

## **Abstract**

Research into Psychological Mindedness (PM) has focuses on its beneficial role in improving physical and mental well-being. The aim of the current study was to investigate the role of two PM measures and personality in predicting creative cognition performance. Following the completion of a battery of questionnaires 176 participants from the general population (age ranged from 16-68 years old) completed three creative cognition tasks. Hierarchical multiple regression analyses revealed independent effects for both the PM Interest and Insight variables in performance on two of the three creative cognition measures. Critically, these showed that the PM variables positively predicted performance on both the Creative Visualization Task and the Remote Associates Test. Conversely, the association between performance on the Alternate Uses Task and the PM variables was explained by the Openness to new experience variable. These findings are discussed in the context of the inclusion of further mediating variables that may explain the causal relationship between PM and creative cognition.

Key Words: Creativity, Psychological Mindedness, Creative Meta-cognition, Self-knowledge and -Interest

## 1. Introduction

Psychological Mindedness (PM) emerged from the psychodynamic literature and has been adopted by clinicians as a useful assessment of coping and meta-cognition in mental and physical well-being (Nyklíček & Poot, 2010). It is defined as an individual's ability to be aware, assess, reflect and be interested in their mental states in both the affective and intellectual dimensions (Hall, 1992). Research suggests that PM develops during childhood and its growth is dependent upon the perceptions and learned actions and behaviours of significant carers (Alvarez, Faber & Schonbar, 1998). Theorists conceptualise two aspects of PM, a person's interest and their ability to reflect upon their psychology (Hall, 1992). Research in to PM has generally focused upon three aspects of well-being: its effects upon physical and psychological well-being and coping, its predictive value in clinical settings and its association and development in attachment status.

Research has reported the beneficial effects of high levels of PM in physical and psychological well-being (Nyklíček & Denollet, 2009). For example, Beitel, Ferrer, & Cecero (2005) found that students high in PM showed lower levels of distress in emergency situations. Similarly, Cecero, Beitel, and Prout (2008) observed that PM was positively associated with self-reported college adjustment in Fresher students. Finally, Nyklíček and Denollet (2009) observed that community and mental health patients scored significantly lower on both the Interest and Insight PM measures (taken from The Balanced Index of Psychological Mindedness) than healthy normal controls. The research on PM as a predictor of therapeutic outcome is less consistent. Whilst some researchers have found a positive link between PM and therapeutic outcome (McCallum, Piper, Ogrodniczuk, & Joyce, 2003; Piper, McCallum, Joyce, Rosie, & Ogrodniczuk, 2001) others have failed to confirm these findings (Conte, Ratto, & Karasu, 1996). Finally, research on PM and attachment shows that it is positively linked to maternal care and negatively associated with attachment avoidance (Bourne, Berry & Jones, 2013). Predictably, it is also positively associated with perceptions of

both attachment security and attachment to peers (Ford & Pidgeon, 2013; Beitel & Cicero, 2003).

## **1.2. PM, Self, Personality and Creativity**

The authors are aware of only one other study investigating the link between PM and creativity. This study, conducted by Feist and Barron (2003), employed a longitudinal design (a 44-year follow-up study) to investigate the predictive role of intelligence and a variety of personality factors in predicting life-span creative achievement. The PM sub-scale measure was derived from The California Psychological Inventory (Gough, 1987). Results showed that PM was significantly positively related to both life-time receipt of awards and achievements. They concluded that lifetime creativity is dependent upon a variety of cognitive and affective domains. Creative potential is determined by many factors other than talent (notably psychological mindedness) and if these are missing then so are the creative products.

There may be mediating measures that researchers hypothesise to be related to both PM and creativity. These include measures of personality, psychopathology, and self. PM would be expected to be related to measures of self and there is a good body of research that demonstrates these associations (Beitel, Ferrer & Cicero, 2005; Kabat-Zinn, 1990; Taylor, Bagby & Parker, 1989). Many of these findings were also observed in Nyklíček and Denollet's (2009) research. They found medium positive associations between the PM Insight and Interest measures and the Public and Private Self-Consciousness Scale measures. They also observed medium and strong negative associations between the PM measures and the subscales of the Toronto Alexithymia Scale. Furthermore, they found strong positive associations between the Reflection and Rumination Questionnaire scales and the PM measures. Finally, strong associations were also found between the emotional intelligence scales (derived from the Trait Meta-Mood Scale) and both of the PM measures. Other measures related to self (Emotional Processing, Empathy, Locus of Control and Mindfulness) have been found to be positively related to PM (Beital et al., 2005).

