

RISK AVERSION IN CREATIVE INDIVIDUALS

The Effects of Gender Role, Age and Experience Abroad on Economic Risk Taking

NUR YALDIZ

MAY 2014

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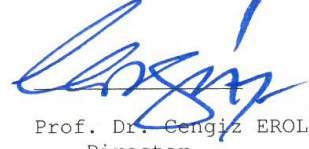
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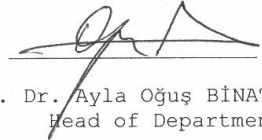
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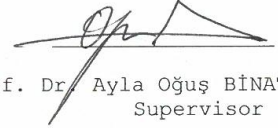
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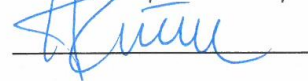

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ABSTRACT

RISK AVERSION IN CREATIVE INDIVIDUALS

The Effects of Gender Role, Age and Experience Abroad on Economic Risk Taking

Yaldız, Nur

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Decision making on a risky context has its roots from expected utility theory by Daniel Bernoulli. The flaws of the theory are discovered by Daniel Kahneman and Amos Tversky. Behavioral economics is related to decision theory which has bases from both economics and psychology. Prospect theory states that humans make decisions based on their perceptions and emotions. Loss aversion explains how individuals develop attachments to their possessions, while going for smaller gains with larger probability is explained by risk aversion. Prospect theory highlights that humans avoid losses even for larger possible gains. This thesis focuses on economic risk aversion in individuals with creative achievements which refer to gifted individuals with higher creative products. Creative individuals are less risk averse to produce novel ideas. This association is investigated from different angles. Gender role, age and experience abroad are three main sub categories which are also studied in relation to risk aversion. The association between gender roles and creative achievement is another focus. Feminine individuals tend to be more risk averse compared to masculine individuals. Age may have impact on risk aversion, while individuals with experience abroad can be less risk averse. Masculine individuals may have higher creative achievements.

Keywords: Risk Aversion, Creative Achievement, Femininity, Masculinity, Experience Abroad, Age.

ÖZET

YARATICI BİREYLERDE RİKSTEN KAÇINMA

Cinsiyet Rolü, Yaş ve Yurt Dışı Deneyiminin Ekonomik Riskten Kaçınma üzerine Etkileri

Yaldız, Nur

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Riskli bağlamda karar verme temellerini Daniel Bernoulli tarafından geliştirilen Beklenen Fayda Kuramından almaktadır. Kuramda yer alan kusurlar Daniel Kahneman ve Amos Tversky tarafından saptanmıştır. Karar kuramı temellerini Ekonomi ve Psikoloji bilimlerinden alır ve Davranışsal İktisat ile yakından bağlantılıdır. Beklenti Kuramına göre insanlar kararlarını algı ve duygularına dayanarak alırlar. Kayıptan Kaçınma, bireylerin sahip oldukları varlıklara geliştirdikleri bağlılıkları açıklarken, bireylerin küçük ve elde edilme olasılıkları yüksek kazançları neden tercih ettiklerini de açıklar. Karar Kuramı bireylerin neden küçük kayıplar için bile elde edilme olasılığı yüksek büyük kazançları engellediklerini açıklamaya çalışır. Bu çalışma ekonomik riskten kaçınma ve Yaratıcı Edinim arasındaki ilişkiyi açıklamayı amaçlar. Yaratıcı Edinim, yetenekli bireylerin yaratıcı ürün geliştirmesini açıklar. Yaratıcı bireyler alışılmışın dışında fikirler geliştirmek için riskten daha az kaçınırlar. Bu ilişki farklı açılardan incelenmiştir. Cinsiyet rolü, yaş ve yurt dışı deneyimi riskten kaçınma ile ilgili üç alt inceleme alanını oluşturmaktadır. Diğer bir odak ise cinsiyet rolü ve yaratıcı edinim arasındaki ilişkidir. Maskülen bireyler, feminen bireylerle karşılaştırıldığı zaman daha az riskten kaçınmaktadırlar. Yaş riskten kaçınma eğilimini etkilerken, yurt dışı deneyimi olan bireyler daha az riskten kaçınabilirler. Maskülen bireylerin yüksek yaratıcı edinimleri olabilir.

Anahtar Kelimeler: Riskten Kaçınma, Yaratıcı Edinim, Feminenlik, Maskülenlik, Yurt Dışı Deneyimi, Yaş.

*I would like to dedicate my first work in the field of Behavioral Economics to my three professors,
Prof. Dr. Ayla Ođuş Binatlı, Senior Psychologist Yudit Namer, Mr. Erda Gerçek,
who supported me endlessly.*

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I would like to thank to many undergraduate students, and graduate students of İzmir University of Economics, who participated in my survey, and the administrative staff of İzmir University of Economics, who devoted time to be participants as well.

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I would like to thank to all participants who made time to fill out the questionnaire forms.

Preface

The main inspiration for this study comes from an illustrative story in *Black Swan* by Nassim Nicholas Taleb (2010)². I directly retrieved the story below just to share my enthusiasm. The idea that combines creativity with economic risk taking occurred to me as an attractive subject to focus on. Although, for this study, I did not obtain the answers that I am looking for, I will keep up improving my work.

Risk aversion is mainly an attractive topic for me. The concept lies in the intersection of psychology and economics, which provides many opportunities to study the concept from different angles.

I had no intention to include a chapter about gender role at first, but reading literature which begins with “women are more risk averse than men” made me to include the gender section. I am simply fed up with the biased view against women.

The further concepts are just included to have insights about the determinants of the relationship between creativity and risk aversion. For this study I employed a Creative Achievement Questionnaire by Carson, et.al. (2005)¹. The concept is slightly different than the sole notion of creativity, but the test helped me to have interesting findings.

I, once again, would like to thank to anyone who helped me to conduct this study in a short period of time.

Nur

Izmir, May 2014

FAT TONY²

“Fat Tony” is one of Nero’s friends who irritates Yevgenia Krasnova beyond measure. We should perhaps more thoughtfully style him “Horizontally-challenged Tony,” since he is not as objectively overweight as his nickname indicates; it is just that his body shape makes whatever he wears seem ill-fitted. He wears only tailored suits, many of them cut for him in Rome, but they look as if he bought them from a Web catalog. He has thick hands, hairy fingers, wears a gold wrist chain, and reeks of licorice candies that he devours in industrial quantities as a substitute for an old smoking habit. He doesn’t usually mind people calling him Fat Tony, but he much prefers to be called just Tony. Nero calls him, more politely, “Brooklyn Tony,” because of his accent and his Brooklyn way of thinking, though Tony is one of the prosperous Brooklyn people who moved to New Jersey twenty years ago.

Tony is a successful nonnerd with a happy disposition. He leads a gregarious existence. His sole visible problem seems to be his weight and the corresponding nagging by his family, remote cousins, and friends, who keep warning him about that premature heart attack. Nothing seems to work; Tony often goes to a fat farm in Arizona to not eat, lose a few pounds, then gain almost all of them back in his first-class seat on the flight back. It is remarkable how his self-control and personal discipline, otherwise admirable, fail to apply to his waistline.

¹ Carson, S. H., Peterson, J. B., & Higgins, D. M. (2005). Reliability, validity, and factor structure of the creative achievement questionnaire. *Creativity Research Journal*, 17(1), 37-50.

² Directly retrieved from (pages: 122 – 125): Taleb, N. N. (2010). *The Black Swan:: The Impact of the Highly Improbable Fragility*. Random House LLC.

He started as a clerk in the back office of a New York bank in the early 1980s, in the letter-of-credit department. He pushed papers and did some grunt work. Later he grew into giving small business loans and figured out the game of how you can get financing from the monster banks, how their bureaucracies operate, and what they like to see on paper. All the while an employee, he started acquiring property in bankruptcy proceedings, buying it from financial institutions. His big insight is that bank employees who sell you a house that's not theirs just don't care as much as the owners; Tony knew very rapidly how to talk to them and maneuver. Later, he also learned to buy and sell gas stations with money borrowed from small neighborhood bankers.

Tony has this remarkable habit of trying to make a buck effortlessly, just for entertainment, without straining, without office work, without meeting, just by melding his deals into his private life. Tony's motto is "Finding who the sucker is." Obviously, they are often the banks: "The clerks don't care about nothing." Finding these suckers is second nature to him. If you took walks around the block with Tony you would feel considerably more informed about the texture of the world just "tawking" to him.

Tony is remarkably gifted at getting unlisted phone numbers, first-class seats on airlines for no additional money, or your car in a garage that is officially full, either through connections or his forceful charm.

Non-Brooklyn John

I found the perfect non-Brooklyn in someone I will call Dr. John. He is a former engineer currently working as an actuary for an insurance company. He is thin, wiry, and wears glasses and a dark suit. He lives in New Jersey not far from Fat Tony but certainly they rarely run into each other. Tony never takes the train, and, actually, never commutes (he drives a Cadillac, and sometimes his wife's Italian convertible, and jokes that he is more visible than the rest of the car). Dr. John is a master of the schedule; he is as predictable as a clock. He quietly and efficiently reads the newspaper on the train to Manhattan, then neatly folds it for the lunchtime continuation. While Tony makes restaurant owners rich (they beam when they see him coming and exchange noisy hugs with him), John meticulously packs his sandwich every morning, fruit salad in a plastic container. As for his clothing, he also wears a suit that looks like it came from a Web catalog, except that it is quite likely that it actually did.

Dr. John is a painstaking, reasoned, and gentle fellow. He takes his work seriously, so seriously that, unlike Tony, you can see a line in the sand between his working time and his leisure activities. He has a PhD in electrical engineering from the University of Texas at Austin. Since he knows both computers and statistics, he was hired by an insurance company to do computer simulations; he enjoys the business. Much of what he does consists of running computer programs for "risk management."

I know that it is rare for Fat Tony and Dr. John to breathe the same air, let alone find themselves at the same bar, so consider this a pure thought exercise. I will ask each of them a question and compare their answers.

NNT (that is, me): Assume that a coin is fair, i.e., has an equal probability of coming up heads or tails when flipped. I flip it ninety-nine times and get heads each time. What are the odds of my getting tails on my next throw?

Dr. John: Trivial question. One half, of course, since you are assuming 50 percent odds for each and independence between draws.

NNT: What do you say, Tony?

Fat Tony: I'd say no more than 1 percent, of course.

NNT: Why so? I gave you the initial assumption of a fair coin, meaning that it was 50 percent either way.

Fat Tony: You are either full of crap or a pure sucker to buy that “50 percent” business. The coin gotta be loaded. It can’t be a fair game. (Translation: It is far more likely that your assumptions about the fairness are wrong than the coin delivering ninety-nine heads in ninety-nine throws.)

NNT: But Dr. John said 50 percent.

Fat Tony (whispering in my ear): I know these guys with the nerd examples from the bank days. They think way too slow. And they are too commoditized. You can take them for a ride.

Now, of the two of them, which would you favor for the position of mayor of New York City (or Ulan Bator, Mongolia)? Dr. John thinks entirely within the box, the box that was given to him; Fat Tony, almost entirely outside the box.

To set the terminology straight, what I call “a nerd” here doesn’t have to look sloppy, unaesthetic, and shallow, and wear glasses and a portable computer on his belt as if it were an ostensible weapon. A nerd is simply someone who thinks exceedingly inside the box.

(Black Swan, 2010)³

³ Directly retrieved from (pages: 122 – 125): Taleb, N. N. (2010). *The Black Swan:: The Impact of the Highly Improbable Fragility*. Random House LLC.

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CHAPTER 1: INTRODUCTION

Decision making on a risky context dates back to the theory of “Expected Utility” by Daniel Bernoulli in 1738. According to the expected utility theory, humans make decisions under risky conditions to maximize their wealth (Kahneman, 2003a).

The first theory of decision making, which highlights the link between our emotions and choices, was generated by Jeremy Bentham in 1789. It was stated that utility is the sum of positive and negative emotions that we experience (Loewenstein, 2000). Individuals make decisions to maximize their utility gain and are always faced with different alternatives (Edwards, 1954).

Risk taking behavior simply depends on the decision making of an individual. It can never be known whether the outcome will be against to a decision maker or not. The alternative with the highest payoff can be the riskiest decision since the decision can meet with the strongest defense from the counter parties (Bernstein, 1996). Currently, this theory is shaped by cognitive science which investigates the role of emotions and perception in human decision making (Loewenstein, 2000). Studies in human decision making got a new edge with “Prospect Theory” by Kahneman and Tversky, and found that decision making is affected by a number of different factors instead of just utility maximization (Bernstein, 1996). Prospect theory mainly focuses on human decision making in a risky context. Risk averse individuals tend to avoid risks even there will be possible monetary gains (Kahneman & Tversky, 1979).

Creative individuals can be less risk averse and being creative basically means being comfortable with risk (Csikszentmihalyi, 1997). Creative achievement simply refers to creative achievements of creative individuals in one or more specific creative domains (Carson, Peterson & Higgins, 2005).

The question is, therefore, individuals with creative achievements can also be economic risk takers. This study basically seeks the answer of this question. This assumed relationship also studied in terms of experience abroad, femininity, masculinity and age. The structure of this thesis is as in the following. The first chapter introduces the history of risk and decision making, and psychological foundations of economics. The second chapter focuses on the literature review in terms of risk aversion and diverse fields and concepts such as demographics, neuroscience, evolution and emotions, etc. The third chapter presents the theoretical framework which is based on decision theory, creativity, gender and age. Hypotheses are presented as a separate sub section as well. The fourth chapter explains the methodology, and experimental design is presented in this chapter. The fifth chapter focuses on the results. To test the hypotheses several procedures were employed. For the main hypothesis and sub hypothesis 1, each gamble question is tested as well. The significant questions are retested again to see the impact of creative achievement and experience abroad on risk aversion.

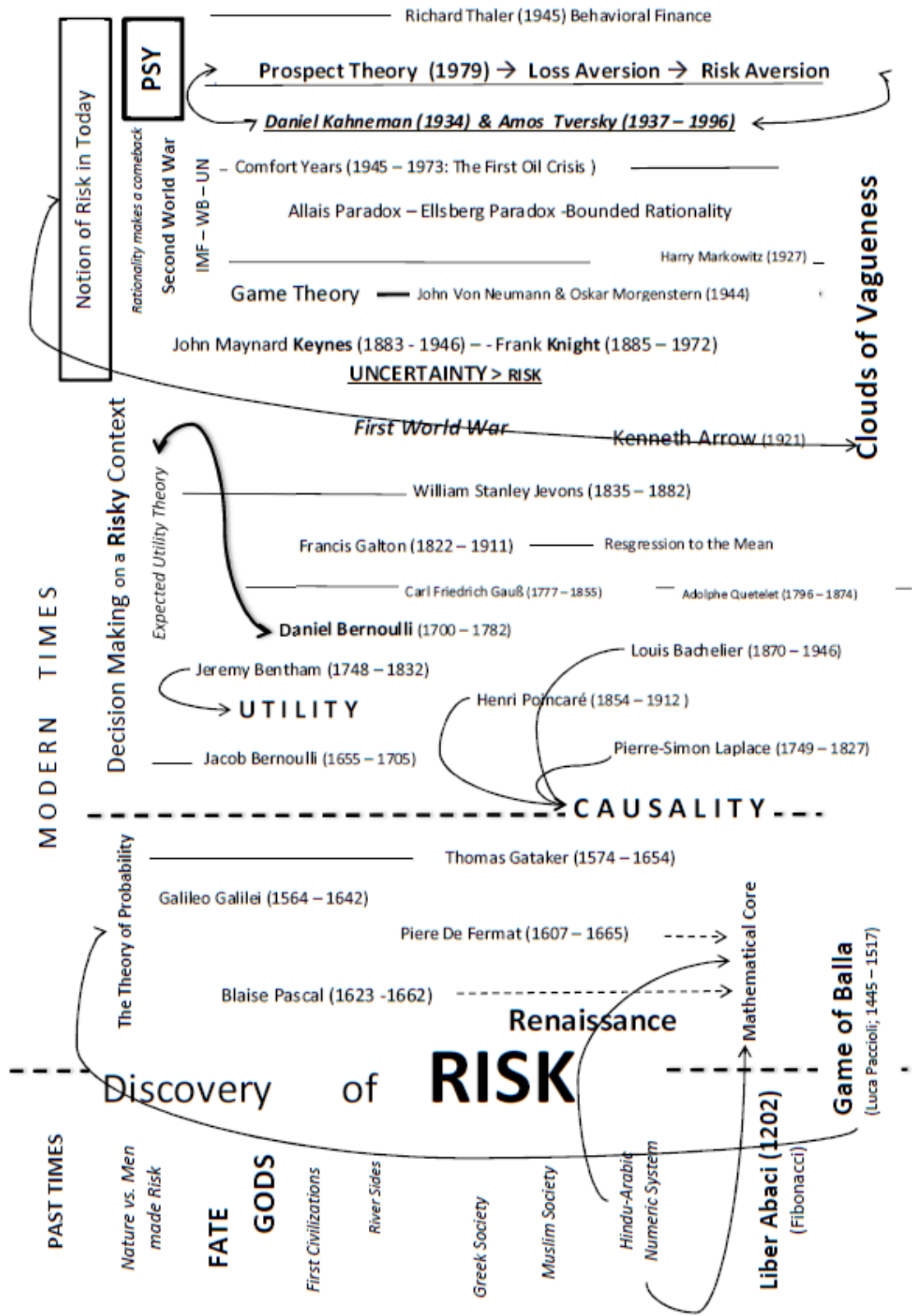


Figure 1. Historical Framework of Risk from past times to modern times.

1.1. History of Risk

Notion of risk generates a mile stone in the course of history. The mastery of risk may define a boundary between modern times and past. After this point, nature did not appear as a land of mystery for humans. It was realized that humans did not have to rely on past events and religion did not appear as a source to solve the unknown that lies ahead. Risk taking behavior generates the core of today's complex societies. Individuals have had advantage to make a decision among different alternatives with different weights – probabilities – to occur. Risk has sources from different fields such as psychology, statistics, mathematics, and history. The modern understanding of risk dates back to when the Western world acquired Hindu – Arabic numeric system. The main advancement brought by Renaissance, the era in which individuals started to discard dogmatic believes, and have great willingness to discover unknown (Bernstein, 1996).

In the year of 1202, in Italy, Loenardo Pisano wrote a book named “Liber Abaci” (Book of the Abacus). Pisano, who has been known as Fibonacci, got advantage to learn Hindu – Arabic system in detail, and recognized the superiority of system over Roman, Greek or Hebrew letters. Liber Abaci can be considered as a first step of forecasting which may appear as a turning point in the measurement of risk. However, in the days of Fibonacci, individuals had not been ready to assign numbers to the likelihood of risk, which was perceived as the capriciousness of nature. It took more than two hundred years to recognize man made risks that can be a way to stand against the fate lays ahead (Bernstein, 1996).

The first time humans, who regularly put effort on measuring and counting, were living close to river sides such as the Nile, the Amazon, the Tigris, the Indus, the Yangste, and the Euphrates. By means of the growth of agriculture, these locations turned out to be trade hubs which required calendar time, navigation, and the knowledge about geography. Although mathematics started to dominate the human life, by means of calculating flooding or withdrawing cycles of these rivers, humans still attached to past and the fate that created by gods.

Although significant advances made in terms of geometry, astronomy, navigation, and mechanics, the discovery of the laws of probability came with calculus, and basic algebra came with zero. With this discovery, counting, calculating and advanced mathematics turned into science of abstract and measurement. However, like early Christians and Greeks, Muslims were in the belief of human fate that was in the hands of gods, which was the idea that prevented Arabs to discover the theory of probability (Bernstein, 1996).

1.2. History of the Theory of Probability

The brain teaser that appears in the book of Summa written by Luca Pacioli, turned out to be beginning of a systemic analysis of probability. During the 16th century, Girolamo Cardano, a Milanese physician, held first serious work about the analysis of games of chance. The great book on mathematics, *Ars Magna* (The Great Art), was the first Renaissance book that focused on algebra. Besides introducing main concepts, Cardano tried to solve Pacioli's puzzle but failed like many other distinguished mathematicians. Cardano was first to put serious effort to establish statistical principles of methodology through the book named *Liber de Ludo Aleae* (Book on Games of Chance) (Bernstein, 1996).

As a gambler, Cardano focused on chance. The word Aleae describes games of dice, and games of chance came from the same root, which is Aleatroius. The current version of these words has ended up with the word aleatory which describes the result of uncertain events. Gambles can be a great source to study human behavior in terms of risk. The word risk has its origins from an Italian word "risicare" means to dare. In this extent, risk means making a choice instead of being faced with fate. By means of gambles, humans have generated a way to stand against their fate, and luck has started to take place as a collaborator against the unknown. Gambles can be based on both luck and choice, since there is always probability of winning a game based on a decision (Bernstein, 1996).

Discoveries of Cardano had existed for thousands of years. Hindu – Arabic numeric system arrived in Europe three hundred years before Liber de Ludo Aleae. However, Renaissance brought the missing ingredients which were the desire for experimentation and to control the future, and the freedom of thought. With the discovery of probability, humans moved the next state to discover the balance between risk management and decision making (Bernstein, 1996).

The correspondence between Pascal and Fermat resulted in a breakthrough in the history of mathematics and the theory of probability. By means of Pascal's triangle it became possible to forecast economic gains and losses (Bernstein, 1996). The work of Cardano and Galileo lead to development of the most powerful tool to deal with risk, that is, the laws of probability were strongly established. The game of balla, the brain teaser of Pacioli, was attracted the attention of Pascal and the Chevalier de Méré. The question was that what would happen if both players quit the game without completing it. There was no answer for the teaser until Pascal met with Pierre de Fermat. The cooperation between Pascal and Fermat resulted in serious improvement in the theory of probability (Bernstein, 1996).

The solution of the game of balla, the problem of points, which was the result of Pascal and Fermat collaboration, has been generated the modern tools to control risk. While Fermat solely focused on algebra to measure the outcomes, Pascal combined a geometric format with an algebra structure. Pascal was aware of the fact that the concept was not something new. This geometric algebra structure did not originally belong to Pascal, and was considered 450 years earlier than Pascal by Omar Khayyam. After that, a Chinese mathematician Jia Xian discovered Yang Hui triangle in 1303 (Bernstein, 1996).

