DOĞUŞ UNIVERSITY

INSTITUTE OF SOCIAL SCIENCES

MASTER OF ARTS IN CLINICAL PSYCHOLOGY

AN EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF STATE & TRAIT ANXIETY AND SELF ESTEEM ON DECISION MAKING

Graduation Thesis

Seha ÇOBANOĞLU

201280002

Thesis Advisor:

Assist. Prof. Hasan G. BAHÇEKAPILI

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PREFACE

This thesis is submitted for the degree of Master of Arts in Clinical Psychology at the Doğuş University. The research described herein was conducted under the supervision of Assist. Prof. Hasan Galip Bahçekapılı between May 2016 and January 2017. This study is an original, unpublished and independent work by the author.

This work aims to investigate the effects of both state and trait features of anxiety on decision making assessed by a behavioral task in an experimental design with a control group. Also, the relationship between self-esteem and decision making is investigated.

Istanbul, January 2017 Seha Çobanoğlu

ABSTRACT

AN EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF STATE AND TRAIT ANXIETY AND SELF - ESTEEM ON DECISION MAKING

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M.A., Department of Psychology

Supervisor: Assist. Prof. Hasan Galip Bahçekapılı

January 2017

The dynamics of how people make decisions has received attention for a long time. But it is a recent assumption that emotions have unique effects on how people decide. Anxiety – as one of the widespread form of negative emotionality- is also shown to have an impact on decision making but findings are contradictory across studies for both state and trait forms of anxiety. This study tries to explore the influence of state and trait anxiety on Iowa Gambling Task (IGT), a well-validated behavioral index of decision making, by experimentally inducing anxious mood. Also, the association between self-esteem and decision making is investigated, since few studies reported inconsistent data. A hundred and three university students were assigned to mood induction or control group randomly. State Trait Anxiety (STAI), Beck Depression Inventory (BDI), Positive and Negative Affect Schedule (PANAS), Rosenberg Self Esteem Scale (RSES) and sociodemographic form were used as instruments. To induce anxious mood, movie scripts were used. To pursue changes in mood STAI – State form, PANAS and visual analogue scales were used at different times. Results revealed that the control and experimental group displayed similar performances in IGT, but experimental group picked fewer cards from an advantageous deck, indicating impairment in decision making. This finding supported partially the hypothesis that anxious mood induced by an irrelevant source impairs decision

making. However, trait anxiety affected negatively decision making in IGT, since those high on trait anxiety scored lower in IGT, picked less from an advantageous deck and more form a disadvantageous deck. Nonetheless, the correlations between self esteem and decision making as measured by a complex task was non-significant. The findings are discussed in the light of relevant literature.

Key words: State Anxiety, Anxious mood, Trait Anxiety, Iowa Gambling Task, Self Esteem, Decision Making, Mood Induction

ÖZ

DURUMLUK VE SÜREKLİ KAYGI İLE BENLİK SAYGISININ KARAR VERME DAVRANIŞIYLA İLİŞKİSİNİN DENEYSEL YÖNTEMLE İNCELENMESİ

Çobanoğlu, Seha

Yüksek Lisans, Psikoloji

Danışman: Yrd. Doç. Dr. Hasan Galip Bahçekapılı

Ocak, 2017

İnsanların kararlarını nasıl aldıkları uzun süreden beri araştırılmıştır. Ancak duyguların alınan kararlar üzerinde farklı etkileri olabileceği olgusu yakın zamanda araştırılan bir konudur. Yaygın olumsuz duygudurumu formlarından biri olan kaygının karar verme dinamiklerine etkisi ise hem durumluk hem de sürekli kaygı açısından çelişkili sonuçlar göstermiştir. Bu çalışmada amaç, deneysel olarak durumsal kaygı yaratarak, hem durumsal kaygının hem de sürekli kaygının kişilerin karar verme davranışlarına olan etkisini davranışsal bir karar verme aracı olan ve çalışmalarda sıkça kullanılan Iowa Kumar Testi ile incelemektir. Deneye katılan 103 üniversite öğrencisi seçkisiz atama yöntemiyle deney ya da kontrol grubuna dahil edilmiştir. Katılımcılardan bilgiler; Durumluk-Sürekli Kaygı Envanteri, Beck Depresyon Ölçeği, Poziif ve Negatif Duygu Ölçeği, Rosenberg Benlik Saygısı Ölçeği, görsel analog ölçek ve sosyodemografik formlar ile toplanmıştır. Kaygılı bir duygudurum yaratmak için görsel film videoları kullanılmıştır. Duygudurumundaki değişiklikleri takip edebilmek için, manipülasyon öncesinde, sonrasında ve deneyin tamamlanmasının ardından olmak üzere 3 kez Durumluk Kaygı Ölçeği, Pozitif ve Negatif Duygu Ölçeği ile görsel analog ölçekler doldurtulmuştur. Buna göre, durumluk kaygı deney ya da kontrol grubunda herhangi bir anlamlı farklılık yaratmamıştır. Sadece karar verme konusuna ilgisiz olan bir kaynak tarafından oluşturulan durumluk kaygının Iowa Kumar Testi'nde dezavantajlı kararlar almaya etki edebileceği gösterilmiştir. Sürekli kaygı açısından, sürekli kaygısı daha yüksek olan katılımcıların Iowa Kumar Testi'nde anlamlı şekilde daha düşük performans sergiledikleri, dezavantajlı destelerden daha çok, avantajlı

destelerden ise daha az seçtikleri bulunmuştur. Benlik saygısı ile karar verme davranışları arasındaki ilişki ise anlamlı bir farklılık göstermemiştir. Bulgular ilgili yazın açısından tartışılmıştır

Anahtar kelimeler: Sürekli Kaygı, Durumluk Kaygı, Kaygılı Duygudurum, Karar Verme, Benlik Saygısı, Iowa Kumar Testi, Duygudurum Manipülasyonu

DEDICATION

To my dear sister ***Seray,***

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To start with, I would like to express my greatest appreciation and gratitude to my supervisor Assist. Prof. Hasan Galip Bahçekapılı for his unconditional support and patience and innumerable contributions throughout this challenging journey. He was always there to help and mentor me with his knowledge, experience and insightful feedbacks. It would be very tough to complete this thesis without his encouragement and motivation. Once again, I am very grateful for all of his positive influences he has on me and on my thesis.

