The relationship between plasticity and stability in relation to creative self-concept

Angelica M. Jurgens

Swinburne University of Technology

PSY30008 Psychology of Personality

eLA: Natalie Chiang

Word Count: 2844

Date: 25/01/2023

Abstract

The aim of this study was to investigate if a relationship was present between the Two Hug meta-traits and creative self-concept, and to further investigative whether the Two Huge meta-traits were effective in predicting performance on creativity tasks (e.g., convergent, and divergent tasks). We hypothesised that the positive correlation between creativity and plasticity, would be stronger than that of stability. Furthermore, it was predicted that better performance on convergent creativity tests would be positively correlated with Stability and negatively correlated with Plasticity. Moreover, it was hypothesised that better performance on tasks requiring divergent creativity would be favourably connected with plasticity and adversely correlated with stability. Our findings revealed a weak positive relationship between plasticity and creative self-concept supporting our hypothesis but that the Two Huge meta-traits were not significant overall at predicting performance on the creativity tasks. Moreover, our study was limited by not taking into account possible confounding variables such as intelligence, attitude and mood. Future research would do well to incorporate these factors in future studies.

Introduction

In the fields of the arts, sciences, technology, and politics, there is a tremendous cultural value placed on creativity. People who are creative have been praised throughout history. According to several researchers, humankind's greatest asset is inventiveness. Creative individuals and processes are crucial to social and technological advancement. However, despite creativity's undeniable significance, psychological study on creativity is still a niche field (Batey & Furnham, 2006). When talking about creativity, we are talking about the capacity to create or develop unique ideas, theories, methods, or works. It is viewed as a characteristic or gift that is typically distributed and possibly genetically predetermined in some way (Batey & Furnham, 2006). Moreover, little is known about creative self-concept constructs (CSC), the dynamics of their transformations over time and the connections between various elements of the creative self-concept (Karwowski, 2016). Creativity can be broken down into two elements, creative self-concept (how creative a person believes they are) and creative behaviour (how creative a person's behaviour is when faced with both convergent and divergent tasks). To clarify, convergent assessment seeks to ascertain if the learner is aware of, comprehends, or is capable of doing a specific action. Finding out what the learner knows, understands, or can do is the goal of diverse assessment. A divergent assessment is rooted in developing new concepts and potential new ideas.

Furthermore, another important factor that affects someone's creativity is personality. The term "personality" refers to the persistent traits, interests, motivations, values, self-concept, abilities, and emotional patterns that make up a person's particular way of adjusting to life (American Psychological Association, 2022). However, in the field of psychology this can be broken down into The Big Five. The theory identifies extraversion (also known as extroversion), agreeableness, openness, conscientiousness, and neuroticism as the five major personality traits. Additionally, personality can be broken down further into the Huge Two, also known as plasticity and stability (Karwowski & Lebuda, 2016). The essential tenet is that learning in a parallel and distributed system

requires stability to prevent forgetting of prior knowledge as well as plasticity for the integration of new knowledge.

As both personality and creativity work in harmony, investigating their relationship is both interesting and necessary. The current literature has provided a solid base for establishing a relationship between personality and creativity. In a meta-analysis conducted by Karwowski and Lebuda (2016), it was found that Stability was a poor predictor of creative self-concepts whereas, Plasticity was strongly positively linked with them. A reason for this could be that persons who score highly on Plasticity combine the attributes of Extraversion, Openness and Experience; they enjoy reading books and are flexible in their behaviour and ideas. Whereas, people who score significantly higher on the Stability scale value consistency and uniformity, limiting disruption or nonconformity whenever possible (Silvia, Nusban, Berg, Martin & O'Conner, 2009). However, it must be mentioned that the studies used in this meta-analysis were limited. Moreover, there are few studies examining CSCs (Creative self-concepts) in conjunction with personality, despite the growing interest in creative self-concepts among creativity academics. Future research should examine these relationships in more detail (Karwowski & Lebuda, 2016).