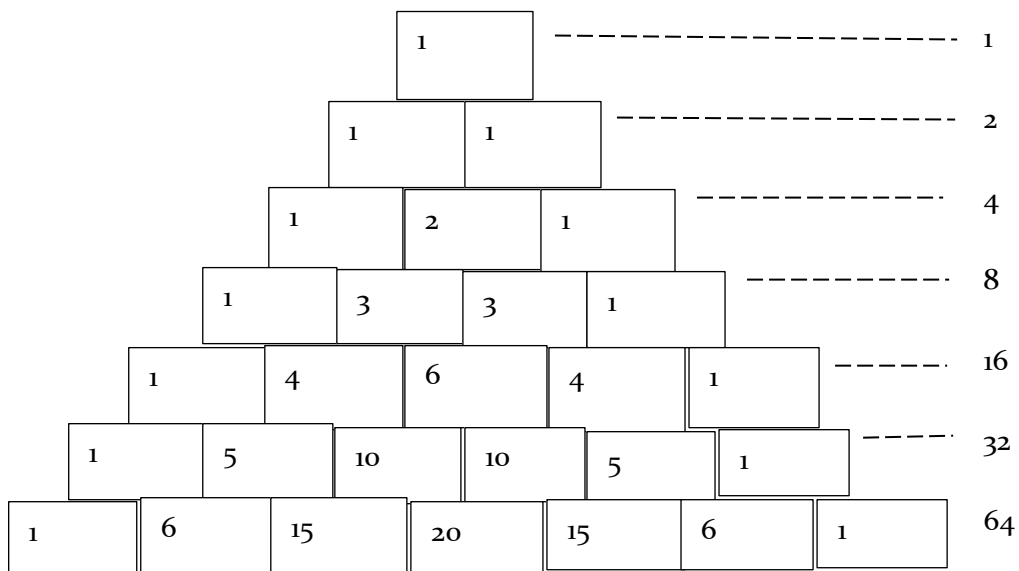


Figure 2. Pascal's Triangle: Each number is the sum of the two numbers to the right and to the left on the row above

In each row, the probability of an event that may occur is provided. The top row defines the probability of an event that cannot fail to occur. The second row shows a 50 – 50 situation which resembles a coin tossing experiment. As rows go down the likelihood of occurrence of events chances according to the possible number of events and the results (Bernstein, 1996).

The theory of probability determines the division of stakes. At the end of the game, the amount of divided stake that each player earns is determined. The solutions developed by Pascal and Fermat lead to the generation of rules to calculate the probabilities that relates to more than two subjects. Determining the likelihood of possible outcomes of game of balla also generated basis of “decision theory” which is defined as “the theory of deciding what to do when it is uncertain what will happen” (pg. 69) (Bernstein, 1996).

In other words, decision making can be the first step to control risk. The probability of occurrence of an event can simply influence decisions of an individual. Decision must have strength of the desire and the degree of belief about the probability for a particular outcome to occur. Here, the strength of our desire can refer to utility which generates the core of the theories of decision making and risk taking. The contributions of Pascal and Fermat can be counted as a big step towards forecasting (Bernstein, 1996).

1.2.1. The Notion of Utility

Daniel Bernoulli stated that “the value of an item must not be based on its price, but rather on the utility it yields” (p. 99). This argument took place in the paper named “Exposition of a New Theory on the Measurement of Risk.” Before the arguments of Bernoulli, expected value was estimated by multiplying the number of different possible payoff with the number of possible ways these payoffs may occur. Then the result is divided by the total number of events. However, according to Bernoulli, price and probability are not enough to measure the value of the things that individuals enjoy (Bernstein, 1996).

The utility is dependent on the conditions in which an individual makes a decision, and the risks that are decided to be taken. The notion of utility can be an intuitive experience which depends on satisfaction, desirability, or usefulness. Bernoulli established the core idea of risk as each individual can assign different value to risk (Bernstein, 1996).

This value is determined by the utility obtained from any small increase in wealth which is inversely related to current wealth. Utility can be inversely related to the possessions which have been belonged to an individual. It was a turning point in the history that Bernoulli applied measurement to a concept which cannot be counted (Bernstein, 1996).

The studies of Cardano, Pascal and Fermat generated techniques to determine risks that can be taken in the roll of a dice, and Bernoulli introduced the notion of a risk taker who determines the amount of bet in a game. Probability theory determines the risks that can be faced or taken in a gamble. Bernoulli, for the first time, introduced the reasons that turn individuals into risk takers. The arguments of Bernoulli improved the basics of the theory of decision making. Risk can help individuals to determine the best available option among the prospects which the decision maker faces with, and utility is defined as the satisfaction obtained from the specific increase in wealth when compared to substantial possessions (Bernstein, 1996).

Utility turned out to be an important notion which has shaped the theory of decision making and went beyond the borders of economic decision making. Jacob Bernoulli, the uncle of Daniel Bernoulli, introduced the fact that it is only possible to calculate future occurrence of an event if it assumed that that event is reoccurring again in the future under similar conditions. In real life, this measurement for almost all cases may not be applicable, and it is only possible to predict outcomes of future events if past appears as a reliable guide to the future. By means of these developments, it became possible to measure uncertainty which started to be defined as unknown probabilities. An event can be uncertain if the event fails to occur, but under the fact that the information regarding the event is correct (Bernstein, 1996).

Jacob Bernoulli was the first to focus on the connection between probability and the available information. The previous studies on probability have no means to be generalized. The likelihoods of outcomes were just able to be calculated by being based on specific conditions and events. The probability of real life situations can be determined by taking a sample from universe, and making a measurement of possible outcomes. The possible outcomes or real life occurrences may not be calculated as in the game of balla. A priori situation occurs when it is possible to estimate probable outcomes beforehand, as in the game of balla. However, the events in real life are a posteriori; the probabilities of events are calculated after the occurrence (Bernstein, 1996).

The concept of utility was discovered again at the end of the eighteenth century. Jeremy Bentham explains utility as the happiness, pleasure or benefit that individuals gain from a specific object. For the economics of the nineteenth century, future stands still while buyers and sellers consider available opportunities. Loss was not even considered as a possibility to occur. The main focus was to analyze subjective and psychological elements behind the motivations of individuals to buy specific products. The idea of individuals without enough income to buy a loaf of bread was not even considered (Bernstein, 1996).

William Stanley Jevons, Benthamite economist, published *The Theory of Political Economy* in 1871, and stated that “value depends entirely upon utility (p. 190).” The value of utility that an individual can have from a specific good can also depend on the accumulated wealth, in this way Jevons was in line with Bernoulli (Bernstein, 1996). The economists of nineteenth century mainly focused on to study how individual wants can change with income. It was stated that as income of an individual increases, the variety of goods that can be purchased tend to increase as well. The explanation for such relationships was appeared to be psychological concepts according to the early neoclassical economists (Bruni & Sugden, 2007).

1.2.2. Uncertainty vs. Risk

In *Treatise on Probability*, John Maynard Keynes stated that there can be relationship between the evidence and the decisions that were made, but this relationship may not be measurable. Inductive reasoning can leave individuals in uncertain conditions whether to take risks or not, which can be faced with. Nobel Laureate Kenneth Arrow has made spectacular studies on decision making under uncertainty. In general, individuals can overestimate the amount of information available to them. The economists were failed to determine or recognize the causes of the Great Depression, which can show that the knowledge of economists about the economy at that time could be very limited. While working as an Air Force weather forecaster during the Second World War, Arrow also recognized the fact that, the natural world is unpredictable (Bernstein, 1996).

Arrow stated that

To me our knowledge of the way things work, in society or in nature comes trailing clouds of vagueness. Vast ills have followed a belief in certainty, whether historical inevitability, grand diplomatic designs, or extreme views on economic policy. When developing policy with wide effect for an individual or society, caution is needed because we cannot predict consequences (p. 203).

Individuals need to make future predictions to make more accurate decisions under uncertainty. However, it is better not to forget the fact that the decisions can fail and unexpected events can occur. Decisions can be made by considering future forecasts, without developing strong attachments to these forecasts. There is a wide gap between Laplace and Poincaré and Arrow, and the First World War made a remarkable change (Bernstein, 1996).

It was clearly seen that humans does not have the all necessary information to make rational decisions, and it was realized that having more information can increase the severity of uncertainty in decision making. The optimistic atmosphere of the Victorian era was destroyed by the severe struggle of the First World War (Bernstein, 1996).

Radical transformations occurred in arts and science. Up to the First World War, Classical economics defined a riskless economic system that can produce optimal results in a stable environment. When individuals decided to save more and spend less, interest rate would fall eventually lead to increase in investment or decrease in saving, to reestablish stability of the system. If business managers decided to expand production but when households failed to save enough to buy these products, interest rates increase to set back the equilibrium in an economy (Bernstein, 1996).

Under these conditions, the economy would not experience involuntary unemployment, dramatic decline in profits, and except the risk taking behavior of investors and companies, the economy would remain risk free. Everything reach equilibrium is an inaccurate concept to base economics on. Under the conditions of Classical Thinking, there is always an equilibrium in labor market, which makes Classical view wrong right from the start. It was first hard to realize the fact that things in the real economic world do not work as claimed by classical economics. A big era in measurement, which started with Paccioli's game of balla, was ended with the death of Francis Galton (1911) and Henri Poincaré (1912) (Bernstein, 1996).

1.2.3. After the First World War

Frank Knight and Keynes were first to discuss what will happen when individuals face with unexpected outcomes which are not even considered within the set of probabilities, why low probability events tend to occur more than expected, or why past outcomes do not repeat themselves in the future. By looking answers for these questions, Knight and Keynes shaped the notion of risk as being understood today. In *The General Theory of Unemployment, Interest and Money*, Keynes clearly rejected the arguments of Jevons. There is no way to measure the utility that is experienced by all individuals with one application (Bernstein, 1996).

Instead Keynes was far from the concept of a rational reasonable man and stated that humans have animal spirits which do not make decisions based on optimal payoffs. By means of post war years, it was realized that things in the real world problems cannot be solved with the applications of the theory of probability. The doctoral dissertation of Knight, *Risk, Uncertainty and Profits* was published as a book in 1921, was first significant study which deals with decision making under uncertainty. Knight was first to make a distinction between risk and uncertainty. Knight stated that

Uncertainty must be taken in a sense radically distinct from the familiar notion of Risk, from which it has never been properly separated. ... It will appear that a measurable uncertainty, or "risk" proper... is so far different form an unmeasurable one that it is not in effect an uncertainty at all (p. 219).

The arguments certainly divorced Knight from the arguments based on predominant economic view. It was not possible to make decisions under the established laws of probability in a perfectly certain world. In 1921, Keynes wrote a masterpiece named *A Treatise on Probability*. The work is an investigation on the previous studies on the applications of probability. Keynes makes a distinction between what is definable from what is undefinable when individuals make decisions about the future. Like Knight however, Keynes was against to predict future outcomes based on past occurrences (Bernstein, 1996).

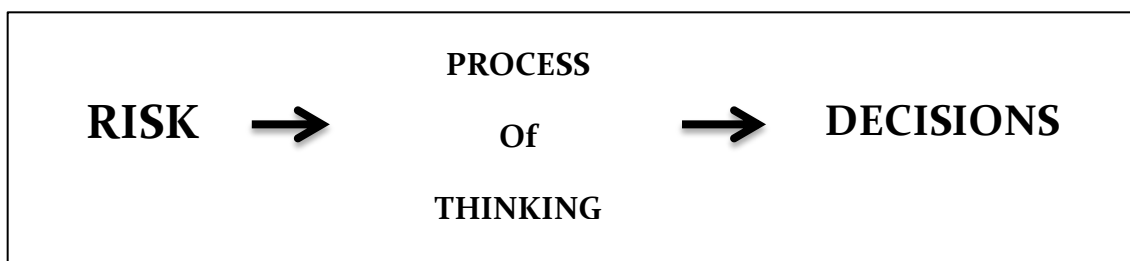


Figure 3. Process of Decision Making

Keynes and Knight stated that huge array of uncertainty and thinking plays a huge role in terms of decision making. Individuals make decisions by enlarge generated by uncertainty. From the very beginning it is all about mathematics. The universe is orderly at the very root has mathematical level and cause and effect is very important. In this little stage decisions really matter. Bachelier, Keynes, et.al. were talking about the essence of creation whether become life has become more uncertain now or in the past. Cause and effect is important and very nature of uncertainty, and decisions are relevant in this context. Being in line with the arguments of Knight, Keynes states that individuals cannot know what future will exactly bring, and sticking to past outcomes will not imply certainty about the occurrences of the possible future payoffs (Bernstein, 1996).

1.2.4. The Second World War Period

During the chaos of the Great Depression and the Second World War, in spite of the arguments of Knight and Keynes, the theory of rationality was still dominating the concept of risk. Game theory was generated by John Von Neumann during the 1920s. Game theory brought a different perspective to interpret uncertainty, and views risk as “The source of uncertainty lies in the intentions of the others” (p. 232). Decision making is based on a number of negotiations which each party tries to reduce uncertainty by engaging in mutual trading of the desires of each party. It was the game theory for the first time which focuses on the concept of a loss (Bernstein, 1996).

After the Second World War, by means of Bretton Woods agreements, many problems were aimed to be solved. US dollar and gold were connected at a fixed rate. All other currencies were fixed to gold. Fixed foreign currency resulted in disappeared volatility. After the war, International Monetary Fund, World Bank and United Nations were established. IMF and WB aim to deal with economic uncertainty and UN was established to control political uncertainty (Bernstein, 1996).

These three organizations were the result of Keynesian Fiscal Policy, to manage risk in the global environment. These enterprises spread the feeling of comfort and rationality which took place from 1945 until the first oil crisis in 1973. This extreme confidence led to a comeback in rationality. The arguments based on rationality and the theory of probability got a new edge with the Theory of Portfolio Selection. Harry Markowitz was discovered the concept of diversification which is based on splitting up the risk among the available investment options. With the Theory of Portfolio Selection, Markowitz was the first one who connected the dots between risk and return (Bernstein, 1996).

1.2.5. Against the Theory of Rationality

One of the most leading studies on risk was conducted by Daniel Kahneman and Amos Tversky. The study was first published as *Prospect Theory: An Analysis of Decision under Risk* which was published in one of the most important journals of econometrics and decision making, *Econometrica*, in 1979 (Kahneman, 2011). Rationality theory states that humans are risk averse, rational men's decisions are not context dependent, but prospect theory argues that humans are loss averse and the idea of rationality is psychologically unfeasible (Bernstein, 1996).

Decision making can be affected from a number of different factors instead of just focusing on utility maximization. Human irrational behavior, and reasons of our decision under uncertainty, has two main cognitive bases which are emotions and being unable to understand. People can make decisions depending on their emotions. Additionally, people can be tricked through their perception which can be explained with prospect theory. The most well-known example can be about a subscription advertisement in the Economist Magazine. The sole availability of the print option as in the same price as the plus online subscription, resulted in the choice of the plus subscription which has a price almost two and a half times higher than the price of print subscription (Ariely, 2008).

Another outcome of prospect theory is loss aversion which can be basically defined as a human preference to acquire gains instead of being suffered from losses (Kahneman & Tversky, 1979). In 1992, the advancements regarding the prospect theory summarized with another paper. Prospect theory does not have a pessimistic view on human decision making. Instead, it was stated that less rational human behavior can be the best way to survive in a competitive environment (Bruni, & Sugden, 2007).

A detailed literature survey is presented in the following chapter to provide insights in terms of the relationship of risk aversion with specific concepts such as demographics different contexts, and methods, and cognitive abilities.

CHAPTER 2: LITERATURE SURVEY

Literature survey provides information directly related to hypotheses which are studied in this research. The results of these studies are summarized in this section, and the areas of controversy are also presented. This research review is limited to the information of the researcher who held this thesis. The main themes discussed are the connection of risk aversion to different fields. The first subsection begins with demographics and followed by investigation of risk aversion in different contexts. Subsequently, the relationship between risk aversion and human cognition is presented. The last section focuses of different applications areas in terms of risk aversion.

2.1. Risk Aversion and Demographics

Risk taking behavior can be explained in terms of socio demographic diversity. There can be specific cross national differences when it comes to risk preferences. It appeared that Chinese people are less risk averse than American people (Hsee & Weber, 1999). It is also found that risk attitudes of Danes can be highly related to several socio-demographic variables (Harrison, Lau & Rutström, 2007). Individuals, under the age of 25, can be more risk taker than individuals who are 25 or over. It is also found that the risk taking behavior of a male and the age of mother can have a positive relationship.

Males born to young mothers can engage in less risk aversive behaviors (Da Silva, Baldo & Matsushita, 2013). Risk aversion in elder individuals can be viewed as a stereotype since whether being a young or elder adult; it was found that individuals do not show significant difference in risk taking behavior (Mather, 2006).

2.2. Risk Aversion Based on a Specific Context

Risk aversion can be subject to different contextual studies such as defining specific reference points to determine risk taking behavior (Lee, 2008; Nguyen, 2011; Koop & Johnson, 2012; Taylor, 2013). A reference point can be taken from a social context, or economic conditions such as wealth, income, etc. (Linde & Sonnemans, 2012). Risk aversion can be studied by means of social utility which is determined as a payoff in social contacts (Loewenstein, Thompson, & Bazerman, 1989).

It is found that the risk aversion of individuals can vary related to contextual change (Isaac & James, 2000). There can be a relationship between goals and decision making in a risky context. A specific goal can be determined as a reference point while making risky decisions. It is studied that individuals can take risks above that aim (Jeffrey, Onay & Larrick, 2010).

Risk preferences can be affected from different contexts. A study is conducted in three different decision domains which are related to work, health and finance. It was found that, individuals either consistent or inconsistent in their cross domain risk taking. Consistent individuals appear to be risk averse in their decisions (Soane & Chmiel, 2005).

Individuals make risky financial decisions based on other available options. The relationship between saving and risk aversion can also be the subject of a contextual research (Schechter, 2007). The relationship between long term retirement saving and investment can be affected from these available alternatives. The decisions of individuals are manipulated in a way to increase saving rates and to take more investment risk. It is found that context is very effective when it comes to decision making (Vlaev, Chater & Stewart, 2007). Risk attitudes can be highly context dependent, and willingness to take risks can change depending on several factors such as age, gender, height, etc. (Dohmen, Falk, Huffman, Sunde, Schupp & Wagner, 2011).

Furthermore, risk attitudes can be observed in a laboratory environment, and experimental procedures are generated to analyze risk attitudes of individuals by means of different procedures, auctions, and games (Harrison & Rutström, 2008).

There are also studies regarding domain specific risk taking and different types of measurement. Improved version of Domain- Specific Risk –Taking (DOSPERT) scale can be one of those studies. By means of DOSPERT, the relationship between risk taking and risk perception is investigated in 5 different risk domains (Blais, & Weber, 2006). The relationship between actual risk taking behavior and experimental results can be studied to understand whether actual behavior meets with the given responses to the VSB psychological questionnaire (Wärneryd, 1996).

2.3. Risk Aversion and Human Cognition

“Cognition is usually defined as the acquisition of knowledge” (p.2). Cognition broadly includes mental skills that are required for acquisition and use of knowledge. One of the main fields, which is investigated in terms of cognition, is decision making (Reed, 2007). The relationship between risk aversion and cognitive ability has not been subject to many studies (Frederick, 2005; Burks, Carpenter, Goette & Rustichini, 2009; Dohmen, Falk, Huffman & Sunde, 2010).

It is found that individuals with higher cognitive abilities can be less risk averse (Dohmen et.al., 2010). Risk taking behavior can be positively linked to past experiences. It is observed that successful past outcomes can positively affect risk taking behavior of the individuals (Fatás, Jiménez, & Morales, 2011). A strong relationship between cognitive skills and preferences can be observed. Individuals with better cognitive skills appeared to be more patient in the short run and long run, and may have more willingness to take risks. Higher cognitive skills may lead to better economic decision making (Burks et.al., 2009).

There can be a positive relationship between risk taking behavior and level of education. In a hypothetical gamble task, it is found that more educated individuals were more risk tolerant in terms of choices with different possible payoffs. However, individuals with different cognitive abilities can have different attitudes towards risk taking (Frederick, 2005). Risk taking behavior tends to be increasing when an individual has higher cognitive ability. Even after specific personal characteristics i.e. age, gender, and particular economic elements i.e. income, education, and liquidity constraints are eliminated, the relationship between cognition and risk stays strong and significant (Dohmen, et.al., 2010).

Judgment and decision making theorists argue that decision making in a risky context is a cognitive activity. Humans evaluate risk cognitively, and cognition based approach depends on probabilities of different outcomes (Loewenstein, Weber, Hsee, & Welch, 2001). Risky decision making is based on options that have uncertainty, and individuals can never be sure about the certain payoff (Reed, 2007).

Perceived risk can depend on the amount that could be lost in a gamble. Humans can make risky decisions without perceiving the choice as a risky option. This may also depend on cultural context. Individuals from different countries may have different attitudes towards risk (Reed, 2007). Risk can totally be dependent on how humans perceive risk, and the perception can be different from one person to another. That can be dependent on several factors such as family background, personal income, etc. "Perception is reference dependent: the perceived attributes of a focal stimulus reflect the contrast between that stimulus and a context of prior and current stimuli" (pg. 1454) (Kahneman, 2003a).

2.4. Risk Aversion and Different Methods

Risk aversion can be investigated by means of different experimental methods (Anderson & Mellor, 2009). Risk attitude can be defined as willingness to take risks (Dohmen, et.al., 2012). Intrinsic risk attitude can be investigated through different measures which are “problem structuring, beliefs, and values,” “context and process factors,” “portfolio effects,” and “incomplete markets” (Schoemaker, 1993).

Another measure can be “laboratory-based behavioral measure of risk taking” which is defined as the Balloon Analogue Risk Task; BART. The relationships between BART and risk taking behavior according to self-reported measures of “risk-related constructs,” and self-reported real world risk taking behavior are studied (Lejuez, Read, Kahler, Richards, Ramsey, Stuart & Brown, 2002). Some studies investigate how individuals predict the risk preference of other individuals. The risk taking behavior of other individuals in terms of stereotypes, such as gender, strength and specific physical features, can generate the focus of different studies (Blavatsky, 2007; Ball, Eckel, & Heracleous, 2010). Risk aversion of individuals can be measured in terms of gender stereotypes, and individuals are asked to make predictions about the risk taking behavior of others (Wade & Rochlen, 2013). The accuracy of risk preferences of the others can be studied by means of belonging to a certain social network. It may appear that men have more willingness to take risks than women (Siegrist, Cvetkovich & Gutscher, 2002).

