

An investigation on the effects of personal characteristics on creativity and innovation

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ABSTRACT

This paper examines the effects of big Five factors including openness, conscientiousness, extraversion, agreeableness, and neuroticism on creativity and innovation among selected employees of municipality in city of Tehran, Iran. The proposed study uses a standard questionnaire developed by Costa and McCrae (1980) [Costa, P. T., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: happy and unhappy people. *Journal of Personality and Social Psychology*, 38(4), 668.] to measure the effects of five personality characteristics. In addition, the study has adopted a questionnaire developed by Torrents et al. (2010) [Torrents, C., Castaner, M., DINUŠOVÁ, M., & Anguera, M. T. (2010). Discovering new ways of moving: Observational analysis of motor creativity while dancing contact improvisation and the influence of the partner. *The Journal of Creative Behavior*, 44(1), 53-69.] for measuring creativity. Using a simple regression analysis, the study has detected negative and meaningful relationship between neuroticism and creativity and innovation ($\beta = -0.229$, t-value = -3.196), a positive and meaningful relationship between extraversion and creativity and innovation ($\beta = 0.209$, t-value = 3.204) and finally a positive and meaningful relationship between openness and creativity and innovation ($\beta = 0.225$, t-value = 3.717). However, the study did not confirm any relationship between agreeableness as well as conscientiousness and creativity & innovation.

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1. Introduction

Creativity and innovation are essential factors in firms and organizational leaders because much of today's competitive marketplace demands substantial value to customers, which reduces different cost components, increase quality, cycle time, and overall customer satisfaction (Scott & Bruce, 1994; Hunt et al., 2004). There are various studies on learning more about the effects of personality characteristics on creativity and innovation. Hoseinifar et al. (2011) performed an investigation on relationship between creativity and five factors of personality in high school students of Ardabil. They reported that boys were more creative than girls were. In addition, they showed that among five

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factors of personality, openness to experience, extraversion, agreeableness and conscientiousness were positive predictor of creativity and neuroticism was negative predictor of creativity. Yesil and Sozbilir (2013) performed an empirical investigation into the effect of personality on individual innovation behavior in the workplace.

2. The proposed study

This paper examines the effects of big Five factors are openness, conscientiousness, extraversion, agreeableness, and neuroticism on creativity and innovation among selected employees of municipality in city of Tehran, Iran. The proposed study uses a standard questionnaire developed by Costa and McCrae (1980) and McCrae and Costa (1987) to measure the effects of five personality characteristics. In addition, the study has adopted a questionnaire developed by Torrents et al. (2010) for measuring creativity. The proposed model of this paper is as follows,

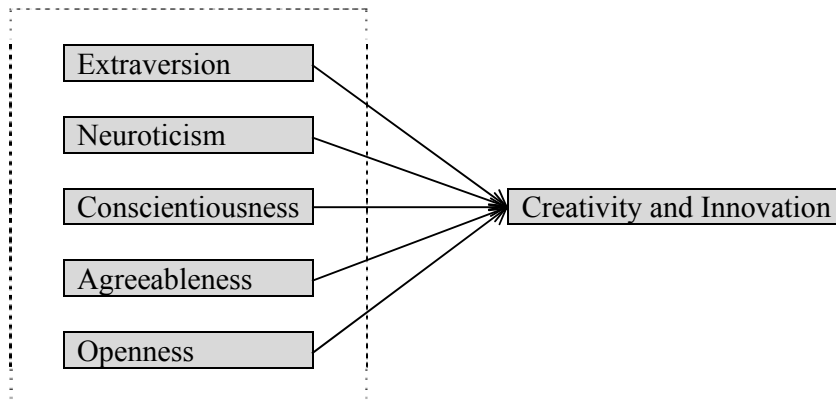


Fig. 1. The proposed study

The population of the study includes all full-time employees who work for municipality of Tehran, Iran. The sample size is calculated as follows,

$$n = \frac{N \times z_{\alpha/2}^2 \times p \times q}{\varepsilon^2 \times (N - 1) + z_{\alpha/2}^2 \times p \times q}, \quad (1)$$

where N is the population size, $p = 1 - q$ represents the yes/no categories, $z_{\alpha/2}$ is CDF of normal distribution and finally ε is the error term. Since we have $p = 0.5$, $z_{\alpha/2} = 1.96$ and $N = 620$, the number of sample size is calculated as $n = 237$. Cronbach alpha for openness, conscientiousness, extraversion, agreeableness, and neuroticism are 0.74, 0.87, 0.83, 0.76 and 0.86, respectively. In addition, the creativity questionnaire consists of four factors including fluid, expansion, innovation and flexibility are 0.85, 0.80, 0.82 and 0.84, respectively. These values are well above the desirable limits and we therefore perform the survey among all randomly selected people. There are size hypotheses associated with the proposed study of this paper as follows,

1. There is a positive and meaningful relationship between personality characteristics and creativity.
2. There is a negative and meaningful relationship between neuroticism and creativity and innovation.
3. There is a positive and meaningful relationship between extraversion and creativity and innovation.
4. There is a positive and meaningful relationship between openness and creativity and innovation.

