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THE IMPACT OF INDIVIDUAL DIFFERENCES ON CONSUMERS' ADOPTION OF PRODUCT INNOVATION

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ABSTRACT

Today, innovation is one of the main concerns of companies' senior managers. In the new age, organizations on the one hand should be equipped to innovation system in order to preserve their own existence, and on the other hand should adopt methods for production and supply of goods to make their goods and services accepted by the users. The purpose of this study is to determine the impact of individual differences (variety-seeking, risk aversion, and consumer product knowledge) on consumer adoption and attitudes towards innovation in electronic products. This research is applied in terms of objective, and descriptive-survey based on data collection method. The main data collection tool is questionnaire. The statistical population includes electronic products consumers in Rasht city, and using available non-probability sampling method, the sample includes 384 persons. Experts' views are used to examine the validity of the questionnaire and Cronbach's alpha is used to examine its reliability. Data analysis is conducted in descriptive and inferential statistics. Since research data are non-normal, structural equation modeling in PLS method is used to analyze the data. The results show that variety-seeking and consumer product knowledge affect consumer attitudes towards product innovation. However, effect of risk aversion on consumer attitudes towards product innovation is rejected. The impact of attitude on consumer adoption is also confirmed.

Keywords: *Product Innovation, Consumer Attitude, Consumer Adoption, Risk Aversion, Product Knowledge, Variety-seeking*

INTRODUCTION

Field of consumer behavior is so huge that everyone can recognize only a part. Nowadays, consumers are the key to the success or failure of a company (Zarei *et al.*, 2012). Considering that consumers act in a dynamic and constantly changing environment, and products and services are constantly developing, marketing managers must have a detailed understanding of consumer behavior (Safarzadeh & Kheiri, 2011). It is very important for marketers to understand the consumers' decision-making process in purchasing new products (Coelho *et al.*, 2010).

Due to the intense competition in today's world, innovation is one of the main concerns of the senior executives of companies. Companies feel forced to take innovation to the market at frequent intervals to meet the consumers' market demand (Hoffmann & Soye, 2010). Many industries, including electronic products industry, are faced with several challenges such as production technology development, shortening of product life-cycles, the expansion of competition, ever-changing tastes and expectations of customers (Ghavidel, 2013). What is influential besides production and product quality is innovation and diversification of products according to consumers' taste and individual differences (Majlesi, 2002).

In the absence of new products, companies are faced with many risks. On the other side, most of the new ideas do not lead to new acceptable products (Rajab & Faridi, 2012). The success of a new product or service depends on consumer's adoption (Buligescu *et al.*, 2012). Adoption is a decision made to take full advantage of innovations the best and most accessible action. Due to the acceleration of technological innovation and shortening of product life-cycles, it is getting increasingly difficult to explain and predict consumer's adoption towards innovation (Wenjing, 2006). For a company to be successful in bringing about innovation, it is important to know and understand the target Acceptors the factors influencing their

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decision to adoption (Kundu & Roy, 2010). Coupled with the increasing importance of innovation, it is important to consider consumer's adoption of innovation and the factors affecting consumer's adoption; yet at the same time, this is a very risky process (Lee, 2012).

Users' reluctance to accept products often impairs its performance targets. Rogers (1983) suggested that consumer's adoption process involves knowledge, persuasion, decision, implementation and verification. Also, adoption process includes recognition (knowledge and interest) and behavioral procedures (test and adoption). Due to individual differences, consumers develop different consumption behaviors (Iman, 2008). These individual differences have different effects on adoption of various products and services (Udo *et al.*, 2010). Better understanding of the consumers' characteristics can be effectively helpful for corporate executives in successful release of new product (Amirshahi *et al.*, 2012). People show different reactions to an action, idea, or object based on their different attitudes towards innovation. Consumer attitude affects the purpose and intent of people, and subsequently their actions. Behavioral attitudes and intentions usually predict innovation diffusion and adoption rate (Rogers, 2003).