Risk taking behavior of individuals can be studied by means of lotteries and personality types which are classified as risk seeking, risk neutral and risk aversive (Luce, 2010). That is, personality features and risk aversion may have a positive relationship (Lauriola & Levin, 2001).

The relevant conceptual framework is presented in the next chapter. The theory is presented in terms of Classical and Neo-Classical Economics. To provide a deeper understanding of the concept of risk aversion, Rational Choice Theory, Expected Utility Theory and Prospect Theory are presented. Besides, the concept of decision making, creativity, gender, and demographic factors are discussed. In the final section, the hypotheses of this thesis are presented.

CHAPTER 3: THEORETICAL FRAMEWORK

Human behavior is in the focus of different social sciences. Psychology and Economics are the two main fields which cooperate when it comes to the investigation of human decision making (Edwards, 1954). From a psychological perspective, “economics is the study of the allocation of behavior within a system of constraint” (p. 246) (Domjan, 2009). The theoretical framework provides detailed information about the main concepts which generate the core of this study.

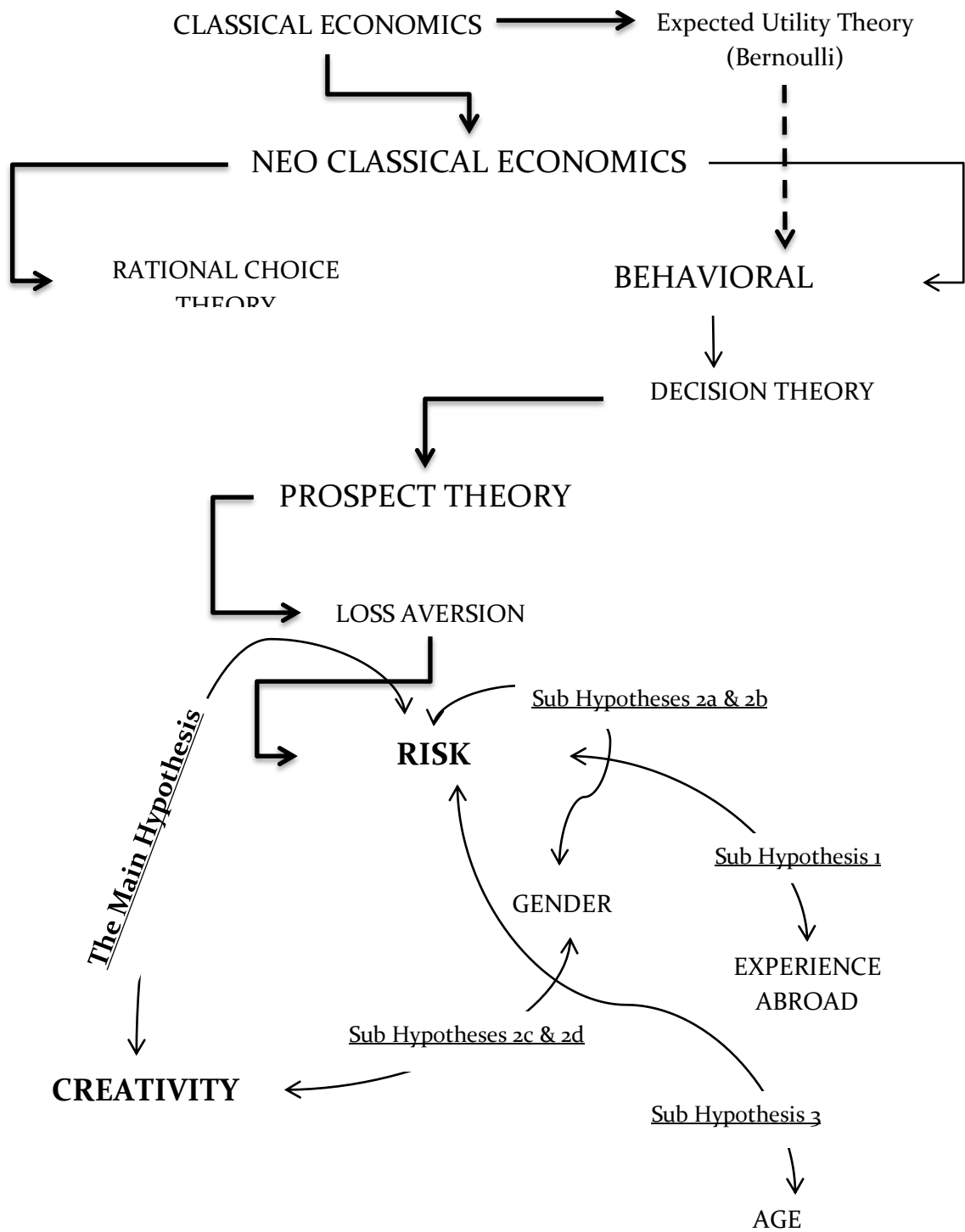


Figure 4. The Diagram of Theoretical Framework

3.1. Classical Economics

When economics first started to appear as a separate discipline, psychology did not yet manifest itself as a field of study. Since there was no specific area, economists could have been also counted as psychologists of their time. Before writing *The Wealth of Nations*, Adam Smith wrote a book called *The Theory of Moral Sentiments* which stated that the behaviors of individuals can be as important as economic observations (Camerer & Loewenstein, 2004).

In *The Wealth of Nations* in 1776, Adam Smith stated that the economic behaviors of individuals were motivated by self-interest. In 1759, *The Theory of Moral Sentiments* showed that behavior was based on the conflict between *passions* and the *impartial spectators*. Emotions, hunger, motivational feelings and sex were grouped under passions. Individuals could make decisions which were highly affected by their passions. Impartial spectator was defined as an approval mechanism of individual self and from the others. The book gives many insights about the individual behavior which generates the bases of today's behavioral economics by providing arguments on loss aversion, altruism and market interactions (Camerer & Loewenstein, 2005).

3.2. Expected Utility Theory

Decision making under risk, first defined with a theory of expected utility by Daniel Bernoulli in 1738. The essay of Bernoulli focuses on the argument that individuals make decision under risk to maximize their expected utility of wealth (Kahneman, 2003a). Expected Utility theory was generated to find an appropriate answer to the question of *what price, a reasonable person should be prepared to pay, to enter a gamble*. At that time, it was expected to answer this question with any amount that meets the expected value of the gamble. Bernoulli was against the answer by arguing that individuals pay to enter the gamble only with a small amount. Through this argument Bernoulli stated that sole value of the gamble may not be equal to expected monetary value (Starmer, 2000).

In 1783, Bernoulli introduced two arguments. The utility of wealth does not increase constantly. There is no linear relationship between the amount of wealth and utility. Instead, the utility increases at a decreasing rate. Utility, therefore, can be an inversely measurable quantity which has no relation to probabilistic view. The second argument is that, risk is based on the expected utility of wealth. As our gains increase, we prefer to take place in a risky gamble (Fishburn, 1988).

Expected utility theory assumes that probabilities are the main determinant of the utility of an outcome. However, individuals make decisions in favor of certain outcomes. That is, certainty effect occurs when “people overweight outcomes that are considered certain, relative to outcomes which are merely probable” (p. 265) (Kahneman & Tversky, 1979). Expected utility theory cannot provide reliable arguments on risk aversion over moderate bets such as \$10, \$100, etc. Large scale risk attitudes can be the result of algebraic observations. Expected utility theory states that risk attitudes of individuals merely based on changes in utility which occurs as the wealth of an individual changes through the course of a lifetime, and highlights that individuals may not be risk averse regarding monetary gains and losses as long as the change in the magnitude of lifelong wealth may not affect the marginal utility gain (Rabin & Thaler, 2001).

Bernoulli explained that individuals do not like to take risks, and prefer to choice with certain outcome over a gamble. Bernoulli argued that an individual tends to be risk averse under the conditions of diminishing marginal utility for wealth. This new concept of expected utility explained the main reason why poor individuals prefer to buy insurance while insurance is sold by richer ones. However, the theory assumes that the happiness of individuals is determined by the amount of wealth that they have. The happiness is determined by the actual change in the wealth of individuals not by the actual amount. In this way, Bernoulli’s theory appears to be flawed. In terms of economics, expected utility theory has two edges (Kahneman, 2011).

The theory provides background about how decisions should be made and how economic agents, in terms of classical economics, make choices. In a gamble worst outcome can be different from the sure outcome depending on the reference point of individuals (Kahneman, 2011).

Individuals can face with different psychological outcomes. One individual can have gains from a gamble while loss can be the outcome for another individual. Without a reference point, it may not be possible to explain risk seeking behavior of an individual. When the available choices are presented with moderate or high probabilities, individuals can turn out to be risk averse in terms of gains and turn out to be risk seeker in terms of losses. In this way, individuals may end up paying large premiums to have a sure gain and no loss, instead of dealing with a gamble (Kahneman, 2011).

3.3. Neo Classical Economics

Neoclassical theory applies a framework which is based on full information and unlimited capacity to process information. All economic agents are assumed to have relevant information to make accurate decisions and to achieve maximum payoff. Behavioral economics, on the other hand, recognizes that human agents have limited capabilities to have all relevant information to reach maximum utility (MacFayden, 2006; Weber & Johnson, 2008).

Behavioral economics have roots from neoclassical field. Jeremy Bentham generated the foundations of neoclassical economy through utility theory. Francis Edgeworth introduced a box diagram, which was built on utility theory, to show endowments of two different individuals to specific goods. The outcome shows the effects on the utility of each individual depend on payoffs. The decline of psychology in economics has begun with the neoclassical revolution. Paradoxically, neoclassical economics was based on the assumption about the behaviors of homo economicus (Camerer & Loewenstein, 2004).

In the beginning of twentieth century, economics was expected to be a natural science, and psychology at that time appeared to be not improved enough to provide stable arguments for economics. Consequently, arguments of Benthamite utility did not provide reliable insights for economics. These circumstances led to exclusion of the psychology from economics. During the first decades of twentieth century, Irving Fisher and Vilfred Pareto were still taking the advantage of psychological insights, and later on John Maynard Keynes attracted to psychological observations. By the mid twentieth century the psychological insights mostly lost their effectiveness in economics (Camerer & Loewenstein, 2004). Jeremy Bentham, Adam Smith, Irving Fisher and William Jevons were the economists who aimed to build economics on psychological insights. However, behavioral economics was abandoned with the dominance of mathematical tools in economics, consumer theory and general equilibrium model (Camerer, 2005).

During the second half of the twentieth century arguments about the importance of psychology and rationality appeared but these were not appealing enough to bring a significant change. During the 1960s, the views of cognitive psychology started to generate bases for neoclassical economics in terms of utility maximization. Amos Tversky and Daniel Kahneman are two well-known psychologists who have been contrasting economic and psychological models. This resulted as prospect theory which has appeared to be one of the milestones in the intersection of economics and psychology (Camerer & Loewenstein, 2004).

3.3.1. Rational Choice Theory

The relationship between utility and wealth can be a feature of rationality. From Bernoulli's point of view, the final situation and long term outcomes are important (Kahneman, 2003b).

During the 1930s and 1940s, economics witnessed the elimination of psychological concepts from economics. The economist such as John Hick, Roy Allen, Paul Samuelson, et. al. contributed to economics theory to have foundations from the principles of rational choice theory. The formation of rational choice theory was first appeared against the core of neoclassical economics which has bases from psychology as well. At that time, both neoclassical economics and experimental psychology were newly born fields which did not have exactly defined boundaries between each other. Neoclassical economy was based on the assumptions of pleasure and pain. These two notions met the findings of psychophysics (Bruni, & Sugden, 2007).

During the early 1950s, the main argument was to improve rationality based models in terms of scope. Dealing with risk and uncertainty was one of the main extensions. Keynesian macroeconomic arguments, which have empirical and psychological bases, were tried to be replaced with the literature of micro foundations and rational expectations. This attempt resulted in the generation of the new sub disciplines such as institutional economics, law and economics, and public choice. Through these new sub disciplines, rational choice modeling was extended to the non-economic areas such as social life. This trend continued to exist until the 1980s (Bruni, & Sugden, 2007).

In 1986, Tversky and Kahneman stated that decision making of individuals can be affected from framing of decision prospects. Framing effects can challenge extensionality and consequentialism which are the main assumptions of invariance. Reference dependence can be defined as one of the features of the theory of rationality. Individuals are assumed to constantly have the same tastes and preferences. When bets are low, the level of risk aversion cannot be explained by attitudes to wealth. As a descriptive model, expected utility theory appears to be incorrect, the reason behind to be retained for a very long time can be hidden in the theory of rationality (Kahneman, 2003b).

3.3.2. Behavioral Economics

Economic consequences can be highly based on individual decision making, individual feelings, emotions, and ideas. Adam Smith argued that individuals make decision to follow their economic interest. Although this argument can be correct, humans are driven by other motivators such as emotions and can be guided by their animal spirits. John Maynard Keynes, highlighted the animal spirits can be in action when it comes to economic decision making of humans. In terms of economics, animal spirits is basically “a restless and inconsistent element in the economy. It refers to our peculiar relationship with ambiguity or uncertainty. Sometimes we are paralyzed by it. Yet at other times it refreshes and energizes us, overcoming our fears and indecisions” (p.38) (Akerlof & Shiller, 2010).

“Behavioral economics which uses empirical evidence of limits on computation, willpower and greed to inspire new theories” (p.26) (Camerer, 2007). Behavioral economists use psychological insights to make applications on economics (Loewenstein, 1999b). Behavioral economics can be defined as “the application of psychological insights to economic problems.” Utility maximization has both economic and psychological features. For example, a situation can be the main focus of neoclassical economics, and can be defined as a psychological theory of behavior (Loewenstein, 1999a).

By another definition, “Behavioral economics simply rekindles an interest in psychology that was put aside when economics was formalized in the latter part of the neoclassical revolution (p. 39)” (Camerer & Loewenstein, 2004). Behavioral economics study economy in terms of psychological methodology and theory. How human beings think and behave in reality is one of the main evaluation points of behavioral economics (Hursh 1984; Bruni, & Sugden, 2007). By applying psychological concepts to economy, researchers have advantage to test empirical validity through laboratory experiments (Hursh, 1984).

“Behavioral economics explores, catalogues, and rationalized systematic deviations from rational choice theory” (pg. 1) There are three main categories that define these deviations. Bounded rationality refers to limits on human decision making to process all available information provided. Bounded willpower defines the lack of self-control that humans have. Individuals can make biased decisions based on emotions, procrastinate, and consume much more than necessary. Bounded self-interest basically refers to notions which are caused by social interactions. Humans can behave emotionally when it comes to reciprocity, aversion, altruism, etc. (Shogren & Taylor, 2008).

Behavioral economics look for ways to inform economics which appears to be different from other social sciences by means of mathematical structure. The combination of psychology and economics, however, does not represent a new area instead the combination can be defined as a reunification of these two major areas. In the beginning of the 1900s economics was being tried to shape by two different directions. The first one was determined by theorists as Arrow, Debreu, and Samuelson who put effort to base economics on mathematics and physics. Psychologists, on the other hand, were affected from experimental structure (Camerer, 1999).

Today, behavioral economics can be defined as a well-established discipline. However, the flaws of the classical economics remain the main research area of behavioral economics. The most common studies are based on defining a flaw, regarding a well-known economic assumption, through experiments. The conclusion is generally reached by providing explanations for economic flaws from psychological perspective. This approach can only lead to small changes on the arguments of the classical theory. Behavioral economics may only remain as a small force that does not have enough strength to shape up the classical models. Constrained optimization, for example, may not be suitable to show the biased human behavior. There is only small change that describes humans can make mistakes about forecasting the probabilities of future utilities. It is also possible that important points can be different for psychology and economics (Pesendorfer, 2006).

3.4. Decision Theory

Mainstream economics defines humans as fully rational beings who do not make nonrational decisions. However, in real life, humans have emotions and can fail to make appropriate decisions (Thaler & Sunstein, 2008).

Modern decision theory has roots from the study of Daniel Bernoulli, which was called St. Petersburg essay. The original version of expected utility has basics from this study. According to Bernoulli, “decision-maker values financial outcomes as states of wealth and orders options by the expected utility of these states” (p. 164). This assumption simply states that economic agents have fixed tastes since the utility gained from states of wealth does not help to determine current endowment (Kahneman, 2003b).

Decision making is in the focus of many fields such as economics, statistics, sociology, psychology and political science. The research on decision making studies has both descriptive and normative questions. The descriptive studies focus on the preferences and beliefs of individuals as they are, and do not seek answers about how these beliefs and preferences should be, while the concept of rationality and the logic of decision making generate the core of normative studies (Kahneman & Tversky, 1984; Loewenstein, 1996). Descriptive side of decision theory is based on cognitive psychology. The impact of emotions in decision making can also be the focus of decision theory. Existence of emotions can cause individuals to make irrational decision. Basically, irrationality refers to “impulsive and self-destructive behavior and to actions that violate generally accepted norms about the relative importance of different goals” (p.719) (Loewenstein, 1996).

The distinction between risky and riskless choice is the main concern of decision making analyses. Risky choices are made without having advance knowledge about the possible upcoming consequences such as whether to take an umbrella or not on a cloudy day. Risky choice can also appear in a gamble which has many outcomes with different probabilities. To observe basic attitudes toward risk, decision making studies take advantage of gambles with monetary payoffs and various probabilities to occur (Kahneman & Tversky, 1984).

During the 1940s, economics adapted logical positivism with F twist. Economic theories which assume that rational economic agents make accurate choices to have maximum utility appeared to help accurate predictions. These theories, however, proved to be wrong by psychologists. This F twist deepens the distinction between these two fields. In the 1950s, Herbert Simon introduced bounded rationality. Judgment and decision making has started to have attention of cognitive psychologists since the 1970s (Camerer, 1999).

3.4.1. Behavioral Decision Theory

Behavioral decision theory emerged as a result of the critiques against the traditional decision theory. Behavioral decision theory has started to emerge during the late 1960s, and has been based on two main arguments. Firstly, decision making of individuals can be under the effect of cognitive errors that can be made while trying to make accurate predictions about the future. Secondly, behavioral decision making can be a broad interpretation of heuristics which are dealt with during the decision making process (Loewenstein & Lerner, 2003).

Behavioral decision making produced two main models. The first one is decision making under risk which is based on determining desirability of different outcomes, and estimation of the likelihood of the occurrence of these payoffs. The second one is defined by intertemporal choice which provides explanations about how individuals make decisions over time (Loewenstein & Lerner, 2003). Human choices can be related to the behaviors of Time Preference, Risk Preference, and Altruism (Camerer, Loewenstein & Prelec, 2005).

Time preference can particularly stand for instantaneous utility over delayed utility (Frederick, Loewenstein & O'donoghue, 2002). Risk preference can be defined as decision making patterns of individuals under a situation with several probabilistic choices with different payoffs (Hsee & Weber, 1999). Basically, altruism can be described as unconditional kindness. An individual can sacrifice her won resource to help to increase the well-being of the other individuals. A favor that is done, does not occur in response to a previously received favor (Fehr & Schmidt, 2006).

Decision making under risk brought three main innovations to behavioral decision theory. The first innovation is about the assumption of asset integration. The expected utility theory focused on whether individuals are either happy or sad when they faced with the result of their choices. However, it was explained first by Markowitz, and later on by Kahneman and Tversky that, individuals are not concerned with their final level of wealth while making a decision instead, these individuals focus on incremental gains or losses that may occur (Loewenstein & Lerner, 2003). The second innovation is mainly based on comparison of the outcomes of different events by means of emotions. The third innovation is related to nonlinear probability weighting. Unlike the arguments of expected utility theory, outcomes of a decision may not be strongly proportional to the probability of occurrence of an event. Humans can overweight small probabilities about occurrence of an event (Loewenstein & Lerner, 2003).

3.4.2. Prospect Theory

Prospect theory provides explanations to decision making under risk. Decision making in a risky context may occur differently than the assumptions of expected utility theory. Individuals can show strong tendency towards the outcomes that can happen with certainty and underweight the outcomes which has high probability to occur. This situation can be described with certainty effect which provides explanations about risk aversion. "A person is risk averse if he prefers the certain prospect to any risky prospect with expected value." (p.264) (Kahneman & Tversky, 1979).

Prospect Theory is based on three main features. Firstly, for financial outcomes reference points can be based on status quo, or the outcome that can be expected to be gained by an individual. Gain, in here, turns out to be larger than the expected value and loss refers to values below the reference point. Secondly, changes in wealth can be subject to diminishing sensitivity. Decline from the large amount of initial wealth by a small amount may not be as effective as increase in a small amount of initial wealth by a significant amount. Thirdly, individuals can be subject to loss aversion which appears as “when directly compared or weighted against each other, losses loom larger than gains” (pg. 282) (Kahneman, 2011). That is, a human preference to acquire gains instead of suffering from losses (Kahneman & Tversky, 1979).

The graph shows the diminishing sensitivity of gains and losses over time. The slope of the graph can change depending on the reference point which means wealth. Losses may awake a result that is stronger response than gains. The main argument of prospect theory can be explained through risk seeking and risk aversive behavior. In mixed gambles, the possible amount of loss appears to be twice larger than any possible gain. In bad choices, diminishing sensitivity can result in risk seeking. An individual can suffer more by losing \$900 than losing \$1000 by 90% chance. In prospect theory, individuals attach wealth to gains and losses instead of making judgments based on their wealth (Kahneman, 2011).