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And, my thesis! It was like to read your favourite book that had been read many years ago. Obviously, I had forgetten many precious things about myself. You just reminded me myself. Thank you.

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ABBREVIATIONS

RSES: Rosenberg Self-Esteem Scale

STAI: State Trait Anxiety Inventory

STAI - SA: State Trait Anxiety Inventory State Anxiety Form

STAI - TA: State Trait Anxiety Inventory Trait Anxiety Form

PANAS: Positive and Negative Affect Schedule

TA: Trait Anxiety

SA: State Trait

PA: Positive Affect

NA: Negative Affect

VAS: Visual Analog Scale

BDI: Beck Depression Inventory

OCD: Obsessive Compulsive Disorder

SE: Self Esteem

GAD: Generalized Anxiety Disorder

PAD: Panic Attack Disorder

vmPFC: Ventromedial Prefrontal Cortex

dlPFC: Dorsolateral Prefrontal Cortex

ACC: The Anterior Cingulate Cortex

OFC: Orbitofrontal Cortex

PC: Parietal Cortex

PFC: Prefrontal Cortex

IGT: Iowa Gambling Task

DM: Decision Making

SMH: The Somatic Marker Hypothesis

BART: Balloon Analogue Risk Task

GDT: Game of Dice Task

EG: Experimental Group

CG: Control Group

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1. INTRODUCTION

Decision making (DM), represents an important aspect of daily life. Sometimes people make simple choices such as what to eat at dinner or how to go to work, which are simple and not having long term consequences. However, some decisions are difficult to make and have severe and long term consequences such as deciding how to invest money or what to do when faced with a gunman. Besides the simplicity/complexity of the decisions, many situations in daily life lack of adequate information about the possible outcomes. Under some conditions, people may have explicit information about the possible outcomes to decide and can estimate the possible outcomes, which are generally referred as DM under risk or risky DM (Brand, Labudda, & Markowitsch, 2006). However, sometimes no explicit information is provided, so people decide without knowing potential outcomes, which is referred as DM under ambiguity (Bechara et al., 1997). Either having explicit knowledge about the probabilities or not, both conditions may result in psychological stress during the process of deciding (Gathmann et al., 2014) So, it remains as an important point to understand how people decide among different options under stressful conditions.

Besides its significance in daily life functioning, role of DM in psychological functioning has also received attention recently since any disturbance in DM processes may result in psychological, financial, social or health related problems (Brand et al., 2006). Those findings demonstrate the significance of DM on healthy psychological functioning besides its importance in finance, politics, or sociology. This fact led many researchers to investigate the underlying factors in DM such as emotion, personality traits or past experiences (Preston, Stansfield, Buchanan, & Bechara, 2007; Lauriola & Levin; 2001). Since DM is composed of various complex cognitive processes (Paulus & Yu, 2012) and DM, itself, generates different emotional reactions (Gathmann et al., 2014), many researchers have emphasized the role of emotional states on DM (Baillon, Koellinger & Treffers, 2009) Anxiety, as one of the widespread forms of negative emotionality, has shown to have impact on DM both under risk and under ambiguity (Maner & Schmidt, 2006; Smith, Ebert, & Broman-Fulks; 2016). Although impact of anxiety, both trait and state features, on DM mechanisms has been shown, inconsistencies in findings still necessitate more investigation on this topic.

Besides emotions, another line of research has sought out for certain personality correlates such as optimism or self esteem in order to understand the individual differences in DM (Lauriola & Levin; 2001). In contrast to numerous researches on the link between anxiety and DM, very few studies searched for the link between self-esteem (SE) (Josephs, Larrick, Steele, & Nisbett, 1992). Consequently, the main objectives of this study are to uncover the connection between anxiety – both trait and state features - and DM, and the potential link between SE and DM.

1.1. Decision Making as a Psychological Construct

Research on DM has been growing with the contribution of several disciplines such as finance, sociology, politics and psychology. Although different disciplines define DM in their own terminology it simply refers to the complex process of choosing between two or more alternatives (Paulus & Yu, 2012). It is generally conceptualized as a response to a situation and consisting of analyzing options, future expectations and evaluation. From a very broad perspective, the phenomenon of DM can be seen as a dynamic process composed of decision and behavior. This process is assumed to be comprised of people's reflections about the conditions in which they are -including their reflections to these conditions which are related to past experiences and future expectancies- and the psychological consequences following the decisions. Oliveira (2007) suggested that the process of DM in response to a particular situation involves three aspects. The first one is the assumption that individuals may tend to consider more than one possible action, which means one have to choose one of them as a response. The second aspect could be that individuals in the moment of decision tend to generate expectations about the probable outcomes. Finally, these expectations could be seen as reflecting individual characteristics and current goals.

According to Einhorn (1986), there are three variables by which individuals are influenced in DM process, namely decision features, situational factors and individual differences. Decision features describes the characteristics of the decision itself. For example, the framing and the order of options have been shown to affect DM (Appelt, Milch, Handgraaf & Weber, 2011; Tversky & Kahneman, 1979). There are also situational factors, which are

the characteristics of the situation in which a decision has to be made, such as time constraints, cognitive burden of the individual and the social context in which the decision is faced (Appelt et al., 2011; Drolet & Luce, 2004). Individual factors refer to the characteristics of the decision maker. For example, gender (Preston et al., 2007), age (İçellioğlu, 2015), emotional states (Werner, Duschek & Schandry, 2009) or personality characteristics such as neuroticism (Lauriola & Levin; 2001) or impulsivity (Appelt et al., 2011) have been found to disturb DM processes. As stated by Appelt et al. (2011) despite findings examining individual factors are promising, still much left to uncover to understand the effects of individual factors on DM such as personality traits or emotions.

