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The Construct of Creativity: Structural Model for Self-Reported Creativity Ratings

ABSTRACT

Several thousand subjects completed self-report questionnaires about their own creativity in 56 discrete domains. This sample was then randomly divided into three subsamples that were subject to factor analyses that compared an oblique model (with a set of correlated factors) and a hierarchical model (with a single second-order, or hierarchical, factor subsuming all of the first order factors). After model refinement, both models were then tested on a confirmation sample. The hierarchical model had a better fit with the data than the oblique model, providing support for theories that have proposed a hierarchical structure to creativity, such as the Amusement Park Theoretical Model. The analysis provided evidence of both an over-arching general factor and seven more specific General Thematic Areas of creative performance (Artistic-Verbal, Artistic-Visual, Entrepreneur, Interpersonal, Math/Science, Performance, and Problem-Solving).

INTRODUCTION

Most theories of creativity either focus on the confluence of factors that can lead to creativity (e.g., Amabile, 1996; Sternberg & Lubart, 1995) or on how products or people are considered creative (e.g., Csikszentmihalyi, 1996, 1999; Sternberg, Kaufman, & Pretz, 2002). Often left implicit or ignored is the question of whether creativity is domain-specific or general — in other words, if it more sensible to talk about the creative person, in general, or to talk about creative poets, creative mathematicians, and creative architects, in particular. One theory that focuses explicitly on creativity across domains is the Amusement Park Theoretical Model (APT Model; Baer & Kaufman, 2005; Kaufman & Baer, 2005a, 2005b, 2006).

The APT Model is based on the metaphor a large amusement park. In an amusement park there are initial requirements (e.g., a ticket) that apply to all areas of the park. Similarly, there are initial requirements that, to varying degrees, are necessary to creative performance in all domains (e.g., intelligence, motivation).

Amusement parks also have *general thematic areas* (e.g., at Disney World one might select among EPCOT, the Magic Kingdom, the Animal Kingdom, and Disney-MGM Studios), just as there are several different general areas in which someone could be creative (e.g., the arts, science). Once in one type of park, there are sections (e.g., Fantasyland, Tomorrowland), just as there are *domains* of creativity within larger *general thematic areas* (e.g., physics and biology are domains in the *general thematic area* of science). These domains in turn can be subdivided into *micro-domains* (e.g., in Fantasyland one might visit Cinderella's Castle or It's a Small World; in the domain of psychology, one might specialize in cognitive psychology or social psychology).

The *general thematic areas* form the building blocks of creative activity — these are the core domains that can then be divided and subdivided by specific interest. Yet how many general thematic areas are there? One? Ten? One hundred? The question of articulating all of the important different thematic areas is an ancient one. In Greek mythology, there are nine muses — goddesses who helped inspire those mortals who would attempt to be creative in the arts or sciences. There were initially three muses — Melete (muse of Practice), Mneme (muse of Memory), and Aeode (muse of Song). These three muses were eventually replaced and their number expanded to nine (although the original name of the muse of Memory lives on when we try to remember the order of the planets and use a mnemonic).

Consider the expanded list of muses and what they represented (D'Aulaire & D'Aulaire, 1992):

- Calliope: Epic poetry
- Euterpe: Lyric poetry/music
- Erato: Love poetry
- Polymnia: Sacred poetry
- Clio: History
- Melpomene: Tragedy
- Thalia: Comedy/pastoral poetry
- Terpsichore: Choral song/dance
- Urania: Astronomy/astrology

These nine muses could easily be reread as nine general thematic areas. Clearly, our values and conceptions of creativity have changed from the times of Greek mythology — one senses a certain focus on poetry that is, perhaps unfortunately, not as present in modern times. But even all those years ago, the idea that there was a choice of muses, who varied by domain, showed certain awareness of how creativity works. If you were creative and looking to be inspired, you might need different stimuli depending on your area of creativity.

