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THE STUDY ON THE MEDIATOR ROLE OF LEADERSHIP TASKS IN THE RELATIONSHIP BETWEEN ENTREPRENEURIAL PASSION AND INNOVATIVE BEHAVIORS: THE CASE OF THE ENGINEERING PROFESSION

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Abstract

This study aims to analyze the mediating role of leadership tasks in the impact of entrepreneurial passion on innovative behaviors. Looking at the entrepreneurial ecosystem, engineers, as a professional group that closely follows innovations and the rapid interaction of global markets, come to the fore with their entrepreneurial passion and innovative behavior. In this context, the sample of the research consists of 325 working individuals who graduated from engineering faculties. In the study, the data were collected through a questionnaire measuring scales of entrepreneurial passion, innovative behaviors and leadership tasks; then validity and reliability of the data put to the test. SPSS 2.0 statistical program was used in the analysis process. According to the research findings, it has been determined that passion for entrepreneurship has a positive effect on innovative behaviors. In addition, they show that leadership duties have a partial mediating role in the relationship between entrepreneurial passion and innovative behaviors. This study was ethically approved by Istanbul Esenyurt University Ethics Committee with its decision dated 12.09.2022 and numbered 2022/08-25.

Keywords: Entrepreneurial passion, innovative behaviors, leadership tasks

Jel Classification: M10, M13, M19

GİRİŞİMCİLİK TUTKUSU VE YENİLİKÇİ DAVRANIŞLAR İLİŞKİSİNDE LİDERLİK GÖREVLERİNİN ARACI ROLÜNÜN İNCELENMESİ: MÜHENDİSLİK MESLEK GRUBU ÖRNEĞİ

Özet

Bu çalışmanın amacı girişimcilik tutkusunun yenilikçi davranışlar üzerindeki etkisinde liderlik görevlerinin aracı rolünü analiz etmektir. Girişimcilik ekosistemine bakıldığında girişimci tutkusu ve yenilikçi davranışları ile birlikte küresel pazarların hızlı etkileşiminin ve yeniliklerin yakın takipçileri olan mühendisleri ön plana çıkarmaktadır. Bu bağlamda çalışmanın örneklemini mühendislik fakültesinden mezun olmuş 320 çalışan birey oluşturmaktadır. Çalışmada veriler girişimcilik tutkusu, yenilikçi davranışlar ve liderlik görevleri ölçeklerini kapsayan bir anket yardımı ile toplanmış ve verilerin geçerlilik ve güvenilirlikleri test edilmiştir. Analiz sürecinde SPSS 2.0 istatistik programı kullanılmıştır. Araştırma bulgularına göre girişimcilik tutkusunun yenilikçi davranışlar üzerinde pozitif etkisi olduğu tespit edilmiştir. Ayrıca araştırma bulguları liderlik görevlerin, girişimcilik tutkusu ile

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yenilikçi davranışlar ilişkisinde kısmı aracılık rolüne sahip olduğunu göstermektedir.Bu çalışma İstanbul Esenyurt Üniversitesi Etik Kurulu tarafından 12.09.2022 tarihli ve 2022/08-25 sayılı kararı ile etik açıdan uygun bulunmuştur.

Anahtar Kelimeler: Girişimcilik tutkusu, yenilikçi davranışlar, liderlik görevleri

JEL Sınıflandırması: M10, M13, M19

1. Introduction

Over the past decade, the theme of passion has entered into the focus of discussions in popular media and international bestsellers. According to the common opinion, making a potentially significant contribution to society by engaging in passionate activities that transform people's talents and interests into productive and successful action is an indicator of a successful life (O'Keefe, et al., 2018). The subject of passion has also been the focus of attention in many academic studies (Curran, et al., 2015). Studies conducted in a wide range of academic disciplines, including educational and sports psychology, organizational behavior, and strategic management, highlights the key role that passion plays in influencing individuals' motivations and behaviors (Vanhees, et al., 2021). In the last decades entrepreneurial passion is the one of the subfields of passion studies that researchers have particularly focused their interest on. Entrepreneurial passion, in its simplest definition, is described as an individual's passion for inventing, establishing or developing a new business (Cardon, et al., 2013). Given the importance of entrepreneurial activity in economic and social development, researchers have begun to examine the role entrepreneurial passion plays in the creation and development of start-ups, as well as the personal and contextual factors associated with entrepreneurial passion. Recent studies have shown that entrepreneurial passion is linked to a range of outcomes, including venture growth and performance, access to financial sources and entrepreneurial persistence (Drnovsek, et al., 2016; Mueller, et al., 2017). While research on entrepreneurial passion is a burgeoning and growing subfield of passion, there are many variables associated with entrepreneurial passion encapsulating myriad insights.