It is accepted that any individual has distinct ways and skills when choosing the advantageous alternative over the disadvantageous one in the short and long run (Brand et al., 2008). Recently, Van den Bos et al. (2013) argued that DM process is a complex, cognitive and emotional process which motives individuals to select the optimal alternative according to its potential advantages and disadvantages. To reveal how people develop a DM by evaluating advantages and disadvantages, Van den Bos et al. (2013) proposed that DM is a reciprocal and dynamic process in which two separate but related systems operate on. The impulsive system responds to immediate short term gains whereas the reflective system helps to regulate long term gains and losses. Ultimately by integrating the products of these systems, individuals form a profitable DM strategy. People seem to have unique ways and abilities about how to decide. Both the impulsive and reflexive systems enable us to choose the most optimal alternative, when operating in balance.

1.1.1. Theoretical Approaches to Decision Making

Until recently, the fact that DM was seen as an example of economic behavior composed of consistent evaluation of probabilities and outcome caused the first formulations of DM to rely heavily on mathematical concepts or rational theories (Tversky & Kahneman, 1979). However, contemporary descriptive theories attempt to explain the psychological dynamics of DM in addition to rational aspects. In other words, descriptive theories mainly focus on psychological and cognitive aspects of how people tend to make choices and the

mechanisms through which people process decision relevant information, whereas rational theories attempt to enlighten how individuals should decide (Oliveira, 2007).

Contemporary theories of DM seem to be somewhat eclectic, since it has come up as a construct with economic, political, cognitive, emotional and neurological components. However it may be beneficial to recover some dominant theories of DM back in history to comprehend the background of descriptive psychological perspectives on DM.

1.1.1.1.The Expected Utility Theory

This theory (Von Neumann & Morgenstern, 1944; as cited by Josephs et al., 1992) is based on the idea that when faced with a decision, people tend to choose the option which has the maximum expected benefit. Utility is accepted as a concept that enables people to maximize gains and minimize losses while making decisions (Bechara & Damasio, 2005). According to this theory, individuals decide among options according to their judgments based on possible gains and losses of that particular decision. The decision maker is seen as capable of choosing the option with the maximum benefit (Josephs et al., 1992). So, the theory proposes that decisions, as rational products, may exhibit a persistent pattern of evaluation about the possible outcomes. However, recent DM models and findings violated the basic assumptions of this theory in such a way that emotions and some cognitive biases (e.g. heuristics) may hinder people making rational choices (Tversky & Kahneman, 1979).

1.1.1.2. The Prospect Theory

Kahneman and Tversky (1979) showed that individuals do not make rational choices constantly. The theory presumes that people do not constantly weigh gains or losses and tend to evaluate them. It has been proven that individual preferences are inconsistent under same conditions and depend on how the options are presented due to the constraints in information processing and cognitive biases (Josephs et al., 1992; Tversky & Kahneman, 1979). In other words, decision makers are believed to ground their decisions on not only objective probabilities but also their perceptions of the probabilities (Schwartz, 1983). It is a highly accepted fact that individuals make decisions by not relying on mathematical

models of probability; rather they base their decisions on cognitive biases, intuitive tendencies or other non-rational processes such as affective states (Starcke & Brand, 2012).

As stated in the Introduction part of the paper, decisions also differ from each other according to their level of explicit knowledge about the possible outcomes and alternatives. So, in the next sections DM under risky and ambiguous conditions will be covered briefly.

1.1.2. Decision Making Under Risk and Risk Aversion

DM under risky conditions refers to the conditions in which individuals have accurate and explicit knowledge about the consequences of each alternative (Schwartz, 1989). Because the decision maker is aware of the possible outcomes, the risk may be thought as possible to be minimized. So, the decision maker does not have to rely on subjective judgments about the possible outcomes. In risky DM situations, because individuals are assumed to have knowledge about potential outcomes, they are supposed to analyze this information to weigh the potential rewards and punishments in and decide accordingly (İçellioğlu, 2015). In addition, recent data demonstrated that knowing explicitly the possible outcomes enables individuals to use cognitive/calculative strategies (Brand et al., 2008). Parallel to these findings, it is reported that executive functions seem to be utilized by decision makers under risky conditions (Brand et al., 2006). Schwartz (1989) also stated that DM under risky conditions requires individuals to engage in higher cognitive operations.

Although DM under risk is conceptualized as more relying on analyzing and calculating the possibilities, the *framing effect* tells a different story. Framing effect is a cognitive bias exhibited by people under conditions of risk. It is proposed that a choice will be treated differently according to how it is presented or "framed" (Oliveira, 2007). The findings demonstrated that people tend to avoid risk when an option is worded (framed) positively. In contrast, they tend to behave as risk seekers when the options are framed negatively (Kahneman & Tversky, 1984). So, this phenomenon shows that although people have information about the possible outcomes, they are still under the effect of cognitive shortcuts.

Studies showed that under some conditions, people have a tendency to choose safer options even the other alternative has greater expected utility, an attitude defined as “risk aversion” (Hartley, et al. 2012). As an example to risk aversion, it is found that when offered with two options either choosing a guaranteed amount of 100 TL or % 50 possibility of gaining 210 TL or %50 possibility of getting nothing, a considerable amount of individuals chose the guaranteed gain (Kahneman & Tversky, 1984). Although choosing the uncertain gain would produce a larger gain, many people refused to take risks. Trait anxiety, anxiogenic mood or heightened physiological arousal are some of the factors which are shown to contribute risk aversive attitudes (Hartley, et al. 2012).

1.1.3. Decision Making Under Ambiguity and Ambiguity Aversion

Sometimes people face with alternatives with implicit probabilities. The probability of each outcome is uncertain and decision maker is unable to evaluate the probabilities of certain outcomes (Schwartz, 1989). DM under ambiguity is evaluated as a very essential part of real life because most decision people make in daily life are ill defined and consist of too many uncertainties about the possible outcomes (Lauriola & Levin, 2001). Under those circumstances, individuals are assumed to make their choices by processing back and using the information from relevant, previous feedback (Zhang et al., 2015). Some argue that, in ambiguous situations, people are inclined to evaluate the implicit/uncertain knowledge from their stand point (Schwartz, 1989). Contrary to DM under risk, DM under ambiguous situations is linked to executive processes only weakly (Brand et al., 2006). Rather using executive functions, in ambiguous conditions, people are affected by their personal judgments and previous experiences with the relevant outcomes (Baillon et al., 2016).