Some of these measures have also been found to be associated with performance on creativity tasks. For example, Czernecka and Szymura (2008) found that Alexithymics (low in emotional processing and high in concrete thinking) performed significantly worse than Non-Alexithymics on creativity tasks. Similarly, Botella, Zenasni and Lubert (2013) reported that artists were lower in Alexithymic traits and higher in affect intensity than non-artists. Furthermore, Ostafin and Kassman (2012) recently observed that trait mindfulness positively predicted performance on insight problem solving tasks. Finally, Feist's (1998) meta-analytic review of the personality factors that determine creativity concluded that self-confidence and self-acceptance were key determinants. Feist (1998) also found that scientists were higher in PM than non-scientists, however, no differences were found between artists and non-artists. Collectively, this research suggests that measures of insight and interest in self-awareness would be positively associated with performance on creative cognition tasks.

Personality measures were examined in a series of studies conducted by Nyklíček and Denollet (2009) in the development of their Balanced Index of Psychological Mindedness (BIPM) measure. They found small to medium association between PM, Extraversion (positive) and Neuroticism (negative) which have also been observed in previous research (Beirtal & Cicero, 2003). They also found that the personality variable, Openness to new experience was the best predictor of PM. Nyklíček and Denollet (2009), further found significant small to medium negative associations between measures linked to psychopathology and the PM Insight variable; as measured by the Symptom Checklist-90. These included the measures of: Depression, Somatization, Hostility, Inter-Personal Sensitivity, and Cognitive Performance Deficits.

There are several reasons to expect there to be a significant relationship between PM and creativity. Much of this is based upon shared attributes found in the research literature specifically linked to the Big-Five measures of personality (McCrae

& Costa, 1977). Conscientiousness, extraversion and especially Openness to new experience have been linked to both creativity and PM (Beitel & Cicero, 2003; Miller & Tal, 2007 von Stumm, Chung, & Furnham, 2011). Beitel and Cicero (2003) investigated the role of the Big-Five in predicting scores on the Psychological Mindedness Scale (PMS). They found that Openness to new experience was the best predictor of PMS scores. This was followed by Extraversion and then a smaller inverse relationship with Neuroticism. They concluded that PM was linked more to the positive (as opposed to the pathological) aspects of personality. These findings concur with those observed by Nyklíček and Denollet's (2009) study of extraversion and neuroticism.

A considerable body of research supports an association between the Big-Five personality measures and creativity. Most of these are positive associations between Openness to new experience, Extraversion and creativity (Dollinger, Urban & James, 2004; Feist, 1998; Furnham & Bachtier, 2008; Martindale, 2007). Furthermore, previous research assessing the relationship between creativity and other variables (e.g. sub-clinical signs of psychopathology) has shown that personality may mediate the previously reported associations. For example, research conducted by Miller and Tal (2007) concluded that personality and intelligence explained the association between schizotypy and creativity, most notably the variable Openness to new experience. Similarly, Furnham, Batey, Anand, and Manfield (2008) found that the association between Hypomania and creativity disappeared when the personality variables Openness to new experience and Extraversion were included in a multiple regression analysis. As both of these variables have been linked to PM it is of value to include these measures of personality in a study of the link between PM and creativity.