Additionally, this was supported by Silvia et al. (2009), who found that Plasticity predicted higher scores, while stability had a number of important effects. Plasticity and stability had opposing effects on various creativity tests. This supports the notion suggested by other studies that plasticity is positively associated with creativity. However, future research would do well to clarify what contribution other elements offer to creativity.

Furthermore, Karwowski (2016) found both constructs showed short-term stability, but they also showed significant change over a longer period of time. Specifically, those from late adolescence to early adulthood showed an increase in creative self-efficacy and creative personal identity, while older participants showed a decline. Moreover, it was also shown that creative self-efficacy and creative personal identity have reciprocal longitudinal relationships, with the former being a more reliable predictor of the latter than the latter. However, in order to create a more comprehensive, consistent, and complicated picture of the link between the creative self-concept constructions, two

investigations were integrated into one article (Karwowski, 2016). Both of these studies had limitations despite adopting robust designs (longitudinal and cross-sequential), which must be considered. The creative self-concept was not examined in either study, despite the fact that the academic literature on self-concept clearly demonstrates that it declines during elementary and middle school. Future research needs to close this gap in the knowledge (Karwowski, 2016).

Moreover, it should also be noted that a comprehensive knowledge of creativity is still a challenging but is hopefully an achievable objective. The challenge has developed in part as a result of measurement challenges as well as the construct's historical context. The transition away from using DT (Dark Triad) tests as a sole criterion for creativity, the tendency of researchers to take the field of study into account, as well as the utilisation of multitrait, multimethod research, all hint towards a promising future for creativity research (Batey, Chamorro-Premuzic & Furnham, 2010).

Therefore, using this previous research as a base, we plan to investigate the links between personality, specifically the Huge Two meta-traits and creativity. The two are interconnected, and some personality qualities are more likely to be linked to both a person's creative self-concept and their creative behaviour. We hypothesis that the positive correlation between creativity and plasticity, will be stronger than that of stability. Furthermore, it was predicted that better performance on convergent creativity tests would be positively correlated with Stability and negatively correlated with Plasticity. Moreover, it was hypothesised that better performance on tasks requiring divergent creativity would be favourably connected with plasticity and adversely correlated with stability.

Method

Participants

This study involved 57 participants who were Swinburne University third-year psychology students. The data collection contains the sample's fundamental demographic information.

Design

The dependent variable was creativity, which was operationalized as creative self-concept, convergent creative performance, and divergent creative performance. The study examined the

relationship between independent factors of stability and plasticity and creativity, as well as convergent and divergent creative performance and the impact it has on creativity.

Measures

Demographic variables

Sex (male, female, or other) and age.

Personality

The personality meta-traits of Stability and Plasticity were evaluated using the IPIP-NEO 120 (Maples, Guan, Carter, & Miller, 2014). It is a Big Five measure that has been verified. Participants are asked to score, on a 5-point Likert-type scale, how closely each of the scale's 120 sentences describes who they are. The total Plasticity score was calculated by adding the results from each item on the Openness to Experience and Extraversion scales. The total Stability score was calculated by adding the results from the (reversed) Neuroticism, Conscientiousness, and Agreeableness scales.

Creative self-concept

To assess creative self-concept, researchers employed the Short Scale of Creative Self (Karwowski, Lebuda, & Wisniewska, 2018). Participants score each of the 11 statements on the scale based on how well they match their own self-concept. A 5-point Likert-style scale is used for responses. The average of the individual item scores yields a creative self-concept score, which ranges from 1 to 5.

Creativity Tasks

To evaluate creative behaviour, one convergent thinking task and one divergent thinking task were used.

In Guilford's Alternate Uses Task (Guilford, 1967), a divergent thinking exercise, participants were given three minutes to think of as many uses as they could for the everyday items "a brick," "a newspaper," and "a shoe." The subjective multiple-rater method described by Silvia et al. (2008) was used to grade the responses according to how unusual, far-flung, and intelligent they were. Ratings ranged from 1 (not at all inventive) to 5 for each response (highly creative). Participants' scores were

added together and divided by the total number of responses for the creativity index. Scores range from 1 to 5.