The fact that DM under risk and under ambiguity are two distinct factors, studies of Ellsberg (1961) constituted a parallel link between risky decisions and decisions under ambiguity (Lauriola et al., 2007). Ellsberg demonstrated that people show a preference for risk in the face of ambiguous conditions which is called “ambiguity aversion” (Borghans, Goldsteyn, Heckman & Meijers; 2009). For example, when people are presented with an urn containing 20 black and 20 red balls or another urn with black and red balls with

unknown proportion and offered 50 $ for choosing a black ball, most of the people chose the first urn with the known proportion. What is functioning here is the tendency to avoid the ambiguous urn, regardless of the fact that the second urn may contain more black balls indicating higher probability of winning (Trautman, Vieider, & Wakkar, 2008). The tendency of people towards risk in the face ambiguity is shown to be affected by various psychological factors such as anxiety, trust, and particular affective state such as sadness or personality traits (Baillon et al., 2016).

1.1.4 Neurobiological Components of Decision Making

Research reporting the role of executive functioning, information processing and working memory in DM processes provided an opportunity to investigate the neural mechanisms underlying DM. Neuropsychological studies with individuals having neurological or psychiatric disturbances showed that several brain regions and different neural circuitries are activated while making a decision (Bechara et al., 1994; Brand et al., 2007). Bechara et al. (1994) observed that individuals who were severely injured in vmPFC regions tended to show impairments in real-life decisions. Similarly, evidence from studies conducted with individuals with lesions or dysfunctions in ventromedial prefrontal cortex (vmPFC) and dorsolateral prefrontal cortex (dlPFC) revealed that those patients made impaired decisions in risky circumstances (Manes et al., 2002). Research conducted with healthy participants also revealed that, similar to the findings obtained from neurological patients, the vmPFC, the dlPFC, the anterior cingulate cortex (ACC), the orbitofrontal cortex (OFC) and the parietal cortex (PC) become activated in DM under risky circumstances. Especially PC is reported to become activated while evaluating and integrating the extent of gains or losses (Labudda et al., 2008).

Studies conducted with animals also revealed that the prefrontal cortex (PFC) and the amygdala connections seem to regulate the both decisions involving delayed discounting (smaller immediate rewards vs. larger rewards in the future) and effort-based decision making (immediate and easily obtained rewards vs larger rewards after making an effort) (Aupperle & Paulus, 2010). Similar to these findings, studies conducted with patients with amygdala dysfunctions exhibited impairments in DM under risky conditions and increased

activation of amygdala when faced with risky decisions (Auperle & Paulus, 2010). In addition to these areas, the insula region and ventral striatum (making alterations in the approach-avoidance behavior in risky DM tasks) are also found to be activated in DM (Auperle & Paulus, 2010; Hartley & Phelps, 2012).

However, when the conditions contain some degree of ambiguity, in addition to the brain regions involved in analytical DM (vmPFC, the dlPFC and the OFC), an emotional-intuitive system also becomes activated (Starcke & Brand, 2012). Findings showed that this emotional-intuitive system is activated by the limbic and basal ganglia regions. According to the degree of uncertainty, the vmPFC is also activated to integrate the material coming from both prefrontal regions and the limbic system (Starcke & Brand, 2012). In other words, the limbic and the basal ganglia regions involve in emotional processing, whereas the vmPFC is activated as a secondary process to integrate, edit and inhibit emotional information.

These findings points out that a complex neural network is activated during DM process. The degree of uncertainty requires the activation of different regions in the brain. It seems clear that DM under risky conditions causes individuals to use more rational-analytical system which has a distinct neural pathway, whereas DM under ambiguous conditions provokes the activation of emotional-intuitive system which also has distinct pathways. Despite DM under risk and ambiguity engage in different pathways, each of those neural pathways seem to have a specific function in the process, they have been found to be highly interconnected (Starcke and Brand, 2012; Baillon et al., 2016) and share overlapping neural connections (Hartley & Phelps, 2012).

Although the neural mechanisms underlying DM is not included in the main framework of the present study; DM and some emotional processes share a neural network, which suggests a connection between anxiety and DM, as it will be discussed in the next sections.

1.2. The Link Between Emotions and Decision Making

Before reviewing the literature about the effects of emotions/affective states on DM, brief information about the relationship between emotions and higher cognitive processes will be presented. After the summary, effects of emotions/affective states on DM will be discussed with the recent findings and relevant theories.

1.2.1 The Effects of Emotions on Cognitive Processes

Emotions are one of the most essential constructs in the quality of daily human experience since various emotions are shown to affect individual's cognitive functioning (Lazarus, 1991). Recent findings demonstrated that emotions play an essential role in higher cognitive processes (Dolan, 2002). Findings revealed that emotions affect higher cognitive processes and information processing through changing perception and enhancing attention which results in increasing detection of emotional events (Dolan, 2002). The study carried out by Lees, Mogg and Bradley (2005) showed that subjects demonstrated an attention bias towards emotional stimuli. Memory is also another function on which emotions have an impact. Several studies revealed that individuals showed better performance when remembering emotional stimuli than they did with neutral stimuli (Cahill and McGaugh, 1998). Lerner and Keltner (2001) argued that emotions affect individuals' cognitive processes in two ways. Firstly, emotions are activated to adjust individuals to the conditions which cause emotions to occur. Secondly, emotions influence cognitions, neurophysiology and behaviors which causes the effects of emotions expand beyond the original cause of the emotions. So, they argued that by affecting the subsequent cognition and action, emotions could continue to affect information processing even when the situation vanishes. So, the findings showing that emotions affect information processing by different mechanisms triggered the research to understand the relationship between distinct emotions and DM.

1.2.2 The Influence of Emotions on Decision Making

How rational thinking and DM processes are affected by emotions is still intriguing. Up to last three decades, it was assumed that most of decisions were taken as a result of rational calculations or brain storms (Bechara & Damasio, 2005). However numerous studies conducted recently revealed that DM is affected by various emotions (Starcke & Brand, 2012; Maner et al., 2007; Baillon et al., 2016). As Loewenstein and Lerner (2003) stated affect, either innate or induced, is shown to affect the quality of decisions. It is also stated that affect which was irrelevant to the existing decision could impair the decisions and the judgmental process, too. Additionally, Maner et al. (2007) argued that emotions support information processing while making a decision by supplying information about the possible positive or negative consequences and eliciting cognitive responses to enhance the possibility to maximize the gain and minimize the loss.

