tr>
<tr>
<td>Enfp</td>
<td>Fluency 45.5</td>
<td>Titles 38.3</td>
<td>Originality 34.8</td>
<td>Elaboration 33.5</td>
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<tr>
<td>Esfp</td>
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<td>Fluency 43.5</td>
<td>Closure 32.0</td>
<td>Originality 28.5</td>
</tr>
<tr>
<td>Entp</td>
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<td>Fluency 45.5</td>
<td>Titles 32.0</td>
<td>Originality 27.5</td>
</tr>
<tr>
<td>Infj</td>
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<tr>
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</tr>
<tr>
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<tr>
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<td>Closure 35.0</td>
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<tr>
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</tr>
<tr>
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<td>Fluency 45.5</td>
<td>Closure 34.0</td>
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</tr>
<tr>
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<td>Fluency 46.5</td>
<td>Closure 35.0</td>
<td>Originality 31.0</td>
</tr>
<tr>
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<td>Originality 29.0</td>
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<tr>
<td>Efp</td>
<td>Fluency 43.5</td>
<td>Closure 33.0</td>
<td>Originality 30.0</td>
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</tr>
<tr>
<td>Nf</td>
<td>Elaboration 41.0</td>
<td>Fluency 40.0</td>
<td>Originality 39.0</td>
<td>Elaboration 38.0</td>
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<tr>
<td>St</td>
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<td>Originality 32.0</td>
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</tr>
<tr>
<td>Nf</td>
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<td>Closure 35.0</td>
<td>Originality 33.0</td>
<td>Elaboration 30.0</td>
</tr>
<tr>
<td>Nt</td>
<td>Fluency 43.5</td>
<td>Closure 34.0</td>
<td>Originality 32.0</td>
<td>Elaboration 31.0</td>
</tr>
<tr>
<td>Sf</td>
<td>Fluency 44.1</td>
<td>Closure 33.0</td>
<td>Originality 31.0</td>
<td>Elaboration 30.0</td>
</tr>
<tr>
<td>Sf</td>
<td>Fluency 45.5</td>
<td>Closure 34.0</td>
<td>Originality 32.0</td>
<td>Elaboration 31.0</td>
</tr>
</tbody>
</table>

Note. First, Second, Third, Fourth, and Fifth indicate first, second, third, fourth, and fifth highest percentile ranks based on mean scores, respectively.

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Post hoc tests were not conducted because each domain did not have a significant sample size ($n = 8.37$) for comparisons, which prevents the increase of the Type I errors.
functions. For the personality types variables, Pillai’s Trace was referenced because the homogeneity of covariance was not satisfied (Olson, 1979). The MANOVA tests showed that Pillai’s Trace of .44 and Wilks’ Lambda of .89 were significant, indicating that the creative characteristics of these adults were statistically different by their personality types, $F(75, 1080) = 1.38, p = .019$, partial $\eta^2 = .088$, and four orienting functions, $F(15, 619) = 1.84, p = .027$, partial $\eta^2 = .039$. Specifically, $F$ values were statistically significant on the two subscales of fluency, $F(15, 216) = 2.18, p = .008$, partial $\eta^2 = .131$, and originality, $F(15, 216) = 2.26, p = .006$, partial $\eta^2 = .136$, according to the personality types. Statistically significant differences were also found on the subscales of fluency, $F(3, 228) = 3.30, p = .021$, partial $\eta^2 = .042$, and abstractness of titles, $F(3, 228) = 4.68, p = .003$, partial $\eta^2 = .058$, by the four orienting functions. With small effect sizes, post-hoc tests confirmed the significant differences between SF and NF ($d = .32$) in fluency, and between ST and NF ($d = .32$) and between ST and NT in titles ($d = .25$). NF and NT had higher means than SF and ST respectively, suggesting overall strengths in intuition (N) over sensing (S) (see Table 5).