Reasoned Action Theory states that consumer attitude influences intention and intention subsequently influence action. Hence, consumer attitude towards product innovation is likely an important mediator to investigate the consumer adoption of product innovation (Lee, 2012). Consumers' attitudes affect buying behavior; accordingly, what consumers know about the products can create a positive or negative attitude toward the product (Ivan & Penev, 2011). In the study conducted by Lee (2012), using the technique of focus group discussions, the likely precedents of consumers' attitude toward product innovation were examined and thus three consumer traits were selected as possible antecedents of consumer attitude towards product innovation: variety-seeking, risk aversion, and product knowledge (Lee, 2012).

Variety-seeking consumers tend to change the brand and to purchase innovative goods and services. Risk adoption is an indicator of accepting the risk of purchasing new products. This indicator is used for the assessment of individual's values or general attitudes towards testing new products. Risk aversion is the opposite of risk adoption. Risk aversion consumers, have a higher risk perception. High degree of risk perception reduces adoption of innovation (Schiffman & Kanuk, 2009). Previous research shows that knowledge can affect attitude, evaluation and consumption behavior. Sufficient information about a product can affect a consumer's perceptions of the product features. Also, it will have an impact on the adoption of the product (Tuu & Olsen, 2012).

Introduction to the Literature

Consumer's Adoption of Innovation

Innovation: According to Rogers (1995), "Innovation is an idea, practice or object accepted as a new thing by an individual or other entities". Idea, practice or object need not be on a new market. It just suffices to be for a new person. Robertson (1976) classifies innovation into three categories of continuous, dynamic-continuous, and discontinuous based on its impact on social behavior and structure (Kim, 2008).

Adoption of innovation: Adoption, refers to the decision of the person or organization in applying innovation. Adoption of innovation can be defined as the consumer's decision in absolute application of innovation (Rogers, 2003). People react to their environment through two opposite forms of behavior: adoption and avoidance. Adoption behaviors refer to the positive activities that may be led in a particular area. Previous research has shown that positive emotions and understanding engendered by product features and the environment lead to adoption behavior (Elahi *et al.*, 2013). It is vital for managers involved in marketing innovation to understand why consumers accept a new product / service. This is the norm that they perceive consumer's attitude toward innovation and their purchase intention based on market research (Arts *et al.*, 2011). Rogers (1983), Rogers and Shoemaker (1971), divide the adoption process into five stages: 1) knowledge, 2) interest or encouragement 3) assessment or decision 4) test or run 5) approval or adoption (Schiffman & Kanuk, 2009).

Factors affecting the adoption of innovation: in the literature on adoption of innovation, the potential characteristics of acceptors and the perceived characteristics of innovation play a major role in the adoption of innovation. The number of variables used to record the characteristics of acceptors is very high and a great deal of the research has been devoted to finding the attributes of the consumers who are

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likely to accept innovation. The characteristics of acceptors records personal (potential) attributes of acceptors of innovation, which can be divided into psychological and demographic characteristics. Innovative features refer to the characteristics of consumers who evaluate innovation. In the literature of innovation, these are generally shown by consumer perception of relative advantage, compatibility, complexity, capability to be observed and tested, and the uncertainty and risk of innovation (Arts *et al.*, 2011).

Consumer Attitude

Kotler and Armstrong define attitude as the individual's evaluation, feeling, and a relatively stable tendency towards an agreeable or disagreeable object or idea. Attitude provides a conceptual framework for the individual, which specifies loving, or hating something and going towards it or away from it (Kotler & Armstrong, 2013). Turst one (1928), defined attitude as the intensity of a person's feeling about a stimulus. He emphasizes that attitude reflects the "sum of tendencies and feelings, prejudice and bigotry, pre-conceived notions, ideas, fears, threats and beliefs about any specific subject". One of the most extensive studies on the concept of attitude was performed by Doob (1947). He considers attitude as an absolute response and generator of stimulation in individual communities (Ivan & Penev, 2011). Attitudes are made of beliefs that a person has acquired during his lifetime. Some beliefs are formed from direct experience. Some are obtained from external information and the rest are guessed or come up by themselves (Linh, 2009). However, only a few of these beliefs are used to actually influence the attitudes. These beliefs are called outstanding (sensible) beliefs and are considered as the evident factors of a person's attitude (Ajzen & Fishbein, 1980).