The argument proposed in this introduction suggests that people who score high on PM measures are generally conceived of as flexible, realistic, impulsive, extraverted, independent, and mentally aware of themselves and others. As many of these are key attributes that have been observed in those who score high on creative

cognition tasks the aim of the following research is to assess this association in the general population. To this extent the authors have selected three measures that individually focus upon three types of thinking linked to creativity. The first, a variant of Finke's (1990) Creative Visualization task (CVT), measures imagery-based creativity. The second, Guilford's (1967) Alternative Uses Task (AUT), measures participant's divergent thinking skills. The final measure, Mednick's (1962) Remote Associates Task (RAT), assesses the ability to find solutions to distant semantic contacts. It is proposed that PM may predict performance on all of these measures. Two of these target variables (the AUT and the CVT) yield multiple indicators of creativity. In keeping with Guilford's (1967) model of divergent thinking the author's treat these measures of frequency, value and originality as multiple contributing indicators of creative potential. Specifically, that they combine to provide an overall measure of how likely an individual is to show creative productivity and originality (Runco and Acar, 2012). Consequently, a single target variable will be derived from each measure of creative thinking. A further advantage of this procedure is that it reduces the probability of making a Type 1 error. A final aim is to assess how much of these associations can be explained through the effect of the Big-Five personality measures. Justification for the inclusion of these variables is based upon previous research showing the mediating potential of these personality variables on performance of creativity measures (Miller & Tal, 2007).

## **2. Method**

### **2.1. Participants**

One-hundred-and-Seventy-Six volunteers in the North London region took part in the study at the researchers' Institution. There were 116 females and 60 males. Age ranged from 16-68 years old with a mean age of 27.04 years old (standard deviation=10.59). Participants were recruited from the general population. All participants were fluent English speakers living in London (UK) and were recruited through snowballing personal contacts of the data collection team. The study was

approved by the Middlesex University Psychology Department Ethics Committee. All participants consented to take part in the study and were aware of their right to withdraw at any time during the research. Upon completion of the study the participants were fully debriefed and informed of the nature of the research.

## **2.2. Materials and Procedure**

Participant responses were collected over two sessions. The tasks were individually completed in groups of one to four participants over two sessions. In the first session the participants completed the self-report measures of personality followed by the measure of mindedness. In the second session they completed the creativity tests. Initially, they completed the Remote Associates Task, this was followed by the presentation of the Alternative Uses Task. Finally, they completed the Creative Visualization task. These are described below.

**2.2.1. The International Personality Item Pool (IPIP, Goldberg, 1992).** This measures the five aspects of personality. The participants responded on a five-point scale (very inaccurate to very accurate) to each of the 50 items. These questions related to: Extraversion ( $\alpha=.61$ ), Agreeableness( $\alpha=.76$ ), Conscientiousness ( $\alpha=.60$ ), Neuroticism ( $\alpha=.65$ ), and Openness ( $\alpha=.67$ ) . Cronbach's alpha analyses (reported above) on the personality measures ranged from acceptable to good.

**2.2.2. The Balanced Index of Psychological Mindedness (BIPM).** This 14-item questionnaire was developed by Nyklíček and Denollet (2009) to measure a person's perceived ability to evaluate their thoughts, feelings and actions. Research by the aforementioned authors found that it measured two aspects of mindedness (Interest and Insight). The items are scored on a five-point Likert scale ranging from *not true* to *very true*. Cronbach's alpha analyses of the current data set showed that

measures of Interest showed good ( $\alpha=.78$ ) and Insight showed very good ( $\alpha=.83$ ) internal consistency. These concur with Nyklíček and Denollet's (2009) original evaluation.

**2.2.3. The Creative Visualization Task** (CVT: Finke, 1990). A modified version of the original CVT was administered to the participants. Fifteen shapes on separate cards were placed face down and participants were required to randomly select three shapes and memorize them for a one-minute period. The shapes were then withdrawn and the participants were given one minute to combine the figures. Underneath the instructions rules for integrations were specified:

1. You can rotate the stimulus parts
2. You can change the size of the stimulus parts
3. You cannot change the basic shape of the stimulus parts

Two judges were informed about the nature of the task and were asked to make three judgments about each composite form. The first task was to identify the number of appropriate responses on the basis of:

1. Integration of all of the parts
2. Did not include other shapes
3. A title was provided
4. The object or scene fulfilled minimal correspondence with the title

If the response was judged to be appropriate the raters were required to state the correspondence of the form and whether or not they thought the composite form was creative. Inter-rater reliability coefficients exceeded 0.8 in all measures.