Considering premises for entrepreneurial passion, subjects like age, gender, educational status, age of the company, entrepreneurial trials/experiments, motivation are important as personal factors whereas we find topics such as entrepreneurship education, organizational climate, leader's attitude, market situation and entrepreneurship culture as contextual factors. Factors such as innovative behaviors, effort, ambition, creativity and performance as outputs of entrepreneurial passion are the findings obtained in studies (Cannals, 2016; Crumpton, 2012).

When one looks at entrepreneurial ecosystem, the entrepreneurial passion of technology-savvy engineers and their potential to exhibit innovative behaviors bring this profession to the forefront. In the light of all these facts, the primary purpose of the study is to make sense of the relationship between entrepreneurial passion triggering the desire in entrepreneurship activities as tools for innovation and change, with innovative behaviors and leadership duties. Within the scope of the research model designed in this framework, the mediating role of leadership tasks in the relationship between entrepreneurial passion and innovative behaviors will be taken under examination.

As the literature indicates, countries specialized in engineering and invest in an economy based on technology production, produce entrepreneurs in their next generation. By the year of 2021 56% of the entrepreneurs who receive investments are graduates from engineering faculties in our country (Startup Centrum, 2021). Companies that produce value-added products/services on a global scale work with

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engineers who exhibit innovative behaviors. In addition, in recent years, there has been a great increase in the number of entrepreneurial activities of people with engineering backgrounds. The fact that engineers are well-educated, have analytical mindsets, and exhibit innovative behaviors in the face of problems brings entrepreneurship to the forefront in the career projectiles of engineers (Metin, 2003).

Development and transformation of individual creativity and the economic development of countries depend on the entrepreneurial culture. Leaders who will guide the innovative behaviors resulted from entrepreneurial passion play a key role in this model. It is clear that there is a gap in the literature in regard to this contextual framework. From this point of view, this research presents a different model and a holistic framework to the field in order to examine the effect of leadership duties on the relationship between the concept of entrepreneurial passion and innovative behavior.

2. Literature Review on Innovative Behaviors, Leadership and Entrepreneurial Passion

2.1. Innovative Behaviors

Innovation refers to a new idea, product or method that creates value or is transformed into a good or service that customers are willing to pay for. The essence of innovation is improvement; so it can also be defined as the ability to create something better and present it to the world (McGourty et al., 1996). Innovation corresponds to practices of inventing, developing and introducing something new, such as an invention. Although innovation is generally known as introducing a new product, it is also expressed as a new way of doing something, or even a new way of thinking (Kurz et al., 2018). Innovative behavior, on the other hand, is the research, development and application of new ideas based on the interrelationship between members in the current situation. It is also defined as developing creativity by using individual problem-solving skills in developing and applying new ideas and strategies as well as products and services (Pons et al., 2016).

2.2. Leadership

In 1990s, leadership scholars began to give importance to followers in leadership process. They stated that leadership is not just a process of influence of the leader on others, but an interaction process that can be influenced by everyone involved in this process. Leadership is an interaction between two or more members of a group, usually involving restructuring of the current situation and perceptions and expectations of the members (Rost, 1993; Bennis & Townsend, 1995).

Handy (1992) insisted on the importance of leader's ability to set a vision and share that with others. He also emphasized that leadership is a relationship-based process aimed at achieving some common goals. He affirmed that leadership is "the capacity to create a compelling vision and transform it into concrete organizational facts". Drucker (1996) summarized the ideas of the late 20th century as follows: "A leader is the person who has followers".

While most contemporary scholars refrain from giving a definition of leadership, Kellerman visualized leadership as an equilateral triangle: leader, followers, and context (Volckmann, 2012). He acknowledged the importance of the leader as has been done for centuries, but like Bass (1990), stated that followers are as important as the leader, and recognized the context as an equally important component in the leadership process.