Research on attitude was popularized in the early 1900's. One of the main reasons for it was explained by Wicker (1969). Theorists came to the conclusion that there is a real connection between attitude and behavior. The idea was reinforced by recent authors that attitude explains consumer behavior even better than other factors such as age and income (Ivan & Penev, 2011). In an effort to understand the relationship between attitudes and behavior, psychologists provided models in which the basic aspects of attitude could be identified. One of these models is the model of rational action theory introduced first by Ajzen and Fishbein (1967). The aim of this theory was to predict and understand the stimulatory factors influencing individual behavior. According to this theory, the determining factor of a person's behavior is his purpose for doing or not doing a particular behavior (Abdolvand & Barvand, 2011).

Components of Attitude

In the present study that is adapted from Lee's research method (2012), attitude components include quality, value and attractiveness. Consumer's attitude towards innovation is measured by these three components.

Product quality: the customer's overall evaluation is defined by the superior performance of a product or service. After the completion of 1135 personal interviews with large and small companies, it was concluded that, in total, from among 26 parameters, quality is the most important parameter to be considered in creating a competitive advantage (Sanayei & Shafei, 2012).

Value: nowadays, the value creation process has become one of the main research topics in marketing. Although various definitions have been made for value such as the "resultant benefits and costs" or "relationship between quality and price," market value is generally the value perceived by the customer which includes both economic and non-economic components. Based on this definition, it seems that value assessment is done only by the customer (Ahmadi & Jafarzadeh, 2013).

Attractiveness: product attractiveness is among the parameters of product characteristics, which includes "attractive product price", "attractive product quality" and "attractive product design". These factors stimulate customers to accept the product. To compete in the market, companies need to consider these factors (Chan *et al.*, 2010).

Consumer's Variety Seeking

When a person wants to satiate their desire through a change or renewal of product features, they will not hold fast to one thing but prefers to have different choices, which is called variety seeking. According to McAlister and Pessemier (1982), there are two types of variety-seeking behaviors: derived variety-

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seeking and direct variety-seeking. Derived variety-seeking behavior is associated with the stimuli other than the desire for variety-seeking and this type creates multiple users or multiple positions as a result of multiple needs. Direct variety-seeking behavior is the result of internal stimulation (Cam, 2011). According to Lee (2012), it is more likely that the consumers who are dissatisfied with the product look for variety. The consumers who are looking for diversity more than others show more positive attitude to product innovation (Lee, 2012).

Consumer's Risk Aversion

Risk can be defined as an objective feature of a particular situation; yet, risk estimation includes a detailed assessment of the individual's characteristics and an accurate risk assessment in that situation. Following the theory of subjective expected utility, risk is modeled in reflecting the decider's response to the uncertain results in terms of specific probabilities of the risk (Mitchell, 1999). Risk aversion is defined as "the extent to which people feel threatened in unclear situations and believe that they should avoid them". Individuals with higher risk aversion, actually those who are prone to fear in risky and unclear situations (Lee, 2007).

One of the concepts considered in the study of consumer behavior is the customer's perceived risk. Researchers studying customer behavior, often define the perceived risk as the customer's perception of uncertainty and potential adverse consequences of buying a product or service. Mitchell (1992) argued that the perceived risk is influenced by the 5 stages of consumer decision process including problem identification, searching for pre-purchase information, evaluation of options, purchase decision and post-purchase behavior (Lee, 2007). The most common types of risks perceived by consumers when making decisions about the product are: operational risk, physical risk, financial risk, social risk, psychological risk, and temporal risk. Each consumer has his/her own strategy for reducing the perceived risk. The risk-reducing strategies increase consumer confidence despite the uncertainty in their decision about the product. Some of the most common risk-reducing strategies are: information search by consumers, loyalty to the brand, product selection based on brand image, relying on the image of the store, purchase of the most expensive model, and search of guarantee (Schiffman & Kanuk, 2009).