In more modern days, the debate continues. Feist (2004) used the term "domains of mind," and has proposed seven: psychology, physics, biology, linguistics, math, art, and music. Gardner (1999), famously, has proposed eight intelligences; although they are usually interpreted as aspects of intellectual ability, they serve just as well as areas of creative achievement (e.g., Gardner, 1993). His eight areas are interpersonal (i.e., dealing with other people), intrapersonal (dealing with yourself, so to speak), spatial, natural history, language, logical-mathematical, bodily-kinesthetic (which could be dancing or playing baseball, for example), and musical. Holland's (1997) model of vocational interests could also apply to creative interests; his six categories are realistic, investigative, artistic, social, enterprising, and conventional.

Some initial studies on the general thematic areas in creativity have provided mixed results. Carson, Peterson, and Higgins (2005), in creating the Creativity Achievement Questionnaire, selected 10 domains, which loaded onto two factors: the Arts (Drama, Writing, Humor, Music, Visual Arts, and Dance) and Science (Invention, Science, and Culinary). The tenth domain, Architecture, did not load on a factor.

Kaufman and Baer (2004) asked 241 college students to rate their creativity in nine areas: science, interpersonal relationships, writing, art, interpersonal communication, solving personal problems, mathematics, crafts, and bodily/physical movement. A three-factor solution emerged, with Creativity in Empathy/Communication (creativity in the areas of interpersonal relationships, communication, solving personal problems, and writing); "Hands On" Creativity (art, crafts, and bodily/physical creativity); and Math/Science Creativity (creativity in math or science). These factors on this scale were later replicated by Rawlings & Locarnini, 2007. Interestingly, these are similar to three factors found in the area of student motivation — writing, art, and problem solving (Ruscio, Whitney, & Amabile, 1998).

A study of Turkish undergraduates found a slightly different factor structure, with an Arts factor (art, writing, crafts), an Empathy/Communication factor (interpersonal relationships, communication, solving personal problems), and a Math/Science factor (math, science). Bodily/kinesthetic was not associated with any factor (Oral, Kaufman, & Agars, 2007).

Another, similar line of research has been by Ivcevic and her colleagues, who have studied self-reported creative behaviors instead of self-ratings on overall creative areas. Ivcevic and Mayer (in press) tested college students with open-ended questionnaires and group discussions, which then resulted in a comprehensive assessment of creativity across specific behavior. Factor analysis of these behaviors resulted in three second-order dimensions: The first factor was dubbed the creative lifestyle (comparable to both the Hands On factor and the Empathy/Communication factor from Kaufman and Baer (2004), with crafts, self-expressed creativity, interpersonal creativity, sophisticated media use, visual arts, and writing. The second factor was dubbed performance arts, and encompassed music, theatre, and dance, and is close to the Hands On factor from Kaufman and Baer (2004). The third factor, intellectual creativity, represented creativity in technology, science, and academic pursuits. This factor is akin to Kaufman and Baer's (2004) Math/Science factor. In a separate investigation, Ivcevic and Mayer (2007) used a creative activities checklist in combination with a personality inventory to derive five "types": Conventional, Everyday Creative Individuals, Artists, Scholars, and Renaissance Individuals.

The purpose of this study was to investigate the factor structure of creative general thematic areas using a much larger scale — instead of surveying people on nine domains, we examined 56; in addition, a very large sample allowed for more sophisticated analysis.

METHODS

Participants. A total of 3,553 people participated in the study. The majority of the participants were college students, as follows: 1,848 students were recruited from psychology classes at a California university, 321 students were recruited from education classes in a New Jersey university, 71 students were recruited from theatre classes in a California university, 64 students were recruited from history classes in a Massachusetts university, and 58 students were recruited from advanced biology classes in a California university. In addition, the following groups (all in California) were recruited to complete the survey: 532 members of two local churches, 282 high school students, 122 people randomly asked in front of a movie theater and in a mall, 94 nurses, 79 school teachers, 42 professional psychologists with an advanced degree, and 40 counselors working at a group home. These groups were chosen in an attempt to sample beyond traditional college students. The California university is a Hispanic-serving institution with many returning students, whereas the Eastern school was more elite. The groups were selected to get a diverse group with different education levels, financial situations, and cultures.

Students were recruited by flyers and by researchers speaking to classes. Some students received extra credit for their participation. Nonstudents were recruited by student assistants who knew people who worked at the respective places (hospital, school, etc.), and obtained permission to distribute and collect the surveys. The surveys were typically administered in large group settings. The surveys were brief and typically took less than ten minutes to complete.