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2.3. Entrepreneurial Passion

An entrepreneur is someone who establishes and/or invests in one or more businesses, bears most of the risks and enjoys most of the profits. In short, the process of establishing a business is defined as entrepreneurship (Drucker, 2014). The entrepreneur is often seen as a source of innovative ideas, products, services, works/efforts or procedures. Others define entrepreneurship as the process of designing, starting and running a new business often resembling a small business, or "the capacity and willingness to develop, organize and manage a commercial enterprise with its risks to make a profit" (Bessant & Tidd, 2007; Haykır and Deveciyan, 2018).

It is possible to define entrepreneurial passion simply as an individual's passion for inventing, establishing or developing a new business. Entrepreneurial passion helps coordinate cognitive and behavioral activities of entrepreneurs by fueling innovation, providing persistence and leading to ultimate success. Studies suggest that there are six major sources of entrepreneurial passion: passion for growth, passion for people, passion for products or services, passion for invention, passion for competition, and passion for a social cause (Cordon et al., 2017).

2.4. The Relation Between Entrepreneurial Passion,Innovative Behaviors and Leadership Tasks

There are findings in literature that if passion is not managed it will have negative consequences as well as positive results (Vallerand & Houlfort, 2003; Amiot et al., 2006). If one manages this emotion that could be felt against any situation properly, it causes positive feelings and concentration. Entrepreneurial passion, as one of the many sub-dimensions of passion, is an output that results from the proper management of passion. In this context, entrepreneurial passion is a concept that has important individual and organizational consequences for exhibiting innovative behaviors (Deveciyan et al., 2021). In this regard this hypothesis has been formulated in accordance with the research model:

"H1: There is a significant relationship between entrepreneurial passion and innovative behaviors."

The development and transformation of individual creativity and the economic development of countries depend on entrepreneurial culture. Leaders who will guide innovative behaviors resulted from entrepreneurial passion play a key role in this model. Conducted studies emphasize that leaders who support entrepreneurship have an opportunity-oriented vision and give positive energy to the people they work with (Renko et al., 2015; Akıncı, 2019). In this framework, it is possible to say that leaders' vision and sense of duty can be effective in the innovative behavior of the employees who feel entrepreneurial passion. Herein this second hypothesis has been formulated in accordance with the research model:

"H2: Leadership tasks have a mediating effect on the relationship between entrepreneurial passion and innovative behaviors."

3. Research Methodology

As the data collection and analysis method, the current study employs the cross-sectional survey method by using quantitative research methods. For this purpose, it measures 324 active engineers' perception on entrepreneurial passion, innovative behaviors and leadership by means of the convenience sampling method. To measure Entrepreneurial Passion, it applies for to entrepreneurial passion scale incented by Cardon et al. (2013) and adapted into Turkish by Gülbahar (2019). The scale developed by Scott and Bruce (1994) in order to measure the perception towards Innovative Behavior, was adapted to Turkish contexts. Also it uses the scale developed by Yıldız (2021) to measure the perception towards Leadership Tasks.

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The analysis of the data obtained from the sample group of the research was carried out with the SPSS 2.0 (Statistical Program for Social Sciences) program. Statistical tests to be used in data analysis were determined by considering the questions and scales used in the study. For this purpose, the Correlation Coefficient was used to evaluate if there was a relationship between the relevant variables in the study or not and Linear Regression analyzes were used to measure the impact level of the variables in this relationship. In addition to the regression analysis, the Sobel test equation was also applied to measure the mediation effect.

4. Research Findings

4.3.1. Socio-Demographical Characteristics

The socio-demographic characteristics of the employees included in the research are as follows: 75% of 325 employees are male and 25% are female; the average age is 35. In the categorization of the occupational groups of the employees from different professions, the study consists of different numbers of academicians, software and computer engineers, electrical-electronics engineers, industrial engineers, sales engineers, food engineers, mechanical and mechatronics engineers, techno-city specialists, sales engineers, civil engineers, agriculture and forest engineers. 55% of the employees are single and 45% are married. 51% of the employees have a postgraduate education level and 49% have a bachelor's degree.