Generally, it is assumed that decision-makers are risk-avoiding; they prefer smaller risks to greater risks which bring up the consequences (Shahadan, 1996). Ebrahimi *et al.*, concluded in their study that risk aversion has negative effect on individuals' attitude toward fake products and luxury brands (Ebrahimi *et al.*, 2012).

Consumer's Product Knowledge

Product knowledge is the consumer's awareness, knowledge and understanding of a particular product (Nematizadeh & Seraji, 2010). Consumers should grow a certain attitude toward the product while evaluating product features and make most of their experiences. Product knowledge can be defined as the information stored about a particular product (Ivan & Penev, 2011). Knowledge is mainly classified into understanding and expertise, in which understanding is a function of the experiences on the product collected by the consumer while expertise is the ability to perform tasks related to the product. Also, knowledge is classified according to the content, nature, complexity and amount of information stored in the memory (Tuun & Olsen, 2012).

Consumer knowledge plays an important role in explaining consumer behavior, particularly with respect to information-seeking and information-processing (Linh, 2009). Product knowledge was studied by Brucks (1985), who claims that consumers rely on objective and subjective knowledge to make a purchase decision. Subjective knowledge is defined as consumer's confidence in his/her knowledge or, in other words, refers to the individuals' awareness of the information stored in memory about the product category. Objective knowledge is defined as the true knowledge a consumer has or the actual amount of correct information stored in the memory (Ivan & Penev, 2011). Each of the types of knowledge has different impact on information processing and the subsequent consumer behavior (Linh, 2009). Consumers' attitude is affected by their knowledge. Research shows that knowledge influences attitude, evaluation, and consumer behavior. Consumers with higher levels of knowledge can identify product or service benefits better than those with lower levels of knowledge (Tuun & Olsen, 2012).

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Consumer's attitude affects buying behavior. So what consumers know about the products can create a positive or negative attitude toward the product (Ivan & Penev, 2011).

Research Objectives and Hypotheses

Main Objective

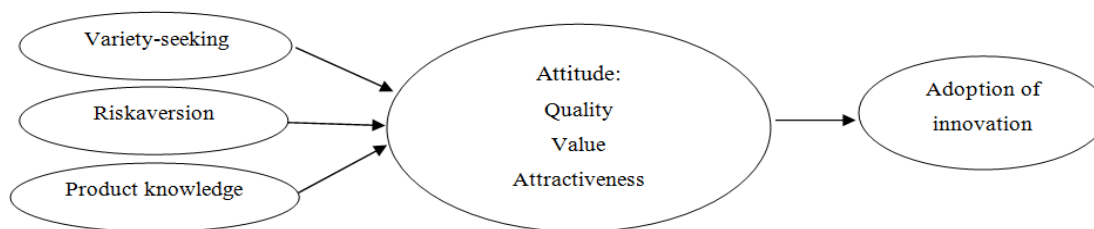
Identification of the effect of individual differences, (variety-seeking, risk aversion and consumer's product knowledge) on consumer's attitudes and adoption towards product innovation.

Research Hypotheses

- 1) Consumers' variety-seeking influences consumers' attitude towards product innovation.
- 2) Risk aversion influences consumers' attitude towards product innovation.
- 3) Consumer product knowledge influences consumers' attitude towards product innovation.
- 4) Consumers' attitude towards product innovation influences consumer's adoption of product innovation.

Theoretical Framework

This study focuses on consumers' attitude towards product innovation in a particular product category rather than on a particular brand and is in line with Lee's 2012 research. Using the technique of focus group discussions (FGD), the possible precedents of consumers' attitudes toward product innovation are examined. As a result, three characteristics of consumers were selected as possible precedents of consumers' attitudes toward product innovation: variety-seeking, risk aversion and product knowledge.



Research conceptual model: (Bruce, 2012)

In this study, the following question will be answered:

Do individual differences affect consumer's attitude toward and adoption of product innovation in electronic products industry?

