A REVIEW

A literature-based study of impact of personality traits on innovation diffusion using the big five personality framework

■ **Shweta Gupta and Shivendra K. Kashyap**

ABSTRACT

Innovation adoption occurs in different societies in varied ways. The theory of diffusion of innovation is, therefore, applicable in a variety of contexts and has implications in various disciplines. The process of diffusion of innovation has been found to be contingent on various individual level factors of which personality traits hold immense significance. This study is an attempt to propose the likely relationship between personality traits and innovativeness. The Big Five personality framework has been used, wherein positive relationship between four personality traits (extraversion, openness to experience, agreeableness, and conscientiousness) and innovativeness has been proposed while a negative relationship between neuroticism and innovativeness has been suggested.

KEY WORDS : Diffusion of innovation, Innovativeness, Big five personality framework

In any social system, individuals adopt innovations at different points of time (Rogers, 1976). The process of diffusion of innovation is defined as the process through which innovation is communicated to different members of a social system over a period of time via certain channels (Rogers, 2003). Based on the time period when individuals begin using any innovation, they are classified into adopter categories. The adopter categories are devised on the basis of innovativeness which is the degree to which an individual is relatively earlier in adopting a new product or technique than other individuals of the same system (Rogers, 2003). There are five adopter categories namely innovators, early adopters, early majority, late majority and laggards. Innovativeness is the main dependent variable in the diffusion research because it depicts behavioural change rather than cognitive or attitudinal change (Rogers, 2004). Behavioural change is the most desirable objective of innovation diffusion programmes. Also, the change agents (government, business organizations) want their clients to adopt innovations and thus, innovativeness becomes their prime objective.

The innovation diffusion categorization has generated considerable research avenues in the area of

---MEMBERS OF THE RESEARCH FORUM---

Correspondence to:
Shivendra K. Kashyap, Department of Agricultural Communication, G.B. Pant University of Agriculture and Technology, **Pant Nagar, U.S. Nagar (Uttarakhand) India**

Authors' affiliations:
Shweta Gupta, Department of Management, Indian Institute of Management, **Indore (M.P.) India**

consumer behaviour and marketing management. It has helped in developing marketing strategies, designing normative guidelines, and preparing analytical models for new products and new technology (Mahajan and Muller, 1979; Mahajan *et al.*, 1990 and Rogers, 1976). But Raynard (2017) suggests that understanding the personality traits of individuals in different adopter categories can help in easing the marketing efforts. Future marketing strategies can be made according to the personality traits of individuals, which can help in easy diffusion. Studies have shown the impact of relevant personality traits during innovation diffusion/adoption in different areas such as hospitality, banking, healthcare, etc. (e.g., Chaudoir *et al.*, 2013; Inwood *et al.*, 2009 and Mattila *et al.*, 2003). But, there are limited studies which examine the impact of personality traits on innovation diffusion using the Big Five personality framework. Since innovativeness is the major dependent variable used by past studies (Rogers, 2004), therefore, this study proposes the possible relationship between innovativeness and various facets of big five personality framework.

Diffusion of innovation :

The diffusion of innovation theory evolved from the Iowa hybrid seed corn study by Ryan and Gross in 1943 and later this lead to the development of a more general diffusion of innovation model by Rogers (Rogers, 2004). The general diffusion of innovation model gained acceptability in a wide range of academic disciplines like anthropology, geography, political science, marketing, history, economics, business management, technology, public health, education etc. (Greenhalgh *et al.*, 2005; Rogers, 2004 and Sahin, 2006). The process associated with diffusion of innovation is complex as it involves multiple factors (Meade and Islam, 2006). However, the process follows a sequential order of events and is represented by a normal curve of distribution wherein the innovators come first in the process by adopting the innovation in the first place, and laggards at the end of the process with them adopting the innovation in the last (Robertson, 1967). The four main elements of this process include innovation, communication channel, time, social system (Rogers, 2003). All these elements affect innovativeness and thereby the innovation decision process which consists of five stages namely knowledge, persuasion, decision, implementation, and confirmation (Sahin, 2006). Thus, the entire chain of diffusion of

innovation helps in predicting the decision of an individual to adopt or the intention to adopt an innovation (Lyytinen and Damsgaard, 2001). Individuals have a threshold for innovation and this threshold is associated with the critical mass (Rogers, 1962 as cited in Meade and Islam, 2006). For an innovation to be widely adopted, there must be a critical mass which has already adopted the innovation; and once the adoption is widespread, the social pressure reaches more threshold (Meade and Islam, 2006). Thus, innovators have a low threshold while laggards have the highest. The relative time of adoption of innovation is represented by innovativeness on the basis of which adopter categories are devised. These categories are exhaustive (excluding non-adopters), mutually exclusive and based on one classificatory principle and the mostly widely used classification as well (Rogers, 2003). There are several variables related to innovativeness and based on past studies Rogers (2003) classified these variables under the head of socio-economic status, personality variables and communication behaviour. For the purpose of this study, personality variables will be considered using the Big Five personality framework.