There are two different roles emotions play on DM and they should be distinguished as "expected" and "immediate". By "expected emotions" Loewenstein and Lerner (2003) referred not the experienced emotions at the time of DM, rather the expectation about the emotion that will be experienced after a particular decision. For instance, you have an appointment in an hour and you try to decide how to go to your appointment, either by taking a cab or go by bus. You are pondering whether it will take too long to go by bus; in turn you will be late and regret that decision. So, your motive not to feel regret due to your decision, leads you to choose to take a cab. Although "regret" is not the experienced emotion at the time of the decision, the expectancy to experience it in the future may shape your decision. In this case, "regret" may be noted as "expected emotion". The second mechanism by which emotions affect DM is "immediate" emotions. Loewenstein and Lerner (2003) stated that immediate emotions refer to the affective states which are experienced simultaneously with the DM process. These emotions may exert "direct" or "indirect" influences on DM process. Let's take the example stated above again. At the very moment of deciding whether take a cab or go by bus, you may feel anxious because of the possible crowd in the bus, so anxiety may deter you from going by bus (this is an example of "direct" effect of emotions), or your preexisting good mood may provide you a

more optimistic perspective, you may think yourself as capable of handling the regret –if anything goes wrong- and go by bus (“indirect effects”).

Early research on the relation between emotions and DM processes mostly approached the issue by investigating the effects of broad affective states such as positive vs. negative mood (Broman-Fulks, Urbaniak, Bondy, & Toomey; 2014). However, data showed a positive relationship between negative affect and risky DM whereas some studies associated negative states with less risky decisions (Mano, 1992). Furthermore, it was reported that negatively valenced affective states cause processing of information more systematically whereas positive affect leads to less elaborative processing of information in DM (Lerner & Keltner, 2001; Ragunathan; 2000) Those differences and inconsistencies have accentuated that the relationship between emotions and DM should be examined more discretely because each emotion elicits different cognitive processes in DM under risk or ambiguity (Baillon et al. 2016).

Research conducted with negative emotions such as anxiety, fear or sadness also revealed different results due to the fact that these emotions impact the cognitive processing of relevant information in a distinct way and induce different arousal levels (e. g. fear and anger are highly arousing while sadness is low on arousal value) (Ragunathan, 2000). For instance, it is shown that anger may be correlated with more risk taking, on the contrary to findings showing that sadness is not (Leith & Baumeister, 1996). Similarly, Lerner and Keltner (2002) reported that anger may increase the likelihood to engage in risky decisions since it is related to more optimistic risk appraisals. Baillon et al. (2016) also found that under ambiguous conditions, participants in a sad mood showed ambiguity-neutral tendencies. Duque, Turla & Evangelista (2013) reported that subjects in happy mood were faster in a decision task, which shows a specific mood could have an effect on both decision making attitudes and time spent on DM. In conclusion, the effects of each emotion on DM seem to have a unique pattern. These findings indicate the importance of investigation of affective states, moods or emotions distinctively.

1.2.2.1 The Somatic Marker Hypothesis

The Somatic Marker Hypothesis (SMH; Damasio, 1996) claims that the knowledge about the possible consequences of a decision or the capacity of reasoning may not be enough to make efficient decisions and the role of emotions in DM processes has been undervalued. Another central assumption is that emotions are beneficial in DM until they are integral to the decision. However, emotions which are irrelevant to the decision can impair the efficiency of the decision.

Evidence for the SMH has come from studies with patients who had damage in vmPFC. These patients were shown to have impairments in judgment and real life DM. It was observed that these patients were having difficulties in their financial investments, friendships or planning the daily schedules, resulting in decisions against their interests (Bechara & Damasio, 2005). Although these patients were as good as healthy individuals in problem solving skills, intellectual level or executive functioning, there were abnormalities in processing emotions and feelings. They were also found be unable to learn from past experiences/mistakes since they continued to engage in same behaviors shown to produce negative consequences in previous experiences (Bechara & Damasio, 2005). These disturbances were attributed to the impairment of emotional processing which informs about the possible outcomes of an act and help to choose an advantageous option. In the absence of these signals, patients with vmPFC had to rely on cognitively consuming calculations of cost – benefit, which in turn, may affect their DM in a disadvantageous manner.

The SMH proposes that somatic markers (e. g. heart rate, tonicity or skin conductance) originating in the different parts of body assist our decisions under complex or uncertain conditions. A somatic state is originated in memory by the somatic signals. The brain region responsible for the regulation of the somatic states is vmPFC and amygdala, partially. When faced with a decision, these somatic signals (primary inducer, originated in the periphery) or the representations of these signals (secondary inducer, entities generated by an emotional event kept in memory) become activated and generate an option to respond. Once a situation emerges similar to a previous experience, various response

options stored in memory as a somatic state become activated and informs about the possible outcomes. The information generated by similar somatic states is related with the somatic signals originated by that particular situation and guide the decision by distracting from disadvantageous ones and inclining towards the advantageous one. So, somatic markers originating in the body assist decisions under conditions of uncertainty or complexity (Bechara & Damasio, 2005). When confronted with a decision, these integral emotional cues provide input about the possible gains and losses about options and recruit to make an advantageous decision (Preston et al., 2007).

The SMH claims that emotions have a significant function in DM process, either consciously or unconsciously. However, the theory also proposes that emotions may not always be beneficial to DM. Although it seems contradictory at first glance, it is assumed that emotions which are integrated to the decision are beneficial by activating the relevant somatic states to decide advantageously. However, mood states irrelevant to the decision at hand may intervene with the process of utilizing somatic signals and disrupt DM. For example, you are driving a car to go for an appointment and are a little bit late. Thinking about driving fast will arouse thoughts of being stopped by police or having an accident. These thoughts (response options) will activate somatic states (anxiety or fear) integral to the decision and help to decide in an advantageous manner. However, at that exact moment you may have a call and learn that one of your friends has an accident. This type of emotion aroused by irrelevant stimuli may disrupt benefitting from somatic states and lead to some disadvantageous decisions (Bechara & Damasio, 2005).