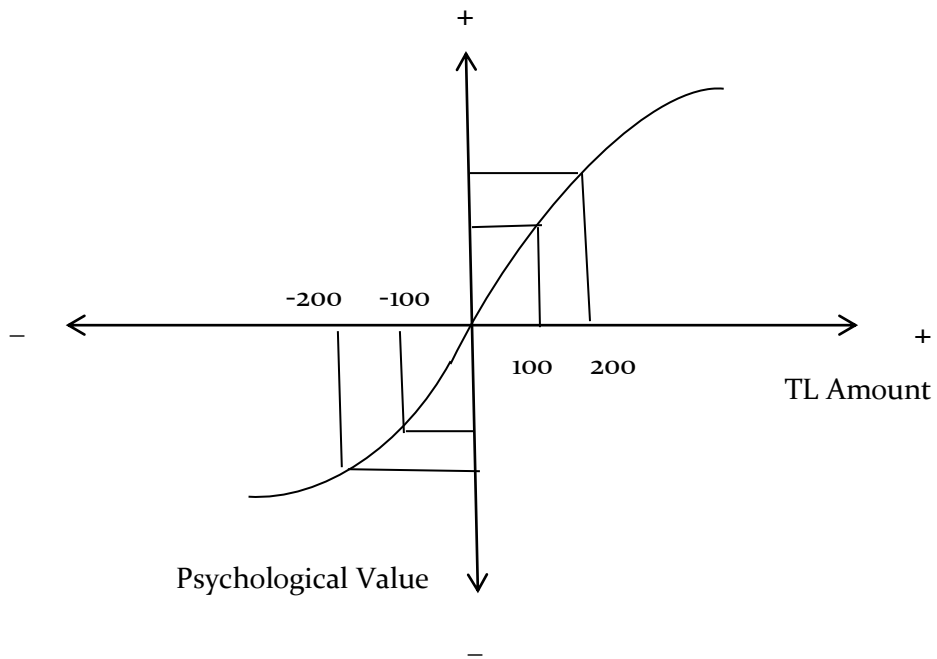


Figure 5. The Graph of Prospect Theory

There can be different applications of prospect theory (Rieger & Wang, 2008). The application area of prospect theory is aimed to be extended to events with complex uncertainties such as applications in finance, health, etc. (Kothiyal, Spinu & Wakker, 2011), and even a third generation prospect theory is presented (Schmidt, Starmer & Sugden, 2008).

3.4.2.1. Weak Points of Prospect Theory

Prospect theory assumes that humans can act under the immediate emotional effect of gains and losses. There are no long term considerations such as wealth and global utility. Prospect theory may not explain the occurrence of nonevents. Based on expectations, winning nothing out of a gamble may not provide a good reference point, and may not assign value to this outcome. Prospect theory lacks in providing explanations to disappointment. Like utility theory, prospect theory cannot provide explanations in terms of regret. It is always assumed that individuals choose the option with the highest gain by independently evaluating the options. The regret felt about choosing one option over another has not been taken into account in both theories. Prospect theory however still appears to be the most plausible study since the theory provides explanations to the cases that utility theory could not provide explanation (Kahneman, 2011).

3.4.3. Cumulative Prospect Theory

In 1952, Markowitz stated that “the objects of choice are prospects, defined in terms of final asset positions” (p.147). This concept generated the heart of Prospect theory by Kahneman and Tversky. The notion of reference point comes from the examinations of human behavior. Individuals tend to be risk averse when there are gains, and can be risk seeking when there are losses and those losses appear larger than gains. Prospect theory also puts forward the argument that individuals can overweight occurrences of events with small probabilities whereas events with higher probabilities can be underestimated. This paradox leads to another argument of decision weights. Cumulative prospect theory is developed to measure expectation in regard to non-additive measure (Wakker & Tversky, 1993).

There are five main phenomena of choice which contradicts standard model. These are defined as framing effects, nonlinear preferences, source dependence, risk seeking, and loss aversion. Framing effects refer to different preferences in terms of gains and losses. In contrast to rational theory, invariance does not exist. Individuals can have various preferences depending on the options. Nonlinear preferences contrast with the arguments of the expectation principle. The possible utility of a risky preference cannot be linear. Allais paradox shows that the utility of the probabilities .99 and 1.00 has more impact than the difference between 0.10 and .11. Besides, recent studies showed that nonlinear preferences may not have certain outcomes. Source dependence is related to the willingness to bet on uncertain events. This depends on the degree and the source of uncertainty (Tversky & Kahneman, 1992).

Humans can also have tendencies to bet on an area that they have expertise. Besides risk aversion, risk seeking behavior can occur under uncertainty. Individuals turn out to be risk seekers when being faced with a small probability of a larger payoff than the expected value. There can be also events that results in a decision between a sure loss and a highly probable larger loss. Loss aversion occurs when individuals are required to make a decision under risk and uncertainty, in which losses appear larger than gains. Prospect theory can be unique in a way of framing and valuation when it comes to decision making. During the framing period, “the decision maker constructs a representation of the acts, contingencies, and outcomes that are relevant to the decision” (p. 299). The valuation period is based on assessing the value of each available option and choosing respectively (Tversky & Kahneman, 1992).

The classical theory assumes that, the utility came from an uncertain option can be obtained by summing the weights of each probable prospect. With cumulative prospect theory two main changes has been done. Firstly, the value can be determined by means of gains and losses. The value of final asset cannot be a determinant. Secondly, instead of additive probability the value of each payoff is multiplied by a decision weight. With cumulative prospect theory, it can be possible to apply cumulative weights solely to gains and to losses. In this way, it is possible to evaluate risky and uncertain choices (Tversky & Kahneman, 1992).

3.4.3.1. Decision Weights

The classical theory states that “decision under uncertainty derives beliefs about the likelihood of uncertain events from people’s choices between prospects whose consequences are contingent on these events” (p. 879). Classical theory, however, cannot explain the fact that individuals can make decision based on their beliefs, and does not consider the role of probability when it comes to providing explanations and predictions about decision making under uncertainty. The choices of individuals occur between risky prospects may not generally occur in the same way that expected utility theory assumes. These flaws can be explained by means of non-linear weighting function. Low probabilities tend to be overweighed whereas underweighting occurs in terms of moderate to high probabilities (Fox & Tversky, 1998).

Tail events refer to rare and high impact occurrences. The psychology of tail events can be described with a two-step framework. The probability of a tail event is observed by an individual in the first step, and the judgment by means of the probability about a decision, is made in the second event. In this framework, the first step is about beliefs, while preferences are the focus of the second step. During the beliefs step, individuals can overestimate the probability of the occurrence of a tail event. Overweighting of the occurrence of a tail event takes places in the second step (Barberis, 2013).

This aspect can be related to probability weighting function which is the part of cumulative prospect theory, model of decision making under risk. Availability heuristic refers to overestimation of the occurrence of an event. This concept can also meet with the overestimation of the possibility of the occurrence of the tail event. Individuals overweight tail events while making decisions based on a description when asked to make a decision between two specific choices. Underweighting occurs when individuals make decisions based on experience which depends on sampling with replacement (Barberis, 2013).

3.4.4. Loss Aversion

Daniel Kahneman has renewed the notion of utility by Bentham as “experience utility.” Loss aversion can be defined as one of the turning points in utility theory. By means of loss aversion, it has become possible to focus on human behavior under risk and uncertainty. There can be several non-consumption sources of utility that can trigger decisions of individuals. When individuals face with frequent losses, it can be possible to observe increased temporal consistency, and consistent risk taking behavior among symmetric risk tasks. The consistency in human behavior is therefore, can be affected from the availability of losses (Yechiam & Telpaz, 2013).

Loss aversion focuses on the reactions of individuals against changes in wealth rather than the fluctuations in the level of wealth. When individuals consider gains against losses, losses can weight more than gains when compared to a specific reference point. This argument explains the reasoning behind the rejection of small gambles with possible positive payoff (Rabin & Thaler, 2001). Individuals can reject gambles that involve 50/50 chance of monetary gain or loss. In terms of prospect theory, humans tend to be more sensitive to losses than gains. For example, individuals look for \$100 gain to cover a loss of \$50. The subjective risk of being faced with a loss can be twice that of gains (Tom et.al., 2007).

Loss aversion can be experienced in terms of different economic domains. It is found that there is a relationship between loss aversion and price elasticity. People tend to purchase less when large price elasticity tends to be larger for increases in price. Loss aversion is also the subject to finance studies to make arguments on equity premium puzzle, for example (Ho, Lim, & Camerer, 2006).

3.4.5. Risk Aversion

From financial and economic perspective risk can be defined as going for an option with a higher variance of probable monetary payoff. Risk seeking can be described as going for higher variance outcome while expected value remains constant (Schonberg, Fox & Poldrack, 2011).

Risk averse individuals prefer to make decision in favor of paying less to certain choices over higher paying gambles. Risk aversion is the result of the psychological values of outcomes, that is, the utility of our choices. The psychological value of a gamble is not determined by actual amount that an individual can gain. Instead, the decision is determined with the utility that an individual can have based on the result (Kahneman, 2011). Risk aversion is a type of behavior that illustrates “the hesitation over risky monetary prospects even when they involve an expected gain” (p.119). From the economic point of view, risk aversion occurs as a result of utility maximization. Individuals look for prospects that can bring the maximum utility. However, this explanation of utility maximization does not applicable for most of the cases of risk aversion (Rabin & Thaler, 2001).

Risk aversion can be based on the value and cost between facing a risk and taking a risk. A game with many payoffs which can be indefinitely large and the chance to win a moderately large return can be very small. To enter this game, nobody has willingness to pay a large amount of fee. Daniel Bernoulli stated that large money prizes can be measured with their “moral worth” instead of their size. Here, “moral worth” refers to utility (Arrow, 1996).

Utility function of wealth cannot explain the change from risk seeking to risk aversion behavior or vice versa. Choices of an individual are determined by gains and losses which are determined by a reference point. Unlike expected utility theory, which determines utility according to states of wealth, prospect theory focuses on gains and losses in terms of changes of wealth. Gains and losses of an individual define value function which has three main aspects. Firstly, risk aversion behavior can be defined by a concave shape in terms of gains. Secondly, convexity defines risk seeking behavior when an individual is faced with losses. Most importantly, utility function has a bending shape to define reference point. The function of a loss averse individual can appear steeper for losses than for gains. Although expected utility function makes wrong assumptions, for almost 300 years, the theory has been retained. The standard economic model is based on the assumption of rational individuals which is also the base of utility from the state of wealth (Kahneman, 2003a).

The reflection effect occurs when the gains are replaced by losses. The reflection effect shows that risk aversion in the positive domain turns out to be risk seeking in the negative domain. In general individuals can prefer to accept the risk of losing 4,000 by .80 probability over the certain loss of 3,000, even with a lower expected value. Before the prospect theory, Markowitz made arguments on risk seeking choices in a negative domain. In the study of Markowitz, participants had an indifferent response between the two different gambles (100, .65; - 100, .35) and (0) which shows risk aversion, whereas staying indifferent between the gambles (-200, .80) and (-100) shows risk seeking behavior (Kahneman & Tversky, 1979).

The certainty effect may occur in the positive domain by simply choosing certain gain over a larger outcome that is probable to occur. Risk seeking behavior is the result of the same behavior in the negative domain, and choosing probable loss over a smaller certain loss that may occur. The same reasoning can be applied to overweight of certainty, which states that individuals tend to be risk averse in the domain of gains and risk seeker in the domain of losses (Kahneman & Tversky, 1979).

3.5. Creativity

“Creativity is any act, idea, or product that changes an existing domain, or that transforms an existing domain into a new one” (pg. 34) (Csikszentmihalyi, 1997). Creativity can be defined as a quasi-cognitive feature that can be highly effective on decision making process of individuals (Borghans, Duckworth, Heckman, & Ter Weel, 2008). Creative individuals can perceive the parts, which are missed by the others, from whole (Carson, Peterson & Higgins, 2003).

“The creative individual is a person who regularly solves problems, fashion products, or defines new questions in a domain in a way that is initially considered novel but accepted in a particular cultural setting” (p. 35) (Gardner, 2011). A creative individual can have thoughts or actions to change or to establish a specific domain, tend to take more risks and can be courageous to cross the traditional boundaries of a specific society. Risk taking can be highly fueled with curiosity to discover unknown (Csikszentmihalyi, 1997). Creative ideas can be generated by means of risk taking, curiosity, and inner motivation (Heller, Perleth & Lim, 2005). Creativity can be the result of interaction among the individuals within a specific environment (Plucker & Makel, 2010), and the outcome can be both novel and a useful idea for a social network (Amabile, 1996a; Plucker & Makel, 2010).

Societies may relate creativity to independence, rebelliousness, and deviance from norms of a specific context. Creativity is based on generation of a new unpredictable tomorrow by using resources from past to generate better options for the future ahead. Focus on the future brings hope and risk. Hope stimulates optimistic view about the change in the future, while unexpected obstacles, chances of failure and uncertainty can be counted as a few remarks regarding why creativity can be a risky business (Nickerson, 1999; Moran, 2010). Creative individuals need to be comfortable with risk (Puccio & Cabra, 2010), and groundbreaking creative outcomes can be based on risk taking behavior (Simonton, 2010; Sternberg & Kaufman, 2010; Kaufman, Plucker & Russell, 2012).

Creativity may play a central role with specific personal achievements (Barron & Harrington, 1981), and can be related to personal traits (Chávez-Eakle, Eakle & Cruz-Fuentes, 2012). Creative individuals tend to take risks to defend their own arguments. In this way, creativity may reduce the risk aversion since creative individuals, take risks, can deal with ambiguity and fight against the obstacles that are faced with (Sternberg, 2006).

3.5.1. Creative Achievement

“Creative achievement may be defined as the sum of creative products generated by an individual in the course of his or her lifetime” (p. 37) (Carson, Peterson & Higgins, 2005).

Various intrapersonal and interpersonal features can affect creative achievement of individuals. Intrapersonal aspects mostly generated by cognitive abilities such as divergent thinking capacity, imagination, intelligence; personality characteristics which may refer to confidence, nonconformity, etc., talent, and intrinsic motivation. Interpersonal aspects mostly highlight familiar resources which may refer to ability to present practical support, societal factors can define the social connections with individuals who have spectacular creative achievements, and economic and political stability refer to cultural considerations (Carson et.al., 2005).

Being a creative individual may appear as an important component of creative achievement. High level of creative achievement can only be obtained by minority of individuals in a specific society. By studying these individuals, it can be possible to make arguments about the conditions that may lead to creative achievement. The previous creative performance of individuals can also be one of the best predictors of creative achievement (Kim, 2008). Creative achievement can be described as a domain specific aspect, and having an achievement in one field may not happen in another creative field such as playing musical instruments professionally while having scientific discoveries as well. In particular cases, however, individuals may have achievements in different creative fields, and these achievements do not have to be equally spectacular. Creative achievement can be the result of having specific knowledge, skills and abilities in a related creative area (Carson et.al., 2005).

Main Hypothesis: Individuals who have creative achievements as measured by Creative Achievement Questionnaire tend to have less risk aversive decisions.

3.6. Experience Abroad

Being exposed to different cultures can be one of the sources of creativity. Individuals tend to show more tolerance to risk and change, and may be comfortable with uncertainty (Lubart, 2010). The common features of a creative individual may consist of “above-average intelligence, tolerance of ambiguity, risk taking, energy, self-confidence, intrinsic motivation, ambition, and cognitive flexibility” (p.1048). Although there is no such current evidence on whether living abroad cause constant change on creativity trait of an individual, however, living abroad may enhance creativity (Maddux & Galinsky, 2009).

Adaption to a different culture can change wiring way of the brain of an individual. In this way, foreign country experience in terms of working or studying can be effective (Maddux & Galinsky, 2009). However, there are also arguments that traits like creativity are biologically determined (Csikszentmihalyi, 1997; Maddux & Galinsky, 2009). Besides, abroad experience can be reversely related to creativity. Willingness to live abroad can be the result of a creativity trait (Maddux & Galinsky, 2009), and increased creativity may lead to higher creative achievements.

Sub-Hypothesis 1: Individuals, who have abroad experience in terms of working and studying, tend to have less risk aversive decisions.

3.7. Gender

Risk taking behavior can be affected from demographics, socio-economic status, and the features of an individual's personality. In terms of investment decisions, previous studies show that men can be less risk averse than women (Powell & Ansic, 1997; Eckel & Grossman, 2008; Harrant & Vaillant, 2008; Meier-Pesti & Penz, 2008; Borghans, Heckman, Golsteyn & Meijers, 2009; Sapienza, Zingales, & Maestripietri, 2009).

The risk taking behavior of individuals can be highly domain specific. Individuals cannot engage in one type of behavior, either being risk averse or risk seeking, all time long. Women tend to be more risk averse in all domains except social context. "Risk taking can be content specific and that domain as well as gender differences in risk taking are as much a function of differences in risk perception that of differences in attitude towards perceived risk" (pg. 264). Risk taking behavior of individuals can be based on their perception of risk (Weber, Blais & Betz, 2002).

There can be behavioral differences between women and men, which can be the result of the differences in the brains of females and males. Female brain is hard wired to interpret emotions, while understanding and building systems are what male brain focus on. It is found that there is no significant gap in mathematical problem solving, reading comprehension, and vocabulary between the two sexes. When it comes to risk taking, women found to be more risk averse than men. The portfolios of single women may include less risky investments than single men. Female risk aversion can be the result of being more pessimistic and being insensitive to probabilities. Men, on the other hand, can be overconfident and have lower payoffs, which makes men less rational decision makers when compared to women (Da Silva, et.al., 2013).

3.7.1. Sex Stereotyping

A stereotype is defined as “a set of beliefs about the characteristics or attributes of a group.” (p.94) (Siegrist et.al., 2002). The most well-known stereotype is that women can be more risk averse than men. Gender studies have shown that women tend to be taking less risk. However, there can be other reasons that make females to more risk averse. For example, females can make smaller and less risky investments than men as a result of relatively lower income (Eckel & Grossman, 2008; Zethraeus, Kocoska-Maras, Ellingsen, von Schoultz, Hirschberg, & Johannesson, 2009; Charness & Gneezy, 2012).

The general belief is in the favor of defining women more risk averse than men, which may result in stereotyping women as highly risk averse. It was found that women can be more risk averse than men towards gambles. It is also possible that higher risk aversion in women can result in lower earnings when it is compared to men. However, hypothetical gambling experiments may not help to give accurate outcomes about risk taking behavior related to context. Men tend to engage in more risky behavior than women (Siegrist, et.al., 2002).

However, contextual differences can reduce the difference between men and women when it comes to risk preference. Higher bets can similarly make men more risk averse in gambling. There can be no sex difference when it comes to financial investments in terms of similar reference points (Eckel & Grossman, 2008). Risk taking behavior of males can be subject to overestimation when it is compared to females (Siegrist et.al., 2002). Gender cannot be just related to biological sex, but instead gender can be a phenomenon which is affected from the combination of social, historical, and cultural aspects. Gender can be effective in a way to explain social interactions, norms and organizations (Whiteley, 2014).

The risk aversion of females can be the result of learnt social features instead of the characteristics of a gender. It is found that females in a coed class can be highly risk averse than females who have been to single sex school. Female behavior can be shaped by social norms which can highly affect risk taking behavior. In a single-sex environment, females appear to be a risk taker like males (Booth & Nolen, 2012).

3.7.2. Femininity and Masculinity

Sex is defined as “innate structural and physiological characteristics” (pg. 182) and separates humans and animals into two different groups as female and male. Gender is defined as “connotes all the complex attributes that a culture ascribes to each of the sexes” (pg. 182). Gender can have social features and “reflects the culture’s definition of femininity and masculinity.” (pg. 183) (Meier-Pesti & Penz, 2008).

Gender can be defined as “heuristics that describe the social meanings by which we figure out who is masculine and who is feminine and what those gendered bodies do with another and feel about one another in a realm we call sex” (p.73) (Pratt, Erengozgin, McDowell, Oswin, Price, Agnew & DeSilvey, 2013). Gender can be shaped by social context that individuals belong to. Male and female attributes can be imposed by social environment. Instead of biological sex, gender stereotyping arises from cultural aspects of a society (Bussey & Bandura, 1999; Booth, Granger, Mazur & Kivlighan, 2006).

Differences in investment behavior can be explained by biological reasons which are based on sex, or social reasons which are dependent on gender. Theories that are based on gender roles can be explained through socially accepted behaviors for both women and men. In western culture risk taking behavior can be more related to men, while feminine stereotype can be strongly risk averse (Meier-Pesti & Penz, 2008).

As social change occurs, the social roles of women and men may not fit into biological tendencies. Women can start to adopt masculine features, and can appear as more of a risk taker. Being masculine can support risk taking behavior, and females with masculine features may show no difference in risk taking when compared to males. Besides sex and gender issues, women still earn less money than men, and being risk averse in terms of financial investments that may occur (Meier-Pesti & Penz, 2008).

Sub Hypothesis 2a: As a gender role measured by The Bem Sex Role Inventory, femininity can make individuals more risk averse.

Sub Hypothesis 2b: As a gender role measured by The Bem Sex Role Inventory, masculinity can make individuals less risk averse.

3.7.3. Creativity Attributes

It is found that females can be more creative than males in specific artistic task. The creative skills may flourish depending on gender traits. Females and males, who are not restricted to the traits imposed by society, appears to be more creative and courageous compared to the individuals who are shaped by the particular norms of being female or male (Amabile, 1996b).

Almost in all cultures, males are imposed to masculine traits while feminine characteristics are considered as a big part of female aspect. The distinctive attribute of creative individuals is to stay away from this gender role stereotyping to a particular extend. Creative and talented females tend to be tough and dominant compared to their peers, and the reverse can be true for males who are less aggressive and more sensitive than their male peers (Csikszentmihalyi, 1997).

In other words, a psychologically androgynous individual, a person with both feminine and masculine traits, can view and respond to world from various different angles. Creative individuals may not only have traits of their gender, but also may have the attributes of the opposite gender as well. It is found that female scientists can be more self-confident and aggressive than the females belong to regular social norms. However, these individuals still show their imposed gender role related attributes, besides the cross gender features (Csikszentmihalyi, 1997).

Sub Hypothesis 2c: As a gender role measured by The Bem Sex Role Inventory feminine individuals will have less creative achievements.

Sub Hypothesis 2d: As a gender role measured by The Bem Sex Role Inventory masculine individuals will have more creative achievements.

3.8. Age

Risk attitudes can vary among individuals depending on socio-demographic factors (Harrison et. al., 2007). There can be a relationship between risk aversion and the level of income, age, gender, parental background and the level of education. It is found that females and older people can be more risk averse, whereas income and the level of education can reduce the risk aversion of individuals (Donkers, Melenberg & Van Soest, 2001; Lauriola & Levin, 2001; Dohmen, Falk, Huffman, Sunde, Schupp, & Wagner, 2011).

Aging may lead to increase in risk aversion. One of the reasons can be related to decreased tolerance in regard to financial and economic risk. However, risk taking behavior and age relationship may be different depending on context. This difference can depend on information processing rather than attitudes against risk. When decisions are based on probabilistic payoffs, older adults can be less risk averse than younger adults (Henninger, Madden & Huettel, 2010).