### Table 5

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluency</td>
<td></td>
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<td>Originality</td>
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<tr>
<td>Titles</td>
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<tr>
<td>Elaboration</td>
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<tr>
<td>Closure</td>
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<tr>
<td>Total</td>
<td>232</td>
<td>93.4</td>
<td>24.2</td>
<td>88.6</td>
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<td>87.5</td>
<td>24.5</td>
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<td>16.1</td>
</tr>
<tr>
<td>NF</td>
<td>29</td>
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<td>91.6</td>
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<td>83.7</td>
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<td>90.5</td>
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<td>87.1</td>
<td>19.5</td>
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<td>81.8</td>
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<td>85.1</td>
<td>13.4</td>
</tr>
</tbody>
</table>

Note. NF = intuition and feeling; NT = intuition and thinking; SF = sensing and feeling; ST = sensing and thinking.

The results showed that the four orienting functions predicted significantly scores on fluency, $R^2 = .04, F(3, 227) = 3.41, p = .18$, and titles, $R^2 = .06, F(3, 227) = 4.54, p = .004$, but not on originality, $R^2 = .02, F(3, 227) = 1.76, p = .155$, elaboration, $R^2 = .02, F(3, 227) = 2.26, p = .083$, and closure, $R^2 = .02, F(3, 227) = 1.38, p = .249$. However, after controlling for the effect of the first set of predictors (i.e., personality types), the domains accounted for a significant amount of scores not only on fluency, $R^2$ change = .05, $F(6, 221) = 2.63, p = .007$, and titles, $R^2$ change = .09, $F(6, 221) = 4.16, p = .001$, but also on originality, $R^2$ change = .06, $F(6, 221) = 2.23, p = .041$, and closure, $R^2$ change = .07, $F(6, 221) = 2.73, p = .014$. The domain factor did not account for a significant proportion of the elaboration variable, $R^2 = .03, F(6, 221) = 1.59, p = .119$. All these results suggested that for the adults who had similar types of perception and judgment, their professional domains explain a significant amount of scores on most of the TTCT subscales (see Table 6).

### DISCUSSION

Overall, the adults showed low levels of creative potential, compared to the norming sample, however, they revealed distinctive profiles of creative and personality characteristics according to their professional domains. Specifically, the businessmen, journalists, and lawyers showed strengths in fluency and weaknesses in closure, although those in areas of medicine, and research and education showed strengths in originality and weaknesses in titles. Domains, such as business, journalism, and law likely need people who are good at logical and sequential thinking, problem solving, and decision making (Lee, Min, & Choi, 2014; Moon, 2006). This possibly led to low scores on closure that has to do with low levels of open-mindedness, independence, and understanding and accepting differences of others people. Because concrete and empirical evidence and scientific thinking are mainly required for doctors, researchers, and educators, it was not surprising to reveal the abstractness of titles as their weakest area. All these results remind that all of the participants were accomplished professionals in South America.

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4 Caution is needed for interpretation because the significant result might be due to the violation of the multivariate normality assumption for the test, while the non-significant result was led by the small sample or a lack of power (Green, Salkind, & Akey, 2000).
Korea where rigidity and convergent productions are demanded for professional accomplishment and success. Also, the results suggest that domains and creative characteristics may influence each other (Feist, 2004; Lee, Min, & Choi; Lubart & Guignard, 2004).

Because this study assumed divergent-thinking-based creative characteristics in identifying individuals’ tested creative potential, the adults in the heteronomous domains (e.g., business, public service) might have lower levels of the tested creative characteristics with an observable weakness in fluency compared to those in the autonomous domains (e.g., law, medicine, journalism, research, education, arts). Differences were manifested between people in business and nonbusiness groups in titles and closure as well as fluency where the former lagged behind the latter non-business group. These are likely accounted for by overall work environment and atmosphere of business organizations in South Korea where authority and regulation are pervasive, and convergent more than divergent thinking skills are encouraged to solve problems (Kim, 2003; Lee et al., 2014).

The environmental and contextual effect is reflected in the personality types of these adults. The two most prominent personality types were ESTJ and ISTJ for the entire sample with noticeable strengths in sensing and thinking. The preferred personality types also fit well with individuals in domains, such as business, public service, research, and education where technical competence, proficiency, rigor, and experiments are highly accepted (see Jarlstrom, 2000; Kim, 2003; Lee & Park, 2002; Park & Kang, 2000; Ryu, 1998). Rigid and authoritative atmosphere, and structured work environments likely have impact on forming and maintaining certain personality types and/or vice versa (Kim, 2003) although causality can go in an either direction.

