

PERSONALITY, AFFECT, AND CREATIVITY: A CASE STUDY OF MACAU UNDERGRADUATES

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ABSTRACT

Creativity can be viewed as comprising two dimensions: domain-general and domain-specific. The current study focuses on domain-general creativity as a creative potential index, and therefore defines creativity as the generation of unique and suitable responses. The purpose of this study is to examine possible links among personality, affect, and creativity in Macau undergraduates. We collected data from 103 third-year undergraduate students (41 males and 62 females) who were enrolled in an art and design program at a university in Macau. Within-variables, zero-order correlations in our empirical investigation of linkages among Macau undergraduates' personality, emotion, and creativity show that openness was positively correlated to conscientiousness, and emotional stability was positively correlated to agreeableness and conscientiousness. With regard to creativity, we found that fluency was positively related to originality and flexibility but not to elaboration. Through structural equation modeling, the results suggested that both personality and PA or NA had a significant positive influence on creativity, with personality having more regression weights ($\beta = 0.85$) than affect ($\beta = 0.64$). Our results provide some evidence for the importance of considering both personality and affect components in models of individual creative performance.

Key words: Personality, Affect, Creativity, Structural Equation Modeling, Macau.

Introduction

Creativity can be viewed as comprising two dimensions: domain-general and domain-specific (Hennessey & Amabile, 2010). Measures of domain-general creativity attempt to capture a global perspective of individuals' creative potential. The most widely used index of this type of creativity is divergent thinking, which involves four dimensions: fluency (the quantity of responses generated by an individual), flexibility (the number of different categories of responses), originality (the uniqueness of an individual's responses in comparison to the group being examined), and elaboration (the level of detail in each response). However, existing measures of domain-general creativity have been critiqued as underestimating creativity in more specific areas (Kaufman, 2012), and this has given rise to the study of domain-specific creativity, i.e., creative abilities in real-life contexts. The current study focuses on domain-general creativity as a creative potential index, and therefore defines creativity as the generation of unique and suitable responses (Tsai, 2012).

The purpose of this study is to examine possible links among personality, affect, and creativity in Macau undergraduates. The motivation of the current study is hoped that this investigation will provide some insights for Chinese educators interested in facilitating creativity in the classroom. Our two research questions were: (a) how are the three variables personality, affect, and creativity related to each other? And (b) what are the interactions among these three variables?

Literature Review

Personality and Creativity

A number of studies have examined correlations between personality and creativity. The framework of the Five-Factor Model (FFM), also known as the Big Five, is widely recognized in the personality-studies community as a reliable approach to capturing individuals' personality traits (Carson, Peterson, & Higgins, 2005). The FFM divides human personality into five traits: openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability. Openness to experience refers to an individual's intellectual willingness to accept new experience and appreciate a variety of experiences, which may allow him/her to embrace novel ideas. Conscientiousness refers to socially prescribed impulse control, which can inhibit people from taking risks or experimenting, and therefore may be detrimental to the generation of new ideas. Extraversion is the set of traits related to activity, energy, and positive emotions, which are likely to boost creativity. Agreeableness includes traits related to altruism and tender-heartedness; agreeable people are likely to uphold the status quo, and may have difficulty in expressing novel ideas or taking unusual actions. Lastly, emotional stability refers to an individual's level of calmness; emotionally stable people often behave in a self-confident and approachable manner. Therefore, people with high emotional stability are more ready to become involved in the creative process (Sung & Choi, 2009).

Out of the five components of FFM, openness to experience has been the most positively and consistently associated with creative traits (Lee & Kemple, 2014; Williams, 2004). However, the relationship of other FFM personality factors to creativity has been less robust. Extraversion has been found to be positively related to creative behavior (Dollinger, Urban, & James, 2004), but the other two personality traits were found to be negatively correlated with creativity. Agreeableness appears to have a

negative association with both creative self-efficacy and creative personal identity (Karwowski, Lebuda, Wisniewska, & Gralewski, 2013), and conscientiousness has a negative relationship to creative drawing (Dollinger, 2011).