Big five personality framework :

The Big Five personality framework is one of the most dominant personality trait framework and has been used in numerous settings (Roccas *et al.*, 2002). The framework describespersonality using five relatively independent dimensions which are labelled as Extraversion, Neuroticism, Agreeableness, Conscientiousness and Openness to Experience (Barrick and Mount, 1991). The taxonomy provides us with a meaningful set of personality constructs and thereby a consistent way to study individual differences and associated relationships (Zhao and Seibert, 2006). It has contributed immensely to the discipline of behavioural and social sciences (McAdams and Pals, 2006) and has helped integrate researches on various aspects linked to an individual like emotional, attitudinal, interpersonal, experiential, and motivational (Zhao and Seibert, 2006). Studies have shown that personality trait impacts a wide range of variables like job performance, entrepreneurial status, turnover decision, psychological contract, purchase intention, etc. (e.g., Barrick *et al.*, 2005; Mooradian and Olver, 1997; Raja *et al.*, 2004; Zhao and Seibert, 2006 and Zimmerman, 2008). But, personality traits and its association with innovativeness has received

limited research attention (Rogers, 2003). There are few studies which have empirically examined the relationship between personality traits and innovativeness (e.g., Vishwanath, 2005 and Zappa and Mariani, 2011). Since, both Big Five personality framework and diffusion of innovation model are applicable to a wide range of settings, therefore, there is immense scope to test for the relationship between innovativeness and personality traits in these varying settings.

Propositions based on review of literature:
Neuroticism and diffusion of innovation :
Neuroticism is associated with negative emotions like anxiety, depression, embarrassment, insecurity, emotional fragility, and nervousness (Barrick and Mount, 1991). While those low on neuroticism tend to be characterized as self-confident, calm, emotionally stable, and relaxed (Roccas *et al.*, 2002; Zhao and Seibert, 2006). Early adopters are willing to take risk (Mattila *et al.*, 2003) and able to cope up with uncertainty in a better way as compared to late adopters (Rogers, 2003). They bear the risk regarding the success of the innovation and the loss associated with it in case of failure. It can be assumed that early adopters have a tendency to remain calm and are emotionally stable. Therefore, it is likely that innovativeness will be negatively associated with neuroticism.

Proposition 1: Innovativeness is negatively associated with Neuroticism.

Extraversion and diffusion of innovation :
Extraversion includes traits like being sociable, assertive, gregarious, assertive, enthusiastic, talkative, dominant and active (Barrick and Mount, 1991). People high on extraversion seek excitement and stimulation with individuals and groups, while those low on it prefer being alone, quiet, reserved and independent (Zhao and Seibert, 2006). Extraversion is found to be positively linked with enterprising behaviour (Costa *et al.*, 1984) as well as interpersonal relationships (Côté and Moskowitz, 1998). As suggested by Rogers (2003), interpersonal communication channel is an important factor related to adoption, and adopters have strong interpersonal links. Similarly, innovativeness also demands an initiation for adoption of innovation by the early adopter. Thus, considering the above arguments it is likely that innovativeness and extraversion will be positively linked.

Proposition 2: Innovativeness is positively associated with extraversion.

Openness to experiences and diffusion of innovation:
The dimension of openness to experience commonly includes traits like imaginative, cultured, creative, curious, reflective, original, broad-minded, intelligent, untraditional, and artistically sensitive (Barrick and Mount, 1991; Zhao and Seibert, 2006). Individuals low on this dimension generally keep narrow interests, tend to be unanalytical, and possess a conventional attitude (Zhao and Seibert, 2006). Early adopters are also assumed to be higher in intelligence, having a more positive attitude towards change and innovation, than late adopters (Rogers, 2003). Studies have found that adoption of innovation requires a predisposition towards openness to new ideas and curiosity to seek information about other innovations (Vishwanath, 2005 and Zappa and Mariani, 2011). Thus, openness to experience is likely impact innovativeness in a positive way.

Proposition 3: Innovativeness is positively associated with openness to experience.

Agreeableness and diffusion of innovation :
Agreeableness depicts the interpersonal orientation of an individual (Zhao and Seibert, 2006). It is characterized by traits like courteousness, flexibility, altruistic, tolerant, caring, forgiving and good-natured (Barrick and Mount, 1991). An individual on the lower end of this dimension is seen as self-centered and manipulative. Early adopters are suggested to be more empathetic and less dogmatic as compared to late adopters (Rogers, 2003). Thus, it can be assumed that they are more courteous and flexible in their attitude. Hence, it is likely that agreeableness will positively relate with innovativeness.

Proposition 4: Innovativeness is positively associated with Agreeableness.

Conscientiousness and diffusion of innovation :
Conscientiousness reveals the ability of an individual to work hard, motivation, perseverance and planning in pursuit of accomplishing a goal (Barrick and Mount, 1991). It is reflected by traits like being responsible, careful, organized, and thorough. It also depicts achievement motivation and dependability (Zhao and Seibert, 2006). Rogers (2003) also described early

adopters to be having higher aspirations, greater achievement motivation, and lesser fatalistic in comparison to late adopters. A study on SME entrepreneurs also indicated a positive correlation between adoption of innovation and conscientiousness (Marcati *et al.*, 2008). Thus, it is likely that innovativeness can be positively related with conscientiousness.

Proposition 5: Innovativeness is positively associated with conscientiousness.

Conclusion :

The concept of innovation of diffusion is widely used in various disciplines ranging from agriculture, to education, medical science, product development, consumer psychology, marketing, etc. Since innovativeness widely relates with components of human behavior in terms of its applications, therefore understanding and further examining what personality traits impact innovativeness would be of immense use. Future studies can empirically examine the propositions discussed in this study for further validation of the theoretical arguments presented. Moreover, these propositions can be tested under different contexts including variables such as organizational or national culture.

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