Participants had to consider three remotely associated terms (such as paint/doll/cat) and come up with a fourth word that is connected to all three as part of the Remote Associates Test, a convergent thinking exercise (Mednick, 1962). (e.g., house). Three minutes were allocated to answer thirty questions, and one mark was awarded for each accurate response. The percentage of all responses that were properly answered is how scores are expressed.

In the Remote Associates Test, a convergent thinking exercise from 1962, participants had to think of a fourth term that was connected to the three remotely associated words, such as paint, doll, and cat (e.g. house). In a three-minute presentation, thirty questions were given, and one mark was granted for each accurate response. Scores are provided as the percentage of all responses that were properly answered.

Procedure

The creativity exercises were first done by the participants in class during their regular tutorial time, in a counterbalanced order. The tasks were performed using the Inquisit application, and they took about 15 minutes to do. Within a week of their tutorial, participants answered the self-report questionnaire using Qualtrics online at a time and place that worked for them. It contained measures of personality and creative self-concept. A special code number that was assigned to each participant at random before the creative tasks in Inquisit began served as a link between the results of the creativity activities and the self-report measures. The study's code number also allowed for anonymous participation.

Participants were given information about their rights as volunteers to decline taking part in the study if they so desired and that they could withdraw from the study at any moment before turning in their results before the study actually started in class. The study's objectives were outlined in a debriefing statement that was given at the end of the survey.

Age, sex, and the personality traits of plasticity and stability were the independent variables for the study. Self-reported creative self-concept and performance on the divergent and convergent thinking tests served as the dependent variables.

Results

A bivariate Pearson's Correlation test was run to investigate what relationships were present between stability, plasticity, and creative self-concept. The results can be seen in Table 1.

Table 1

Correlations between stability, plasticity, and creative self-concept

Variables	1	2	3
1. Stability	1		
2. Plasticity	-.293*	1	
3. Creative Self-Concept Score	-.319*	.285*	1

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

An analysis of Pearson's correlation reveals there is a significant weak negative correlation between Stability and a person's Creative self-concept, $r = -.319$, $n = 57$, $p = .016$. Additionally, an analysis of Pearson's correlation revealed that there is a significant weak positive correlation between Plasticity and a person's Creative self-concept, $r = .285$, $n = 57$, $p = .032$. Lastly an analysis of Pearson's correlation reveals there is a significant weak negative correlation between Stability and Plasticity, $r = -.293$, $n = 57$, $p = .027$.

Moreover, a multiple regression analysis was performed to determine how much variability seen in the test scores on the convergent task could be explained by Stability and Plasticity. The regression analysis revealed a non-significant relationship between the Two Huge meta-traits (Stability & Plasticity) on performance on the convergent task (RAT) $F(2,47) = 0.56$, $p = .575$, $r^2 = .020$.

Additionally, a multiple regression analysis was performed to determine how much variability seen in the test scores on the divergent task could be explained by Stability and Plasticity. The

regression analysis demonstrated a non-significant relationship between the Two Huge meta-traits on performance on the divergent task (AUT) $F(2, 54) = 2.97$, $p = .060$, $r^2 = .990$. However, when broken down Plasticity was a significant predictor of AUT score $b = 0.006$, $t = 2.411$, $p = 0.02$. Yet, Stability was not a significant predictor of AUT score $b = 0.002$, $t = 1.044$, $p = 0.301$.

Discussion

The aim of this study was to investigate the links between creativity and personality, but more specifically what impact the Huge Two meta-traits have on creativity. It was hypothesised that the positive correlation between creativity and Plasticity, would be stronger than that of Stability. Furthermore, it was predicted that better performance on convergent creativity tests would be positively correlated with Stability and negatively correlated with Plasticity. Moreover, it was also hypothesised that better performance on tasks requiring divergent creativity would be favourably connected with Plasticity and adversely correlated with Stability.

