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Narcissism and Creativity

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Abstract

In this study, we investigated the relationship between narcissism, creative personality traits, ideational fluency, and accomplishments in various creative activities. We measured narcissism with the Narcissistic Personality Inventory (Emmons, 1987), creative personality with the Creative Person Profile (Martinsen, 2011), and creative potential with a figural measure of divergent thinking and a biographical inventory to measure accomplishments in creative activities. The sample consisted of 1375 young adults, mainly men. The results showed that narcissism was associated with fluency, seven creative personality dispositions, and five measures of creative activities. The latter associations were in general significant even when controlling for traits and creative potential. The strongest relationship displayed with narcissism was with the creative personality traits, in particular ambition, agreeableness, and motivation. Implications and limitations are noted.

Keywords: *narcissism, creative personality, fluency, creative activities*

Narcissism and Creativity

Narcissism has been associated with creativity for decades (Kris, 1952; Rank, 1936) and it has been seen as a motivational force underlying creativity and self-expression. Despite this, creativity can be seen as a desirable characteristic while narcissism can be seen as undesirable. For example, organizations wishing to employ creative people would also wish to avoid hiring people with a strong narcissistic orientation because of their self-centeredness and potential collaboration problems. Clearly, it seems important to further investigate the association between narcissism and several aspects of creativity to better understand the nature and strength of this relationship.

When considering narcissism, there is a central distinction between clinical and subclinical narcissism (Furnham, Crump, & Ritchie, 2013a), where the former is categorical and serves a diagnostic purpose. The second is based on a trait-like definition and people with sub-clinical narcissism tend to be dominant (Emmons, 1984), overconfident (Campbell, Eisner, & Riggs, 2010), and to have a high need for control, status, power, and achievement (Paunonen, Lönnquist, Verkasalo, Leikas, & Nissinen, 2006). Subclinical narcissism has also been associated with desirable characteristics like self-esteem (Campbell et al., 2010; Sedikides, Rudich, Gregg, Kumashiro, & Rusbult, 2004) and leadership (Brunell, Gentry, Hoffman, Kuhnert & DeMarree, 2008). Indeed, studies suggest that narcissism is often related to success at work and speed of promotion (Furnham et al., 2013a).

Creativity, the other construct involved, is associated with novelty and some widely understood value and can be studied based on several perspectives, like personal characteristics, creative/cognitive processes, creative products, and the social conditions for creativity (Rhodes, 1961). Consequently, there is no agreed upon criterion in this field (Martinsen, Kaufmann, & Furnham, 2011), and when investigating the relationship between narcissism and creativity, it is necessary to initially identify which aspects of creativity to study. As a point of departure for this, Rank (1936), Kris (1952), and later Kohut (1966) have

mainly described narcissism as promoting artistic playfulness. The implication is that narcissism could be related to relevant personality characteristics and in particular to those that motivate creative self-expression. Finally, because narcissism is associated with a need for self-expression, it could relate to participation in creative activities.

Regarding personality, Raskin (1980) suggested that self-absorption, self-orientation, a rich inner life, primary thinking, impulsivity, autonomy, self-assertion, strong needs for mastery, dominance, exploitativeness, lack of empathy, aggressiveness, and need for recognition (p. 57) could to be relevant trait descriptors for narcissism. Supporting the sub-clinical perspective on narcissism, Solomon (1985) found that creative personality traits are connected to subclinical narcissism but not to pathological narcissism. In another study emphasizing normal personality traits, Furnham, Hughes, and Marshall (2013b) found that narcissism was related to the big-five trait of openness and negatively to neuroticism, conscientiousness, and agreeableness.

Quite clearly, when considering narcissism and creative personality traits, there is an expectation of several relationships. However, it has been noted that tests of normal personality typically do not include creativity-specific personality constructs (Lubart, 1994), and we based our study on a measure of the creative personality (Martinsen, 2011). This measure includes 27 facets inspired by previous creativity research and includes 7 factors. Table 1 shows the factor and facet labels in the inventory.