**The Alternative Uses Task** (AUT: Guilford, 1967): The researchers followed the standard format for the administration of the AUT. Participants were required to generate alternate uses for the following household products: bucket, chair, newspaper, paperclip, and rope. They were given three minutes for each product. The responses were scored for fluency and originality. Fluency scores represented the total

number of responses given. Originality scores were determined by frequency of overall response. Hence, responses given by 5% of the participants were awarded a point and those given by 1% two points. Loquacity effects were adjusted by dividing total originality scores by total fluency scores.

**The Remote Associates Task** (RAT; Mednick, 1962). This task requires the participants to find the solution words to 20 three-word associates. For example, the participant may be given the following three associates (cream/skate/water) in the expectation that they will find the word that links these three words (ice). Remote associate problems were derived from Bowden and Jung-Beeman's (2003) normative data. They all contained >50% 30-second solution rates. Participants were given the 20 problems and were asked to solve as many as they could in a 10-minute period.

## Results

Given the large number of predictor and target variables combined measures of creativity were derived for the AUT and CVT. This was done through z-transformation and summation computations. The third dependent variable was the total number of RAT scores. Descriptive statistics for the self-report measures of Mindedness (BIPM) and the five factor personality dimensions (IPIP) and the Pearson's r correlation coefficients with the three creative Cognition (AUT, CVT and RAT) tasks are presented in Table 1. These show significant positive associations between the IPIP Agreeableness and Openness measures and the Creative Cognition AUT variable. They also show significant relationships between BIPM Interest variable and the Creative Cognition RAT total scores. Finally, there was also a significant positive association between the BIPM Insight and the Creative Cognition CVT measure. All significant associations were in the predicted directions.

INSERT TABLE 1 ABOUT HERE

Table 2 shows the Pearson r correlation coefficients between BIPM mindedness variables and the IPIP personality measures. These reveal a three positive associations between the BIPM Interest scores and the IPIP personality

measures; Agreeableness, Conscientiousness, and Openness. There was also a significant positive relationship between the BIPM Insight variable and the IPIP Extraversion measure. These significant associations highlight the possibility that personality may mediate the significant relationships observed in Table 1.

INSERT TABLE 2 ABOUT HERE

To assess the relative role of the BIPM Mindedness variables in predicting performance in creativity three hierarchical multiple regression analyses were conducted. The five factor personality measures were entered in the first block and the Mindedness measures in the second block. A significant effect was observed for the five factor variables where the target variable was the composite AUT score ( $R^2 = .076$ ,  $R^2_{adj} = .048$ ,  $F(5,164) = 2.687$ ,  $p = .023$ ). When the second block was entered in to the model a significant effect was also observed ( $R^2 = .131$ ,  $R^2_{adj} = .076$ ,  $F(7,162) = 2.270$ ,  $p = .031$ ). Further analyses on the change effect showed that the Mindedness variables did not collectively significantly contribute to explaining the composite AUT score ( $\Delta R^2 = .014$ ,  $F(2, 162) = 1.210$ ,  $p = .079$ ). Observation of Table 4 reveals that only the variable IPIP Openness positively predicted AUT performance.

INSERT TABLE 3 ABOUT HERE

The same analytic procedures were employed for the composite CVT variable. Initial analyses showed that Model 1 IPIP personality variables did not significantly predict the composite CVT scores ( $R^2 = .025$ ,  $R^2_{adj} = -.005$ ,  $F(5,164) = 0.832$ ,  $p = .528$ ). However, when the second block was entered a significant effect was found ( $R^2 = .100$ ,  $R^2_{adj} = .061$ ,  $F(7,162) = 2.560$ ,  $p = .016$ ). Furthermore, the significant change effect confirmed that this was due to the contribution of the PM variables ( $\Delta R^2 = .075$ ,  $F(2,162) = 6.732$ ,  $p = .002$ ). Analyses of the univariate effects showed that this significant finding was entirely explained by the BIPM Insight variable.