Affect and Creativity

Several scholars have pointed out that affect is also an important factor affecting creative performance (Averill, Chon, & Hahn, 2001; Baas, De Dreu, & Nijstad, 2008; Russ & Kaugars, 2000). Positive affect (PA) reflects the extent to which people feel enthusiastic, active, and pleasurable engagement, whereas negative affect (NA) reflects their experience of distress, anger, disgust, and non-pleasurable engagement. PA increases individuals' cognitive flexibility and prompts them to explore unusual perspectives, whereas NA tends to create more constrained and troublesome situations that may inhibit creativity (De Dreu, Baas, & Nijstad, 2008). A number of empirical studies seem to support the position that positive mood facilitates some aspects of creativity (Kaufmann, 2003), including creative self-perceptions (Montgomery, Hodges, & Kaufman, 2004) and divergent thinking (Russ & Schafer, 2006). Some scholars have described the connection between affect and creativity as reciprocal, with creativity stimulating emotion (Amabile, Barsade, Mueller, & Staw, 2005), while other have suggested that happy people strategically choose tasks with the potential for creativity (Hirt, Devers, & McCrea, 2008). Both activation and hedonic tone are important for creative performance, and only activating, not deactivating, mood states contributes to higher levels of creative fluency and originality (De Dreu et al., 2008).

Methods

Participants

Convenience sampling was used to the current study. We collected data from 103 third-year undergraduate students who were enrolled in an art and design program at a university in Macau. Participation in this study was voluntary, and students were rewarded with extra credit in their courses. The participants included 41 males and 62 females with an average age of 21.32 years ($SD = 2.61$).

Instruments

Personality. The 10-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003), which is based on the FFM framework described above, was used to measure respondents' personality traits. The TIPI's 10 items include two items for each of the FFM's five domains, one keyed positively and one keyed negatively. Each participants was asked to evaluate his/her own personality using a 7-point Likert scale ranging from 1 ("disagree strongly") to 7 ("agree strongly").

Gosling et al. (2003) reported on the TIPI's reliability domain, with extraversion scoring an alpha coefficient of 0.68, agreeableness 0.40, conscientiousness 0.50, emotional stability 0.73, and openness to experience 0.45. These low alpha values probably relate to the fact that each dimension has only two items. The same authors reported an adequate level of test-retest reliability ranging from 0.62 to 0.77 over a six-week time span, and validated their 10-item inventory using both the 44-item Big-Five Instrument (BFI; John & Srivastava, 1999) and the NEO-PI-R (Costa & McCrae, 1992). The results showed that the TIPI reaches adequate levels of convergent validity.

Affect. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess participants' affect, which relies upon two-factor model – i.e., PA and NA – that has been widely used in the self-report literature. PANAS uses two 10-item mood descriptors for the PA and NA scales, and asks respondents to rate the extent to which they had experienced each mood during a specified time frame, on a 5-point scale ranging from 1 ("not at all") to 5 ("very much"). Watson et al. (1988) reported Cronbach's α ranging from 0.86 to 0.90 for PA and from 0.84 to 0.87 for NA, and test-retest reliabilities ranging from 0.47 to 0.68 (PA) and from 0.39 to 0.71 (NA). Through principal factor analysis, PANAS's originators found that its clearest convergent/discriminant pattern consisted of two factors. Additionally, Thompson (2007) validated a 10-item PANAS short form with regard to its internal-reliability, convergent, and criterion-related validities. In short, PANAS can be considered a reliable and valid measure of PA and NA.

Creativity. The Abbreviated Torrance Test for Adults (ATTA; Goff & Torrance, 2002), a shortened version of the Torrance Test of Creative Thinking (TTCT; Torrance, 1966), was used to measure creative-thinking ability. The ATTA uses three tasks, one verbal and two figural, to measure the creativity of adults by quantifying their figural and verbal creative potentials, which are broken down into four abilities: fluency (the quantities of ideas produced), originality (the rarity or uniqueness of those ideas), elaboration (the degree to which the ideas are embellished with details), and flexibility (the variety of the respondent's information-processing techniques). In our study, three raters calculated the fluency, originality, elaboration, and flexibility of respondents' answers separately, according to the definitions and guidelines provided in the ATTA manual.

The current study used a Chinese-language version of ATTA (Chen, 2006), which has been extensively tested and validated with Taiwanese samples (Shen & Lai, 2014; Wang, 2012). Chen (2006) reported its test-retest reliability as 0.340 to 0.682 ($p < 0.01$). The verbal part of the correlational coefficient for the criterion-referenced creativity indicators was 0.457 ($p < 0.01$) and the figural part was 0.368 ($p < 0.01$). Since the participants in the current study were all young Chinese adults in Macau, the Chinese version of ATTA was considered appropriate as a measurement tool.