Table 1 about here

Based on research in this field (Campbell, Goodie, & Foster, 2004; Emmons, 1984; Paunonen et al., 2006; Raskin, 1980), we expected relationships between narcissism and several facets and factors in Table 1, in particular dominance, exhibitionism, need for recognition, fantasy, conscience-governed concern for others, autonomy, and need for

achievement. Owing to the relationship between these facets and their factors, we mainly expected that the factors of ambition, agreeableness, associative orientation, and motivation are correlated with narcissism.

As regards the relationship between narcissism and creative potential previous findings have been divergent. Raskin (1980) found a significant correlation between narcissism and a figural test of creative thinking. Solomon (1985) and Goncalo et al. (2010) found no significant correlations between narcissism and measures of creativity. On the other hand, Wallace and Baumeister (2002) found that narcissism was significantly related to idea generation when there was an opportunity for self-enhancement in the situation, which supports the motivational nature of narcissism. Based on this, if there is any relationship between creative potential—operationalized as, for example, fluency on idea generation tasks—and narcissism, and the situation does not invite self-enhancement, it would be uncertain, or at best, quite weak.

Regarding the relationship between narcissism and creative accomplishments, we base our expectations on the idea that narcissism motivates participation in creative activities where self-expression is possible. Supporting this idea, Furnham et al. (2013b) found that narcissism was related to creative accomplishments. It can thus be expected that activities involving possibilities for self-enhancement through, for example, art exhibitions, concert performances, and writing and publication, could be related to narcissism. Because narcissism seems related to an overestimation of one's own creativity (Furnham et al., 2013b; Goncalo, Flynn, & Kim, 2010), it seems important to avoid subjective self-evaluations and to emphasize behaviour when measuring creative activities and accomplishments. This can be done with biographical inventories, and such measures have been deemed to be valid criteria for creativity (Hocevar, 1989).

To sum up, we expect narcissism to be strongly related to creative personality traits and related to accomplishments *across* creative activities. Because of divergent findings in the

past we were uncertain what to expect as regards the relationship between narcissism and creative potential.

Method

Sample

The participants were 1375 young adults applying for officer training in the Norwegian military. Of these, 1168 were males. Age was not registered in this dataset, but the mean applicant age was typically 19–21 years.

Instruments

Narcissistic Personality Inventory (NPI). We used Emmons's (1987) 37-item version of the NPI (Raskin & Hall, 1979). The 37-item NPI is a shortened form of a 40-item version (Emmons, 1984) and based on Raskin and Hall (1979; 1981). We used a forced-choice version where scores ranged from 0 to 37 points; higher scores indicated higher levels of narcissism. The Norwegian version was validated by Gimsø (2014). Although this version includes four factors (exploitativeness/entitlement, leadership/authority, superiority/arrogance, and self-absorption/self-admiration), we used only the sum score. This was based on the results of Wallace and Baumeister (2002), who found that total NPI scores are generally more predictive than any of the four factors. Additionally, the factor structure of the NPI does not seem to be stable across samples (see e.g. Ackerman, Witt, Donnellan, Trzesniewski, Robins, & Kashy, 2011; Barelds & Dijkstra, 2010; Corry, Merritt, Mrug, & Pamp, 2008).

Creative Person Profile (CPP). We used the CPP (Martinsen, 2011) to measure creative personality traits. The CPP includes 216 items, and responses for each item are given on a five-point Likert scale. The items are organised into 27 facets and seven factors. The facet names are provided in Table 1. Five of these factors seem related to the five-factor model of personality (e.g., Costa & McCrae, 1992), while the remaining two CPP factors (flexibility and originality) are less well represented by the five-factor model. The correlations

between instability and neuroticism (.81) and between the two measures of agreeableness (.76) are high, while the other correlations were lower (Martinsen, 2011).