This study supported prospective relationships between tested creativity and personality characteristics (Cheng et al., 2010; Kim, 2006) although it is not clear if divergent thinking-based creative potential are strengthened by certain personality types and vice versa. In contrast to the studies in the U.S. reporting NP (intuition and perceiving) as closely related to creativity (Cross, Neumeister, & Cassady, 2007; for a summary; Dollinger, Palaskonis, & Pearson, 2004; Hawkins, 1997), the majority of the adults preferred sensing over intuiting in perceiving information and favored thinking over feeling when making decisions. Although not the majority, the adults with NF had the highest scores across the TTCT subscales; those with SF and ST had the lowest subscores as similar to the previous studies involving Western sample (Dollinger et al., 2004; Witt & Beorkrem, 1989). Sensing, thinking, and judgment were not preferred by many creative individuals including gifted students (Cross, Neumeister, & Cassady; Dollinger et al.), and thus, preferred tendencies for sensing and thinking and low levels of tested creativity found for the adults are understandable (see Kim, 2003; Ryu, 1998).

This study confirmed that the characteristics of domains, individuals’ creative strengths and weaknesses, and personality types are interwoven. Interestingly, this study proved that domains accounted for a significant amount of the TTCT measured creative characteristics, but elaboration, even over and above the personality types. Most of the previous studies involving domains and creative characteristic mainly reported that tested creativity varied by the domains (e.g., Cropley & Cropley, 2005, 2011, 2012; Piirto, 1998, 2008; Winner & Martino, 2000), but they did not reveal causality between these two. In this study, domains might have a stronger impact on creative characteristics than personality types, because all of the participants were in their middle to later stage of professional development. However, because the participants were adults who were able to choose their own professional fields, commensurate with their creative characteristics, interactions between domains and creative characteristics are more likely to be bidirectional than unidirectional. Therefore, caution is

### TABLE 6

Summary of Hierarchical Regression Analysis for Predicting Scores on the TTCT Subscales

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Fluency</th>
<th></th>
<th>Originality</th>
<th>Titles</th>
<th></th>
<th>Elaboration</th>
<th></th>
<th>Closure</th>
<th></th>
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</thead>
<tbody>
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<td></td>
<td>ΔR²</td>
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<td>.03</td>
<td>.02</td>
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<td>.06*</td>
<td>.09***</td>
<td>.03</td>
<td>.07*</td>
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<td>.25***</td>
<td>.14*</td>
<td>.22***</td>
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<tr>
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<td>.04</td>
<td>.16*</td>
<td>.07</td>
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<td>.08*</td>
<td>.15***</td>
<td>.06</td>
<td>.09*</td>
<td></td>
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</tr>
</tbody>
</table>

Note. *p < .05, **p < .01, ***p < .001. N = 231. * Control variables included the personality types based on the four orienting functions (SF, NT; and NF).
needed for interpretation of this result, and further studies are needed to corroborate if the domain identifies and/or predicts certain aspects of creative characteristics.

LIMITATIONS AND SUGGESTIONS

The uneven sample size by domains is one major limitation of the study. Because the participants were adult professionals who had attended a creativity-training program for high-ranking professions, the majority came from business organizations where creativity is a central theme for innovation at work. Authoritative and hierarchical climate in business organizations and the Korean society would facilitate convergent thinking ability for these adults, which might skew the results. Having an equivalent size of research participants for each domain is suggested to strengthen the present findings.

This study examined domain-specific characteristics of tested creativity and personality types, and thus, tasks within the domains were not considered. Profiling task-specific creative characteristics and personality types may help to better understand multifaceted attributes of creativity.

How creative characteristics, personality types, and domains are linked and interact is unknown and out of the scope of this study. Interactions among these three may vary according to ages, cultural background, stages of professional development, and/or tested creative characteristics. Using different age and ethnic groups are suggested for future studies. Qualitative data, such as follow-up interviews with the professionals, will help to verify the results from this study and to better understand the relationships and influences among creative characteristics, personality types, and domains, and particularly how domains contribute to forming certain modes of creative characteristics and vice versa.

ACKNOWLEDGMENTS

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REFERENCES