4.3.2. Factor and Reliability Analysis for Variables.

This study applies factor analysis to the variables in order to test the structural validity. Kaiser-Meyer-Olkin (KMO) test was used to measure sample adequacy in factor distribution. The fact that the KMO ratio is above 0.5 indicates that the data set is suitable for factor analysis (Çinko et al., 2012:54). Alpha model was used to perform reliability analysis. A Cronbach Alpha value of 0.70 and above indicates that the scale is reliable. Appendices 1 shows the results of the factor and reliability analysis of the variables in the research model.

4.3.3. Hypothesis Testing

Table 2 shows the results of correlation and regression analysis of the variables. The correlation analysis demonstrates that there is a significant relationship between entrepreneurial passion and innovative behaviors of employees. Consequently H1 was accepted. According to the results of the regression analysis, explanatory power of the model is 0.761, which shows that 76.1% of the dependent variable (innovative behaviors) can be explained by the independent variable (entrepreneurial passion). In other words, provided that other conditions remain constant, the passion for entrepreneurship directly affects innovative behaviors.

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Table 1: Regression Analysis Results of the Variables

	Innovative Behaviours		Leadership Tasks	
	Beta	t (P value)	Beta	t (P value)
Entrepreneurial Passion	0,761	0.00	0,335	0.00
F	280,111		25,567	
R^2	0.579		0.112	
Adj R^2	0.577		0.108	
	0.01 significance level			

Table 2 shows the results of multiple regression analysis regarding the H_2 hypothesis of the research. According to the results of multiple regression analysis, H_2 is significant (R^2=0.585 F=143,506 p<0.01). In this hypothesis, entrepreneurial passion and leadership tasks explain 58% of the variance of innovative behaviors. Entrepreneurial passion (β=0.503 p<0.01) and leadership duties (β=0.289 p<0.01) have positive effects on innovative behaviors. This supports the H2 hypothesis.

Table 2: Regression Analysis Coefficientsa for Entrepreneruial Passion, Leadership Tasks and Innovative Behaviours

	Unstandardized Coefficients		**Standardized Coefficients**		
Model: Independent Variable	**B**	**Std. Deviation**	**Beta**	**t**	**Significance level**
Constant	1,130	,190		5,936	,000
Entrepreneruial Passion	,693	,033	,090	1,868	,000
Leadership Tasks	,162	,046	,731	15,234	,040
R	0,765[a]				
R square	0,585				
Adjusted R^2	0,581				
Std. Error of the Estimate	0,39				
F	143.506				
Significance level	0.000				
a. Dependent variable: Innovative Behaviours					

Mediator regression analysis was applied to test the H_3 hypothesis of the study. It is suggested that the intermediary variable is a part of the causal relationship between the two variables (McKinnon, Fairchild, & Fritz, 2010: 594). The intermediary relationship is tested with a model shown in the figure below.

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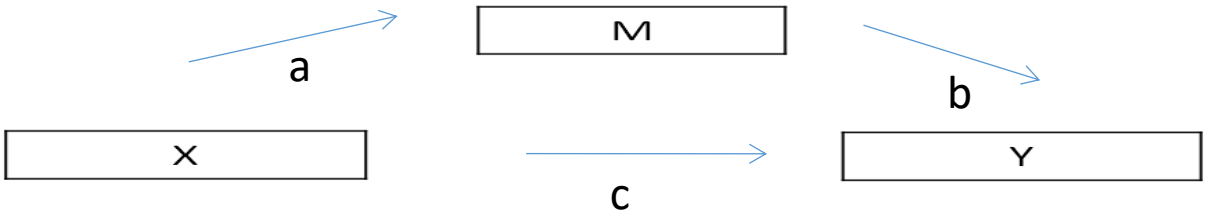
Figure 1: Mediator effect model



In this figure, **X** represents the independent variable, **Y** the dependent variable, and **M** the intermediary/mediator variable. In addition, path **c** shows the impact/effect between the independent variable and the dependent variable, path **a** shows the effect between the independent variable and the mediator variable, and the path **b** shows the effect between the mediating variable and the dependent variable (Baron and Kenny, 1986: 116). In order to make mediator variable analysis possible it is required to meet the following conditions (Baron and Kenny, 1986, p. 1176):

1. The independent variable should have an effect on the intermediary variable.

2. The independent variable must have an effect on the dependent variable.

3. When the intermediary variable is included in the regression analysis in the second step; if there is a non-significant relationship between the independent variable and the dependent variable, there is full mediation; If there is a decrease in the relationship between the independent variable and the dependent variable, there is the partial mediation (Howell, 2013: 547; McKinnon, Fairchild, & Fritz, 2010: 594; Burmaoğlu, Polat, & Meydan, 2013, 17).