In the present study, two new facets (problem finding and adaptability) with eight items each were added to the twenty-five previous facets in the CPP (Martinsen, 2011) so that the total number of facets in the present study was twenty-seven. The two new facets were posited to strengthen the factors agreeableness (new facet: problem finding/critical attitude) and flexibility (new facet: adaptivity/capacity to adjust socially), which only had loadings from two facets each in the original validation study (Martinsen, 2011). Reliabilities for the 27 facets ranged from .87 to .51, with an average of .72.

Divergent thinking tasks. We used two figural divergent thinking tasks based on the study of Wallach and Kogan (1965). Each stimulus figure represented an abstract, meaningless object. Participants were instructed to provide as many different ideas as possible for each stimulus picture and were given four minutes for each task. The sum of responses to the two items was used as a measure of fluency in further analyses. These scores were treated as an indicator of creative ability or potential (Runco, 1991). We used fluency scores only and no other indices of creative ability because such indices (e.g. originality, flexibility) have been shown to be confounded by fluency (Hocevar, 1989).

Creative activity checklist. We used scores from an adapted and expanded version of the Wallach and Wing (1969) creative activities checklist as the creativity criteria. On this measure, participants were asked to report participation and accomplishments in diverse creative activities, such as artistic work and poetry writing. Each item included four response alternatives, where each alternative represented a higher level of creative accomplishment. A sample item ('inventive') is descriptive of the test format:

a. I often think about inventing things.

b. I have invented things.

c. I have received recognition for my inventions.

d. I have patented my inventions.

When participants did not check any of the four alternatives, this was considered a 0-reponse. Responses for each of the 13 items then ranged from 0 to 4. Item contents are indicated in Table 2 below.

Procedure

Subjects participated in a selection session, where they went through a number of assessments, evaluations, exercises, and interviews as part of their application to be accepted into the officer-training program in the Norwegian military. The booklet with the study questionnaires was not part of the selection procedure: this was presented as a research project and participants were asked to volunteer. Participants were debriefed after the session but were not given any feedback on their test results. All participants participated anonymously.

Results

Summary statistics and correlations for the main variables are displayed in Table 2 and are partly based on the analyses reported below and in Tables 3 and 4. An inspection of the distributions of the included variables showed adequate correspondence with the normal distribution, with some exceptions for the creative activity factors, where skewness in general was around 1.00.

Table 2 about here

Before we could analyse the main issues in this study, it was necessary to conduct factor analysis on the CPP to check if the facets loaded as intended for the seven factors. To do this, we initially used Principal Component Analysis with Orthogonal Procrustes Rotation, which is one type of confirmatory analysis that can be applied on complex personality data (Aluja, García, García, & Seisdedos, 2005). In these analyses Tukey's coefficient of

congruence was used to evaluate model fit, with the suggested lower limits for acceptable factor replicability being between .85 and .90 (Mulaik, 1972; Rolland, 2002).

In this analysis we included the 25 original CPP constructs (not the two new ones added for the present study) and used the pattern of factor loadings based on data from Martinsen (2011) as target for Procrustes rotation. We replaced missing values in the present data with the mean. Tukey's coefficient of congruence was .94, which means that the 7-factor structure identified in Martinsen (2011) was well replicated in the present study.

We then included the two new CPP constructs and investigated the 7-factor solution including the full CPP. Here, we specified a 7-factor CFA model in EQS (Bentler & Wu, 2017) and included known cross-loadings from Martinsen (2011). Then, we used modification indices and specified additional cross-loadings above .20. Mardia's normalized estimate was 60.89, indicating deviation from multivariate normal distribution, and we used the HKML estimator in EQS to take this into account. In these analyses, our final model fitted satisfactorily (cf. Byrne, 2006) to the data [$\chi 2(294, N = 1375) = 1682.335$ $p < .000$; RMSEA = .061 (CI = .058 –.064); SRMR = .055; CFI = .943]. It may have been possible to increase model fit further by adding additional cross-loadings below .20, but we avoided doing so.