A final hierarchical multiple regression found that the five-factor IPIP personality variables did not predict scores on the Total RAT score ( $R^2 = .017$ ,  $R^2_{adj} = -$

.013,  $F(5, 164)=.566$ ,  $p = .726$ ). Furthermore, the model did not reach significance when the Mindedness block was entered in to the model ( $R^2=.054$ ,  $R^2_{adj}=.013$ ,  $F(7, 162)=1.318$ ,  $p=.245$ ). However, the importance of the independent contribution of the Mindedness block was confirmed through a significant change effect ( $\Delta R^2=.037$ ,  $F(2, 162)=3.161$ ,  $p=.045$ ). Univariate analyses revealed that the BIPM Interest variable positively independently predicted the RAT scores; see Table 3.

#### **4. Discussion**

The results show interesting findings that require further research in to the role of PM in predicting performance on creative cognition tasks. Initial correlational analyses revealed significant positive associations between both the personality and PM variables and the creative cognition tasks. They also showed predicted positive associations between the PM Insight and Interest variables and the following IPIP personality variables: Extraversion, Agreeableness, Conscientiousness and Openness to new experience. Furthermore, a hierarchical regression analysis showed that the personality variable Openness to new experience explained the association between PM and creative cognition. However, the PM Insight variable independently explained performance on the CVT composite score. Furthermore, a similar effect was observed when PM Interest was the predictor and the RAT total score was the target variable. These findings are discussed in the context of explained and proposed mediating variables. Combined they suggest that creativity requires more than talent, it is also dependent on the temperament and personality factors found in measures of self and insight engagement (Feist & Barron, 2003).

Initial correlational analyses showed that both the Agreeableness and the Openness to new experience variables were positively associated with performance on the composite AUT scores. The PM variables were in the predicted direction but were not significantly related to the AUT scores. A hierarchical regression analysis showed that the Openness to new experience variable uniquely predicted performance

on this task. This finding is well established in the literature where it has been shown that this is both the best predictor of creativity and an established mediating variable in association between psychological disposition and creativity (Aitken-Harris, 2004; Furnham & Bachtier, 2008; Miller & Tal, 2007). The findings therefore concur with previous research in demonstrating a small to medium association between Openness to new experience and creative cognition, as measured by the frequently used alternative uses measure. Specifically, this finding seems to support a relationship between Openness to new experience and divergent thinking (AUT) measures of creative cognition. It is interesting that the same effects are not observed on the imagery (CVT) and convergent (RAT) creative cognition tasks.

The personality variables were not significantly associated with performance on the imagery-based CVT composite measure and the regression analysis showed that the PM Insight measure independently predicted performance on this target variable. This finding that a Psychological Mindedness variable positively explains the variance in a creativity task is interesting to the extent that it highlights an association between creativity, mental imagery and PM. The role of imagery in creativity has been thoroughly researched and small to medium effects observed in a meta-analytic review (LeBoutillier & Marks, 2003). PM is fundamentally linked to mental imagery to the extent that PM Insight involves an awareness of the inner-self. This finding is also indirectly linked to research suggesting that samples scoring low in creativity and PM also show deficits in imagery function (Campos, Chiva & Moreau, 2000). Future research may explain the associations between PM, imagery-based creative cognition, and mental imagery through the inclusion of performance-based measures of the control of mental imagery (Irving, LeBoutillier, Barry & Westley, 2008).

The final analyses also showed no significant associations between the Big Five IPIP personality measures and the RAT scores. However, there was a small significant association between the PM Interest measure and the RAT scores. Consequently, PM Interest was found to independently predict performance on this convergent thinking

creativity task. Explanation is cautious given the small effect observed. Given the RAT is an insight problem solving task (Bowden & Jung-Beeman, 2003)) this finding concurs with a recent study of the link between mindfulness and problem solving performance (Ostafin & Kassman, 2012). In the first study of its kind, Stafin and Kassman (2012), found that trait mindfulness positively predicted performance on insight (but not non-insight) problem solving performance. They suggested two explanations for this improvement in creative performance. The first was that higher trait mindfulness enabled the participants to decentre from past experience, thereby enabling a more flexible search strategy. The second was that improved trait mindfulness encourages the use of nonverbal problem solving strategies. The present findings cloud these explanations as they suggest that having an interest in the inner self (centring) is the key predictor of verbal creative insight problem solving. Future research could investigate this effect through the inclusion of further measures of self and through the addition of a variety of insight problem solving tasks which would clarify the associations.

