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**OBJECTIVE, SUBJECTIVE FINANCIAL LITERACY INFLUENCE
ON COGNITIVE STYLE AND FINANCIAL RISK PERCEPTION**

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Abstract

Personality traits of individuals are one of the important variables that affect their thinking structures and behaviors. Personality traits are genetically formed. However, socialization and education affect the personality characteristics of individuals. Therefore, many studies have been done on collecting information, evaluating this information and making decisions. However, studies that reveal the effect of personality traits on financial decisions are much newer and few. In this study, the effect of financial risk perception was investigated based on cognitive style personality traits and Myers-Briggs style personality dimensions. Also, the effect of both objective and subjective financial literacy on this relationship is examined. This study with this dimension has unique feature. As a result of the analysis, individuals with systematic style have a higher risk request at statistically significant level than individuals with other styles. In addition, it has been found that individuals of all styles and dimensions evaluate subjective financial literacy levels about %60 more than real financial literacy levels.

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1. Introduction

Cognitive style studies are based on 1950's. The first study was conducted in 1951 by Witkin et al. The cognitive type approach defines to organize, process, make decisions and behaviour of individuals (as cited in Ancon, Kochan, Scully, Maanen, & Westney, 2009). This approach determines behaviour patterns of individuals and investigates the effect on behaviour and decision. In this framework, explains cognitive types that include both unconscious and conscious choices. Genetic, family, socialization, education and experience are influential in appearance of cognitive types. For this reason, cognitive types are not absolute and invariant. In studies conducted since the 1950's, two main features of the individual's knowledge perception, learning and related with evaluation process are mentioned, intuitive and systematic. When the literature is examined, it is seen that there are different ideas in both sizing and naming of these two properties. Especially in the first years of the studies, the intuitive and systematic features evaluated such as two opposite poles of one dimension, but exclusively in recent years, the studies emphasize that these two properties are two different dimensions. (Ancon, et al., 2009; Sagiv, Amit, Ein-Gar, & Arieli, 2014; Wang, Highhouse, Lake, Petersen, & Rada, 2017). Another similar approach is for intuitive and systematic concepts. Although the definitions of concepts are combined. It is seen that the concept of analysis, analytic, rationality and thinking is used instead of systematic, experientiality and concept is used instead of intuitive. Kahneman calls the same concepts in *Thinking Fast and Slow* (2011) as System 1 (Intuitive) and System 2 (Rational). System 1 automatically engages and remains active unless disabled by System 2. Hence, these two systems are independent of each other, but when one is active, the other becomes generally inactive. We will use intuitive and systematic expressions that are more common in our work. Intuition refers to a fast and unconscious judgment based on emotion, and systematics refers to a slow and conscious judgment based on logic and information (Allinson & Hayes, 1996; Epstein, Pacini, Danes-Raj, & Heier, 1996). Hamilton, Shih, and Mohammed (2017) emphasizes that intuitive does not affect the decision rate alone, but that individuals with both high intuitive and high systematic features are quicker to decide than individuals with high systematic features. In parallel with Kahneman, they express that these two dimensions are related but independent. The individuals in the systematic feature are rational, tend to explore rules and rule-based thinking. Analyse the situation and evaluate alternatives within a logical framework. That gives them confidence. Therefore, they are more successful in rule-based decision-making problems and decisions related to events they experienced in the past (Sagiv et al., 2014). The Intuitive individuals look at the big picture and have no idea of the patterns of thought. During the evaluation process, their emotions come into play and they decide based on intuition. Individuals of intuitive type are more successful in decision-making problems where rules are not clearly defined and have not been previously experienced (Sagiv et al., 2014) In this framework, the relationship between cognitive style and financial risk perception has been investigated. This is based on two approaches discussed in the theoretical framework. According to the first of these approaches, five personality traits in two dimensions were taken into consideration. The second approach has been evaluated in four dimensions relating to the external environment, gathering information, making decisions and overview of events. The relationship between financial risk perception and each of these has been analysed. In addition, the effect of both objective and subjective financial literacy on this relationship has been examined. It has unique features in the working area with these features.