As shown in Table 3, the pattern of standardized loadings closely corresponds to the expected 7-factor pattern.

Table 3 about here

After this, it was necessary to further analyse the measure of creative activities because there was no clear theory underlying the structure of this and we needed to reduce the number of variables in our subsequent analyses. We therefore split the total sample in two and conducted EFA on the first half of the sample and CFA on the second half to cross-validate the EFA results.

We used principal component analyses with promax rotation for the first half of our sample. We investigated different factor solutions, but finally extracted four factors. We then specified the same model for the CFA, but also specified a second-order factor for the four correlated primary factors. To identify the second-order part of the model, we fixed two disturbances as equal. Mardia's normalized estimate was 54.00, and we again used the HKML estimator in EQS.

Model fit was acceptable [$\chi 2(62, N = 1375) = 128.945$, $p < .000$; RMSEA = .039 (CI = .030 –.049); SRMR = .054; CFI = .963]. As shown in Table 4, the pattern of standardized loadings is easy to interpret. We used factor scores for the activity measure in our further analyses based on principal component analysis with promax rotation.

Because we found support for a general factor, we also created a total score, which was reliable (cf. Table 2). The reliability for each of the four factors was in the lower range, but this was due to the modest number of items included.

Table 4 about here

Subsequent to this, we investigated if there were any strong influence of common method bias in the data. To do this, we included the CPP facets, factor scores for the four creative activity factors, narcissism, and fluency in a principal component analyses to analyse the size of the first unrotated component and the number of components to extract. The explained variance for the first unrotated component was 19.2%, and it was recommended to extract 7 or 8 factors (depending on criteria). Harman's criterion for unacceptable common method variance has been suggested to be 50% of the variance for the first unrotated component and the present amount of explained variance was far below that.

Next, we proceeded with our analyses of the seven CPP factors, the five creative activity variables (including the total score), fluency, and narcissism. Table 2 shows that

narcissism correlated significantly with fluency (.059) and all of the creative activity variables. Using a more conservative approach, we controlled for creative personality and creative potential in hierarchical regression analyses and did separate analyses for each of the creative activity variables.

Table 5 about here

Results in Table 5 showed that narcissism explained unique variance in all of the creative activity factors except music, beyond fluency and the seven CPP factors.

Finally, to analyse the relationship between the creative personality factors and narcissism—one of our three aims as described in the introduction—we used multiple regression with narcissism as the criterion variable and the seven CPP factors entered simultaneously as 'predictors'. We followed this procedure to identify the total association between creative personality traits and narcissism. The results showed that all seven CPP factors were significantly related to narcissism (R square = .35, F(7, 1277) = 97.92**). The strongest association was with ambition (.45), the second strongest with agreeableness (−.23), and there were coefficients around .10–.20 for motivation, associative orientation, and instability (negative correlation), as well as lower, negative, but still significant, coefficients for the two remaining factors.

Discussion

The novel aspects of this study are the inclusion of a broad perspective on creative personality and the simultaneous focus on creative personality, creative potential, and creative accomplishments when studying the relationship of creativity to narcissism. Our results supported the seven-factor structure of the CPP and the four-factor solution for the creative activities. The latter also had a general factor, which is in line with findings such as those of Kaufmann, Cole, and Baer (2009). Beyond this, the essence of the results is shown in Table 2,

where narcissism correlates significantly (but weakly) with fluency, and with all the creative activity factors.

In simultaneous analyses, all seven creative personality factors had significant associations with narcissism. Narcissists described themselves as ambitious, disagreeable, emotionally stable, associative, motivated, less flexible, and with a low need for originality (conform). The strong association with the factor ambition, and its facets, is corresponding to theory and findings by Emmons (1984), Raskin (1980), and Paunonen et al (2006). The negative association with the factors agreeableness and emotional instability, and positive relationship with associative orientation is in line with findings by Furnham, Hughes, and Marshall (2013b). The positive relationship to the factor motivation is partially supported by Raskin (1980). As regards the association between narcissism, low need for originality (conformity) and low flexibility (rigid) these will need to be elaborated in future research.