MATERIALS AND METHODS

Methodology

Since the aim of the present study was to investigate the impact of individual differences on consumer's attitude toward and adoption of product innovation and the results can be used by managers of commercial and manufacturing companies supplying innovative products, the present study is considered an applied research regarding its purpose and is cross – correlational regarding its nature and methods. The data needed for this study were collected using a questionnaire whose validity was tested. Data analysis was conducted in two parts: descriptive and inferential statistics. The Kolmogorov-Smirnov test was used to test normality. Due to the non-normality of research data, the structural equation modeling was used through PLS method to analyze data. The data were analyzed using SPSS and PLS.

The Population, Sampling Method and Data Collection

The sample population consists of all the customers and consumers of electronics in Rasht (a northern city in Iran). Considering that the statistical population was unlimited and there was no possibility of counting all customers, non-probability convenience sampling method was used. 384 people were estimated as

sample number through the formula
$$n = \frac{z_{\alpha}^2 S_x^2}{\epsilon^2}$$

The Measurement of Variables and Measurement Validity

To measure the variables, a questionnaire with five item Likert scale was used. The reliability was calculated through a sample of 30 using Cronbach's alpha as shown in Table 1. The figures indicate the

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reliability of the questionnaire. The content validity was examined using the literature, the experts' and specialists' opinions, and preliminary distribution of the questionnaire among a number of the subjects of the statistical sample.

Table 1: Cronbach's alpha value of questionnaire questions for separate variables

Variables under study	Number of questions	Cronbach's alpha
Consumer's attitude towards product innovation	7	0.791
Consumer's variety seeking	4	0.828
Consumer's Risk aversion	3	0.855
Consumer's product knowledge	3	0.835
Consumer's adoption of product innovation	5	0.756
Total		0.819

RESULTS AND DISCUSSION

Descriptive Findings

53% of respondents are female and the majority of them are young single people between 20 and 30 years of age and their level of education are BA and BS. Their income level is under ten million RSS. The majority of participants chose the mobile phone.

Referential Findings

The t-statistic was used to evaluate the significance of paths (the effects of independent variables on the dependent variable). The results of significance test indicate that the values larger than 1.96 are significant at 0.05 level and the values larger than 2.66 are significant at 0.01 level.

Table 2: Results of hypothesis testing

Hypotheses	Path coefficient	t statistic	Test results
Consumer's variety-seeking influences consumer's attitudes towards product innovation	0.33	4.84	Accepted
Consumer's risk aversion influences consumer's attitudes towards product innovation	-0.08	1.24	Rejected
Consumer's product knowledge influences consumer's attitudes towards product innovation	0.32	5.11	Accepted
Consumer's attitudes towards innovation influences impact on consumer's adoption of product innovation	0.51	8.80	Accepted

First hypothesis: Consumers' variety-seeking influences consumers' attitude towards product innovation. According to the test results and t statistics (4.84) which is not in the range (1.96, -1.96), the first hypothesis is accepted; that is, consumers' variety-seeking influences consumers' attitude towards product innovation. This result is consistent with the research conducted by Mc Alistair and Pessemier (1982) and Lee (2012), but is inconsistent with Oldemaat (2013).

The second hypothesis: consumer's risk aversion influences consumers' attitude towards product innovation.

According to the test results and t statistics (1.24) which is in the range (1.96, -1.96), the second hypothesis is rejected; that is, consumer's risk aversion influences consumers' attitude towards product innovation, which is consistent with Lee's research (2012) in which it was also observed that the impact of risk aversion on attitude towards product innovation is not significant. Also, the result is consistent with the research done by Ebrahimi *et al.*, (1391) who concluded that the impact of risk aversion on the attitude toward forged products is not significant. But it is inconsistent with Lee's research (2007) in which risk aversion had negative effect on attitudes towards virtual store.

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Despite consumer's risk aversion, there may be other factors that make its impact on the attitude insignificant. These factors may be internal or external. Internal factors such as excessive variety-seeking, being forward-looking, and consumer's knowledge which reducing risk aversion. External factors that reduce the risk, including warranty, purchase of the most expensive model, purchase of a famous brand, etc.