Aging may bring a reduction in decision quality which is based on optimized decision making by obtaining and processing relevant information. This situation can be the result of the changes in cognitive abilities such as memory and information processing (Henninger et.al., 2010).

Sub-hypothesis 3: Risk aversion can increase as individuals become older.

3.9. Hypotheses

Main Hypothesis: Individuals who have creative achievements as measured by Creative Achievement Questionnaire tend to have less risk averse decisions.

Sub-Hypothesis 1: Individuals, who have abroad experience in terms of working and studying, tend to have less risk averse decisions.

Sub Hypothesis 2a: As a gender role measured by The Bem Sex Role Inventory, feminine individuals will be more risk averse.

Sub Hypothesis 2b: As a gender role measured by The Bem Sex Role Inventory, masculine individuals will be less risk averse.

Sub Hypothesis 2c: Individuals with higher femininity scores, measured by The Bem Sex Role Inventory, will have lower creative achievement score, measured by Creative Achievement Questionnaire

Sub Hypothesis 2d: Individuals with higher masculinity scores, measured by The Bem Sex Role Inventory, will have higher creative achievement score, measured by Creative Achievement Questionnaire

Sub-hypothesis 3: Risk aversion can increase as individuals become older.

In the following chapter, methodology of this research is presented. Detailed information is provided to describe the process of data collection in a specific period of time.

CHAPTER 4: METHODOLOGY

To test the validity of the hypotheses, which are stated in the previous chapter, a survey is conducted. To see the effects of different independent variables, a questionnaire is generated with several different sub sections (Appendix I: Survey), and the results are interpreted by means of a Software Package, SPSS 20.

4.1. Experimental Design

To determine the effects of various aspects on risk aversion two groups are conducted. Control group is generated from undergraduate students who are not imposed to different cultures in terms of working and studying. Study group is conducted from individuals from various backgrounds who mainly have abroad experiences.

The table (Table 1: Preliminary Number of Participants) provides the number of preliminary participants. The number of participants reduced and changed according to abroad experience and completeness of the questionnaire. 35 participants are eliminated from the control group after checking the completeness of the survey papers. The questionnaires of 40 participants are transferred to study group because of the experience abroad. For statistical testing, 111 participants are left in the control group, while the number of participants is increased to 145 in study group.

*Table 1. Preliminary Number of Participants
The Number of Questionnaire Collected*

Study Group		Control Group	
Date	Number	Date	Number
Not	1	Not	6
Indicated		Indicated	
09.03.2014	2	10.03.2014	22
10.03.2014	18	11.03.2014	19
11.03.2014	6	18.03.2014	20
12.03.2014	2	10.04.2014	38
18.03.2014	3	11.04.2014	36
19.03.2014	1	15.04.2014	10
29.03.2014	5	16.04.2014	2
03.04.2014	4	17.04.2014	24
04.04.2014	2	18.04.2014	9
05.04.2014	1	TOTAL	186
07.04.2014	1		
10.04.2014	14		
11.04.2014	14		
13.04.2014	13		
15.04.2014	3		
17.04.2014	2		
18.04.2014	1		
21.04.2014	1		
22.04.2014	6		
23.04.2014	3		
25.04.2014	2		
TOTAL	105		

4.1.1. Pilot Study

A pilot study was conducted to determine the basic structural features of the questionnaire. 12 participants completed the pilot survey; 6 female and 6 male. Age ranged from 23 to 32 years ($M = 26.67$, $SD = 2.96$ years). The participants were the Master of Arts students who were the participants of graduate level Risk Management course. Individuals had diverse backgrounds including economics, statistics, and business. 10 of the participants were full time employees in different private organizations. The participants were both from national and international students.

The local students were the individuals who have been to foreign countries for their studies before. The language of the survey was in English to determine whether to conduct study on an international level. It was also aimed to decide with whether the questionnaires used for pilot were suitable for the present study before the translation process. However, due to the schedule of this study and the length of the survey, the survey is decided to be conducted just in Turkish.

The aim of the pilot study was to determine the length of the survey, and have idea about the clarity of the questions in general. The study conducted with one trial, and solid feedback was received from the participants. According to the feedback received, the sequence of the survey is determined. Several questions eliminated from the gambles section, and more instructions are added to each part.

4.1.2. Survey

For this research a survey is conducted to determine whether risk aversion can be affected from being masculine or feminine, being exposed to different cultures, having creative achievements, and various demographic aspects.

4.1.2.1. Gamble Questions

In decision studies, gambling metaphor helps to define weights that each individual assign the probability of an outcome of an event that may occur. If the probability to happen tends to be higher, that probability can have relatively higher weight. By means of gambles, researchers aim to understand the complex decisions that individuals can make under uncertainty. Gambles show that outcomes of the choices of an individual are not certain (Kahneman, 2011).

Gamble 1: Which do you prefer?

A: Toss a coin. If it comes up heads you win 100 TL, and if it comes up tails you win nothing.

B: Get 46 TL for sure

The main point was to determine intuitive choices of individuals when were presented by the options above. The choice that appears most tempting, in the first place, was aimed to be determined. Most of the individuals prefer to choose sure thing over the gamble, in other words, risk aversive individuals choose option B over A (Kahneman, 2011).

Gamble 2: Which of the following would you prefer?

A: 50% chance to win 1,000 TL or 50% chance to win nothing

B: 450 TL for sure

The similar type of question above with different amounts is asked again to determine risk aversion of the participants. Risk aversive individuals tend to choose option B (Kahneman & Tversky, 1979).

Gamble 3: Which do you prefer?

A: 45% chance to win 6,000 TL

B: 90% chance to win 3,000 TL

In this gamble above, the probabilities of winning may appear to be high; however, most individuals prefer to choose more probable, 90% (Kahneman & Tversky, 1979).

Gamble 4: Which option do you prefer?

A: 50% chance to win 150 TL

B: 50% chance to lose 100 TL

This question is modified to determine the risk aversion of the participants in terms of the income levels of individuals. For this reason, the base line is required to be considered as income level per month. Gamble 5 is determined as an extension of Gamble 4 (Kahneman, 2003).

Gamble 5: Would your choice change if your monthly income was lower by 100 TL?

There are not so many individuals who may go for the gamble even there are equal chances to win or lose. The gamble may appear attractive if the winning payoff is twice amount of loss (Kahneman, 2003).

Gamble 6: Which do you prefer?

A: Get 1000 TL for sure

B: 75% chance to win 2000 TL

This gamble is modification of Gamble 1 and Gamble 2. The aim is to determine the aversion of individuals when chances and payoffs are high. Risk averse individuals are expected to choose A over B even the chances are high to win the twice amount of option A.

Gamble 7: Choose between

A: Sure gain of 240 TL

B: 25% chance to gain 1,000 TL and 75% chance to gain nothing

Option A can appear attractive to a decision maker whereas avoiding option B reveals aversion. In case of high probabilities, individuals tend to be risk averse when it comes to gains, and turn out to be risk seeker in terms of losses (Kahneman, 2011).

Gamble 8: Which do you prefer?

A: Get 1500 TL for sure

B: 75% chance to win 2500 TL

This gamble appears again as a different version of Gamble 1 and Gamble 2 with only change in the value of payoffs while keeping the difference amount between A and B the same.

Gamble 9: Please choose between questions A and B.

A: Make a bet;

Get 900 TL for sure OR 90% chance to get 1,000 TL

Gamble 9A determines whether an individual can be a risk averse or not. The subjective value of a gain of 900 TL appears to be more than 90% of the value of a gain of 1,000 TL.

B: Make a bet;

Lose 900 TL for sure OR 90% chance to get 1,000 TL.

Gamble 9B determines whether an individual can be a risk seeker or not. Loss of 900TL appears much more than the loss of 1,000 TL with 90% chance. Sure loss appears very averse and can make individuals to take the risk (Kahneman, 2011).

Gamble 10: Choose between

A: Sure loss of 750 TL

B: 75% chance to lose 1,000 TL and 25% chance to lose nothing

Option A shows aversion of an individual when compared to lose 1000 TL with 75% chance (Kahneman, 2011).

Gamble 11: Which do you prefer?

A: Get 500 TL for sure

B: 75% chance to win 2000 TL

This gamble is modification of Gamble 1 and Gamble 2. The aim is to determine the aversion of individuals when the gain with 75% chance appears to be 4 times higher than the sure payoff (Kahneman, 2011).

Gamble 12: Which would you choose?

A: 50% chance to lose 200 TL

B: Lose 100 TL with certainty or 50% chance to win 50 TL

The gamble may appear much more attractive than certain loss. It is found that risk seeking options are chosen by most of the individuals (Kahneman, 2003).

Gamble 13: Which do you prefer?

A: 0.1% chance to win 6,000 TL

B: 0.2% chance to win 3,000 TL

In both prospects, the probabilities of winning appear very low as .002 and .001, and winning can be possible but not probable. It is found that most of the individuals prefer the option that provides the larger payoff (Kahneman & Tversky, 1979).

4.1.3. Psychometric Tests

A psychological test can be defined as a measurement tool. A sample of behavior is measured under standardized conditions with established scoring rules to obtain numeric information from the sample (Murphy & Davidshofer, 1991).

4.1.3.1. Creative Achievement Questionnaire

“Creative Achievement Questionnaire is a new self-report measure of creative achievement that assesses achievement across 10 domains of creativity” (p. 37). The reliability of the test, is tested and retested ($r = .81, p < .0001$), and internal consistency reliability ($\alpha = .96$) in a sample of 117 students. The predictive validity of the test is determined against the ratings of artists of a creative product ($r = .59, p < .0001, n = 39$). Another study is established to determine the convergent validity of the test by means of divergent thinking tests ($r = .47, p < .0001$), the Creative Personality Scale ($r = .33, p = .004$), Intellect ($r = .52, p < .0001$), and Openness to Experience ($r = .33, p = .002$) (Carson et.al., 2005).

Creative achievement questionnaire, in this way, serves as a tool to measure achievements in various creative domains. The questionnaire helps to measure particular training in multiple creative fields. CAQ is generated in three parts which includes 96 components. In the first part, there are 13 different fields of talent are stated to obtain information about the interests of participants. 10 main domains are determined to assess scientific and artistic creativity, and individual sports, entrepreneurship and team sports are added as three extra domains. In the second part, specific questions are asked regarding actual achievements in 10 standard domains, except the additional fields. In the last part, the participants are asked questions about how other individuals perceive the creativity of the participants (Carson et.al., 2005).

The score is obtained by assigning one point for each selected element in parts I and III. The second part scored according to the order number of each component. For example, if a participant check-marked seventh component in the section of culinary arts, receives 7 points. The components with asterisk are asked to indicate the number of times an individual accomplished the stated task. Then the indicated number is multiplied by the order number. Sum of the points from each main section generated the final score of the participant (Carson et.al., 2005).

For this study, the questionnaire is translated to Turkish for the first time. The first translation was made by the researcher from Turkish to English. The second translation was made by the lecturers from the foreign languages department of Izmir University of Economics. In this step, the questionnaire is back-translated from English to Turkish. The aim was to have an accurate scientific translation.

4.1.3.2. BEM Sex Role Inventory

“The Bem Sex-Role Inventory (BSRI), an instrument used to measure gender role perceptions” (p. 929) (Holt & Ellis, 1998). For this study, the version generated by Kavuncu (1987) for Turkey is employed. The original version includes 20 femininity factors, 20 masculinity factors and 20 social desirability factors. For the Turkish version, the total number of factors are reduced to 40 since the original version include notions that do not fit into the cultural and sociological aspects of Turkish society. The test was administered to 479 females and 510 males to determine validity, factorial structure, reliability, and item properties of the Turkish version. To determine factorial structure 40 features were subjected to principal component analysis by varimax rotation. As a result, three factors were appeared to be interpretable, the first factor was general, the second was femininity and the third was masculinity (Dökmen, 1999).

This factorial structure, therefore, was found to be different from original BSRI. Satisfactory results were obtained from the item analysis. Cronbach alpha coefficients were .73 for Femininity Scale and .75 for Masculinity Scale. To obtain femininity, masculinity and androgynous scores, the participants are asked to assign values from “1= Never True” to “7= Always True” to the 40 different traits. The final score is obtained by adding up all assigned values. Then, the obtained values are compared against the median of the sample. This whole process is constructed by means of SPSS 20 (Dökmen, 1999).

4.1.4. Demographics

Several questions are asked to collect the data regarding the information about demographics. First, the participants are asked to fill birthday as in the form of day, month and year. Then, biological sex of the individuals is asked to be filled. Six different conditions are presented in terms of occupational status as “student”, “working”, “not working”, “not looking for a job”, “looking for a job”, and “having military service.” In the following part, four different questions are asked to observe “birth place”, “the place most lived”, “the place currently being lived”, and “the place family most lived”. Each question is asked to state “country”, “province”, “city”, and “village or town.” In the next section, a yes/no question is asked to learn whether the participant has been to a foreign country to work or study.

Then, the duration of the stay, the number of foreign languages known, and the duration of the use of these languages are asked. For students, the school name, department, and the year being studied are asked. For non-students, the school that was graduated or quited is asked with additional comments section that may be filled. Then, occupation and additional information about occupation if preferred to be stated, are asked. For all participants, information about parents in terms of age and occupation, are asked if any of them are alive. Number of siblings and the sibling order of the participant are asked.

The last question is about determining personal income level of the participant and the participant's family by means of a scale from "1 = Very Low" to "5= Very High." For the analysis only age is decided to be employed since most of the participants left most of the questions blank.

In the following chapter, the results section is presented. Each hypothesis is tested by means of SPSS 20, to determine the reliability of the hypotheses. The complete questionnaire is included in (Appendix I: Survey).

CHAPTER 5: RESULTS

For the statistical test employed, different dependent variables are defined for different cases. These dependent variables are determined as each gamble separately and all gambles. The hypotheses are tested by means of a computer software program, SPSS 20 (Field, 2009).

The compute function of SPSS 20 is used to obtain the value of all gambles. The cumulative value is obtained by add function. For each hypothesis different tests are employed. The first one is Chi-square test which can help to compare the frequencies that are observed in certain categories to frequencies that can get into those categories by chance. The second type of measurement is made in terms of correlations. Bivariate correlation is between two variables which help to define whether a linear relationship between two variables exists (Field, 2009).

A correlation coefficient has a value between -1 and +1, this helps to observe whether there is a negative, positive or no relationship between two variables. Zero indicates no correlation. A correlation coefficient measures the size of an observed effect. For example, -.1 or +.1 indicates a small impact, whereas large impact may give -.5 or +.5. The last test is conducted as Analysis of Variance (ANOVA) for all gambles. ANOVA is a tool to analyze conditions to compare more than two different conditions. From ANOVA it is possible to learn different groups have the same means. The null hypothesis is tested to determine whether the group means are equal. ANOVA table produces F-statistic (Field, 2009).

F statistic compares the amount of systematic variance to the amount of unsystematic variance in a specific data. The ratio of the model to its error can be also defined as F ratio. ANOVA helps to determine the success of experimental manipulation; however, it is not possible to learn which groups are affected. By means of One Way ANOVA procedure, it is possible to define several dependent variables to conduct different ANOVAs (Field, 2009).

In addition to these procedures, significant gamble questions are tested again separately by means of correlations, and ANOVA. The main hypothesis retested by means of Log transformation, but no significant effect is observed (Field, 2009).

Linear regression is a modeling in statistics to determine the relationship between a scalar dependent variable (Y) and one or more explanatory variables (X). Modeling with one explanatory variable is defined as simple linear regression. In the case of more than one explanatory variable, the model is defined as multiple linear regression (Field, 2009).

The first multiple linear regression is conducted with significant variables; age, femininity and masculinity. The second linear regression analysis is conducted with an additional creative achievement score predictor. The name “creative” refers to the final score received from CAQ. Experience abroad is not included in both regressions since “Abroad” and “Abroad 3 Conditions” are grouped under different categories such as being abroad more than a year, or less than a year, etc. which do not reflect actual period of time spent.

Table 2. Descriptive Statistics Table for Age, Abroad, Creative Achievement, Femininity (BEM 1), and Masculinity (BEM 2)

		AGE	Abroad	Creative	BEM1	BEM2
N	Valid	251	254	256	255	255
	Missing	15	12	10	11	11
Mean		25,22	2,6181	9,5703	101,3529	93,3961
Median		22,00	3,0000	5,5000	103,0000	93,0000
Mode		21	3,00	4,00	98,00	86,00 ^a
Std. Deviation		9,793	,80991	14,39645	16,53393	17,20110
Variance		95,902	,656	207,258	273,371	295,878
Skewness		1,542	-1,220	6,146	-1,000	-,327
Std. Error of Skewness		,154	,153	,152	,153	,153
Kurtosis		6,342	,198	55,469	2,398	,952
Std. Error of Kurtosis		,306	,304	,303	,304	,304
Range		87	3,00	163,00	117,00	111,00
Minimum		-22	1,00	,00	20,00	20,00
Maximum		65	4,00	163,00	137,00	131,00

Age ranged from 19 to 79 years ($N = 250$, $M = 25.73s$, $SD = 9.81$ years). Age non-normally distributed skewness of 2.60 ($SE = 2.60$) and kurtosis of 7.11 ($SE = 7.11$)

The mean score in experience abroad $M = 2.62s$, $SD = .81$. Experience abroad non-normally distributed skewness of -1.22 ($SE = -1.22$) and kurtosis of .20 ($SE = .20$).

The creative achievement score ranged from 0 to 163 points ($M = 9.60s$, $SD = 14.40$ points). CA score non-normally distributed skewness of 6.15 ($SE = 6.15$) and kurtosis of 55.50 ($SE = 55.50$).

Femininity score ranged from 20 to 137 points ($M = 101.40$ $SD= 16.53$ points). Age non-normally distributed skewness of -1.00 ($SE = -1.00$) and kurtosis of 2.40 ($SE = 2.40$)

Masculinity score ranged from 20 to 131 points ($M = 93.40$ $SD = 17.20$). Age-normally distributed skewness of -.33 ($SE = -.33$) and kurtosis of 1.00 ($SE = 1.00$).

5.1. The Main Hypothesis

Individuals who have creative achievements as measured by Creative Achievement Questionnaire tend to have less risk aversive decisions.

5.1.1. Chi-Square Test for Each Gamble

For the first gamble, there is a significant association between creative achievement score and risk aversion $\chi^2 (1) = 7.24, p < .05$.

Table 3. Chi-Square Test of 2x2 Table for Gamble 1 and Creative Achievement HL

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	7,247 ^a	1	,007		
Continuity Correction ^b	6,588	1	,010		
Likelihood Ratio	7,282	1	,007		
Fisher's Exact Test				,009	,005
Linear-by-Linear Association	7,219	1	,007		
N of Valid Cases	255				

For the second gamble, there is no significant association $\chi^2 (1) = 1.32, p > .3$.

Table 4. Chi-Square Test of 2x2 Table for Gamble 2 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1,323 ^a	1	,250		
Continuity Correction ^b	1,045	1	,307		
Likelihood Ratio	1,324	1	,250		
Fisher's Exact Test				,307	,153
Linear-by-Linear Association	1,318	1	,251		
N of Valid Cases	254				

For the third gamble, there is no significant association $\chi^2 (1) = .001, p > 1.00$

Table 5. Chi-Square Test of 2x2 Table for Gamble 3 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,001 ^a	1	,974		
Continuity Correction ^b	,000	1	1,000		
Likelihood Ratio	,001	1	,974		
Fisher's Exact Test				1,000	,549
Linear-by-Linear Association	,001	1	,975		
N of Valid Cases	253				

For the fourth gamble, there is no significant association, $\chi^2 (1) = 1.06, p > .4$.

Table 6. Chi-Square Test of 2x2 Table for Gamble 4 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1,061 ^a	1	,303		
Continuity Correction ^b	,477	1	,490		
Likelihood Ratio	1,081	1	,299		
Fisher's Exact Test				,334	,246
Linear-by-Linear Association	1,057	1	,304		
N of Valid Cases	255				

For the fifth gamble, there is no significant association $\chi^2 (1) = 1.67, p > .2$

Table 7. Chi-Square Test of 2x2 Table for Gamble 5 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1,664 ^a	1	,197		
Continuity Correction ^b	1,328	1	,249		
Likelihood Ratio	1,668	1	,197		
Fisher's Exact Test				,218	,124
Linear-by-Linear Association	1,657	1	,198		
N of Valid Cases	252				

For the sixth gamble, there is no significant association $\chi^2 (1) = .07, p > .8$.

Table 8. Chi-Square Test of 2x2 Table for Gamble 6 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,066 ^a	1	,797		
Continuity Correction ^b	,017	1	,898		
Likelihood Ratio	,066	1	,797		
Fisher's Exact Test				,898	,449
Linear-by-Linear Association	,066	1	,797		
N of Valid Cases	250				

For the seventh gamble, there is no significant association $\chi^2 (1) = .42, p > .6$.

Table 9. Chi-Square Test of 2x2 Table for Gamble 7 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,418 ^a	1	,518		
Continuity Correction ^b	,243	1	,622		
Likelihood Ratio	,418	1	,518		
Fisher's Exact Test				,543	,311
Linear-by-Linear Association	,416	1	,519		
N of Valid Cases	253				

For the eighth gamble, there is no significant association $\chi^2 (1) = .33, p > .6$.

Table 10. Chi-Square Test of 2x2 Table for Gamble 8 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,328 ^a	1	,567		
Continuity Correction ^b	,199	1	,655		
Likelihood Ratio	,328	1	,567		
Fisher's Exact Test				,615	,328
Linear-by-Linear Association	,326	1	,568		
N of Valid Cases	255				

For the gamble 9A, there is no significant association $\chi^2 (1) = .38, p > .6$.

Table 11. Chi-Square Test of 2x2 Table for Gamble 9A and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,381 ^a	1	,537		
Continuity Correction ^b	,238	1	,625		
Likelihood Ratio	,381	1	,537		
Fisher's Exact Test				,605	,313
Linear-by-Linear Association	,380	1	,538		
N of Valid Cases	252				

For the gamble 9B, there is no significant association $\chi^2 (1) = .40, p > .6$.

Table 12. Chi-Square Test of 2x2 Table for Gamble 9B and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,387a	1	,534		
Continuity Correction ^b	,106	1	,745		
Likelihood Ratio	,388	1	,533		
Fisher's Exact Test				,569	,373
Linear-by-Linear Association	,385	1	,535		
N of Valid Cases	240				

For the tenth gamble, there is no significant association $\chi^2 (1) = 2.63, p > .2$.