These participants had a mean age of 26.6 years (*SD* = 10.89 years). Males comprised 26.0% of the samples, females 72.7% of the sample, with 1.3% of sample not providing gender information. Ethnic composition of the sample was as follows: 39.9% were European American, 21.2% were African American, 24.1% were Hispanic, 6.1% were Asian American, 1.7% were Native American, 5.6% of the sample indicated they were of mixed ethnicity, and 1.4% did not provide information on their ethnicity. For more information about item-level differences by ethnicity and gender, see Kaufman (2006). Finally, educational levels were as follows: 9.4% had attended some high school, 12.0% had completed high school, 47.5% had attended some college, 17.0% were college graduates, 6.4% had taken some post-college classes, 5.6% had a post-college degree, and 2.1% did not provide educational level information.

Instruments. Participants completed the Creativity Domain Questionnaire (see Appendix 1) and demographic questions. The domains were an extension and expansion of the domains studied in an earlier study (Kaufman & Baer, 2004). For the 56 domains, participants rated their creativity as *Not at all creative* (1), *Not very creative* (2), *A little creative* (3), *Somewhat creative* (4), *Very creative* (5), and *Extremely creative* (6). They were also given the opportunity to mark *Not applicable*, which was scored as missing data.

Participants used their own definitions or concepts of creativity, which is consistent with Amabile's (1996) work on creativity ratings. Indeed, layperson perceptions of creativity tend to vary little from more expert opinions (e.g., Sternberg, 1985).

DATA ANALYSIS

Missing data. Given the size of the questionnaire and size of the sample, we realized that missing data would be prevalent in the dataset and an appropriate method to address missingness would be required. Using antiquated techniques such as casewise deletion, mean replacement, or regression-based imputation would lead to marked reduction in sample size, an underestimation of correlations (bad for latent models), or spuriously inflated correlations (similarly bad), respectively (among many other problems,; Schafer & Graham, 2002). Instead, we planned to use a Bayesian multivariate normal imputation (Rubin, 1987). Additionally, based on recommendation from Collins et al. (Collins, Schafer, & Kam, 2001), we used gender, age, and education as auxiliary variables in order to help control for the missingness mechanism (i.e., helping ensure the data are missing at random rather than missing not at random). Gender, in particular, has been shown to be a predictor of missingness in self-report surveys (Acock, 2005).

Prior to analysis of the latent models, the database was split into three even subsamples: an oblique model development sample, a hierarchical development model, and a validation sample. This approach would allow for (A) development of two different models and (B) cross validation of the best developed model (via the validation sample) to help minimize the influence of sample-specific fluctuations upon the final model (Floyd & Widaman, 1995; Schumacker & Lomax, 2004). Based on a synthesis of past models (e.g., Feist, 2004; Gardner, 1993, 1999; Holland, 1997; Kaufman & Baer, 2004), seven factors were selected to be tested: Artistic-verbal, artistic-visual, entrepreneur, interpersonal, math/science, performance, and problem-solving. Several models (e.g., Feist, 2004) emphasize science more than this current model does; the choice to condense math/science into one variable was made due to the nature of the study (i.e., measuring implicit layperson opinions).

Many psychological models postulate a series of related factors, and creativity is no different (e.g., Amabile, 1996; Kaufman & Baer, 2005; Sternberg & Lubart, 1995). A model with a set of correlated factors is called an oblique model (Tabachnick & Fidell, 2007). In the past 20 years, psychometric theorists have argued that many models in psychology are actually best conceived of as hierarchical, with a single second-order (hierarchical) factor subsuming all of the first order factors (Tanaka & Huba, 1984a, 1984b). In our own research, we have seen validation of the hierarchical model in depression (Cole, Motivala et al., 2004;

Cole, Rabin, Smith, & Kaufman, 2004), education placement (Cole, Oliver, McLeod, & Ouchi, 2003), and indications of disability (Cole, Khanna et al., 2006; Cole et al., 2005). However, we have also seen oblique models outperform hierarchical models on measures of sleep quality (Cole, Motivala et al., 2006) and migraine specific quality of life (Cole, Lin, & Rupnow, 2007). In summary, there is little clear reason to suspect that a general hierarchical construct is always the best latent model for a given measure. Therefore, we have opted to examine both models.