In conclusion, the SMH provides a comprehensive framework to understand how emotions can intervene and affect DM processes, especially under complex and uncertain conditions. In the next section, the specific role of anxiety on DM will be discussed.

1.3. The Specific Function of Anxiety on Decision Making

Anxiety has a functional role. It can be defined as an affect which is elicited due to the anticipation of a threatening situation or stimuli and accompanied by increased heartbeat, sweating or muscular tension (Lazarus, 1991; Giorgetta et al., 2012). In general, anxiety

informs the individuals about the existence of a potential danger and activates the metabolic system to reduce the weaknesses against the danger (Butler & Mathews, 1987). However, before discussing the relationship between anxiety and DM, it may be beneficial to make a distinction among state anxiety, trait anxiety and fear.

1.3.1 The Nature of Anxiety

Before detailing the differences between distinct types of anxiety, discrimination between fear and anxiety would be helpful. Although fear and anxiety have many similar physiological and cognitive features, a distinction should also be made. Research showed that fear is an emotional response to a specific stimulus, which is experienced temporarily and tend to decrease after the stimulus vanishes. However, anxiety could be viewed as a more persistent form of fear in the absence of a threatening condition.

In the conceptualization of anxiety, it is crucial to make a distinction between state and trait anxiety. Spielberger (1968) conceptualized anxiety in two distinct constructs as a stable personality trait and a transitory, affective state. Both state (SA) and trait anxiety (TA) has been accepted as unique constructs; although an extensive overlap has been reported by many research (Tovilovic, Novovic, Mihic & Jovanovic; 2009).

State anxiety can be defined as a transitory, unpleasant feelings accompanied by tension, worry and nervousness (McDowell, 2006). It could be also defined as how much threatening people see their environment temporarily. Otherwise, trait anxiety is conceptualized as a stable personality disposition which describes the individual potential to perceive the environment and conditions as threatening. The fact that trait anxiety is not observable, but reflects the potential to be experienced as state anxiety under stressful circumstances shows that state and trait anxiety is distinct but interrelated constructs (McDowell, 2006).

Data demonstrated that high TA makes individuals more prone to experience anxious states more frequently, intensely and persistently as compared to low TA. People low on TA experience transient states of anxiety when faced with a threatening stimulus as a

reaction to the environment. The role trait anxiety play is to mediate the link between actions and emotional states and moderate the levels of state anxiety (Tovilovic et al., 2009). To sum up, state anxiety is an emotional answer to a threatening stimulus which can be observed in all human beings more or less; on contrast, TA is a persistent tendency to respond with an anxious state towards a threatening stimulus. High degrees of trait anxiety are associated with experiencing higher levels of anxious states under stressful conditions. Also, state anxiety is expected to be lower when the individuals do not perceive themselves in danger even if they are high on trait anxiety (Horikawa et al., 2012). What is threatening and not is also found to depend on the vulnerability to anxiety (Mathews & MacLeod, 2002).

In this section of the present study, the distinction between different types of anxiety is covered briefly since effects of state and trait anxiety on DM vary across findings. These findings will be discussed below. But before this, neurobiological correlates of anxiety will be summarized.

1.3.2 The Neurobiological Basis of Anxiety

Studies investigating the neural mechanisms underlying fear revealed complex neural network activation during the experience of anxiety in the face of a threat and the inhibition process (Hartley & Phelps, 2012). Although fear and anxiety are distinct constructs, as pointed above, the dysfunction of the neurocircuitry involved in fear is assumed to sustain anxiety and related disorders. The amygdala is reported to be activated during the acquisition and expression of fear (Hartley & Phelps, 2010). The vmPFC is also shown to play a role for the extinction or inhibition processes in the conditioned fear. In order to regulate negative affect cognitively, the activation of amygdala decreases whereas the activation of the dlPFC increases in order to regulate retrieval (Hartley & Phelps, 2012). Besides the amygdala, vmPFC and dlPFC, hippocampus is shown to be activated during the acquisition, storage and retrieval of conditioned fear acquisition and extinction.

Studies conducted with individuals high on trait anxiety showed that the brain regions involved in fear conditioning have a significant contribution to the occurrence and

prolongation of anxiety disorders since varied activation was observed in the prefrontal-amygdala circuitry (Lissek et al., 2005). Trait anxiety is found to be related to the activation in amygdala, which functions in the regulation of fear expression. Also, alterations in the insula region seem to contribute to the continuation of anxiety symptoms. Furthermore, studies with clinically anxious individuals demonstrated atrophy in hippocampal region, indicating altered contextual modulation of fear, which means overgeneralization of fear to congruent stimuli (Lissek et al., 2010).

In conclusion, recent findings from neurological studies of anxiety revealed that the brain regions (e.g. striatum, amygdala, vmPFC, dlPFC and insula) shown to be involved in the anxiety also play a central role in DM processes. This fact may be thought as establishing a basis for understanding the relationship between anxiety and DM (Hartley & Phelps, 2012). From the neurological perspective, although it is still unclear how this overlapped network is functioning to regulate both DM and anxiety, this empirical basis emphasizes that the neural circuitry regulating anxiety also mediates the processes in DM. Nevertheless, one can assume that due to the fact that anxiety and DM have overlapping areas, anxiety can affect and moderate DM processes.

1.3.3. Effects of Anxiety on Cognitive Functioning

From an evolutionary perspective, anxiety is one of the most crucial emotions since it signals threatening stimulus. Early detection of potential threats in order to increase survival chance is beneficial in activating and enhancing responses to the particular threat. However, inappropriate activation of anxiety may have detrimental effects on psychological and interpersonal functioning (Mathews & MacLeod, 2005). Anxiety is seen as functioning in a continuum. At one extreme, in its exaggerated forms, it may pose vulnerability for psychiatric disorders such as generalized anxiety disorder whereas insensitivity to anxiety may result in the deterioration of the quality of life (Giorgetta et al., 2012). For example, a subclinical level of anxiety is shown to improve performance and be adaptive, while higher levels of anxiety may deter cognitive abilities (Buelow & Barnhart, 2017). However, understanding how and why anxiety -as a valuable mean for survival- has

detrimental effects specifically on DM functioning requires examining the cognitive mechanisms through which it causes deficits in DM processing.