Table 13. Chi-Square Test of 2x2 Table for Gamble 10 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2,632 ^a	1	,105		
Continuity Correction ^b	2,185	1	,139		
Likelihood Ratio	2,641	1	,104		
Fisher's Exact Test				,115	,070
Linear-by-Linear Association	2,621	1	,105		
N of Valid Cases	251				

For the eleventh gamble, there is no significant association $\chi^2 (1) = 2.12, p > .2$.

Table 14. Chi-Square Test of 2x2 Table for Gamble 11 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2,121 ^a	1	,145		
Continuity Correction ^b	1,694	1	,193		
Likelihood Ratio	2,128	1	,145		
Fisher's Exact Test				,165	,096
Linear-by-Linear Association	2,112	1	,146		
N of Valid Cases	252				

For the twelfth gamble, there is no significant association $\chi^2 (1) = 1.15, p > .3$.

Table 15 Chi-Square Test of 2x2 Table for Gamble 12 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1,151 ^a	1	,283		
Continuity Correction ^b	,894	1	,344		
Likelihood Ratio	1,152	1	,283		
Fisher's Exact Test				,309	,172
Linear-by-Linear Association	1,146	1	,284		
N of Valid Cases	253				

For the thirteenth gamble, there is a significant association $\chi^2 (1) = 12.50, p < .001$.

Table 16. Chi-Square Test of 2x2 Table for Gamble 13 and Creative Achievement HL

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	12,489 ^a	1	,000		
Continuity Correction ^b	11,545	1	,001		
Likelihood Ratio	12,646	1	,000		
Fisher's Exact Test				,001	,000
Linear-by-Linear Association	12,439	1	,000		
N of Valid Cases	249				

5.1.2. Analysis of Variance for All Gambles

Creative Achievement scores have no significant effect on risk aversion, $F(1, 222) = 1.40, p >$

.3.

Table 17. ANOVA Test to determine the association between All Gambles and Creative value

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7,215	1	7,215	1,362	,244
Within Groups	1175,744	222	5,296		
Total	1182,960	223			

Table below shows the descriptive statistics of creative and Creative Achievement HL. Creative values ranged from 0 to 163 points ($M = 9.57, SD = 14.39$) creative scores are non-normally distributed skewness of 6.15 ($SE = .15$) and Kurtosis of 55.47 ($SE = .30$). Creative Achievement HL ranged from 1 to 2, ($M = 1.50, SD = .03$) Creative Achievement HL values are non-normally distributed skewness of 0.00 ($SE = 0.00$) and Kurtosis of -2.01 ($SE = .30$).

Table 18. Descriptive Statistics of Creative and Creative Achievement HL

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error	Statistic	Std. Error	
Creative	256	163,00	,00	163,00	9,5703	,89978	14,39645	6,146	,152	55,469	,303
Creative Achievement HL	256	1,00	1,00	2,00	1,5000	,03131	,50098	,000	,152	-2,016	,303
Valid N (listwise)	256										

Table below shows the descriptive statistics of each gamble. Each gamble ranged from 1 “aversion condition”, to 2 “no aversion condition.” Gamble 1 ($N = 255$, $M = 1.51$, $SD = .50$) non-normally distributed skewness of $-.04$ ($SE = .15$) and kurtosis of -2.01 ($SE = .30$). Gamble 2 ($N = 254$, $M = 1.60$, $SD = .49$) non-normally distributed skewness of $-.39$ ($SE = .15$) and kurtosis of -1.90 ($SE = .30$). Gamble 3 ($N = 253$, $M = 1.80$, $SD = .40$) non-normally distributed skewness of -1.50 ($SE = .15$) and kurtosis of $.20$ ($SE = .30$). Gamble 4 ($N = 255$, $M = 1.04$, $SD = .18$) normally distributed. Gamble 5 ($N = 252$, $M = 1.30$, $SD = .50$) normally distributed. Gamble 6 ($N = 250$, $M = 1.41$, $SD = .50$) non-normally distributed skewness of $.40$ ($SE = .20$) and kurtosis of -1.90 ($SE = .31$). Gamble 7 ($N = 253$, $M = 1.80$, $SD = .41$) normally distributed. Gamble 8 ($N = 255$, $M = 1.50$, $SD = .50$) non-normally distributed skewness of $.20$ ($SE = .15$) and kurtosis of -2.00 ($SE = .30$). Gamble 9A ($N = 252$, $M = 1.61$, $SD = .50$) non-normally distributed skewness of $-.50$ ($SE = .15$) and kurtosis of -1.80 ($SE = .31$). Gamble 9B ($N = 240$, $M = 2.00$, $SD = .22$) non-normally distributed skewness of -4.20 ($SE = .16$) and kurtosis of 15.40 ($SE = .31$). Gamble 10 ($N = 251$, $M = 1.74$, $SD = .44$) normally distributed. Gamble 11 ($N = 252$, $M = 1.21$, $SD = .41$) normally distributed. Gamble 12 ($N = 253$, $M = 1.60$, $SD = .50$) non-normally distributed skewness of $-.33$ ($SE = .15$) and kurtosis of -2.00 ($SE = .31$). Gamble 13 ($N = 249$, $M = 1.31$, $SD = .47$) normally distributed.

Table 19 Descriptive Statistics of Gambles (1 – 13)

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Gamble1	255	1,00	1,00	2,00	1,5098	,50089	,251	-,039	,153	-2,014	,304
Gamble2	254	1,00	1,00	2,00	1,5945	,49196	,242	-,387	,153	-1,865	,304
Gamble3	253	1,00	1,00	2,00	1,7945	,40489	,164	-1,466	,153	,151	,305
Gamble4	255	1,00	1,00	2,00	1,0353	,18489	,034	5,067	,153	23,859	,304
Gamble5	252	1,00	1,00	2,00	1,3016	,45986	,211	,870	,153	-1,253	,306
Gamble6	250	1,00	1,00	2,00	1,4080	,49245	,243	,377	,154	-1,873	,307
Gamble7	253	1,00	1,00	2,00	1,7866	,41055	,169	-1,407	,153	-,020	,305
Gamble8	255	1,00	1,00	2,00	1,4510	,49857	,249	,198	,153	-1,976	,304
Gamble9A	252	1,00	1,00	2,00	1,6111	,48847	,239	-,459	,153	-1,804	,306
Gamble9B	240	1,00	1,00	2,00	1,9500	,21840	,048	-4,156	,157	15,396	,313
Gamble10	251	1,00	1,00	2,00	1,7410	,43894	,193	-1,107	,154	-,781	,306
Gamble11	252	1,00	1,00	2,00	1,2103	,40835	,167	1,430	,153	,046	,306
Gamble12	253	1,00	1,00	2,00	1,5810	,49437	,244	-,330	,153	-1,906	,305
Gamble13	249	1,00	1,00	2,00	1,3173	,46635	,217	,790	,154	-1,387	,307
Valid N (listwise)	224										

5.1.3. Correlations

All gambles indicates the cumulative value for each gamble, and Creative Achievement HL is obtained by “Recode into Different Variables” comment, the values of Creative Achievement is divided into two groups according to median value of the achievement scores. The first group indicates low value, whereas higher values are categorized as the second group. The new value of creativity achievement scores are employed in test with All Gambles value. The correlations table, (Table 19. Statistics of Correlations of All Gambles and Creative Variables) which is obtained by means of SPSS 20 software, provides a matrix of the correlation coefficients for the two variables of All Gambles and Creative.

For correlations, actual creative achievement values are preferred over Creative Achievement HL since correlation coefficient measures the association between two continuous variables. Creative Achievement HL serves as a categorical variable. Under each correlation coefficient, the sample size (N) and the significance value of the correlation are displayed.

All Gambles and Creative Achievement HL have no significant association $r = -.03, p > .7$

Table 20. Statistics of Correlations of All Gambles and Creative Variables

		AllGambles	Creative
AllGambles	Pearson Correlation	1	-.031
	Sig. (2-tailed)		,646
	N	224	224
Creative	Pearson Correlation	-.031	1
	Sig. (2-tailed)	,646	
	N	224	256

5.1.4. Tests for Gambles 1 and 13

The matrix of the correlation coefficients for the two variables of Gamble1 and Creative Achievement HL indicates that the higher creative achievements, the lower the risk aversion that individuals display $r = -.15, p < .05$.

Table 21. Statistics of Correlations of Gamble 1 and Creative Variables

		Creative	Gamble1
Creative	Pearson Correlation	1	-.146*
	Sig. (2-tailed)		,020
	N	256	255
Gamble1	Pearson Correlation	-.146*	1
	Sig. (2-tailed)	,020	
	N	255	255

Creative achievement has significant impact on risk aversion, $F(1, 253) = 7.40, p < .01$.

Table 22. ANOVA Test to determine the association between Gamble 1 and Creative value

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1,811	1	1,811	7,401	,007
Within Groups	61,914	253	,245		
Total	63,725	254			

The table shows descriptive statistics from one way procedure for Gamble 1. In this table, 1 indicates no aversion condition ($N = 128$, $M = 1.60$ min, 95% CI [1.51, 1.70], $SD = .50$). 2 indicates aversion condition ($N = 127$, $M = 1.34$ min, 95% CI [1.34, 1.51], $SD = .50$). The mean of condition 1 ($M = 1.60$) appears to be larger than the mean of condition 2 ($M = 1.34$).

Table 23. Descriptive Statistics of ANOVA Test for Gamble 13 and Creative Achievement HL

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00	128	1,5938	,49306	,04358	1,5075	1,6800	1,00	2,00
2,00	127	1,4252	,49633	,04404	1,3380	1,5124	1,00	2,00
Total	255	1,5098	,50089	,03137	1,4480	1,5716	1,00	2,00

There is no significant association between Gamble 13 and creative achievement $r = -.09$ at $p > .2$.

Table 24. Statistics of Correlations of Gamble 13 and Creative Variables

		Creative	Gamble13
Creative	Pearson Correlation	1	-,091
	Sig. (2-tailed)		,154
	N	256	249
Gamble13	Pearson Correlation	-,091	1
	Sig. (2-tailed)	,154	
	N	249	249

Creative achievement has significant impact on risk aversion, $F(1, 247) = 13.04$, $p < .001$.

Table 25. ANOVA Test to determine the association between Gamble 13 and Creative value

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2,705	1	2,705	13,043	,000
Within Groups	51,231	247	,207		
Total	53,936	248			

The table shows descriptive statistics from one way ANOVA procedure for Gamble 13. In this table, 1 indicates no aversion condition ($N = 123$, $M = 1.42$ min, 95% CI [1.33, 1.51], $SD = .50$). 2 indicates aversion condition ($N = 126$, $M = 1.21$ min, 95% CI [1.14, 1.30], $SD = .50$). The mean of condition 1 ($M = 1.42$) appears to be larger than the mean of condition 2 ($M = 1.21$).

Table 26.. Descriptive Statistics of ANOVA Test for Gamble 13 and Creative Achievement HL

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00	123	1,4228	,49602	,04472	1,3342	1,5113	1,00	2,00
2,00	126	1,2143	,41196	,03670	1,1417	1,2869	1,00	2,00
Total	249	1,3173	,46635	,02955	1,2591	1,3755	1,00	2,00

5.2. Sub Hypothesis 1

Individuals, who have abroad experience, in terms of working and studying, tend to have less risk aversive decisions.

Individuals firstly grouped under four categories in terms of abroad experience. "1= Less than 1 year," "2= More than 1 year," "3= None," and "4= 1 Year." To obtain more accurate results, group 2 and 4 combined as one category by means of SPSS 20 "Transform," "Recode into Different Variable" command.

Table below shows the descriptive statistics of Abroad and Abroad 3 conditions. Abroad years ranged from 1 to 4 ($M = 2.62$, $SD = .81$) experience abroad years are normally distributed.

Abroad 3 conditions ranged from 1 to 3, ($M = 2.56$, $SD = .78$) and normally distributed.

Table 27 Descriptive Statistics of Abroad and Abroad 3 Conditions

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis			
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error			
Abroad	254	3,00	1,00	4,00	2,6181	,05082	,80991	-1,220	,153	,198	,304
Abroad 3 conditions	254	2,00	1,00	3,00	2,5551	,04875	,77696	-1,332	,153	-,008	,304
Valid N (listwise)	254										

5.2.1. Chi-Square Test for Each Gamble

For the first gamble, there is no significant association between experience abroad and risk aversion $\chi^2 (2) = .90, p > .7$.

Table 28. Chi-Square Test of 2x2 Table for Gamble 1 and Abroad 3 Conditions

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	,897 ^a	2	,639
Likelihood Ratio	,899	2	,638
Linear-by-Linear Association	,757	1	,384
N of Valid Cases	253		

The second gamble has a significant association $\chi^2 (2) = 6.02, p < .05$.

Table 29. Chi-Square Test of 2x2 Table for Gamble 2 and Abroad 3 Conditions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6,017 ^a	2	,049
Likelihood Ratio	6,636	2	,036
Linear-by-Linear Association	1,036	1	,309
N of Valid Cases	252		

The third gamble has no significant association $\chi^2 (2) = 4.00, p > .2$.

Table 30. Chi-Square Test of 2x2 Table for Gamble 3 and Abroad 3 Conditions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3,995 ^a	2	,136
Likelihood Ratio	4,263	2	,119
Linear-by-Linear Association	1,638	1	,201
N of Valid Cases	251		

The fourth gamble has no significant association $\chi^2 (2) = .30, p > .9$.

Table 31. Chi-Square Test of 2x2 Table for Gamble 4 and Abroad 3 Conditions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	,303 ^a	2	,859
Likelihood Ratio	,335	2	,846
Linear-by-Linear Association	,198	1	,656
N of Valid Cases	253		

The fifth gamble has no significant association $\chi^2 (2) = 1.58, p > .5$.

Table 32. Chi-Square Test of 2x2 Table for Gamble 5 and Abroad 3 Conditions

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1,577 ^a	2	,455
Likelihood Ratio	1,548	2	,461
Linear-by-Linear Association	,189	1	,664
N of Valid Cases	250		

The sixth gamble has significant association $\chi^2 (2) = 8.30, p < .05$.

Table 33. Chi-Square Test of 2x2 Table for Gamble 6 and Abroad 3 Conditions

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8,296 ^a	2	,016
Likelihood Ratio	8,315	2	,016
Linear-by-Linear Association	,814	1	,367
N of Valid Cases	248		

The seventh gamble, has no significant association $\chi^2(2) = .35, p > .9$.

Table 34. Chi-Square Test of 2x2 Table for Gamble 7 and Abroad 3 Conditions

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	,349 ^a	2	,840
Likelihood Ratio	,361	2	,835
Linear-by-Linear Association	,301	1	,583
N of Valid Cases	252		

The eighth gamble has significant association, $\chi^2 (2) = 6.30, p < .05$.

Table 35. Chi-Square Test of 2x2 Table for Gamble 8 and Abroad 3 Conditions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6,291 ^a	2	,043
Likelihood Ratio	6,344	2	,042
Linear-by-Linear Association	,031	1	,860
N of Valid Cases	253		

The gamble 9A has no significant association $\chi^2 (2) = .39, p > .9$.

Table 36. Chi-Square Test of 2x2 Table for Gamble 9A and Abroad 3 Conditions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	,389 ^a	2	,823
Likelihood Ratio	,386	2	,825
Linear-by-Linear Association	,278	1	,598
N of Valid Cases	250		

The gamble 9B has no significant association $\chi^2 (2) = 1.24, p > .6$.

Table 37. Chi-Square Test of 2x2 Table for Gamble 9B and Abroad 3 Conditions

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1,241 ^a	2	,538
Likelihood Ratio	2,242	2	,326
Linear-by-Linear Association	,260	1	,610
N of Valid Cases	238		

The tenth gamble has no significant association $\chi^2 (2) = 5.33, p > .1$

Table 38. Chi-Square Test of 2x2 Table for Gamble 10 and Abroad 3 Conditions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5,329 ^a	2	,070
Likelihood Ratio	5,079	2	,079
Linear-by-Linear Association	3,195	1	,074
N of Valid Cases	249		

The eleventh gamble has significant association $\chi^2 (2) = 15.28, p < .001$

Table 39. Chi-Square Test of 2x2 Table for Gamble 11 and Abroad 3 Conditions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15,282 ^a	2	,000
Likelihood Ratio	12,834	2	,002
Linear-by-Linear Association	,013	1	,911
N of Valid Cases	251		

The twelfth gamble has no significant association $\chi^2 (2) = .10, p > .1$

Table 40. Chi-Square Test of 2x2 Table for Gamble 9A and Abroad 3 Conditions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	,080 ^a	2	,961
Likelihood Ratio	,079	2	,961
Linear-by-Linear Association	,067	1	,796
N of Valid Cases	251		

The thirteenth gamble has no significant association $\chi^2 (2) = 3.23, p > .2$

Table 41. Chi-Square Test of 2x2 Table for Gamble 13 and Abroad 3 Conditions

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3,227 ^a	2	,199
Likelihood Ratio	3,108	2	,211
Linear-by-Linear Association	3,050	1	,081
N of Valid Cases	248		

5.2.2. Correlations

There is no significant association between being abroad more than a year and risk aversion variables $r = .01$, $p > 1$

Table 42. Statistics of Correlations of All Gambles and Abroad

		Abroad	AllGambles
Abroad	Pearson Correlation	1	,006
	Sig. (2-tailed)		,934
	N	254	223
AllGambles	Pearson Correlation	,006	1
	Sig. (2-tailed)	,934	
	N	223	224

5.2.3. Analysis of Variance for All Gambles

Experience Abroad has effect on risk aversion $F(2, 220) = 3.03$, $p = .05$

Table 43. ANOVA Test to determine the association between All Gambles and Abroad

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	31,735	2	15,867	3,032	,050
Within Groups	1151,135	220	5,232		
Total	1182,870	222			

5.2.4. Tests for Gambles 2, 6, 8 and 11

For Gamble 2 and Abroad 3 conditions, there is no significant correlation $r = -.04$, $p > .6$.

Table 44. Statistics of Correlations of Gamble 2 and Abroad

		Abroad	Gamble2
	Pearson Correlation	1	-,036
Abroad	Sig. (2-tailed)		,566
	N	254	252
	Pearson Correlation	-,036	1
Gamble2	Sig. (2-tailed)	,566	
	N	252	254

Being abroad more than a year has significant on risk aversion $F(2, 249) = 3.05$, $p = .05$.

Table 45. ANOVA Test to determine the association between Gamble 2 and Abroad

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1,454	2	,727	3,045	,049
Within Groups	59,447	249	,239		
Total	60,901	251			

The table shows descriptive statistics from one way procedure for Gamble 2. In this table, 1 indicates less than one year experience abroad condition ($N = 45$, $M = 1.60$ min, 95% CI [1.50, 1.75], $SD = .50$). 2 indicates one year or more experience abroad condition ($N = 23$, $M = 1.83$ min, 95% CI [1.70, 2.00], $SD = .40$). 3 indicates none condition ($N = 184$, $M = 1.56$ min, 95% CI [1.50, 1.63], $SD = .50$). The mean of condition 2 ($M = 1.83$) appears to be larger than the mean of condition 1 ($M = 1.60$), and the condition 3 ($M = 1.56$) appears have smallest mean among the three condition.

Table 46. Descriptive Statistics of ANOVA Test for Gamble 2 and Abroad 3 Conditions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00	45	1,6000	,49543	,07385	1,4512	1,7488	1,00	2,00
2,00	23	1,8261	,38755	,08081	1,6585	1,9937	1,00	2,00
3,00	184	1,5598	,49777	,03670	1,4874	1,6322	1,00	2,00
Total	252	1,5913	,49258	,03103	1,5302	1,6524	1,00	2,00

For Gamble 6 and Abroad 3 conditions, there is a significant correlation $r = .13$, $p < .05$.

Table 47. Statistics of Correlations of Gamble 6 and Abroad

		Abroad	Gamble6
Abroad	Pearson Correlation	1	,130*
	Sig. (2-tailed)		,042
	N	254	248
Gamble6	Pearson Correlation	,130*	1
	Sig. (2-tailed)	,042	
	N	248	250

*. Correlation is significant at the 0.05 level (2-tailed).

Being abroad more than a year has significant impact on risk aversion $F(2, 245) = 4,24$, $p < .05$.

Table 48. ANOVA Test to determine the association between Gamble 6 and Abroad

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2,009	2	1,004	4,240	,015
Within Groups	58,040	245	,237		
Total	60,048	247			

The table shows descriptive statistics from one way procedure for Gamble 6. In this table, 1 indicates less than one year experience abroad condition ($N = 45$, $M = 1.29$ min, 95% CI [1.15, 1.43], $SD = .50$). 2 indicates one year or more experience abroad condition ($N = 23$, $M = 1.65$ min, 95% CI [1.44, 1.70], $SD = .10$). 3 indicates none condition ($N = 180$, $M = 1.41$ min, 95% CI [1.34, 1.50], $SD = .04$). The mean of condition 2 ($M = 1.65$) appears to be larger than the mean of condition 3 ($M = 1.41$), and the condition 1 ($M = 1.29$) appears have smallest mean among the three condition.

Table 49. Descriptive Statistics of ANOVA Test for Gamble 6 and Abroad 3 Conditions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00	45	1,2889	,45837	,06833	1,1512	1,4266	1,00	2,00
2,00	23	1,6522	,48698	,10154	1,4416	1,8628	1,00	2,00
3,00	180	1,4111	,49341	,03678	1,3385	1,4837	1,00	2,00
Total	248	1,4113	,49306	,03131	1,3496	1,4730	1,00	2,00

For Gamble 8 and Abroad 3 conditions, there is no significant correlation $r = .08$ which is not significant at $p > .3$.

Table 50. Statistics of Correlations of Gamble 8 and Abroad

		Abroad	Gamble8
Abroad	Pearson Correlation	1	,076
	Sig. (2-tailed)		,231
	N	254	253
Gamble8	Pearson Correlation	,076	1
	Sig. (2-tailed)	,231	
	N	253	255

Experience abroad has significant effect on risk aversion, $F(2, 250) = 1.56$, $p < .05$.