Procedure

During regular class time, based on instructions from the researcher, the participants filled out a questionnaire and completed demographic data, TIPI and PANAS. Participants were allowed three minutes to complete each task on the ATTA. In all, it took about 25 minutes to complete the whole procedure.

Results

The principal questions of interest to the researcher concerned the relations among personality, emotion, and creativity. Table 1 displays the zero-order correlations and summary statistics for these three variables. Higher levels of conscientiousness ($r = 0.32$) and emotional stability ($r = 0.31$) were correlated with higher levels of agreeableness. Higher levels of emotional stability ($r = 0.23$) and openness ($r = 0.37$) were correlated with higher levels of conscientiousness. PA was positively correlated NA ($r = 0.41$) as well as openness ($r = 0.25$). NA was negatively correlated with agreeableness ($r = -0.21$), conscientiousness ($r = -0.27$), emotional stability ($r = -0.21$), and openness ($r = -0.27$). Fluency was positively correlated with openness ($r = 0.23$), originality ($r = 0.40$), and flexibility ($r = 0.63$), and negatively correlated with NA ($r = -0.20$). Originality was positively correlated with elaboration ($r = 0.22$) and flexibility ($r = 0.28$). We also found that none of the four variables related to creativity were correlated with any personality or affect variables at the 0.05 significance level.

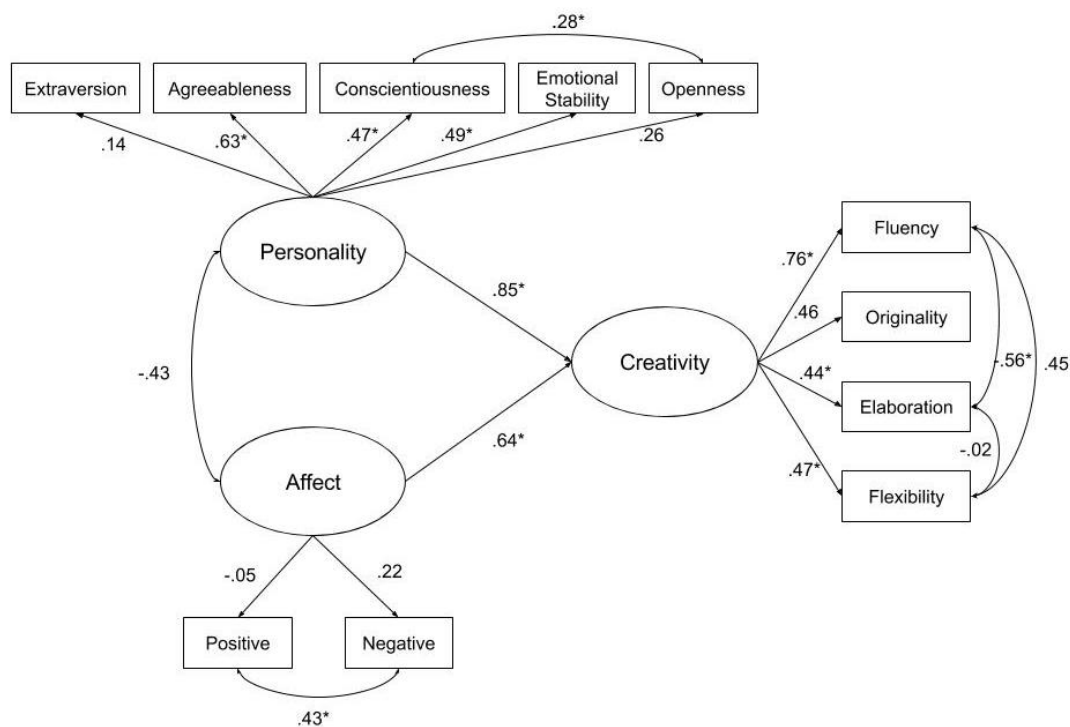
Table 1: Summary Statistics and Zero-Order Correlations for Personality, Emotion, and Creativity Variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1.Extraversion	--										
2.Agreeableness	.11	--									
3.Conscientiousness	.11	.32**	--								
4.Emotional stability	-.06	.31**	.23*	--							
5.Openness	.15	.08	.37**	.08	--						
6.Positive affect	.17	-.12	.03	.06	.25**	--					
7.Negative affect	-.06	-.21*	-.27**	-.21*	-.27**	.41**	--				
8.Fluency	-.01	.01	.01	.02	.23*	-.03	-.20*	--			
9.Originality	-.07	-.15	-.05	.10	.07	.11	.06	.40**	--		
10.Elaboration	-.14	-.05	-.02	-.07	.18	.13	.01	.04	.22*	--	
11.Flexibility	-.06	.03	.04	.07	.16	-.04	-.12	.63**	.28**	.19	--
<i>M</i>	4.06	4.93	4.52	4.31	4.77	2.91	2.30	13.93	2.10	2.68	3.28
<i>SD</i>	1.26	1.10	1.11	1.32	1.27	.80	.84	4.68	1.96	2.49	1.40