Psychometric and conceptual differences between oblique and hierarchical models are important (Cole, Rabin et al., 2004), though typically slight (Widaman, 1985). In an oblique model, all latent factors (e.g., Interpersonal, Artistic/Visual, Math/Science) are allowed to correlate with one another (to any degree best represented by the data, including no correlation at all). A hierarchical model posits that the relationships beyond the latent factors are, themselves, influenced by a single latent factor (i.e., creativity). Psychometrically, the key difference between these two models is that the oblique model mandates that each factor shall be scored and interpreted in order to understand an overall impression of a person whereas hierarchical factors of the first-order factors allow for a single score convey appropriate information about the person (Messick, 1995), though evaluation of the first-order factors is still appropriate (Kaufman, 1994). Conceptually, oblique models assume that nothing else directly influences the latent factors even though they have correlations. In the hierarchical model, we presume that one's creativity directly influences their latent aspects of the first-order creativity domains (e.g., Interpersonal, Artistic/Visual, Math/Science).

Latent modeling. CFA was conducted using the AMOS statistical software package (Arbuckle, 2006). Maximum likelihood (ML) extraction was used to estimate the CFA model. An assumption of ML extraction is that the data are multivariate normal. In the likely event (Byrne, 2001) that Mardia's coefficient (1970) is significant, indicating marked multivariate kurtosis, we decided to implement Bollen-Stine (1992) bootstrapping based on the recommendations of Nevitt and Hancock (2004)

Each of the two development models was refined until it had sufficient fit. Model fit was examined with several fit indices, including root mean square error of approximation (RMSEA; Browne & Cudeck, 1989; Steiger & Lind, 1980, — study criteria of .. 06 or lower with upper bound no higher than .. 08), standardized root mean residual (SRMSR; Bentler, 1995, — study criterion of .. 08 or lower), and the Bayesian information criterion (BIC; Raftery, 1993, — fit is relative). The final oblique and hierarchical models were compared to each other on the validation sample. Model comparison was conducted examining RMSEA (study criterion of nonoverlapping confidence intervals) and BIC (study criterion of 10 points or more favoring lower BIC).

Model Refinement. Often a model's fit indices may come close to reaching these thresholds, but not close enough to be considered satisfactory. In such a case, minor adjustments to the relationships in the model can be made and the model can then be retested. The determination of which adjustments to make can be guided by using modification indices, which provide an estimate of the improvement in model fit that will occur by adding a given relationship, including direct paths and correlations (Schumacker & Lomax, 1996). A standard approach of using a modification index of at least 10.0 was used; paths with a modification index lower than 10 were considered to be too weak to provide substantive benefit. It was determined that modification of the model after an initial analysis would only be conducted if the modification met statistical criteria *and* fit with the theoretical understanding of creativity (Schumacker & Lomax, 2004). When modifications were added to a model, the model would be rerun and interpreted with the new fit indices (Arbuckle & Wothke, 1999).

RESULTS

As we had suspected, many of the participants had some missing data. Indeed, only 858 participants (24.1%) of sample completed all of the items in the survey. Still, no one item had marked missingness: percent of missingness per item ranged from 37.8% (only item with more than 30% missingness) to 1.3%. Bayesian imputation was used to impute missing values and the latent analyses were calculated from the imputed database.

A total of 1,184 participants were randomly assigned to the oblique development dataset, 1,185 participants were randomly assigned to the hierarchical development dataset, and 1,184 participants were randomly assigned to the validation dataset. Figure 1 shows the initial oblique model. Each of the development models underwent several rounds of revision, including reassignment of items to new factors and adding in covaried residuals. This residual value is any variance for an item not accounted for by its latent factor. The residual is influenced by multiple other sources of variance, such as method variance, shared content beyond the primary factor, and measurement error (Palmer, Graham,