#### **4.1. Limitations and Future Directions**

Having established the independent roles of PM Insight and Interest in predicting performance on two creativity measures the remainder of this paper will evaluate the limitations of the current study and how future research could improve our understanding of these links. The current study aimed to evaluate the effects of the standard five personality measures proposed by McCrae & Costa (1987). This is somewhat limited given the dispositions associated with both PM and creativity. For example, Feist and Barron (2003) note that there are at least 12 personality characteristics that predict creative achievement. Three of these were included in the present study (Introversion, Conscientiousness and Openness to new experience) but there may be others that mediate the link between PM and creativity. For example, it may be the case that autonomy, self-confidence, and self-acceptance explain the link.

Future research should therefore clarify the association and mediation between PM and creative cognition through the inclusion of distinct measures of personality that have been linked to creativity in previous research.

A further understanding of PM and creative cognition could be derived through the inclusion of sub-clinical measures of psychopathology that have been linked to creativity; see Acar and Runco (2012) and Acar and Sen (2013) for reviews. Recent research has found that those who score high on PM exhibit more reckless behaviour than those who score low on PM (Ford & Pidgeon, 2013). This is interesting because some negative sub-clinical psychopathology traits (e.g. recklessness, impulsivity, narcissism and psychoticism) have also been associated with creativity (Acar & Runco, 2012; Furnham, Marshall & Hughes, 2013; LeBoutillier, Barry & Westley, 2014). Further research should explore these relationships in the context of PM. A similar measure (introvertive anhedonia) which has been consistently shown to negatively predict performance on creativity tasks (Acar & Sen, 2013) should also be included in further research as the items on this measure should also be negatively related to the PM Interest variable.

Finally, future research should also include measures of self, motivation and meta-cognition that have previously been mentioned in the context of creativity. These obvious associates with PM may help us to understand the intricate arrangement between talent, personality and self in the determination of creativity. As Feist and Barron (2004) state, there is more to this than ability, the ways in which people are inclined and act upon problem solving are important in determining creativity. This research provides a small but important step in understanding how interest and insight in psychological mindedness predicts performance in creative cognition. It supports the distinction between Insight and Interest in the development of the notion of psychological mindedness and adds to a frequently overlooked link between notions of self and creativity proposed and developed by Feist and Barron (2003).

## References

- Acar, S. & Runco, M.A. (2012). Psychoticism and creativity: A meta-analytic review. *Psychology of Aesthetics, Creativity, and the Arts*, 6, 341-350. doi: 10.1037/a0027497
- Acar, S., & Sen, S. (2013). A Multilevel Meta-Analysis of the Relationship Between Creativity and Schizotypy. *Psychology of Aesthetics, Creativity, and the Arts*. 7, 214-228. doi: 10.1037/a0031975
- Aitkin-Harris, J. (2004). Measured intelligence, achievement, openness to experience, and creativity. *Personality and Individual Differences*, 4, 913-929. doi: 10.1016/S0191-8869(03)00161-2
- Alvarez, J.R., Farber, B.A., & Schonbar, R.A. (1998). The relationship of psychological mindedness to adult perceptions of early parental rejections. *Journal of Clinical Psychology*, 54, 1079–1084. doi: 10.1002/(SICI)1097
- Beitel, M., & Cecero, J. J. (2003). Predicting psychological mindedness from personality style and attachment security. *Journal of Clinical Psychology*, 59, 163–172. 10.1002/jclp.10125
- Beitel, M., Ferrer, E., & Cecero, J. (2005). Psychological mindedness and awareness of self and others. *Journal of Clinical Psychology*, 61, 739-750. doi: 10.1002/jclp.20095
- Botella, M., Zenasni, F., & Lubert, T. (2013). Alexithymia and Affect Intensity in Fine Artists. *Journal of Creative Behavior*, 49, 1-12. doi: 10.1002/jocb.54
- Bourne, K., Berry, K., & Jones, L. (2013). The relationships between psychological mindedness, parental bonding and adult attachment. *Psychology and Psychotherapy. Theory, Research and Practice*, 87, 167-177. doi: 10.1111/papt.12007
- Bowden, E.M. & Jung-Beeman, M. (2003). Normative data for 144 compound remote associate problems. *Behavior Research Methods, Instruments, and Computers*, 35, 634-639. doi: 10.3758/BF03195543