Figure 2: The Relation Between Entrepreneurial Passion and Innovative Behaviors (Simple Correlation)

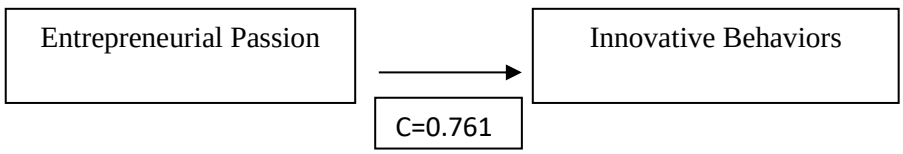


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Figure 3: The Intermediary Role of Leadership Tasks in The Relation Between Entrepreneurial Passion and Innovative Behaviors

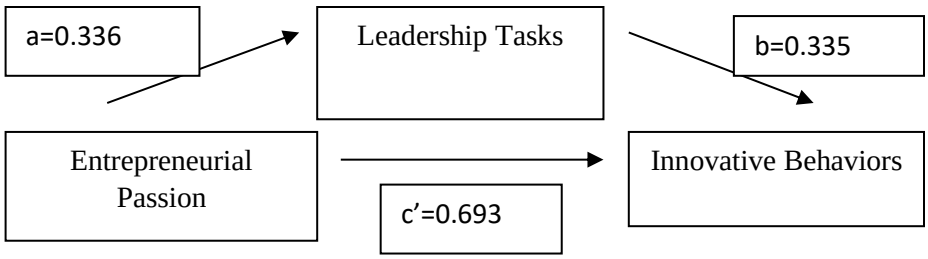

Figure 3 gives us the results of the hypothesis regarding the mediating role of leadership tasks in the relationship between entrepreneurial passion and innovative behaviors. Three regression equations were used to test the statistical significance of the mediation effect in the model. These are; c= the total effect of X on Y, axb= the indirect effect of X on Y, ć= the direct effect of X on Y.

Indirect effect = Total effect – Direct effect

Indirect effect= 0.761- 0.693= 0.068

(axb=0.336x0.335=0.112 95% Bootstrapt confidence interval/range)

The Sobel test method was also used to test the significance of the mediation effect.

Sobel Test Equation

$$z = \frac{ab}{\sqrt{b^2 s_a^2 + a^2 s_b^2 + s_a^2 s_b^2}}$$

In this study, the Sobel test result regarding the significance of the indirect effect of leadership duties on entrepreneurial passion is statistically significant (Z=3.302 p=0.000<0.05). Since the Sobel test is statistically significant, it is possible to conclude that the indirect effect significantly differs from zero. This finding indicates that the effect of leadership tasks has a partial mediating role in the relationship between entrepreneurial passion and innovative behaviors. Z-value, it has a mediating effect since it exceeds the critical values of + 1.96 at the α=0.05 level. This finding supports the H_3 hypothesis.

3. Discussions and Conclusion

New initiatives -start-ups- are important for the economic development of nations. Entrepreneurship is directly proportionate to the economic development of countries and the number of innovative personnel in companies. The prerequisites of global competitiveness depend on the presence of employees who exhibit innovative behaviors in innovative companies that keep up with changes. The improvement in business standards brought by the technological age we live in, is explained by entrepreneurship, transformation and innovation studies in the industry (Stangler, 2009). Innovative perspective and innovative behaviors are

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related to entrepreneurship (Johnson, 2001). In recent years, the subject of entrepreneurship has gained an important place in universities, especially in engineering faculties, and became part of their curricula. In Massachusetts Institute of Technology (MIT) we find that entrepreneurship courses are given to students in engineering departments. According to the results of a recent study conducted in the United States, more than 900 new companies are established in each year. Furthermore, the total annual revenue of the companies founded by MIT graduates constitute the eleventh largest economy in the world (Edward, 2011). From this point of view, the role of engineers in the entrepreneurial ecosystem has great significance.