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

To answer our second research question, concerning the potential interactions among personality, affect, and creativity, a structural model was estimated via IBM AMOS as shown in the path diagram in Figure 1. The overall fit for this model was $\chi^2 = 60.51$ with 41 degrees of freedom ($p = 0.025$), and its normed χ^2 was 1.476. The model's CFI was 0.874, its GFI was 0.907, its AGFI was 0.851, and its RMSEA was 0.068, together indicating an acceptable overall fit. When we examined the model's path coefficients and loadings estimates, most of the standardized loadings were significant, with the exceptions being extraversion, openness, PA, NA, and originality. In short, via this model we found that personality was negatively related to affect, and that both personality and affect had positive and significant effects on creativity, with personality having higher standardized loadings ($\beta = 0.85$) than affect ($\beta = 0.64$).

Figure 1: Standardized Coefficients for Model of Interaction Among Personality, Affect, And Creativity. Latent constructs are shown in ellipses, and observed variables are shown in rectangles. * $p < .05$.



Discussion

The objective of the current study was to investigate the relationships among personality, affect, and creativity in Macau undergraduates. Several important findings were discussed as follows. First, within-variables, zero-order correlations in our empirical investigation of linkages among Macau undergraduates' personality, emotion, and creativity show that openness was positively correlated to conscientiousness, and emotional stability was positively correlated to agreeableness and conscientiousness. These findings were similar to those of other studies (e.g., Karwowski et al., 2013).

Additionally, we found that PA was positively correlated to NA, which was not consistent with the findings of Watson et al. (1988), or with Crawford and Henry (2004)'s construct-validity study of the PANAS, which found that PA was negatively correlated to NA ($r = -0.297$). The reason for this striking discrepancy between our results and the prior literature is unknown and further study is needed to address this. Finally, with regard to creativity, we found that fluency was positively related to originality and flexibility but not to elaboration. We also found that elaboration was positively correlated to originality. These results were similar to those of other studies (e.g., Kim, 2006).

Between-variables, zero-order correlations indicated that NA was negatively correlated to agreeableness, conscientiousness, emotional stability, and openness (ranging from $r = -0.21$ to -0.27). This suggests that individuals' negative emotion was negatively related to their personality traits, but that their positive emotion was not. Surprisingly, our study did not find any relation between creativity and personality or between any of their subcomponents, except that fluency was negatively related to NA. Again, these findings were not in line with those of others (e.g., Sung & Choi, 2009).

To further empirically test the interrelationships of our three main variables, we used structural equation modeling, which suggested that both personality and PA or NA had a significant positive influence on creativity, with personality having more regression weights ($\beta = 0.85$) than affect ($\beta = 0.64$). Moreover, personality and affect were negative correlated ($r = -0.43$). In short, although our correlational data as described above did not find any relationships among creativity, personality and affect, the use of a structural model capable of addressing causality indicated that individuals' personality and affect were in fact important components of their creative performance.

These results have important implications for educators seeking to foster creativity in their classrooms. For example, our study highlights the need for educators to take students' personalities into consideration when promoting creativity, and to recognize that if their students are in a bad mood, it may be impossible to obtain the expected results. In other words, when teachers want to facilitate their students' creativity, they should take context into consideration along with individual differences.

Conclusion

There are several limitations that should be borne in mind when interpreting our findings. First, all the student personality and affect components were measured with a self-report instrument. Self-reports can be used effectively and economically, but the results need to be confirmed using other techniques. Second, our creativity index was measured via a paper-and-pencil instrument rather than based on real-life creative performance. Although the divergent-thinking tests (e.g., ATTA) used in our

study are popular in the creativity literature (Runco & Acar, 2012), some scholars have argued that studying individuals' real-life creative performance may more accurately capture their creativity (Baer, 1993).

Our results provide some evidence for the importance of considering both personality and affect components in models of individual creative performance. We found that personality factors had a more important influence on Chinese undergraduates' creativity than their affect did. The important implication is that individual differences should be taken into consideration by educators who wish to promote creativity in their classrooms.

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