1.3.3.1 Cognitive Theories of Anxiety

Anxiety is related to the cognitive and emotional dimensions of the threat perception. A substantial amount of research investigated whether individuals high on trait anxiety or with anxiety disorders process threat relevant information differently from non-threatening information (Mitte, 2007). Several studies using the Probe Task or the Stroop task showed that highly anxious individuals or people in anxious states have a tendency to show increased attention to threatening cues, which is referred as "attentional bias" (Mathews & Mackintosh, 1998). Correspondingly, highly anxious individuals were tended to evaluate ambiguous stimulus as more threatening, which is referred as "interpretative bias". For example, anxious individuals were found to interpret ambiguous stimuli as more negatively valenced when presented with homophonic words such as "dye/die" or "gilt/guilt" (Eysenck, MacLeod & Mathews, 1987). Besides attentional and interpretative biases, despite the existence of inconsistent data, findings demonstrated that anxious individuals showed better performance in memory tasks compared to non-anxious individuals, which is referred as memory bias (Coles & Heimberg, 2002). Mitte (2008) reported that anxiety seems to affect recollection function of memory, in which they remembered threat-relevant information more easily and readily. These biases in the information processing levels can be characterized as the prioritization of threat relevant information (Calvo & Castillo, 2001).

In conclusion, these findings show the essential role of anxiety in cognitive processing. So, the question of how these cognitive biases function and interact when people make decisions will be discussed in the following part.

1.3.4. Effects of Anxiety on Decision Making

Early studies by Johnson and Tverksy (1983) demonstrated that evaluations of individuals about the probabilities of events and estimates of risk can be changed by manipulating their

moods. In the study the risk estimation of the subjects, who were presented with a detailed account of the death of an individual (a newspaper account to arouse negative mood), increased across all causes of deaths –global effect- , not for the ones which were similar to the detailed death they had read only –local effect- (Johnson & Tverksy, 1893). This finding reflects an example of how judgments of probability can easily be affected by the manipulations on affect and how this effect is reflected in global ratings of risk (Butler & Mathews, 1987).

It is clear that individuals increased levels of anxiety tend to favor threat relevant information. In addition to attentional and interpretative biases, anxiety is found to interfere with the judgmental processes in DM, in which anxious individuals were shown to evaluate the risk of an event more probable, compared to non-anxious individuals and an increased subjective cost related to that event (Mitte, 2007). In a study conducted by Butler and Mathews (1983), anxious or depressed subjects with a control group were presented with various positive or negative scenarios about situations in daily life. For all cases, participants estimated the subjective probability and the subjective cost related to that scenario for themselves and for another unspecified person. Although no difference was detected between patient groups and control subjects, anxious and depressed individuals estimated the subjective risks for negative events higher compared to control group. In the face of subjective costs, the depressed and anxious group differed from each other in such a way that anxious people rated higher subjective costs only for themselves whereas depressed patients rated both for themselves and others. So, it has been shown that anxious individuals have a tendency to exaggerate the probability of subjective risks and subjective costs for themselves. As a cognitive mechanism to explain how anxious people evaluate the costs related to themselves and others differently, Butler and Mathews (1987) proposed that anxious people's memories are organized to keep threatening events and anxiety together, so that under conditions inducing anxiety, the memories relevant to threat easily come to mind.

A similar study conducted by Stöber (1997) also explored the role of anxiety (both state and trait forms) on the appraisal of risk from a cognitive perspective. There was appositive correlation between subjective evaluation of risk and trait anxiety by using a sentence

completion task containing possible positive/negative events. The findings were interpreted as individuals high on trait anxiety evaluated the risk and chance in a more pessimistic manner since they tended to approached bad luck as more probable to happen to them. The author also addressed that the tendency of individuals high on trait anxiety to disfavor good luck reflects their pessimistic bias in predicting future events.

However, some researchers suggested that estimating the probability of an event may not be a reference for DM since avoiding that situation is not same as deciding. To examine the effect of anxiety on daily life DM, Mitte (2007) conducted a study in which everyday DM scenarios were used (i.e. an infectious disease in the holiday country). Subjects were expected to choose one of the options, one of which was safe (i. e., cancelling the vacation") and the other was riskier (i. e., travelling to the destination). The safer options were put in such a way that required effort. According to the results, it has shown that subjects high on trait anxiety selected safer options more frequently, though the correlation was weak. In the 2nd study, Mitte (2007) reported significant correlations between the subjective costs participants perceived and trait anxiety in a non-clinical student population. Up to this point, although there are some inconsistencies (Mitte, 2007; the second study), the data predominantly shows that higher levels of trait anxiety may drive individuals to avoid risky options, to exaggerate the possible consequences and the subjective costs of negative events for themselves.

The study conducted by Maner and Schmidt (2006) investigated whether trait anxiety and risky decision making were related to each other by self report measures in such a way that increased degrees of trait anxiety may correlate with the tendency to evaluate risks more negative and decreased motivation to involve in risky DM. They concluded that increased levels of trait anxiety may have an interaction with extended risk avoidant DM. In other words, people with increased degrees of trait anxiety were less willing to risky DM across various contexts as a global effect of anxiety. The researchers also ruled out the role of depression, which was reported to be a concomitant of trait anxiety by some previous studies (Butler & Mathews, 1987), from the correlation between anxiety and DM under risky conditions. They concluded that increased levels of anxiety in trait form may serve as a bias in DM processes, even managing the effects of depression.

Data up to now have demonstrated that trait anxiety may impair DM through cognitive biases namely, attentional and interpretative mechanisms. However, because anxiety may be exhibited in various forms such as trait, state or in clinical levels, it was needed to conduct research in people with pathological levels of anxiety, too. Giorgetta et al. (2012) explored the pathological anxiety's influence on DM under risky conditions by using a behavioral DM task in subjects having either Generalized Anxiety Disorder (GAD) or Panic Attack Disorder (PAD). It was hypothesized that participants with GAD or PAD would tend to behave in a more risk aversive manner and less risk taking in the behavioral DM task, due to their excessive worry about the possible outcomes compared to control participants. The results revealed that participants diagnosed with an anxiety disorder showed a significant risk aversive pattern, which was affected only by the anxiety status of participants independent of the expected value of choices. This finding was interpreted as clear evidence of how anxiety shaped individual's choices. The authors argued that, specifically in their study, the mechanism underlying this relationship between anxiety and risky DM could be that anxiety signaled a threat's existence and affected cognitions, which in turn, attentional and interpretative biases intervened and drove the individual to catch more threat-relevant information and maintained anxiety as a vicious cycle. However, although the comparison of people's attitudes under risk with extreme anxiety is important, the generalizability of the findings to the populations with more normal anxiety levels is still questionable.