The third hypothesis: Consumer product knowledge influences consumers' attitude towards product innovation.

According to the test results and t statistics (5.11) which is not in the range (1.96, -1.96), the third hypothesis is accepted; that is, consumer product knowledge influences consumers' attitude towards product innovation. This result is consistent with Lee (2012), Ivan and Penev (2011), based on the fact that product knowledge has a positive impact on consumer's attitudes.

The fourth hypothesis: Consumers' attitude towards product innovation influences consumer's adoption of product innovation.

According to the test results and t statistics (8.80) which is not in the range (1.96, -1.96), the fourth hypothesis is accepted; that is, consumer attitude towards product innovation influences consumer's adoption of product innovation. This result is consistent with the study of Elahi *et al.*, (2013), Jahangir and Begum (2008), Wang (2008), Cole (2009), Rogers (2010), Lee (2012) and Barska (2014).

Applications

The results of this study can be widely applied by manufacturers, trading companies offering innovative products and marketers in terms of how to produce and market their technology products. Companies can make a significant progress in the development of their technology products through understanding consumers' individual differences which lead to the desired attitude and have the greatest impact on consumer's adoption behavior.

1. The results of the first hypothesis, based on the impact of consumers' variety-seeking on their attitudes toward product innovation, suggest that corporates should pay more attention to variety-seeking people. Because of their desire to satisfy different tastes and their willingness to learn about the different options that are offered in the market and, at the same time, to maintain flexibility, consumers show variety-seeking behaviors. Managers must take the variety of products into account and offer more choices to consumers and allow the high cost of meeting customers' different tastes. However, too much variety causes consumer confusion and also causes high costs for manufacturers. Accordingly, an optimal variety should be considered. Business managers need to target the consumers who are dissatisfied with existing products and are seeking variety. Also, in their advertising, they should emphasize the new applications and features of innovative products that can create new experiences for consumers.

2) According to the findings for the third hypothesis, based on the impact of product knowledge on consumer's attitudes towards product innovation, it is proposed to increase consumer knowledge by informing consumers about innovative products and the benefits of using it. Further explanation should be given to consumers in the advertisements and at the time of purchase. If consumers are allowed to compare similar products, they can have more knowledge, which accelerates the adoption of innovation. An environment should be provided for clients to examine and try innovative products and they should be taught how to use them. It seems unlikely that the consumers who have much knowledge show deterrence in accepting the product. This knowledge can also be provided through various media.

3) According to the findings for the fourth hypothesis, based on the impact of attitude on consumer's adoption, it is proposed that electronics manufacturers take into account the favorable attitude in relation to these products as their strategic goals in order to predict and understand consumer's buying behavior for innovative products. Managers should focus on changing consumer's attitudes before they make their decision. Considering that attitude is measured by three components of quality, value and attractiveness, it is recommended that new products be improved compared to the existing products and are offered with a price the same as, or even less than, the existing products. In the advertisements, the quality and value of the new product should be stressed compared to similar types. Also, both in the production and

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marketing, the product's attractiveness should be emphasized in terms of price, quality and design compared to similar types.

Limitations of the Study and Implications for Future Research

1) The present study addressed the electronic products industry and only one category of these products. Different results may be obtained for other industries. It is recommended that separate studies are conducted for other categories of electronic products (such as house appliances) or other industries and the results are compared with those of this research.

2) In the present study, the impact of only 3 of individual differences (variety-seeking, risk aversion and product knowledge) on consumer attitudes and adoption towards product innovation was measured. It is recommended that other variables such as consumers' forward-looking tendencies or consumers' demographic characteristics be added to the study model as independent or modified variables in order to further understand the factors affecting the adoption of innovation.

3) The impact of risk aversion on the attitude towards product innovation has been considered in general. It is likely different results are obtained if different aspects of risk are investigated. It is proposed that different aspects of risk such as operational, physical and financial risk, which might have different effects on consumers' attitudes, are used in the model.

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