Narcissism clearly has a strong connection to some creative personality traits. Scores for such traits are often important decision criteria in selection settings, so we cannot exclude the possibility that organizations seeking to employ creative people may also unknowingly employ those with narcissistic tendencies. Moreover, we also cannot exclude the possibility that many creative activities attract people with narcissistic tendencies because of the opportunities for self-enhancement involved in such activities. Although the associations were not strong, results indicate that narcissists may actually perform quite well in such situations, probably because of their need for self-expression and admiration. Narcissism is not, however, beneficial for the work environment, and recruiters need to have such issues in mind when selecting creative staff.

Limitations

We have two concerns about our study. First, because our participants were applying for officer training in the military, we suspect that they see themselves as having leadership

potential, and leadership potential has been associated with narcissism (Emmons, 1987). As a result, narcissism may have been overrepresented among participants. To investigate this, we did a follow up comparison and compared the scores on ambition from the present sample and the original validation sample (Martinsen, 2011). We compared the ambition scores because this factor was closely associated with narcissism in the present study. We did not find any significant differences in this respect (the means were 3.37 in the original sample and 3.34 in the present sample), which suggests that the samples were quite similar on this important narcissism-related trait. However, the sample was male dominated and representing a certain age group, and we do not know if this may have influenced our results.

Second, because our study was based on self-reported data, our results may have been biased. For example, we do not know whether narcissists responded accurately to the dependent biographical activity items. Because our present dependent measure included quite specific behavioural and accomplishment questions and did not ask about the perceived creativity associated with these activities, we assume that we have avoided the self-enhancement tendencies identified by Goncalo et al. (2010). It should also be underlined that activity checklists have been considered valid criteria for creativity (Carson, Peterson, & Higgins, 2005; Hocevar, 1989). Findings in Runco, Noble, and Luptak (1990) supported cross-observer validity for such measures, which adds to their validity.

References

Ackerman, R. A., Witt, E. A., Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., & Kashy, D. A. (2011). What does the narcissistic personality inventory really measure? *Assessment, 18,* 67–87.

Aluja, A., García, O., García, L. F., & Seisdedos, N. (2005). Invariance of the "NEO- PI-R" factor structure across exploratory and confirmatory factor analyses. *Personality and Individual Differences, 38*, 1879–1889.

Barelds, D. P. & Dijkstra, P. (2010). Narcissistic Personality Inventory: Structure of the adapted Dutch version. *Scandinavian Journal of Psychology, 51,* 132–138.

Bentler, P. M. & Wu, E. J.C. (2017). *EQS 6.3.* Encino, CA: Multivariate Software Inc

Brunell, A. B., Gentry, W. K., Hoffman, B. J., Kuhnert, K. W., DeMarree, K. G. (2008). Leader emergence: The case of the narcissistic leader. *Personality and Social Psychology Bulletin, 34*, 1663–1676.

Byrne, B.M. (2006). *Structural equation modelling with EQS. Basic concepts, applications, and programming*. Mahwah, NJ: LEA

Campbell, K. W., Goodie, A. S., & Foster, J. D. (2004). Narcissism, confidence, and risk attitude. *Journal of Behavioral Decision Making, 17,* 297–311.

Campbell, R. L., Eisner, S., & Riggs, N. (2010). Sources of self-esteem: From theory to measurement and back again. *New Ideas in Psychology, 28*(3), 338–349.

Carson, S. H., Peterson, J. B., & Higgins, D. M. (2005). Reliability, validity, and factor structure of the creative achievement questionnaire. *Creativity Research Journal, 17*, 37–50.