2. Theoretical Framework

As studies for understanding decision-making behaviour increased, it was found that there were obvious, observable and measurable differences between the cognitive types of people and that they could be identified. Cognitive models, which are developed by Martin in 1983, are discussed in two dimensions as systematic and intuitive, by the lack of explanation of people's thinking, learning, problem-solving and decision-making behaviour, the approach placed in a five-star structure (Martin, 1988).

The characteristics of these five basic types are as follows:

Systematic Style: It is high on the systematic scale, it is low on the intuitive scale. It is rational and concrete. It focuses on one point when making a decision. Makes logical inferences, follows well-defined methods. It divides the problem into small pieces, moves step by step, and the next step is certain. It adopts a deductive approach. Facts, information, and measurable are important to him. It creates many alternatives but has priorities and searches for logic.

Intuitive Style: Systematic scale is low, intuitive scale is high. It decides on emotional basis, takes care of its inner voice. Abstract thinker does not focus on a single point, it looks at the big picture. During the decision-making process, it searches for shortcuts, finds alternatives quickly and eliminates them quickly. The process is focused, not the result. It adopts inductive approach.

Integrated Style: Higher in both scales. It is proactive, innovative and creative. It is constantly looking for new and different solutions. Locus of control is high. It pays attention both the consequence and the process. Search for measurable information and logic.

Undifferentiated Style: It is low on both scales. Decision-making behaviour is passive. They are not an expert in problem solving, so they tend to postpone the decision and follow others. They are not interested in the process. They want to decide according to the rules and guidelines, they like to say what needs to be done and follow them.

Split Style: Both scales are medium level. Instead of one decision-making behaviour, they exhibit different behaviour in different situations. It is common for one of the systematic or intuitive features to come to the fore. It is important for the decision-makers and their advisors to know the type of person they are involved in. As emphasized by Pompian (2008) in his behavioural Alfa approach, if counsellors know the type of investor, communication with them becomes much healthier and more efficient.

Human behaviour and preferences are affected by a large number of variables (time, wealth, mood, etc.). Ancon et al. (2009) refers to the effect of personality types on the process of collecting and evaluating information. Cognitive type approach tries to clarify a bit of this ignorance. In fact, the structure of personality traits is not fully understood and defined. Therefore, the personality related behaviour and preference relationship could not be fully revealed. Sagiv et al. (2014) relates two characteristics of cognitive type approach with The Big Five Personality approach. In this frame, individuals who are high in conscientiousness (high profile people, organized and careful) level are systematic and those in low level have intuitive properties, whereas those in high extraversion (high size ones, enterprising and ambitious) level are intuitive and low ones are systematic.

For the other three dimensions, they could not identify a relationship. Similarly, Wang et al. (2017) determined systematic relationship between extraversion and intuitive, openness (high ones, intellectual, creative, sensitive and open minded) and conscientiousness. In addition, Wang et al. (2017)

emphasizes the popularity of the Myers-Briggs Type Indicator due to its intuitive and systematic nature. According to the Myers-Briggs Type Indicator, individuals may have the same intuitive and thinking dimensions.

In this study, Myers Briggs cognitive type scale was used which is abbreviated by Ancon et al. (2009). Scale is based on Jung's personality approach. The important feature of this approach is that contains a combination of different dimensions. Therefore, it is very useful to explain the decision-making behaviour. There are four dimensions of the cognitive type scale used: Relationship with the external environment, information gathering, decision making and overview of events.

The first dimension refers to be extraversion or introversion in the individual's relationship with the external environment. Extraversions are able to judge before they realize enough thinking, exhibits herding and seek innovation. Introversions are open to knowledge and want to make decisions on their own. They also believe that they can control events in parallel with their confidence in their own judgment. Information gathering refers to whether individuals are sensing or intuitive based. Those who perceive information (sensing) prefer tangible and clear things, logical approach to events, follow standard solutions and behaviours, are not open to innovation and experience the moment. Those who detect the information (intuitive) do not like the standard solutions and are open to innovation. They focus on the big picture, complicated situations don't bother them, and they make quick decisions. Decision making can be focused on thinking or feeling. Thinking people are analytical, want to make decisions with information, feelings and beliefs do not affect their decisions. When making decisions, they seek logic, prefer tangible and clear solutions, show individual behaviour. Sensing people make decisions based on feelings and emotions. They have strong beliefs, they look for information that supports their own thoughts, and they ignore other information. Overview of events may be judging or perceptive. Judging people make analytical, objective and quick decisions. They do not like uncertainty, knowledge is important and it is not easy to be persuaded. Perceptive people analyse as much information as possible in detail. They want to be able to control the results, uncertainty doesn't bother them, they're open to innovation. All these characteristics are not classified as true or false. These are personal characteristics and may have advantages or disadvantages depending on circumstances, time, circumstances.