In our contemporary world, the source of motivation for entrepreneurs is the "entrepreneurial passion" they feel emotionally (Soriano & Huarng, 2013). The intensity of the emotion and the belief of the person not to give up appear as motivational power in overcoming the obstacles in the entrepreneurial adventure (Cardon et al., 2009b). Also, at this point, the expectations of the employees from their leaders and the task of the leader are crucial. Unlike the studies focusing on the relationship between entrepreneurial passion and innovative behaviors in the literature, this study has tried to determine the role of the leader in this relationship.

According to the research findings, it has been determined that there is a positive and significant relationship between entrepreneurial passion and innovative behaviors. This result is in accord with studies of Fadaee and Abd Alzahrh (2014), Fernald (1988), Sarooghi et al. (2015), Shi et al., (2020) and Phan et al. (2010). Additionally, it turns out that the perception of engineers about their leadership duties has a partial mediating role in this relationship. This finding allows us to state that the attitudes and behaviors of the leader are also an important factor in environments where entrepreneurship and innovation are supported. The literature review shows that studies examining the relationship between entrepreneurial passion and innovative behaviors did not discuss the mediation role of leadership tasks. In future studies, it is recommended to conduct studies in which leadership is the focus with a larger sample group. It is expected that our findings will contribute to the management and strategyliterature.

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APPENDICES:

App. 1:Factor and Reliability Analysis

	Factor Loading	%Variance Explained	Cronbach alpha
Liderlik Görevleri		21,858	0.942
L1.İşyerimde liderler, örgütleri başarıya ulaştırmak amacıyla geleceği bugüne taşıyarak vizyon yaratırlar	0,88		
L2.İşyerimde liderler, örgütlerin temel değerlerin benimser ve bu değerleri örgütlerine yerleştirirler	0,851		
L3.İşyerimde liderler, takım üyelerini örgütün stratejisi doğrultusunda seçer, eğitir ve onlara yön verirler.	0,85		
L4.İşyerimde liderler, örgüt içerisinde etkin bir iletişim yapısı kurarlar	0,847		
L5.İşyerimde liderler, etkili ve başarılı takımlar oluşturmaktadırlar	0,819		
L6.İşyerimde liderler, örgütsel değişimi yönetmekte ve geliştirmektedirler	0,815		
L7.İşyerimde liderler, işletmelerin etkin ve verimli bir şekilde yönetilmesi için kaynak yaratmaktadırlar.	0,784		
L8.İşyerimde liderler, krizi başarıyla ve etkin bir şekilde yönetmektedirler.	0,777		
Yenilikçilik Davranışı		14,917	0.902
Y1.Yeni teknolojiler, süreçler, çalışma yöntemleri, teknikler ve/veya ürün fikirleri araştırırım	0,783		
Y2.Yenilikçi fikirler geliştiririm	0,769		
Y3.Yeni fikirleri başkalarına tanıtır ve savunurum	0,747		
Y4.Yeni fikirler için kaynaklar araştırır ve tahsis ederim.	0,743		
Y5.Yeni fikirlerin uygulanması için gerekli plan ve programları yaparım	0,594		
Y6.Yenilikçi bir insanım.	0,574		
Girşimcilik Tutkusu		21.638	0.937
G1.Her zaman yeni fırsatlar için yeni yöntemler bulma arayışında olurum.	0,692		
G2.Ürün geliştirmek için yeni fikirler geliştiririm	0,615		
G3.Mevcut ürünleri nasıl geliştireceğime odaklanırım	0,591		
G4.Yeni fırsatlar arar ve bulurum.	0,53		
G5.Sorunlara yeni çözümler getirmek kişilik özelliğimdir	0,81		
G6.Yeni bir fikir geliştirmek beni heyecanlandırır.	0,727		
G7.Yeni girişimlerde bulunmak bana enerji verir.	0,725		

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G8.Girişimim başarılı olduğu müddetçe heyecan vericidir.	0,701		
G9.Yeni bir girişimin parçası olmak kişilik özelliğimdir.	0,692		
G10.Ürünleri sunmak için doğru kişileri seçerim	0,785		
G11. Girişimlerimde doğru insanları bir araya getirmeyi tercih ederim.	0,772		
G12. İşlerimi daha iyi yapmak için kendimi ve çevremi motive ederim	0,677		
G13.İşlerimi geliştirmek ve büyütmek kişilik özelliğimdir.	0,626		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy =0,930 Chi-Square Barttlett's Test=4350,40			