Our bivariate Pearson's Correlation test revealed that there was a significant weak negative correlation between Stability and a person's Creative Self-Concept. As expected, the more Stability a person had the lower their creative self-concept. However, our results demonstrated a significant positive weak correlation between Plasticity and a person's creative self-concept. Therefore, indicating that greater Plasticity a person has, the higher their creative self-concept. These results somewhat supports the findings of by Karwowski and Lebuda (2016), who found that while plasticity had a strong positive correlation with creative self-concepts, stability was a poor predictor of them. Unlike the study of Karwowski and Lebuda (2016) we did not find a strong positive relationship, only a weak positive relationship. However, it does support the findings of Silvia et al. (2009) who demonstrated that Plasticity predicted higher score in creative self-concept.

Additionally, our first multiple regression analysis revealed a non-significant relationship between the Two Huge meta-traits (Stability & Plasticity) on performance on the convergent task (RAT). Moreover, our second multiple regression analysis demonstrated a non-significant relationship

between the Two Huge meta-traits on performance on the divergent task (AUT). However, when this relationship was broken down, it was found that Plasticity was a in fact significant predictor of AUT. This supports the findings of Silvia et al. (2008) who found that Plasticity had a large positive effect on divergent thinking.

In conducting this study, one noticeable pattern that emerged was the fact that Stability often was not a significant predictor of creative self-concept or divergent thinking. A reason for this could be that persons who score much higher Stability scale scores value consistency and uniformity, avoiding disruption or nonconformity whenever possible (Silvia et al., 2009). This does not necessarily fit well with divergent thinking which is rooted in the process of coming up with new concepts and possibilities. This kind of thinking tends to fit better with the personality trait of Plasticity which combines the attributes of Extraversion, Openness and Experience which encourages flexibility in their behaviour and ideas (Silvia et al., 2009).

This study has contributed to what we understand about personality and creativity by further investigating the relationship between the Two Huge meta-traits an creativity. It has also furthered knowledge about particular aspects of personality and creativity. For example, our study revealed no significant relationship between personality traits and convergent thinking. These results may provide some support for the notion that there may not be a significant relationship between the variables themselves (Hirsh, 2015).

Moreover, in the existing evidence in the case of divergent thinking, it is suggested that previous research results are inconclusive, indicating that a confounding factor's interference should be considered. Prior research on the influencing variables and earlier research on personality and creative performance both indicated that intelligence played a role in both of these areas. Thus, a limitation of our study was that the intelligence of participants was not accounted for before participating (Baer, 1998).

Additionally, Vosburg (1998) and Williams (2004) have stated that when exploring the relationship between personality and creativity, both mood and attitude should be considered as they

can present as confounding variables that may or may not have an indirect impact on the results of any given study. For example, when someone is trying to solve an issue, a bad mood can lead to bad cognition, whereas a good mood can lead to more and better viable solutions (Vosburg, 1998). Additionally, individual performance on divergent tasks may be improved by having positive views towards the task and fully appreciating divergent cognition (Williams, 2004). This, therefore, was another limitation of our study as we did not take in account the mood and attitude of participants.

Furthermore, another limitation of our study was the fact the creative self-concept could have been measured incorrectly. A reason for this is because there is still some debate and varying opinions within the field of psychology as to how creativity should be measured. Therefore, the way we measured creativity may not be the same as other studies. Therefore, lacking consistency.

However, despite these limitations, the results of our study are still valid as they support the findings of previous research and therefore add strength to previous schools of thought and thus, will encourage future research to move forward in a more beneficial direction. However, future research would do well to account for intelligence, attitude, and mood as previous research has demonstrated that these factors can act as confounding variables that may skew results. Finally, future research would also benefit from utilising larger sample sizes as the sample used in this study was relatively small.

Yet, overall our study shed further light on personality and creativity, by further establishing that there does seem to be a significant relationship between Plasticity and divergent thinking, but that perhaps overall the Two Huge meta-traits are not sufficient at predicting performance on convergent and divergent tasks. However, this research adds and builds to the ever-growing field of personality and its relationship to creativity and therefore will create a firm base on which future research can build upon.