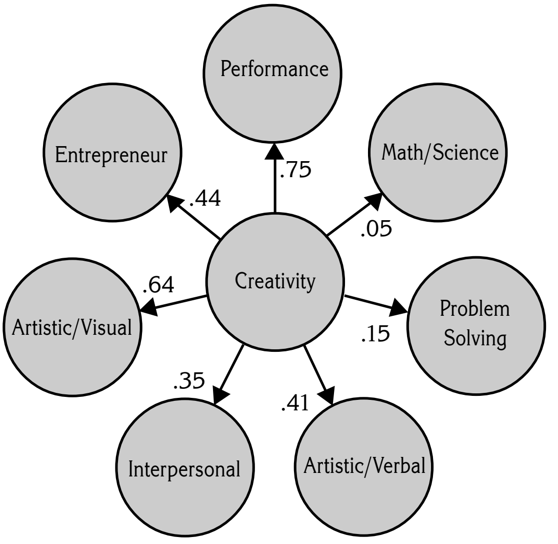

FIGURE 1. Final hierarchical Model with the Validation Sample.

Taylor, & Tatterson, 2002). Hence, a correlation between two residuals occurs when aspects of these residual terms are strongly related, although correlations between residuals are not generally assumed to arise from correlated measurement error as this should be random (Anastasi & Urbina, 1998).

The original and final oblique models met all three fit criteria (see Table 1 for fit statistics). Unfortunately, clarifications to the model did not really improve the overall model fit (as noted by the lack of real difference between the initial and final oblique model fit statistics). The initial hierarchical model did not perform well (meeting no fit criteria), but was markedly improved after model refinement (meeting all model fit criteria).

TABLE 1. Fit Statistics for all Structural Models.

Model	RMSEA	RMSEA 90% CI	SRMR	BIC
Development Models				
Initial oblique (χ^2 = 6405.79; *df* = 1463)	.053*	.052 - .055*	.066*	7346.99
Final oblique (χ^2 = 6460.16; *df* = 1451)	.054*	.053 - .055*	.070*	7486.39
Initial hierarchical (χ^2 = 24144.15; *df* = 1477)	.066	.065 - .066	.084	25117.04
Final hierarchical (χ^2 = 4880.79; *df* = 1460)	.045*	.043 - .046*	.062*	5843.21
Validation Sample				
oblique (χ^2 = 7389.44; *df* = 1451)	.059*	.057 - .060*	.078*	8415.55
Hierarchical (χ^2 = 6877.03; *df* = 1460)	.056*	.055 - .057*	.076*	7839.46

* = Met study criterion
Note: Define names.

Examination of the oblique and hierarchical models on the validation sample was conducted next. Figure 3 shows the standardized path coefficients for the oblique model with the validation sample (based on the final oblique model after model refinement) and Figure 4 shows the standardized path coefficient for the hierarchical model with the validation sample. As expected, the fit statistics went up a bit, but not markedly. Indeed, each model still met all three model fit criteria (see Table 1). Comparison between the oblique and hierarchical models favored the hierarchical models with both fit statistics: RMSEA was significantly lower and BIC was not just 10 points or more lower, but was lower by more than 576 points. Standardized and unstandardized path coefficients for the final hierarchical model with the validation sample are shown in Table 2.

TABLE 2. Standardized and Unstandardized Coefficients for Final Hierarchical Model with the Validation.