Corry, N., Merritt, R. D., Mrug, S., & Pamp, B. (2008). The factor structure of the Narcissistic Personality Inventory. *Journal of Personality Assessment, 90,* 593–600.

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO personality inventory: Professional manual*. Odessa, Fl.: Psychological Assessment Resources.

Emmons, R. A. (1984). Factor analysis and construct validity of the Narcissistic Personality Inventory. *Journal of Personality Assessment, 48,* 291–300.

Emmons, R. A. (1987). Narcissism: Theory and measurement. *Journal of Personality and Social Psychology, 52*, 11–17.

Furnham, A., Crump J., & Ritchie (2013a). What it takes: Ability, demographic, bright and dark side trait correlates of years to promotion. *Personality and Individual Differences, 55,* 952–956.

Furnham, A., Hughes, D. & Marshall, E. (2013b). Creativity, obsessive compulsive disorder, narcissism and the big five personality traits. *Thinking Skills and Creativity, 10, 91–* 98.

Gimsø, C. E. (2014). Narcissus and leadership potential: The measurement and implications of narcissism in leadership selection processes (Doctoral dissertation). Oslo, Norway: Norwegian Business School. Retrieved from http://hdl.handle.net/11250/196463

Goncalo, J. A., Flynn, F. J., & Kim, S. H. (2010). Are two narcissists better than one? The link between narcissism, perceived creativity, and creative performance. *Personality and Social Psychology Bulletin, 36*, 1484–1495

Hocevar, D. (1989). A taxonomy and critique of measurements used in the study of creativity. In J. A. Glover, R. R. Ronning, & C. R. Reynolds (Eds.), *Handbook of creativity. Perspectives on individual differences* (pp. 53–75). New York: Plenum.

Kaufmann, J. C., Cole, J. C., & Baer, J. (2009). The construct of creativity: Structural model for self-reported creativity ratings. *The Journal of Creative Behavior, 43*, 119–134.

Kohut, H. (1966). Forms and transformations of narcissism. *Journal of American Psychoanalytical Association, 14*, 243–272.

Kris, E. (1952). *Psychoanalytic explorations in art*. Madison, Conn.: International Universities Press.

Lubart, T. I. (1994). Creativity. In R. J. Sternberg (Ed). *Thinking and problem solving. Handbook of perception and cognition* (2nd ed.) (pp. 289–332). San Diego, CA, US: Academic Press.

Martinsen, Ø. L. (2011). The creative personality: A synthesis and development of the Creative Person Profile. *Creativity Research Journal, 23*, 185–202.

Martinsen Ø. L., Kaufmann G., & Furnham A. (2011) Cognitive style and creativity. In M.A. Runco & S. R. Pritzker (Eds.), *Encyclopedia of creativity* (2nd ed., vol. 1) (pp. 214–221). San Diego: Academic Press.

Mulaik, S. A. (1972). *The foundations of factor analysis*. New York: McGraw Hill.

Paunonen, S. V., Lönnquist, J., Verkasalo, M., Leikas, S., & Nissinen, V. (2006). Narcissism and the emergent leadership in military cadets. *The Leadership Quarterly, 17,* 475–486.

Rank, O. (1936). *Truth and reality: A life history of the human will.* (J. Taft, Trans.). New York: Knopf.

Raskin, R. N. (1980). Narcissism and creativity: Are they related? *Psychological Reports. 46, 55*–60.

Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports. 45,* 590.

Raskin, R N., & Hall, C. S. (1981). The Narcissistic Personality Inventory: Alternate form reliability and further evidence of construct validity. *Journal of Personality Assessment, 45,* 159–162.

Rhodes, M. (1961). An analysis of creativity. *Phi Delta Kappan, 42*, 305–310.

Rolland, J. P. (2002). The cross-cultural generalizability of the five-factor model of personality. In R. R. McCrae & J. Allik (Eds.), *The five-factor model of personality across cultures* (pp. 7–28). New York: Kluwer academic

Runco, M. A. (1991). The evaluative, valuative, and divergent thinking of children. *Journal of Creative Behavior, 25,* 311–319.