- Campos, A., Chiva, M., & Moreau, M. (2000). Alexithymia and mental imagery. *Personality and Individual Differences, 29*, 787–791. doi: 10.1016/S0191-8869(99)00231-7
- Cecero, J., Beitel, M., & Prout, T. (2008). Exploring the relationships among early Maladaptive schemas, psychological mindedness and self-reported college adjustment. *Psychology and Psychotherapy: Theory, Research, and Practice, 81*, 105-118. doi: 10.1348/147608307X216177
- Conte, H., Ratto, R., & Karasu, T. (1996). The Psychological Mindedness Scale : Factor structure and relationship to outcome of psychotherapy. *Journal of Psychotherapy Practice and Research, 5*, 250-259.
- Czernecka, K. & Szymura, . (2008). Alexithymia – Imagination – Creativity. *Personality and Individual Differences, 45*, 445-450. doi: 10.1016/ j.paid.2008.05.019
- Dollinger, S.J., Urban, K.K., & James, T.A. (2004). Creativity and Openness: Further Validation of Two Creative Product Measures. *Creativity Research Journal, 16*, 35-47. doi: 10.1207/s15326934crj1601\_4
- Feist, G.J. (1998). A Meta-Analysis of Personality in Scientific and Artistic Creativity. *Personality and Social Psychology Review, 2*, 290-309. 10.1207/s15327957pspr0204\_5
- Feist, G.J. & Barron, F.X. (2003). Predicting creativity from early to late adulthood: Intellect, potential, and personality. *Journal of Research in Personality, 37*, 62-88. doi: 10.1016/S0092-6566(02)00536-6
- Finke, R.A. (1990). *Creative Imagery: Discoveries and Inventions in Visualization*. Hillsdale: Lawrence Erlbaum Associates
- Furnham, A. & Bachtier, V. (2008). Personality and intelligence as predictors of creativity. *Personality and Individual Differences, 45*, 613-617. doi: 10.1016/j.paid.2008.06.023
- Furnham, A. Marshall, E. & Hughes, D. (2013). Creativity, OCD, Narcissism and the Big Five. *Thinking Skills and Creativity, 10*, 91-98. doi: 10.1016/j.tsc.2013.05.003

- Goldberg, L.R. (1992). The development of markers for the Big-Five Factor Structure. *Psychological Assessment, 4*, 26-42. doi: 10.1037/1040-3590.4.1.26
- Gough, H. G. (1987). California Psychological Inventory administrator's guide. Palo Alto, CA: Consulting Psychologists Press Inc..
- Guilford, J.P. (1967). *The nature of human intelligence*. New York: McGraw-Hill.
- Hall, J.A. (1992). Psychological-mindedness: A conceptual model. *American Journal of Psychotherapy, 46*, 131-140.
- Irving, L., Barry, R., LeBoutillier, N., & Westley, D. (2011). The Image Control and Recognition Task: A Performance-Based Measure of Imagery Control. *Journal of Mental Imagery, 35*, 67-80.
- LeBoutillier, N., Barry, R. & Westley, D.P. (2014). The role of schizotypy in predicting performance on figural and verbal imagery-based measures of creativity. *Creativity Research Journal, 26*, 461-467. doi: 10.1080/10400419.2014. 961778
- LeBoutillier, N. & Marks, D.F. (2003). Mental imagery and creativity. *British Journal of Psychology, 94*, 29-44. doi: 10.1348/000712603762842084
- Martindale, C. (2007). Creativity, primordial cognition, and personality. *Personality and Individual Differences, 43*, 1777-1785. doi: 10.1016/j.paid.2007.05.014
- McCallum, M., Piper, W.E., Ogrodniczuk, J.S., & Joyce, A.S. (2003). Relationships among psychological mindedness, alexithymia and outcome in four forms of short-term psychotherapy. *Psychology and Psychotherapy Theory, Research and Practice, 76*, 133-144. doi:
- McCrae, R.R. & Costa, P.T. (1987). Validation of the Five-Factor Model of Personality Across Instruments and Observers. *Journal of Personality and Social Psychology, 52*, 81-90. doi: 10.1037/0022-3514.52.1.81
- Mednick, S. (1962). The associative basis of the creative process. *Psychological Review, 69*, 220-232. doi: 10.1037/h0048850