From	To	Standardized	Unstandardized	From	To	Standardized	Unstandardized
Creativity	Entrepreneur	.439	.958	Artistic/Visual	Wood-Metalworking	.257	.606
Creativity	Artistic/Visual	.639	1.500	Artistic/Visual	Spatial/Visual	.172	.404
Creativity	Math/Science	.053	.154	Artistic/Visual	Textiles	.382	.945
Creativity	Problem Solving	.150	.298	Artistic/Visual	Wood-Metalworking	.257	.606
Creativity	Artistic/Verbal	.406	1.000	Problem Solving Broad	Computers	.361	1.000
Creativity	Interpersonal	.352	.547	Problem Solving Broad	Law	.376	.976
Creativity	Performance	.749	2.745	Problem Solving Broad	Logic	.504	1.534
Entrepreneur	Accounting	.377	1.000	Problem Solving Broad	Mechanical	.737	1.614
Entrepreneur	Advertising	.534	1.326	Problem Solving Broad	Problem-Solving	1.000	.950
Entrepreneur	Business	.480	1.165	Problem Solving Broad	Sports Strategy	1.161	.127
Entrepreneur	Personnel	.281	.673	Interpersonal	Cooking	1.008	1.000
Performance	Acting	.625	1.000	Interpersonal	Emotions	.593	1.896
Performance	Ballet	.424	.723	Interpersonal	Humor	1.297	.941
Performance	Fashion	.342	.582	Interpersonal	Interact-Kids	.956	2.025
Performance	Film	.516	.811	Interpersonal	Interact-Family	.718	2.121
Performance	Playing Music	.165	.280	Interpersonal	Interact-Strangers	1.053	1.998
Performance	Sports Performance	.050	.091	Interpersonal	Psychotherapy	.878	1.477
Performance	Vocal Performance	.434	.737	Interpersonal	Personal Problems	1.000	2.286
Performance	Music Composition	.570	.062	Interpersonal	Spirituality	1.405	1.648
Math/Science	Algebra	.478	1.000	Interpersonal	Social Science	1.633	1.633
Math/Science	Chemistry	.643	1.161	Interpersonal	Teaching	.845	1.656
Math/Science	Earth Science	.544	1.008	Interpersonal	Travel	.496	1.430
Math/Science	Geometry	.389	.593	Interpersonal	Working-Animals	1.181	.472
Math/Science	Life Science	.652	1.297	Interpersonal	Problem Solving	1.120	1.120
Math/Science	Medicine	.504	.956	Interpersonal	Speech	1.389	.460
Math/Science	Naturalism	.426	.718	Interpersonal	Personnel	1.341	1.341
Math/Science	Political Science	.496	.878	Interpersonal	Spatial/Visual	1.573	1.573
Artistic/Visual	Architecture	.429	1.000	Artistic/Verbal	English	1.465	1.000
Artistic/Visual	Crafts	.548	1.405	Artistic/Verbal	Speech	.948	.460
Artistic/Visual	Graphic Design	.374	.845	Artistic/Verbal	Writing Fiction	.404	2.129
Artistic/Visual	Horticulture	.202	.496	Artistic/Verbal	Writing Nonfiction	.945	1.903
Artistic/Visual	Interior Design	.476	1.181	Artistic/Verbal	Writing Poetry	.606	1.592
Artistic/Visual	Painting	.589	1.465				
Artistic/Visual	Photography	.413	.948				
Artistic/Visual	Spatial/Visual	.172	.404				
Artistic/Visual	Textiles	.382	.945				

DISCUSSION

Results from the analyses revealed the seven domains of creativity are best interpreted as being a reflection of a hierarchical second-order factor of creativity. Creativity domains that were most reflective of the hierarchical creativity construct were Performance (standardized loading of .75) and Artistic/Visual (standardized loading of .64), whereas Math/Science was the least related to Creativity (standardized loading of .05). This composition suggests that, whereas an overall construct of creativity better explains the data than just correlated domains of creativity, some of the first-order domains are not very reflective of overall creativity. Specifically, the more cerebral and less affective creative domains of Math/Science and Problem Solving were not very reflective of the hierarchical creativity factor.

For each of the first-order creativity domains, certain items were most reflective of the domains. The key items for each domain are noted next, along with their standardized loadings. For the Entrepreneur domain, the items of advertising (.53) and business (.48) were most reflective. Acting (.63) and film (.52) were the most reflective items on the Performance domain. Life science (.65) and chemistry (.64) were the most reflective items in the Math/Science domain. For the Artistic/Visual domain, painting (.59) and crafts (.55) items were the most reflective. The Problem Solving domain had the most reflective items with mechanical (.57) and logic (.50) items. Personal problem (.64) and interacting with one's family (.59) were the items most reflective of the Interpersonal domain. Finally, the Artistic/Verbal domain had the most reflective items with writing fiction (.87) and writing nonfiction (.79).