Runco, M. A., Noble, E. P., & Luptak, Y. (1990). Agreement between mothers and sons on ratings of creative activity. *Educational and Psychological Measurement, 50*, 673–680.

Sedikides, C., Rudich, E. A., Gregg, A. P., Kumashiro, M., & Rusbult, C. (2004). Are normal narcissists psychologically healthy? Self-esteem matters. *Journal of Personality and Social Psychology, 87,* 400–416.

Solomon, R. (1985). Creativity and normal narcissism. *Journal of Creative Behavior, 19*, 47–55.

Wallace, H. M., & Baumeister, R. F. (2002). The performance of narcissists rises and falls with perceived opportunity for glory. *Journal of Personality and Social Psychology, 82,* 819–834.

Wallach, M. A., & Kogan, N. (1965). *Modes of thinking in young children*. New York: Holt, Rinehart & Winston.

Wallach, M. A., & Wing, C. W. Jr. (1969). *The talented student: A validation of the creativity-intelligence distinction*. New York: Holt, Rinehart & Winston.

Table 1

Labels of 7 factors and 27 facets included in the Creative Person Profile.

Instability	**Ambition**	**Associative orientation**	**Agreeableness**	**Motivation**	**Need for originality**	**Flexibility**
Impersonal orientation	Need for recognition	Boundaries	Friendliness	Autonomy	Low rule orientation	Restructuring tendency
Low self-confidence	Exhibitionism	Fantasy	Conscience governed concern for others	Need for achievement	Opposition against conventions	Tolerance for ambiguity
Neuroticism	Dominance	Playfulness	Low problem finding	Novelty seeking	Low rigidity	Adaptiveness
Mood swings	Extraversion	Absorption		Goal orientation		
		Preference for complexity		Persistence		

Table 3

Standardized loadings and cross loadings above .20 based on CFA for the 27 facets in the revised CPP. Loadings in boldface indicate theoretically based primary factor loadings.

	Motivation	Associative orientation	Emotional instability	Ambition	Agreeableness	Need for originality	Flexibility	R-square
Impersonal orientation	−.389		**.573**					.736
Low self-confidence	−.335		**.502**	−.323				.690
Neuroticism			**.796**					.634
Mood swings			**.729**					.532
Need for recognition				**.532**				.283
Exhibitionism				**.848**				.719
Dominance	.480			**.394**				.435
Extraversion				**.606**	.325			.472
Boundaries		**.627**	.459					.604
Fantasy		**.755**						.570
Playfulness		**.707**						.499
Absorption		**.640**	.399					.569
Preference for complexity		**.469**						.220
Friendliness					**.897**			.804
Conscience governed concern for others					**.558**			.312
Low problem finding					**−.645**			.416
Autonomy	**.537**			.297		.277		.403
Need for achievement	**.823**							.677
Novelty seeking	**.543**	.294						.453
Goal orientation	**.562**		−.255					.546
Persistence	**.716**							.513
Low rule orientation						**.679**		.461
Low rigidity		−.338				**.445**	.383	.282
Opposition against conventions			.340			**.739**		.661
Restructuring tendency							**.604**	.365
Tolerance for ambiguity	−.332		−.418				**.567**	.395
Adaptiveness				.366			**.342**	.251

Table 4

Standardized factor loadings from CFA for 13 creative activities items. Second order standardized factor correlations for the four primary factors in this analysis ranged from .647 to .724.

	Technical	**Visual**	**Writing**	**Musical**	**R-square**
Crafts		.492			.242
Painting		.683			.466
Drawing		.741			.549
Poetry			.532		.283
Short stories			.779		.607
Write articles			.691		.477
Play instrument				.622	.387
Singing folk songs				.34	.116
Singing in a choir				.483	.234
Inventing	.623				.388
Technical construction	.617				.381
Data programming	.558				.311
Scientific work	.567				.322

Table 2

Means, standard deviations, alpha reliabilities (in parentheses), and correlations between the seven factors in the CPP (mean scores), narcissism, fluency, four creative activities factors, and total creative activities scores (sum scores).