- Miller, G.F. & Tal, I.R. (2007). Schizotypy versus openness and intelligence as predictors of creativity. *Schizophrenia Research*, 93, 317-324. doi: 10.1016/j.schres.2007.02.007
- Nyklíček, I., Poot, J.C., & van Opstal, J. (2010). Psychological Mindedness in Relation to Personality. *Journal of Clinical Psychology*, 66, 34-45. doi: 10.1002/jclp.20627
- Nyklíček, I. & Denollet, J. (2009). Development and evaluation of the Balanced Index of Psychological Mindedness (BIPM). *Psychological Assessment*, 21, 32-44. doi: 10.1037/a0014418
- Ostafin, B.D. & Kassmann, K.T. (2012). Stepping out of history: Mindfulness improves insight problem solving. *Consciousness and Cognition*, 21, 1031-1036. doi: 10.1016/j.concog.2012.02.014
- Pidgeon, A.M. & Ford, L. (2013). Investigating the relationship between reckless behaviours, gender, psychological mindedness, and attachment security. *The International Journal of Healing and Caring*, 13, 1-14.
- Piper, W.E., McCallum, M., Joyce, A.S., Rosie, J.S., & Ogradniczuk, J.S. (2001). Patient personality and time-limited group psychotherapy for complicated grief. *International Journal of Group Psychotherapy*, 51, 525-552. doi: 10.1521/ijgp.51.4.525.51307
- Runco, M.A., & Acar, S. (2012). Divergent Thinking as an Indicator of Creative Potential. *Creativity Research Journal*, 24, 66-75. Doi: 10.1080/10400419.2012.652929
- von Stumm, S., Chung, A. & Furnham, A. (2011). Creative ability, creative ideation and latent classes of creative achievement: What is the role of personality? *Psychology of Aesthetics, Creativity, and the Arts*, 5, 107-114. doi: 10.1037/a0020499

**Table 1.**

**Descriptive Statistics and correlations between Self-Report Predictor and Creative Cognition Target Variables.**

Variable	Mean	St. Dev.	AUT	CVT	RAT
IPIP					
Extraversion	30.478	5.258	.007	-.052	-.053
Agreeableness	32.624	6.862	.201	.068	-.065
Conscientiousness	31.521	5.932	.032	-.001	.065
Neuroticism	29.562	5.996	-.057	-.044	.007
Openness	31.085	5.349	.246**	.138	.053
BIMQ					
Interest	3.192	0.765	.141	.085	.173*
Insight	3.834	0.765	.096	.260***	.113

Note: N=176; \*  $p < .05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < .001$  for all two-tailed correlations; AUT is Alternative Uses Task; CVT is Creative Visualization Task Fluency Total Score; RAT is Remote Associates Task.

**Table 2.**

**Correlations between the Mindfulness Variables and the Personality Measures**

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BIPM	Ext.	Agree.	Consc.	Neur.	Open.
Interest	-.007	.220**	.192*	.036	.170*
Insight	.185	.005	-.070	-.132	-.023

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Note: N=176.; \*  $p < .05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < .001$  for all two-tailed correlations.

**Table 3.**

**Significant Coefficients Following Inclusion of the Personality Variables in Model 1 and the Psychological Mindedness Variables in Model 2.**

Target	Predictor	B	St. Error	St. B	t	Sig.	95% CI
AUT	IPIP Openness	0.074	0.030	.202	2.453	.015	-0.017, 0.131
CVT	BIPM Insight	6.818	1.907	.295	3.576	<.001	0.346, 1.103
RAT	BIPM Interest	1.192	0.603	.169	1.987	.049	-0.118, 2.260

Note. N=176.