Table 51. ANOVA Test to determine the association between Gamble 8 and Abroad

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1,557	2	,779	3,188	,043
Within Groups	61,075	250	,244		
Total	62,632	252			

The table shows descriptive statistics from one way procedure for Gamble 8. In this table, 1 indicates less than one year experience abroad condition ($N = 45$, $M = 1.40$ min, 95% CI [1.25, 1.55], $SD = .50$). 2 indicates one year or more experience abroad condition ($N = 23$, $M = 1.70$ min, 95% CI [1.50, 1.90], $SD = .50$). 3 indicates none condition ($N = 185$, $M = 1.43$ min, 95% CI [1.40, 1.50], $SD = .50$). The mean of condition 2 ($M = 1.70$) appears to be larger than the mean of condition 3 ($M = 1.43$), and the condition 1 ($M = 1.40$) appears have smallest mean among the three condition.

Table 52. Descriptive Statistics of ANOVA Test for Gamble 8 and Abroad 3 Conditions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00	45	1,4000	,49543	,07385	1,2512	1,5488	1,00	2,00
2,00	23	1,6957	,47047	,09810	1,4922	1,8991	1,00	2,00
3,00	185	1,4324	,49676	,03652	1,3604	1,5045	1,00	2,00
Total	253	1,4506	,49854	,03134	1,3889	1,5123	1,00	2,00

There is marginally significant correlation between Gamble 11 and Experience Abroad $r = .12$, $p = .054$

Table 53. Statistics of Correlations of Gamble 11 and Abroad

		Abroad	Gamble11
Abroad	Pearson Correlation	1	,122
	Sig. (2-tailed)		,054
	N	254	251
Gamble11	Pearson Correlation	,122	1
	Sig. (2-tailed)	,054	
	N	251	252

Experience abroad has significant effect on risk aversion, $F(2, 248) = 8.04$, $p < .001$.

Table 54. ANOVA Test to determine the association between Gamble 11 and Abroad

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2,545	2	1,273	8,039	,000
Within Groups	39,263	248	,158		
Total	41,809	250			

The table shows descriptive statistics from one way procedure for Gamble 11. In this table, 1 indicates less than one year experience abroad condition ($N = 44$, $M = 1.14$ min, 95% CI [1.03, 1.24], $SD = .35$). 2 indicates one year or more experience abroad condition ($N = 23$, $M = 1.52$ min, 95% CI [1.30, 1.74], $SD = .51$). 3 indicates none condition ($N = 184$, $M = 1.20$ min, 95% CI [1.13, 1.25], $SD = .40$). The mean of condition 2 ($M = 1.52$) appears to be larger than the mean of condition 3 ($M = 1.20$), and the condition 1 ($M = 1.14$) appears have smallest mean among the three condition.

Table 55. Descriptive Statistics of ANOVA Test for Gamble 11 and Abroad 3 Conditions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1,00	44	1,1364	,34714	,05233	1,0308	1,2419	1,00	2,00
2,00	23	1,5217	,51075	,10650	1,3009	1,7426	1,00	2,00
3,00	184	1,1902	,39354	,02901	1,1330	1,2475	1,00	2,00
Total	251	1,2112	,40894	,02581	1,1603	1,2620	1,00	2,00

5.3. Sub Hypothesis 2a

As a gender role measured by The Bem Sex Role Inventory, feminine individuals will be more risk averse.

5.3.1. Correlations

The table of the correlation coefficients below, shows that, the more feminine individuals are, higher the economic risk aversion they display $r = .21, p < 0.01$

Table 56. Statistics of Correlations of All Gambles and Femininity

		AllGambles	BEM1
AllGambles	Pearson Correlation	1	,210**
	Sig. (2-tailed)		,002
	N	224	223
BEM1	Pearson Correlation	,210**	1
	Sig. (2-tailed)	,002	
	N	223	255

** . Correlation is significant at the 0.01 level (2-tailed).

5.3.2. Analysis of Variance for All Gambles

Femininity has significant effect on risk aversion, $F(61, 161) = 1.72, p < .01$.

Table 57. ANOVA Test to determine the association between All Gambles and Femininity

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	466,037	61	7,640	1,723	,004
Within Groups	714,017	161	4,435		
Total	1180,054	222			

5.4. Hypothesis 2b

As a gender role measured by The Bem Sex Role Inventory, masculine individuals will be less risk averse.

5.4.1. Correlations

The table of the correlation coefficients below, shows that, the more masculine individuals are, lower the economic risk aversion they display $r = -.21$, $p < .001$

Table 58. Statistics of Correlations of All Gambles and Femininity

		AllGambles	BEM2
AllGambles	Pearson Correlation	1	-,213**
	Sig. (2-tailed)		,001
	N	224	223
BEM2	Pearson Correlation	-,213**	1
	Sig. (2-tailed)	,001	
	N	223	255

** . Correlation is significant at the 0.01 level (2-tailed).

5.4.2. Analysis of Variance for All Gambles

Masculinity has significant impact on risk aversion $F(66, 156) = 1.61$, $p < .01$.

Table 59. ANOVA Test to determine the association between All Gambles and Femininity

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	477,624	66	7,237	1,607	,009
Within Groups	702,429	156	4,503		
Total	1180,054	222			

5.5.Sub Hypothesis 2c

Sub Hypothesis 2c: Individuals with higher femininity scores, measured by The Bem Sex Role Inventory, will have lower creative achievement score, measured by Creative Achievement Questionnaire

5.5.1. Correlations

There is no significant association between femininity and creative achievement, $r = .01$, $p > .9$

Table 60. Statistics of Correlations of All Gambles and Femininity

		Creative	BEM1
Creative	Pearson Correlation	1	,014
	Sig. (2-tailed)		,826
	N	256	255
BEM1	Pearson Correlation	,014	1
	Sig. (2-tailed)	,826	
	N	255	255

5.5.2. Analysis of Variance for All Gambles

Femininity has no significant impact on creative achievement $F(66, 188) = 1.10$, $p > .4$

Table 61. ANOVA Test to determine the association between All Gambles and Femininity

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17,736	66	,269	1,098	,310
Within Groups	46,013	188	,245		
Total	63,749	254			

5.6. Sub Hypothesis 2d

Individuals with higher masculinity scores, measured by The Bem Sex Role Inventory, will have higher creative achievement score, measured by Creative Achievement Questionnaire

5.6.1. Correlations

The table of the correlation coefficients below, shows that, the more masculine individuals are, higher the creative achievements they have $r = .22$, $p < .001$

Table 62. Statistics of Correlations of All Gambles and Masculinity

		Creative	BEM2
	Pearson Correlation	1	,219**
Creative	Sig. (2-tailed)		,000
	N	256	255
	Pearson Correlation	,219**	1
BEM2	Sig. (2-tailed)	,000	
	N	255	255

** . Correlation is significant at the 0.01 level (2-tailed).

5.6.2. Analysis of Variance for All Gambles

Masculinity has no significant impact on creative achievement, $F(69, 185) = 1.03$, $p > .5$.

Table 63. ANOVA Test to determine the association between All Gambles and Masculinity

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	17,666	69	,256	1,028	,433
Within Groups	46,083	185	,249		
Total	63,749	254			

5.7. Sub Hypothesis 3

Risk aversion can increase as individuals become older.

5.7.1. Correlations

The more individuals become older, higher the risk aversion they display $r = .20$ is significant at $p < .01$

Table 64. Statistics of Correlations of All Gambles and Age

		AllGambles	AGE
AllGambles	Pearson Correlation	1	,190**
	Sig. (2-tailed)		,005
	N	224	220
AGE	Pearson Correlation	,190**	1
	Sig. (2-tailed)	,005	
	N	220	251

** . Correlation is significant at the 0.01 level (2-tailed).

5.7.2. Analysis of Variance for All Gambles

Age has no significant impact on risk aversion, $F(34, 184) = .89$ $p > .7$.

Table 65. ANOVA Test to determine the association between All Gambles and Age

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	159,271	34	4,684	,888	,648
Within Groups	970,409	184	5,274		
Total	1129,680	218			

5.8. Correlations among Risk Aversion, Experience Abroad, Creative Achievement, Femininity, Masculinity, and Age

There is a positive correlation between risk aversion and femininity $r = .21, p < .01$. There is a negative correlation between risk aversion and masculinity $r = -.21, p < .01$. There is no significant correlation between experience abroad and risk aversion $r = .01, p > .1$. There is no significant correlation between experience abroad and creativity $r = -.10, p > .2$. There is no significant correlation between experience abroad and femininity, $r = .10, p > .5$. There is no significant correlation between experience abroad and masculinity, $r = -.03, p > .7$. There is no significant correlation between experience abroad and age, $r = .04, p > .6$. There is no significant correlation between creative achievement and femininity, $r = .01, p > .9$. There is a significant correlation between creative achievement and masculinity, $r = .22, p < .01$. There is no significant correlation between creative achievement and age, $r = .11, p > .09$. There is a significant correlation between femininity and masculinity, $r = .30, p < .01$. There is no significant correlation between femininity and age, $r = .10, p > .4$.

Table 66. Statistics of Correlations of Risk Aversion, Experience Abroad, Creative Achievement Femininity, Masculinity and Age

		AllGambles	Abroad	Creative	BEM1	BEM2	AGE
AllGambles	Pearson Correlation	1	,006	-,031	,210**	-,213**	,190**
	Sig. (2-tailed)		,934	,646	,002	,001	,005
	N	224	223	224	223	223	220
Abroad	Pearson Correlation	,006	1	-,100	,053	-,026	,039
	Sig. (2-tailed)	,934		,111	,403	,682	,540
	N	223	254	254	253	253	249
Creative	Pearson Correlation	-,031	-,100	1	,014	,219**	,110
	Sig. (2-tailed)	,646	,111		,826	,000	,082
	N	224	254	256	255	255	251
BEM1	Pearson Correlation	,210**	,053	,014	1	,284**	,055
	Sig. (2-tailed)	,002	,403	,826		,000	,390
	N	223	253	255	255	255	250
BEM2	Pearson Correlation	-,213**	-,026	,219**	,284**	1	,011
	Sig. (2-tailed)	,001	,682	,000	,000		,864
	N	223	253	255	255	255	250
AGE	Pearson Correlation	,190**	,039	,110	,055	,011	1
	Sig. (2-tailed)	,005	,540	,082	,390	,864	
	N	220	249	251	250	250	251

** . Correlation is significant at the 0.01 level (2-tailed).

5.9. Multiple Linear Regression Analysis

Multiple linear regression is used to test if femininity, masculinity and age values significantly predict the participants' economic risk aversion (AllGambles). The results of the regression indicate the three predictors, BEM 1 (femininity), BEM 2 (masculinity) and AGE explain 13% of the variation ($R^2 = .13$, $F(3,213) = 10.30$, $p < .001$) in AllGambles. It is found that BEM1 (femininity) significantly predicts risk aversion ($t(251) = 3.64$, $\beta = .04$, $p < .001$), BEM2 (masculinity) significantly predicts risk aversion ($t(251) = -4.20$, $\beta = -.04$, $p < .001$), as does AGE ($t(247) = 2.30$, $\beta = .04$, $p < .05$).

Table 67. The Model Summary of the Multiple Linear Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,356 ^a	,127	,114	2,14779

a. Predictors: (Constant), AGE, BEM2, BEM1

Table 68. ANOVA Table of the Multiple Linear Regression Analysis

Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	142,493	3	47,498	10,297	,000 ^b
	Residual	982,567	213	4,613		
	Total	1125,060	216			

a. Dependent Variable: AllGambles

b. Predictors: (Constant), AGE, BEM2, BEM1

Table 69. The coefficients of the Multiple Linear Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	20,283	1,205	16,838	,000	
	BEM1	,035	,010	,239	3,640	,000
	BEM2	-,038	,009	-,275	-4,192	,000
	AGE	,035	,015	,147	2,300	,022

a. Dependent Variable: AllGambles

5.9.1. Multiple Linear Regression Analysis with Creative Achievement Score Predictor

Multiple linear regression is used to test if femininity, masculinity, age and creative achievement values significantly predict the participants' economic risk aversion (AllGambles). The results of the regression indicate the three predictors, BEM 1 (femininity), BEM 2 (masculinity) and AGE explain 13% of the variation ($R^2 = .13$, $F(4,212) = 7.70$, $p < .001$) in AllGambles. It is found that BEM1 (femininity) significantly predicts risk aversion ($t(250) = 3.63$, $\beta = .04$, $p < .001$), BEM2 (masculinity) significantly predicts risk aversion ($t(250) = -4.11$, $\beta = -.04$, $p < .001$), AGE significantly predicts risk aversion ($t(246) = 2.28$, $\beta = .04$, $p < .05$), but creative achievement value (Creative) does not predict risk aversion ($t(251) = .12$, $\beta = .00$, $p > 1.00$).

Table 70. The Model Summary of the Multiple Linear Regression Analysis with CA Score Predictor

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.356 ^a	.127	.110	2,15277

a. Predictors: (Constant), AGE, BEM2, BEM1, Creative

Table 71. ANOVA Table of the Multiple Linear Regression Analysis with CA Score Predictor

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	142,563	4	35,641	7,690	.000 ^b
	Residual	982,497	212	4,634		
	Total	1125,060	216			

a. Dependent Variable: AllGambles

b. Predictors: (Constant), AGE, BEM2, BEM1, Creative

Table 72. The coefficients of the Multiple Linear Regression Analysis with CA Score Predictor

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	20,287	1,208		16,797	.000
	Creative	.002	.017	.008	.122	.903
	BEM1	.035	.010	.239	3,634	.000
	BEM2	-.038	.009	-.277	-4,112	.000
	AGE	.035	.015	.147	2,279	.024

a. Dependent Variable: AllGambles

The next chapter makes explanations in terms of the statistical results of the hypotheses which were presented in this chapter.

CHAPTER 6: DISCUSSION

According to the results indicated in the previous chapter, the main hypothesis is rejected. Sub Hypothesis 1 also does not have significance to support not to reject condition. Sub Hypotheses 2a and 2b are not rejected, and 2c is rejected and 2d is not rejected, and sub hypothesis 3 is not rejected.

In terms of the significance of these hypotheses, the first regression analysis is conducted with three predictors, BEM 1 (femininity), BEM 2 (masculinity), and AGE. It is found that femininity has positive impact on risk aversion, as femininity values of an individual increases, the risk aversion of that person increases as well. Masculinity has negative effect on risk aversion as well as age. The change in risk aversion associated with a unit change in these three predictors, and from the statistical results, it is observed that femininity, masculinity and age almost cause a similar amount of change in economic risk aversion. Femininity, masculinity and age can explain the risk aversion of individuals, whereas from the second regression analysis it is learnt that economic risk aversion cannot be explained by CAQ score (creative). In other words, risk aversion is not affected from a unit change in CAQ score, and except that predictor, femininity, masculinity and age make significant contributions to predict economic risk aversion.

6.1. Risk Aversion and Creative Achievement

Individuals who have creative achievements as measured by Creative Achievement Questionnaire tend to have less risk aversive decisions.

The main hypothesis is rejected. There can be several reasons behind the failure of this assumption. Firstly, Creative Achievement Questionnaire (Carson et.al, 2005) aims to measure the creativity of individuals who have been already part of a working environment that requires strong creative insights.

Due to limited amount of time, it was not possible to reach many individuals from different fields such as academia, architecture, arts and literature, and culinary arts. Secondly, most of the participants are from undergraduate students, including architecture and design, who may not have particular achievements in the mentioned specific fields. Thirdly, there are some limitations in terms of the questionnaire. Most of the participants made notes about their interests which were not asked with questionnaire. Since there are not questions regarding achievements in the field of sports, most of the survey participants received lower scores. Although sports are included in the first part of the questionnaire, no detailed sub sections are provided in the second part. This can be a flaw of the questionnaire, or sports may not indicate strong attribute for creativity since creative minds generally refer to artists or scientists (Csikszentmihalyi, 1997; Gardner, 2011).

Fourthly, the questionnaire does not focus on a specific period in human life. Most of the adult respondents did not check the fields which were the area of interest. With respect to the age of the participants, individuals may have creative achievements during their childhood, adolescence, or young adulthood and do not prefer to mention these achievements as area of interest or specific achievement because of the time lag.

Literature review represents that the relationship, between creative achievement and economic risk aversion, which has not been subject to any published research yet. For this reason, it is not possible to compare the current results with any previous research. Some of the respondents find the amounts that were offered in the gamble questions were not attractive enough. It was also suggested, by some of the participants, that, to make a better measurement, it would be better to base gamble questions on a specific income level.

The only questions that were provided significant results are the gambles 1 and 13. To study the results further, the significant gambles 1 and 13 are separately observed in correlation and one way ANOVA tests. The retesting procedure also displayed that both Gamble 1 and 13 have significant results.

Gamble 1: Which do you prefer?

A: Toss a coin. If it comes up heads you win 100 TL, and if it comes up tails you win nothing.

B: Get 46 TL for sure

The human mind may not be very successful at estimating accurate probabilities of a possible payoff of a decision (Damasio, 2005). Most of the participants preferred option A over B. The hypothesis is observed to be significant in terms of the correlation between Gamble 1 and Creative Achievement HL. It shows that as creative achievement of an individual increases as the risk aversion declines.

The most plausible explanation can be about the amounts which are offered. Since most of the participants are undergraduate students, 46 TL and 100 TL may appear to be more realistic, and having 46 TL over losing 100 TL can be attractive.

The certainty effect can be in action by preferring certain small payoff over a larger probable payoff. The survey participants can simply overweight the certainty over a larger gain with 50% chances to occur. This case may serve as an illustration to risk averse behavior since individuals turn out to be risk averse in the domain of gains (Kahneman & Tversky, 1979).

The statistical results of one way ANOVA shows that individuals with lower creative achievement score have lower risk aversion, and individuals who have higher creative achievement score tend to be more risk averse. There can be several reasons behind this outcome. Turkish society may have different values when compared to any Western society.

Today, it can be observed that highly creative people, who have potential to have creative achievements, may not be welcomed by the rest of the society. Even though the creative achievement can be considered as a positive attribute for the western world, creative achievement may not be observed as a spectacular feature in nonwestern societies.

Gamble 13: Which do you prefer?

A: 0.1% chance to win 6,000 TL

B: 0.2% chance to win 3,000 TL

Although most of the participants are expected to choose the gamble with highest payoff, in this case, A appears to be chosen over B. Both options have chances that are almost the same while one of the stakes twice higher than the other. The participants may overweight the option with the payoff that has 0.1% chances to occur. In any case, individuals face with a loss, and are expected to be risk seeker by preferring to have 6,000 TL with 0.1% chances (Kahneman & Tversky, 1979).

The same outcome, as in the gamble 1, is obtained in this gamble as well. The same reasons can be the main motivation behind this outcome. Additionally, individuals with low creative achievement may earn and have more income than individuals' higher creative achievement scores. In Turkey, the common point of view can be summarized as "having a job with regular income and health insurance." This may give opportunity to individuals with lower or no creative achievement to take economic risks. In Western societies, the situation can be reverse depending on several factors such as Gross Domestic Income (can be an indicator of development level), governmental support to arts and/or sciences, the attitude of a society against creative individuals, etc.

There are also several factors that may have impact on decisions. There can be hormonal factors which may affect economic risk aversion. It is found that menstrual cycle of females and hormonal changes have impact on risk aversive behavior (Chen, Katuščák, & Ozdenoren, 2005; Schipper, 2012; Da Silva et.al., 2013). Emotions can also play an important role when it comes to economic decisions on a risky context (Lerner, Small & Loewenstein, 2004; Shiv, Loewenstein, Bechara, Damasio, & Damasio, 2005; Kuhnen, & Knutson, 2011; Kugler, Connolly & Ordóñez, 2012).

6.2. Risk Aversion and Abroad Experience

Individuals, who have abroad experience, in terms of working and studying, tend to have less risk aversive decisions.

Control group is generated from the students who do not have abroad experience in terms of studying. However, some of the participants in the study group appeared to have no abroad experience in terms of working or studying but observed to have relatively longer years of working experience. This situation may generate a problem when it comes to statistical results since the hypothesis is rejected because of marginal differences. Based on the researcher's knowledge, there is no research which investigates the relationship between abroad experience and economic risk aversion, to extend creativity. However, there are several studies which investigate the link between multicultural experience and creativity (Leung, Maddux, Galinsky & Chiu, 2008).

Being exposed to different cultures can be defined as a multicultural experience which refers to "all direct and indirect experiences of encountering or interacting with the elements and/or members of foreign cultures (p.169)." Multicultural practices can include various level education programs in terms of academic and business environment (Leung et.al., 2008).

Multicultural experience can increase creativity by simply serving as a direct access to novel ideas, inaccessible knowledge and different concepts related to foreign cultures. Individuals also have advantage to see working mechanisms of a specific concept from different angles. Eventually, individuals can combine various concepts, which mostly perceived as incompatible, to each other. This can make individuals less risk averse since these tasks require courage to try new things which have not done before (Leung et.al., 2008).

From this angle, multicultural experience studies (Leung et. al., 2008; Maddux, Leung, Chiu, & Galinsky, 2009) can provide some basics about abroad experience. The only study focuses on abroad experience and creativity (Maddux & Galinsky, 2009) states that creative individuals can be less risk averse.

In terms of gambles individuals with abroad experience one year or more tend to be less risk averse than the individuals without abroad experience in terms of working or studying, and individuals with experience less than a year. One or more year appears to be consistent with the hypothesis; however, without abroad experience condition shows less risk aversion than the condition with less than one year. There can be various reasons behind these findings depending on personal attitudes, and context. There can be also multicultural practices which affect individuals positively. Since it is only asked about working and studying, there is no available data about the abroad visits and vacations such as business trips, culture tours, etc.

6.3. Risk Aversion and Gender Role

Sub Hypothesis 2a: As a gender role measured by The Bem Sex Role Inventory, feminine individuals will be more risk averse.

Sub Hypothesis 2b: As a gender role measured by The Bem Sex Role Inventory, masculine individuals will be less risk averse.

“Gender, both as cultural system and as a lived experience, might be described as a type of attractor, a systematic pattern with a number of different forms: steady collector, homeostatic system, periodic or limit cycle, or more fractal, unpredictable conditions” (pg. 170) (Harris, 2005).

In terms of Turkish society biological sex refers to “cinsiyet” while gender is defined as “toplumsal cinsiyet.” Gender is based on norms, social forms, agents, hierarchies that have effect femininity and masculinity of individuals, and systems (Pratt et.al. 2013).