3. Research Method

In this study, the effect of personality traits on risk perception was investigated based on cognitive-type approaches. In this context, the effect of financial literacy on this relationship was evaluated for the first time.

Many studies have detected that financial literacy affects risk perception (Aren & Aydemir, 2015; Aren & Zengin, 2016 etc.). However, financial literacy has been examined for the first time in relation to personality risk perception. For this purpose, Rooij, Lusardi, and Alessie, (2011) 11 items advanced financial literacy scale was used. At the same time subjective financial literacy levels were measured and compared. Aydemir and Aren (2017) 7 items scale was used for risk perception. For the measurement of personality traits, Martin (1988) and Ancon et al. (2009) benefited.

The data of the study were obtained from students who volunteered to participate in a state university with easy sampling method. 135 students participated in the study. They are all between the ages of 20 and 25 and single. 79 are males, 56 are females.

4. Findings

In the study, KMO and Bartlett analyses were conducted with the aim of determining the adequacy of the sample and its suitability for factor analysis. The significance of the KMO value 0.806 (>0.700) and Bartlett test statistic was determined at 0.000 error level. The adequacy of the sample and the appropriateness of the factor analysis were accepted according to the results and the following factor analysis and reliability analysis were performed. The reliability of the factor is 0,802 ($>0,700$). All calculated control values are above the accepted values. After providing statistical requirements for follow-up analysis, based on the Martin (1988) scale, it was determined that the subjects were included in Systematics Style, Intuitive Style, Integrated Style, Undifferentiated Style and Split Style characteristics. After that One Way Anova and Duncan tests were performed to determine if the risk perception of these five-personality traits were different from each other. With One Way Anova analysis, it was determined that the risk perception of five personality traits was not same at 0.05 error level. Also, Duncan test was performed to find the source of the difference. According to Duncan test, the five personality traits were divided into two subgroups at 0.05 error level. While systematic style was included in the subgroup that wanted more risk alone, the other four personality traits were included in the second subgroup. Three subgroups were formed when the error margin was increased to 0.10 and the test was repeated with this margin. Intuitive Style was included in a sub-group as more risk aversion individuals while the systematic style was still in a single subgroup. The other three personality traits have formed third subgroup. In the second step, we investigated the differentiation of risk perception using Ancon et al. (2009) scale. In the use of the scale, differences in four basic dimensions were investigated rather than in 16 different personality traits. The main reason for this is that the four basic dimensions, as explained in the theoretical framework, point to individual's knowledge perception, evaluation, analysis and decision-making. For this reason, it was investigated whether the differences in dimensions caused a difference in risk perception. Each of the four dimensions is divided into two poles within itself. Communication with the external environment is extraversion and introversion, information gathering is sensing and intrusive, decision-making is thinking and feeling and overview of events is judging and perceptive. For this reason, the independent sample t test was applied for two poles of each dimension. As a result of the four independent samples t test, there was a difference between sensing and intuitive characteristics of information gathering in terms of risk perception and it was determined statistically that the individuals with sensing are more likely to demand for risk. As regards financial literacy, which is an important dimension of our study, objective financial literacy measured by 11 items and subjective literacy measured by 5 Likert scale are the same scale. For this purpose, the subjective financial literacy answers were multiplied by 11 and divided into 5, and new values were calculated. Statistically significant correlation was found between objective and subjective financial literacy at 0,241 level and 0.000 error margin. However, the average of objective financial literacy for individuals is 3.80 out of 11, while the average of subjective financial literacy is 6.11, which is significant at an error level of 0,000 when tested

with paired t test. In other words, although there is a statistically significant correlation between the objective and subjective financial literacy levels of individuals, individuals evaluate their financial literacy levels by about 60% more than their actual levels.