	Mean	Std dev	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Instability	2.20	.41	(.91)													
2. Ambition	3.34	.37	−.247**	(.87)												
3. Associative orient.	2.84	.41	.156**	.289**	(.89)											
4. Agreeableness	3.69	.37	−.351**	.088**	.001	(.84)										
5. Motivation	3.56	.36	−.616**	.329**	.147**	.339**	(.91)									
6. Originality	2.68	.35	.196**	−.136**	.019	−.259**	−.282**	(.79)								
7. Flexibility	3.28	.31	−.117**	.118**	.281**	.122**	.117**	−.025	(.69)							
8. Narcissism	19.51	5.73	−.231**	.532**	.202**	−.092**	.286**	−.119**	.027	(.81)						
9. Fluency	17.75	7.07	−.068*	.126**	.211**	.021	.116**	.023	.117**	.059*	(.83)					
10. Visual arts	1.59	2.24	.039	.032	.227**	−.019	.060*	−.017	.011	.084**	.066*	(.58)				
11. Writing	2.03	2.42	−.059*	.124**	.315**	.010	.171**	.004	.063*	.182**	.158**	.392**	(.64)			
12. Music	2.87	2.63	.008	.095**	.167**	.047	.099**	−.066*	.014	.061*	.070*	.285**	.366**	(.46)		
13. Technical	2.65	2.56	−.073**	.007	.164**	−.139**	.182**	−.016	.070*	.167**	.047	.216**	.322**	.197**	(.69)	
14. Total creativity	9.13	6.82	−.055*	.094**	.313**	−.043	.211**	−.040	.070*	.183**	.138**	.652**	.747**	.678**	.630**	(.75)

*p<.05. **p<.01

Table 5.

Betas, explained variance (Rsq) and changes in explained variance (Rsq ch) based on three-step hierarchical regression analyses with each of the five dependent creative activity scores as dependent variables. In step 1, we entered fluency, in step 2 we entered the seven CPP factors, and in step 3 we entered narcissism. Whenever the beta for narcissism was significant, it had a positive value.

	Visual arts			**Technical**			**Writing**			**Music**			**Total**	
Step 1. Fluency	.07*	.03	.03	.05	−.00	.00	.16***	.08***	.09***	.08***	.04	.04	.14***	.07*	.07***
Step 2. CPP Agreeableness		−.04	−.02		−.23***	−.20***		−.04	.01		.03	.03		−.13***	−.10***
Originality		−.04	−.03		−.02	−.00		.04	.05		−.04	−.04		−.03	−.01
Flexibility		−.06*	−.06		.03	.04		−.05	−.05		−.04	−.04		−.03	−.2
Instability		.03	.04		−.04	−.02		−.06	−.05		.07	.07		−.02	.001
Ambition		−.05	−.09*		−.12***	−.19***		−.01	−.07*		.04	.03		−.07*	−.13***
Associative orientation		.23***	.22***		.17***	.15***		.31***	.30***		.13***	.13***		.30***	.29***
Motivation		.06	.05		.24***	.23***		.12***	.11***		.11*	.10*		.21***	.20***
Step 3. Narcissism			.07*			.16***			.13***			.01			.13***
Rsq	.004*	.056***	.06***	.002	.11***	.13***	.03***	.13***	.15***	.006***	.04***	.043	.02***	.15***	.16***
Rsq change		.052***	.003*		.11***	.02***		.11***	.01***		.04***	.00		.13***	.01***
F	5.28	9.03	8.50	2.69	18.83	19.49	31.64	23.48	22.80	6.85	6.78	6.04	25.50	26.96	26.05

*p<.05, **p<.01, ***p<.001