There has been much debate about the structure of creativity (see, e.g., Feist, 2004; Gardner, 1999; Kaufman & Baer, 2004; Oral, Kaufman, & Agars, 2007; Ruscio, Whitney, & Amabile, 1998) and the degree to which creativity is properly conceived as domain-general or domain-specific (see, e.g., Baer, 1993, 1998; Kaufman & Baer, 2005a; Plucker, 1988; Sternberg, Grigorenko, & Singer, 2004). This study was an attempt to discover the structure of creativity using the self-reported levels of creativity of a large number of subjects across a wide range of domains and activities.

The results and analyses reported here lend support to a model with seven General Thematic Area factors: Artistic-Verbal, Artistic-Visual, Entrepreneur, Interpersonal, Math/Science, Performance, and Problem-Solving. It is interesting to note that the areas with the lowest relationship with general creativity were Math/Science and Problem-Solving. This finding is consistent with Kaufman and Baer (2004), who found that the Math/Science factor was not correlated with overall creativity. As they hypothesized, mathematics and science may not fall into people's conceptions of creativity. The average person may not consider such areas as math, science, or problem solving as representing ways of being creative. This idea is consistent with Paulos's (1988) idea of innumeracy, the inability to accurately use numbers and chance. "Romantic misconceptions about the nature of mathematics," Paulos wrote, "lead to an intellectual environment hospitable to and even encouraging of poor mathematical education and psychological distaste for the subject and lie at the base of much innumeracy" (1988, p. 120). Perhaps we should not be surprised to find that a society that does not value mathematical ability also does not associate creativity with mathematics.

The seven factors were best seen as a reflection of a hierarchical model of creativity. This finding lends support to the Amusement Park Theoretical Model, which argues there are some initial requirements common to all creative activity (e.g., motivation, intelligence, environment). It is consistent to find a basic general creativity factor, followed by the seven different large domains (or General Thematic Areas).

It is important to note and clarify that this model has been developed using self-reported creativity. Such research is consistent with past work that has emphasized layperson theories of creativity (e.g., Sternberg, 1985). However, one can *not* say that the results of this study are necessarily indicative of the same model derived from creative products created in each of these domains. Although several studies have found self-reported creativity to be associated with real-life measures of creativity (e.g., Furnham, 1999; Furnham, Batey, Anand, & Manfield, 2008; Furnham, Zhang, & Chamorro-Premuzic, 2006; Park, Lee & Hahn, 2002), other studies have found conflicting results (e.g., Lee, Day, Meara, 2002, & Maxwell; Priest, 2006).

This study was conducted using the self-report data of a large and diverse sample, with all subjects indicating how creative they believe themselves to be in a wide range of domains and activities. The analyses reported here support a hierarchical model for the overall structure of creativity as perceived by individuals and for the seven General Thematic Areas outlined above, but it is important to bear in mind that this is not necessarily the same as the actual underlying cognitive and personality structure (or structures) of creativity-relevant abilities or traits. We believe, however, that the General Thematic Areas suggested by this analysis and the hierarchical model that it supports can provide significant guidance for researchers who might wish to identify the cognitive structure of such underlying abilities and traits, and we suggest that this is a potentially rich area for future research.

Additionally, it is important to note that just two plausible models were compared to one another in the current study, and numerous alternative models exist (Hershberger, 2006). However, as we used a theoretically sound and psychometrically common technique for new model development is to examine a theoretical model with an initial logical comparator (Schumacker and Lomax, 2004), we believe the current technique is an appropriate beginning for understanding the latent construct of creativity using self-report data. In addition, we strengthened the generalizability of the model examinations by allowing for refinement and cross-validation on separate samples (Floyd & Widaman, 1995). Ultimately, we hope this research will engender voluminous model comparisons. We also note that the breadth of the current sample will potentially mask some subgroup differences in the model, either between subgroups or between a subgroup and this broad sample. Byrne (2001) has recommended that all new models should be examined and validated in a broad sample prior to any subgroup comparisons. Once a broad model has been established, and the research community has had time to react and critique, approach invariance tests are then ready for assessment (Cole, Khanna et al., 2006). We await the reaction of the research community on the current models in order to guide any intriguing model modifications that may be necessary during the examination of model invariance between demographically desperate subgroups (Vandenberg & Lance, 2000). In the short term, we believe that the current approach provides a rigorous technique recommended by many methodologists.

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