In terms of gender studies and economic decisions, it is better to first look at the definition of gender. For this study, gender is defined as femininity and masculinity traits of an individual, imposed by the society that individuals belong to, without considering the biological sex (Marecek, Crawford & Popp, 2004; Meier-Pesti & Penz, 2008).

The research which consider gender as biological sex showed that women can be more risk averse than men in terms of investment decisions or economic decision making (Siegrist et.al., 2002; Niederle & Vesterlund, 2007; Borghan, Heckman, Golsteyn & Meijers, 2009; Dohmen et.al., 2011).

Biological sex can be a very limited point of view to determine risk aversion, and femininity and masculinity features can provide more interesting results to observe economic decision making based on gender (Meier-Pesti & Penz, 2008; Charness & Gneezy, 2012; Whiteley, 2014).

The results show that femininity and masculinity values have positive association. An individual can have similar levels of these gender values. The current findings are in line with the findings of previous research. The statement of, *women are more risk averse than men*, can be misleading. Risk taking behavior can be affected from feminine and masculine attributes of an individual, and may not be determined by means of biological sex (Booth & Nolen, 2012; Ergun, García-Muñoz & Rivas, 2012; Nelson, 2012). Hypotheses 2a and 2b are not rejected.

6.3.1. Gender and Creative Achievement

Sub Hypothesis 2c: As a gender role measured by The Bem Sex Role Inventory feminine individuals can have less creative achievements.

Sub Hypothesis 2d: As a gender role measured by The Bem Sex Role Inventory masculine individuals can have more creative achievements.

Sub Hypothesis 2c is rejected. There is no significant relationship between femininity and creative achievement. However, Sub Hypothesis 2d is not rejected; it is found that masculine individuals are observed to have more creative achievements. Findings, in terms of the hypothesis 2d, support the arguments from previous studies.

6.4. Risk Aversion and Age

Risk aversion can increase as individuals become older.

The hypothesis is not rejected. The results show that age is positively correlated with risk aversion. However, no significant impact of age is observed on risk aversion. There can be several reasons behind this argument, and impact of age may depend on context, cultural background, personal background, cognitive skills, etc. The behavior of teenagers and young adults are subject to various risk aversion studies (Machin & Sankey, 2008; Steinberg, 2008; Steinberg, 2010; Van Leijenhorst, Moor, Op de Macks, Rombouts, Westenberg, & Crone, 2010).

Based on the researcher's knowledge, there is just one study which compares the economic risk taking behavior of adults and children (Harbaugh, Krause & Vesterlund, 2002). There is no general agreement on the effects of age in economic risk taking since age is studied in terms of specific periods of human life. The next chapter focuses on concluding remarks of the study.

CHAPTER 7: CONCLUSION

By means of significant results, this study would have produced interesting findings. It is found that masculine individuals may have higher creative achievement values, whereas no significant finding is observed for feminine individuals. Being in line with the previous research, feminine individuals are found as more risk averse compared to masculine individuals.

7.1. Limitations

This study is conducted in a limited amount of time with mostly undergraduate students. The same concept can be applied to specific occupation groups in a longer duration of time. In the same way, the distinction between control group and study group can be determined more strictly. Just focusing on individuals with and without abroad experience in terms of working and studying can produce more significant results.

The results can also be affected from cultural aspects. The concepts, which were developed in Western societies, may not produce expected results. In terms of gamble questions, it is observed that simple questions with attractive stakes may produce more accurate results. The risk aversion questions can be determined with more than one plot study regarding the population aimed to be investigated.

There can be problems regarding the Turkish version of the BSRI. Some of the traits may lead to biased scores such as “33. Riski göze almaktan çekinmeyen,” 22. İncinmiş duyguları tamir etmeye istekli,” “31. Namuslu”, etc. The trait number 33 and 22 may not generate good quality indicators for a reliable result. “Namuslu” mostly perceived as a vague term by the participants, whether the term refers to being sexually conservative, or being an honest person, and left by no number given.

7.2. Implications for Future Research

The studies further can be conducted in terms of different research areas. Firstly, the correlation between masculinity and creative achievements may generate interesting research topic in the field of psychology. The economic risk taking behaviors of masculine individuals can be subject to interesting studies. The bias against risk taking behavior of females may be reduced through this research focus. Secondly, the same study can be implemented in terms of behavioral finance. Instead of gambles, the behavior of investors can be investigated in terms of the aversion questions regarding stock market.

Thirdly, creativity and economic risk taking can be extended on micro and macroeconomic levels. On micro scale, economic risk aversion of individuals from various creative industries and/or scientific industries or from academic environment can be studied. On macro level, the relationship between the government support to these sectors, and economic risk aversion of individuals who belong to these working environments, can be subject to a research. Last of all, cross country studies can be held. Based on the tests of significant gamble questions, individuals from different cultures may act differently when it comes to the relationship between creative achievement and economic risk taking.

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APPENDIX I: SURVEY

Bu araştırma, İzmir Ekonomi Üniversitesi, Finans Ekonomisi bölümünde hazırlanan bir yüksek lisans tezi çalışmasıdır. Araştırma 15 – 20 dakika arası sürmektedir ve dört bölümden oluşmaktadır. Bölümler sırasıyla risk alma eğilimi, demografik bilgiler, yaratıcılık ve cinsiyet rolü ile ilgili sorular sormaktadır.

Çalışmada tüm kişisel bilgilerin gizliliği esas alınmıştır. Verilen cevaplar toplu halde istatistiksel olarak çalışılacak ve sonuçlar yüksek lisans tezi çalışmasında sunulacaktır.

Çalışmadaki yanıtlarınızı dilediğiniz zaman geri çekebilirsiniz. Araştırmada yer aldıktan sonra dahi verinizin çalışmaya dahil olmamasına karar verebilirsiniz.

Çalışma bittikten sonra çalışmayla ilgili sormak istediğiniz tüm sorular için yandaki e-mail adresinden araştırmacıya ulaşabilirsiniz.

Katılmak istiyorsanız lütfen aşağıya tarih atarak imzanızı atınız. Bu form verinizden ayrı saklanacaktır.

Katıldığınız ve zaman ayırdığınız için teşekkür ederiz.

İmza _____ Tarih _____
(Lütfen isim yazmayınız.)

Bilgisayar ortamında yapılan araştırmalar için:

İsteğiniz doğrultusunda ilgili seçeneği işaretleyiniz

Çalışmaya katılıyorum Tarih (--/--/--)

Çalışmaya katılmıyorum Tarih (--/--/--)

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Boğaziçi Üniversitesi
Psikoloji Bölümü

A. BAHİSLER

1. Lütfen tercih ettiğiniz seçeneği işaretleyiniz.

A: Madeni para attığımız zaman; tura gelirse 100 TL kazanmak, yazı gelirse bir kazancınızın olmaması.

B: Bahse girmeyip 46 TL almak

2. Tercih ettiğiniz seçeneği işaretleyiniz.

A: %50 olasılıkla 1000 TL kazanmak veya %50 olasılıkla bir kazancınızın olmaması.

B: 450 TL almak

3. Tercih ettiğiniz seçeneği işaretleyiniz.

A: %45 olasılıkla 6000 TL kazanmak

B: %90 olasılıkla 3000 TL kazanmak

4. Tercih ettiğiniz seçeneği işaretleyiniz.

A: %50 olasılıkla 150 TL kazanmak

B: %50 olasılıkla 100 TL kaybetmek

5. Bu bahisteki seçiminiz eğer aylık geliriniz 100TL azalsaydı değişir miydi?

EVET

HAYIR

6. Tercih ettiğiniz seçeneği işaretleyiniz.

A: 1000 TL kazanmak

B: %75 olasılıkla 2000 TL kazanmak

7. Tercih ettiğiniz seçeneği işaretleyiniz.

A: 240 TL kazanmak

B: %25 olasılıkla 1000 TL kazanmak ve %75 olasılıkla hiç kazancınızın olmaması.

8. Tercih ettiğiniz seçeneği işaretleyiniz.

A: 1500 TL kazanmak

B: %75 olasılıkla 2500 TL kazanmak

9. Tercih ettiğiniz seçenekleri işaretleyiniz (A ve B sorularını ayrı ayrı cevaplayınız).

A: Bahse girmek;

900 TL kazanmak veya %90 olasılıkla 1000 TL kazanmak

B: Bahse girmek;

900 TL kaybetmek veya..... %90 olasılıkla 1000 TL kazanmak

10. Tercih ettiğiniz seçeneği işaretleyiniz.

A: 750 TL kaybetmek

B: %75 olasılıkla 1000 TL kaybetmek ve %25 olasılıkla hiç kaybınızın olmaması

11. Tercih ettiğiniz seçeneği işaretleyiniz.

A: 500 TL kazanmak

B: %75 olasılıkla 2000 TL kazanmak

12. Tercih ettiğiniz seçeneği işaretleyiniz.

A: %50 olasılıkla 100 TL kaybetmek

B: %50 olasılıkla 50 TL kazanmak ve %50 olasılıkla 200 TL kaybetmek

13. Tercih ettiğiniz seçeneği işaretleyiniz.

A: %0.1 olasılıkla 6000 TL kazanmak

B: %0.2 olasılıkla 3000 TL kazanmak

B. DEMOGRAFİK BİLGİLER

Doğum tarihiniz:			Cinsiyetiniz:		Aşağıdakilerden size uygun olanların tümünü işaretleyiniz.	
Gün	Ay	Yıl			<input type="checkbox"/> Öğrenciyim	<input type="checkbox"/> İş arıyorum
					<input type="checkbox"/> Çalışıyorum	<input type="checkbox"/> İş aramıyorum
					<input type="checkbox"/> Çalışmıyorum	<input type="checkbox"/> Askerliğimi yapıyorum

Lütfen adlarıyla belirtiniz.	ÜLKE	İL	İLÇE	SEMT veya KÖY
Doğum yeriniz:				
En uzun süre yaşadığınız yer:				
Şu anda yaşadığınız yer:				
Ailenizin en uzun süre yaşadığı yer:				

Lütfen belirtiniz.

Daha önce bir yabancı ülkede eğitim veya çalışma amaçlı bulundunuz mu? (Lütfen sadece tatil ve iş gezileri için hayır cevabını veriniz).
 Evet Hayır

Eğitim ve/veya çalışma amaçlı olarak bulduğunuz ülke(ler)de toplam kalış sürenizi belirtiniz.

Bildiğiniz yabancı dilleri belirtiniz.

Bu dilleri toplam ne kadar süredir kullanıyor sunuz?

Öğrenci iseniz: Size uygun olanların tümünü işaretleyiniz.

Okulunuz (tam adıyla):

Bölümünüz:	Sınıfınız:
------------	------------

Öğrenci değilseniz:

En son bitirdiğiniz okul (veya bıraktığınız sınıf): Eğitiminizle ilgili ayrıca belirtmek istediklerinizi yazınız.

Lütfen mesleğinizi belirtiniz Mesleğinizle ilgili ayrıca belirtmek istediklerinizi yazınız.

Lütfen Belirtiniz

Anneniz hayatta mı? Hayattaysa, Annenizin yaşı: _____ Annenizin mesleği: _____	Babanız hayatta mı? Hayattaysa, Babanızın yaşı: _____ Babanızın mesleği: _____
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Kaç kardeşsiniz: <input type="checkbox"/> Tekim <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 veya 5'ten fazla	Kaçıncı kardeşsiniz: <input type="checkbox"/> Tekim <input type="checkbox"/> 1 <input type="checkbox"/> 2. <input type="checkbox"/> 3. <input type="checkbox"/> 4. <input type="checkbox"/> 5. veya daha fazla
--	---

Kendinizi hangi gelir grubunda görüyorsunuz? <input type="checkbox"/> En düşük <input type="checkbox"/> Düşük <input type="checkbox"/> Orta <input type="checkbox"/> Yüksek <input type="checkbox"/> En yüksek	Ailenizi hangi gelir grubunda görüyorsunuz? <input type="checkbox"/> En düşük <input type="checkbox"/> Düşük <input type="checkbox"/> Orta <input type="checkbox"/> Yüksek <input type="checkbox"/> En yüksek
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C. YARATICILIK

Lütfen aşağıda belirtilen alanlardan, ortalama bir bireye göre daha fazla yetenek, beceri veya eğitim sahibi olduklarınızı işaretleyiniz.

- | | | | |
|--|--|---|---|
| <input type="checkbox"/> Görsel sanatlar (resim, heykeltçilik) | <input type="checkbox"/> Takım sporları | <input type="checkbox"/> Mizah | <input type="checkbox"/> Mutfak sanatları |
| <input type="checkbox"/> Müzik | <input type="checkbox"/> Mimari tasarım | <input type="checkbox"/> İcatlar | |
| <input type="checkbox"/> Dans | <input type="checkbox"/> Girişimcilik | <input type="checkbox"/> Bilimsel araştırma | |
| <input type="checkbox"/> Bireysel sporlar (tenis, golf) | <input type="checkbox"/> Yaratıcı yazarlık | <input type="checkbox"/> Tiyatro ve film | |

Size uyan cümleleri lütfen işaretleyiniz.

Yıldızlı (*) olan cümlelerin yanına, belirtilen durumu kaç defa gerçekleştirdiğinize dair uygun olarak rakam yazınız.

GÖRSEL SANATLAR (resim, heykeltçilik)

- Bu alanda belirli bir eğitimim veya yeteneğim bulunmamaktadır (lütfen müzik kısmına geçiniz).
- Bu alanda ders aldım
- Bu alanda insanlar yeteneğim hakkında değerlendirmede bulundu
- Jürili bir sanat yarışmasında bir veya birden çok ödül aldım
- Çalışmalarım bir sanat galerisinde sergilendi
- Kendi eserlerimden sattıklarım oldu
- Yerel yayınlar benim çalışmalarım hakkında eleştirel yazı yazdı
- *Ulusal yayınlar çalışmalarım hakkında eleştirel yazı yazdı

MÜZİK

- Bu alanda belirli bir eğitimim veya yeteneğim bulunmamaktadır (lütfen dans kısmına geçiniz).
- Bir veya birden fazla enstrümanı uzmanlık derecesinde çalabilirim
- Tanınmış bir orkestra veya müzik grubunda çalışıyorum.
- Kendime ait bestelerim var.
- Müzik yeteneğim hakkında yerel yayınlar eleştirel yazı yazdı
- Bestem kaydedildi
- Bestemin kayıtları satışa sunuldu
- *Ulusal yayınlar bestelerim hakkında eleştirel yazı yazdı

DANS

- Bu alanda belirli bir eğitimim veya yeteneğim bulunmamaktadır (lütfen mimari kısmına geçiniz).
- Tanınmış bir dans topluluğunda dans ediyorum
- Kendime ait dans koreografim var
- Benim koreografim halk karşısında gösterime sunuldu.
- Dans becerim hakkında yerel yayınlarda eleştirel yazı yazdı
- Profesyonel olarak dans koreografisi hazırladım.
- Yerel yayınlar tarafından koreografim takdir edildi.
- *Ulusal yayınlar tarafından koreografim takdir edildi.

MİMARİ TASARIM

- Bu alanda belirli bir eğitimim veya yeteneğim bulunmamaktadır (lütfen yazma kısmına geçiniz).
- Orijinal bir yapı tasarladım
- Benim tarafımdan tasarlanan bir bina inşa edildi.
- Bir mimarı tasarımı sattım.
- Satmış olduğum mimarı tasarım profesyonelce inşa edildi.
- Benim tasarımı bir veya birden fazla ödül aldı.
- Yerel yayınlar benim tasarımı takdir etti.
- *Ulusal yayınlar benim tasarımı takdir etti.

YARATICI YAZIM

Bu alanda belirli bir eğitimim veya yeteneğim bulunmamaktadır (lütfen mizah kısmına geçiniz).
Bana ait orijinal kısa bir çalışmam var (şiir veya öykü)
Çalışmam ödül kazandı
Orijinal uzun bir çalışmam var (destan, roman veya oyun)
Çalışmamı bir yayın evine sattım
Çalışmam basılıp satışa çıkarıldı.
Çalışmam hakkında yerel yayınlar tarafından inceleme yazısı yayınlandı.
*Çalışmam hakkında ulusal yayınlar tarafından inceleme yazısı yayınlandı

MİZAH

Bu alanda belirli bir yeteneğim bulunmamaktadır (lütfen icat kısmına geçiniz).
İnsanlar mizah yeteneğimi takdir eder.
Esprilerim çevremdeki insanlar tarafından sürekli kullanılır
Diğer insanlar için espriler üretirim.
Ürettiğim bir espri veya çizdiğim karikatür yayınlandı.
Profesyonel bir komedyen olarak çalıştım
Profesyonel bir komedi yazarı olarak çalıştım
Ulusal yayınlar mizah yeteneğimi takdir etti.

İCATLAR

Bu alanda belirli bir yeteneğim bulunmamaktadır.
Ev eşyaları için yaratıcı kullanım amaçları bulurum.
Bir icat tasarımı var ve tasarımımın eksiklikleri üzerinde çalışıyorum.
Kendi geliştirdiğim bir bilgisayar yazılım programım var.
Kendi tasarladığım icatlarımdan birinin ilk örneğini geliştirdim.
İcatlarımdan birini tanıdığım insanlara sattım.
*İcatlarımdan biri için patent aldım.
*İcatlarımdan birini imalatçı bir firmaya sattım.

BİLİMSEL BULUŞ

Bu alanda belirli bir eğitimim veya yeteneğim bulunmamaktadır (Tiyatro bölümüne geçiniz).
Bilimsel problemlerin çözümü için yollar düşünürüm.
Bilim fuarında veya bir başka yerel yarışmada ödül kazandım.
Bilim veya tıp alanında yaptığım bir çalışmayla burs kazandım.
Bilimsel bir dergide yayınlanan makalede yazarlık veya yardımcı yazarlık yaptım.
*Bilim veya tıp alanında ulusal ödül aldım
*Bilim veya tıp alanında çalışmalarımı devam ettirmek için hibe aldım.
Çalışmam diğer bilim adamları tarafından ulusal yayınlarda alıntılanı

TİYATRO VE FİLM

Bu alanda belirli bir eğitimim veya yeteneğim bulunmamaktadır.
Bir tiyatrodada veya filmde rol aldım.
Rol yapma yeteneğim yerel bir yayın tarafından takdir edildi.
Film veya tiyatro yönetmenliği deneyimim var.
Film veya tiyatrodada sergilediğim performansla ödül kazandım.
Bir tiyatro oyununda veya filmde aldığım rolden para kazandım.
Yönettiğim bir tiyatro oyunu veya filmde para kazandım.
*Tiyatro çalışmam ulusal basın tarafından takdir gördü.

MUTFAK SANATLARI

Bu alanda belirli bir eğitimim veya yeteneğim bulunmamaktadır.
Sık sık yeni tarifler denerim.
Tariflerim yerel yemekleri tanıtan bir kitapta yayınlandı
Tariflerim restoranlarda ve diğer halka açık mekânlar tarafından kullanıldı
Ünlü kişilere ve toplumun ileri gelenlerine yemek hazırlamam için tekliflerde bulunuldu.
Tariflerim ödül kazandı
Mutfak sanatları alanında diplomam var.
*Tariflerim ulusal olarak basıldı.

Yukarıda belirtilmeyen başka bir yaratıcı başarınız var mı? Lütfen belirtiniz.

Size uyan cümleleri işaretleyiniz.

Yeni biriyle tanışılırken hakkımda bahsedilen ilk şey yukarıda belirtilen alanlarda sahip olduğum yaratıcı yetenektir.

İnsanlar beni genelde “sanatçı ruhlu” olmakla suçlar.

İnsanlar genelde beni genelde “dalgın profesör” tipli olmakla suçlar.

D. CİNSİYET ROLÜ

Aşağıda belirtilen özelliklerin her birine 1 – 7 arasındaki uygunluk derecesinden birini seçerek size en uygun olacak şekilde doldurunuz

1: Hiç uygun değil

2: Genellikle uygun değil

3: Çok seyrek olarak uygun

4: Bazen uygun

5: Sıklıkla uygun

6: Çoğu zaman uygun

7: Sürekli uygun

1. Ağırbaşlı, ciddi	<input type="checkbox"/>	2. Ailesine karşı sorumlu	<input type="checkbox"/>
3. Anlayışlı	<input type="checkbox"/>	4. Baskın, tesirli	<input type="checkbox"/>
5. Başkalarının ihtiyaçlarına duyarlı	<input type="checkbox"/>	6. Boyun eğen	<input type="checkbox"/>
7. Cana yakın	<input type="checkbox"/>	8. Cömert	<input type="checkbox"/>
9. Çocukları seven	<input type="checkbox"/>	10. Duygularını açığa vurmayan	<input type="checkbox"/>
11. Duygusal	<input type="checkbox"/>	12. Erkeksi	<input type="checkbox"/>
13. Etkileyici, güçlü	<input type="checkbox"/>	14. Fedakar	<input type="checkbox"/>
15. Girişken	<input type="checkbox"/>	16. Gönül alan	<input type="checkbox"/>
17. Gözüpek	<input type="checkbox"/>	18. Haksızlığa karşı tavır alan	<input type="checkbox"/>
19. Hassas	<input type="checkbox"/>	20. Hırslı	<input type="checkbox"/>
21. İdealist	<input type="checkbox"/>	22. İncinmiş duyguları tamir etmeğe istekli	<input type="checkbox"/>
23. Kaba dil kullanmayan	<input type="checkbox"/>	24. Kadınsı	<input type="checkbox"/>
25. Kendi ihtiyaçlarını savunan	<input type="checkbox"/>	26. Kendine güvenen	<input type="checkbox"/>
27. Kuralcı, katı	<input type="checkbox"/>	28. Lider gibi davranan	<input type="checkbox"/>
29. Mantıklı	<input type="checkbox"/>	30. Merhametli	<input type="checkbox"/>
31. Namuslu	<input type="checkbox"/>	32. Otoriter	<input type="checkbox"/>
33. Riski göze almaktan çekinmeyen	<input type="checkbox"/>	34. Sadık	<input type="checkbox"/>
35. Saldırgan	<input type="checkbox"/>	36. Sevecen	<input type="checkbox"/>
37. Sıkılgan	<input type="checkbox"/>	38. Sözünde duran	<input type="checkbox"/>
39. Tatlı dilli	<input type="checkbox"/>	40. Yumuşak, nazik	<input type="checkbox"/>