5. There is a positive and meaningful relationship between agreeableness and creativity and innovation.
6. There is a positive and meaningful relationship between conscientiousness and creativity and innovation.

Fig. 2 shows details of the personal characteristics of the participants.



Fig. 2. Personal characteristics of the participants

As we can observe from the results of Fig. 2, nearly half of the people who participated in our survey had at least a bachelor of science. The study uses Kolmogorov-Smirnov test to verify the normality of five big components of personality characteristics and Table 1 summarizes the findings of our survey.

Table 1

The summary of some basic statistics along with Kolmogorov-Smirnov

Component	No.	Z	Sig.	Result
Neuroticism	237	.680	.745	Confirmed
Extraversion	237	1.175	.127	Confirmed
Openness	237	1.235	.095	Confirmed
Agreeableness	237	.999	.271	Confirmed
Conscientiousness	237	.979	.294	Confirmed
Creativity & Innovation	237	.585	.883	Confirmed

As we can observe from the results of Table 1, all components of the survey are normally distributed. The study uses regression analysis to examine different hypotheses of the survey. The general form of the proposed study is as follows,

$$\text{CRE-INV} = \beta_0 + \beta_1 \text{ Big Five} + \varepsilon, \quad (1)$$

where CRE-INV is the dependent variable, which represents creativity and innovation and Big Five states different components of personality characteristics including openness, conscientiousness, extraversion, agreeableness, and neuroticism.

3. The results

In this section, we present details of our findings on testing six hypotheses of the survey based on the implementation of structural equation modeling. Fig. 3 shows details of our findings. As we can observe from the results of Fig. 3, the coefficients associated with the first three variables including neuroticism, extraversion and openness are -0.229, 0.209 and 0.225, respectively and they are meaningful when the level of significance is five percent. However, the signs of two variables including agreeableness and conscientiousness are not statistically meaningful.

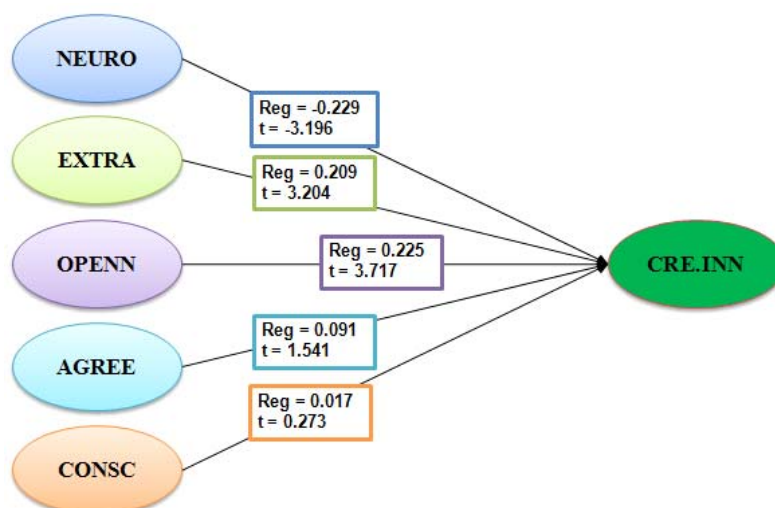


Fig. 3. The results of structural equation modeling

4. Conclusion

This paper has presented an empirical investigation to study the effects of five personality characteristics on creativity and innovation among regular employees of municipality of Tehran, Iran. Using a simple regression analysis, the study has detected negative and meaningful relationship between Neuroticism and creativity and innovation ($\beta = -0.229$, t -value = -3.196), a positive and meaningful relationship between extraversion and creativity and innovation ($\beta = 0.209$, t -value = 3.204) and finally a positive and meaningful relationship between openness and creativity and innovation ($\beta = 0.225$, t -value = 3.717). However, the study did not confirm on relationship between agreeableness as well as conscientiousness and creativity and innovation.

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