In order to investigate the impact of objective and subjective financial literacy on the relationship between personality traits and risk perception, first individuals with five personality characteristics of Martin (1988) were determined to have objective financial literacy levels lower and higher than average. Then, individuals with each personality are divided into two groups, classified as objective financial literacy levels low and high. Whether there was a difference in the risk perception between these two groups was investigated for each personality trait by the five paired t test. Following this, the same operations and analyses were repeated for eight pairs covering four dimensions and two opposite poles which belongs Ancon et al. (2009). According to a total of thirteen paired t test results, objective financial literacy in any personality trait or dimension does not result in a change in risk perception.

The same calculations and tests were also conducted for the subjective financial literacy. As a result of the thirteen paired t tests, it was found that the demand for risk increases as subjective financial literacy increases in individuals with Judging traits. This result is an accepted relationship in financial literacy and risk perception literature (Aren & Aydemir, 2014).

Finally, the five personality traits of Martin (1988), four dimensions of Ancon et al. (2009) and the difference between the objective and subjective financial literacy levels of individuals in the thirteen groups for each of the two opposite poles was investigated. According to the results of the thirteen paired t tests, the difference between the objective and subjective financial literacy levels in each of the four dimensions (extraversion, information gathering; sensing, decision making, judging) in Ancon et al. (2009) and the other four styles besides intuitive style in Martin (1988) is significant at error level 0.05. This difference stems from the higher evaluation of the subjective financial literacy level than the objective financial literacy level.

5. Conclusion and Discussions

Personality traits are an important variable that influences individual thinking and behaviour. Although personality traits are partly due to genetics, socialization and education are also important influences. Many studies based on psychology have investigated the relationship between personality traits and information gathering, evaluation and decision making. However, studies showing the impact of personality traits on financial decisions are relatively new and less. In this study, based on cognitive style personality traits and Myers–Briggs style dimensions, the effect of financial risk perception was investigated. In addition, the impact of both objective and subjective financial literacy has been examined. Study with this dimension has a unique feature. It was investigated whether five basic personality traits, based on Martin (1988), which classifies individuals on both systematic and intuitive scale, differed in risk perception. As a result of the analysis, it was determined that individuals with systemic style had a statistically significant risk demand more than individuals in the other four styles. According to this, people who think based on information and do not choose and analyse information with their intuition who is called genius cognitive people, can measure the risk more realistic and evaluate the positive and negative aspects of the risk and make decisions about the risk. However, intuitive-style individuals are

likely to be affected by the negative side of the risk and act risk aversion behaviour. Then, according to the four basic dimensions of Myers–Briggs style and their two opposite poles, differentiation in the perception of risk was investigated. As a result of the analyses, there was a difference in the perception of risk among individuals with sensing and intuitive in the information gathering dimension. The risk demand of the individuals with sensing is statistically greater. This result is quite consistent with the previous finding. Because those who perceive information (sensing) prefer tangible and clear things, approach events logically, follow standard solutions and behaviours. With these features they overlap with the systematic style at Martin (1988). Both characteristics correspond to the type of personality that behavioural Finance who makes a cognitive decision based on information. It is not achieved any significant results when investigating the impact of both objective and subjective financial literacy on these relationships. This is an unexpected result in the first place. Because people who think based on information, evaluate, analyse and make decisions, are expected to change their risk perceptions as increasing their financial literacy levels. The finding behind this expected outcome is the difference between subjective and objective financial literacy levels, which are also important contributions of our study. Both Martin (1988)'s two-dimensional five-personality traits and Ancon et al. (2009)'s four-dimensional structure, individuals consistently evaluate their subjective financial literacy levels higher than objective financial literacy levels.

In conclusion, this study is unique in that it will examine the relationship between two different personality traits and the perception of financial risk and evaluate the impact of both objective and subjective financial literacy on this relationship.

However, as in every study, there are various limitations of this study. Especially, we think that studies that will be repeated with higher data will make a significant contribution to the literature. In addition, we believe that the enrichment of sampling as both education and expertise and the investigation of these effects will provide significant benefits to the conceptual framework of the subject.

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