References

American Psychological Association (2022). *Personality*. Retrieved January 9, 2022, from

https://dictionary.apa.org/personality

Baer, J. (1998) The Case for Domain Specificity of Creativity. *Creativity Research*

Journal, 11(2), 173-177. https://doi.org/10.1207/s15326934crj1102_7

Batey, M., & Furnham, A. (2006) Creativity, Intelligence, and Personality: A Critical Review of the

Scattered Literature. *Genetic, Social, and General Psychology Monographs*, *132*(4), 355-429.

https://doi.org/10.3200/MONO.132.4.355-430

Batey, M., Chamorro-Premuzic, T., & Furnham, A. (2010) Individual Differences in Ideational

Behavior: Can the Big Five and Psychometric Intelligence Predict Creativity Scores?.

Creativity Research Journal, 22(1), 90-97. https://doi.org/10.1080/10400410903579627

Guilford, J.P. (1967). Creativity: Yesterday, today and tomorrow. *Journal of Creative Behaviour,*

1(1), 3-14. https://psycnet.apa.org/doi/10.1002/j.2162-6057.1967.tb00002.x

Hirsh, J.B. (2015). Personality and creativity. *International Encyclopedia of the Social & Behavioural*

Sciences, 2, 770-773. https://doi.org/10.1016/B978-0-08-097086-8.25024-1

Karwowski, M., & Lebuda, I. (2016). The Big Five, the Huge Two, and creative self-beliefs: A meta-

analysis. *Psychology of Aesthetics, Creativity, and the Arts, 10*(2), 214-

232. https://doi.org/10.1037/aca0000035

Karwowski, M. (2016). The dynamics of creative self-concept: Changes and reciprocal

relations between creative self-efficacy and creative personal identity. *Creativity Research*

Journal, 28(1), 99-104. https://doi.org/10.1080/10400419.2016.1125254

Karwowski, M., Lebuda, I., & Wisniewska, E. (2018). Measuring creative self-efficacy and creative personal identity. *The International Journal of Creativity and Problem Solving, 28*(1), 45-57. https://psycnet.apa.org/record/2018-59236-003

Maples, J.L., Guan, L., Carter, N.T., & Miller, J.D. (2014). A test of the International Personality Item Pool representation of the revised NEO personality inventory and development of a 120-item IPIP-based measure of the Five-Factor model. *Psychological Assessment, 26*(4), 1070-1084. https://doi.org/10.1037/pas0000004

Mednick, S. A. (1962). The associative basis of the creative process. *Psychological Review, 69*(3), 220-232. https://psycnet.apa.org/fulltext/1963-06161-001.pdf

Silvia, P.J., Winterstein, B.P., Willse, J.T., Barona, C.M., Cram, J.T., Hess, K.I., . . . Richard, C.A. (2008). Assessing creativity with divergent thinking tasks: Exploring the reliability and validity of new subjective scoring methods. *Psychology of Aesthetics, Creativity, and the Arts, 2*(2), 68-85. https://doi.org/10.1037/1931-3896.2.2.68

Silvia, P.J., Nusbaum, E.C., Berg, C., Martin, C., & O'Connor, A. (2009). Openness to experience, plasticity, and creativity: Exploring lower-order, high-order, and interactive effects. *Journal of Research in Personality, 43*(6), 1087-1090. https://doi.org/10.1016/j.jrp.2009.04.015

Vosburg, S. K. (1998) The Effects of Positive and Negative Mood on Divergent-Thinking Performance. *Creativity Research Journal, 11*(2), 165-172. https://doi.org/10.1207/s15326934crj1102_6

Williams, S. D. (2004). Personality, attitude, and leader influences on divergent thinking and creativity in organizations. *European Journal of Innovation Management, 7*(3), 187-204. https://www.emerald.com/insight/content/doi/10.1108/14601060410549883/full/html