Maner et al. (2007), performed successive studies to overcome the limitations of previous studies by using samples including individuals with different forms of anxiety and depression and a standardized behavioral task – Balloon Analogue Risk Task [BART; Lejuez et al. (2002)]. In the first study, subjects were rated on a scale to assess social anxiety and completed the BART. The BART is a task in which individuals are expected to accumulate points by pumping a balloon by using the mouse. Each balloon has a threshold before explosion but participants are blind to that information. After an explosion, the points gained by pumping that balloon are deleted. So, in order to maximize points, one should be evaluate to pump or not, for not losing all gains. The BART has been demonstrated to have good discriminative (from impulsivity and anxiety sensitivity) and convergent (e.g. gambling) properties (Lejuez et al., 2002). By using the BART, it is aimed

to reach to the conclusions more generalizable to real life DM. The results revealed that scores from the scale measuring social anxiety and the BART were correlated. In the second study, researchers included measures of trait anxiety, worry (a cognitive distracter by its ruminative components; Buelow &Barnhart, 2017), negative affect and the BART. According to the results, anxiety -trait form- and worry were significantly associated with the performance as assessed by the BART. Also the effects of trait anxiety and worry were significant when the effect of negative affect was controlled. So the researchers implied that risk avoidant DM strategy may only be due to trait anxiety and worry. In the third study, they included a sample of individuals with anxiety disorders (previous studies' samples were limited in terms of clinical anxiety range), mood disorders (a comparison group as having higher levels of negative affect), non-affective psychopathology (i.e. ADHD) and a healthy controls. As an index of risk taking, a self report scale was used. Analyses demonstrated that individuals with anxiety disorders were more risk aversive than the other three groups. The importance of these three experiments would be that it demonstrated the link between various forms of anxiety and avoidant strategy when faced with risky DM contexts. The diversity of the samples in three studies increases the generalizability of the findings that trait anxiety independent of any other psychopathology and negative affect is linked to risky DM, in which may drive individuals to detect threats and use an avoidant strategy. However, as a limitation of these studies, it is still unclear whether the effect of anxiety on DM is attributable to trait anxiety. Due to the design of the experiments, it is still questionable whether state or trait anxiety is the one affecting DM processes. Also, the experiments mentioned up to here were mainly investigated the effects of trait anxiety on DM under risky conditions. However, ambiguous conditions were also found to exert stress in DM processes (Smith et al., 2016).

Another study conducted by Smith, Ebert and Broman-Fulks (2016) tried to explore the impact of anxiety on risky DM under either high or low ambiguous conditions. In their study, they used two different versions of the BART, one is low on ambiguity, the other is high. The study was conducted to understand the impact of trait anxiety, depression and optimism under low –in which the participants could follow their chance of pumping the balloon - and high ambiguity –the usual version of the BART- conditions since previous research mostly focused on DM under risky conditions. By adjusting the level of ambiguity

in the same measure would disclose how DM behavior changes accordingly. The main finding was that under highly ambiguous conditions, the higher the anxiety, the less risk taking strategy was used. However, under low ambiguous conditions, individuals with both high and low levels of anxiety were similar to each other statistically. In other words, under the conditions in which the information relevant to the probabilities of negative or positive outcomes –high ambiguity– is absent, people high on anxiety evaluate these conditions as threatening and are less willing to take risks. The demonstration of the role of ambiguity in risky DM highlights the importance of ambiguity since many decisions in real life are taken under conditions with various degrees of ambiguity.

In a recent study, the effects of TA were investigated by using two different behavioral measures of DM, namely the Iowa Gambling Task (IGT) as an instrument for DM under ambiguity and the Game of Dice Task (GDT) as an index of DM under risk (Zhang et al., 2015). IGT (Bechara et al, 1994) can be said as a behavioral DM task originated to imitate decisions in daily life by involving gains, losses and ambiguity whereas GDT (Brand et al., 2006) involves obvious rules for rewards and punishments, assessing DM under risky conditions. In GDT, the explicit knowledge of the potential rewards and punishments are provided to the participants, in which they can calculate the possibilities of winning or losing. In the experiment, the sample was divided into 3 with refereance to scores from TA scale (low, medium and high). All of the participants attended to IGT, GDT and some executive functioning tasks. The results demonstrated that individuals high and low on TA scored significantly lower than individuals in medium trait anxiety group on IGT. However, this difference did not exist in GDT performance indicating that trait anxiety impacts DM under ambiguous, but not risky conditions. This finding, somewhat, is inconsistent with the previous research that increased degrees of trait anxiety was related to DM under risky conditions by using another behavioral DM task –the BART- (Maner et al., 2007). But also parallel to the study of Smith et al. (2016) which demosntrated DM under ambiguous conditions is associated with high trait anxiety.

Sstudy conducted by Starcke et al. (2008) explored the state effects of anxiety on DM by GDT as the index of DM under risky conditions. To manipulate state anxiety, subjects were instructed to give public speech about their cognitive abilities in front of a jury as an

irrelevant source of stress to the behavioral measure (GDT). Analyses showed that participants who were in anxious state because of the anticipation of public speech scored significantly lower in GDT, a task known as having explicit rules about gains and losses, indicating that state anxiety may impair DM even under explicit conditions about possible consequences. One possible explanation for this effect was proposed by the authors is that the task unrelated emotions –anxiety induced by experimental manipulation- may have detrimental effects on DM by influencing orbitofrontal cortex and limbic system and intervene with information processing and attentional processes. The findings from this study is also important in the way that besides trait anxiety, state anxiety is also another important form of anxiety since it impairs DM in a disadvantageous way.

Furthermore, a recent study (Matthews, Panganiban &Hudlicka; 2011) aimed to find out whether trait and state anxiety –manipulated by experimenters- would affect participants DM in a tactical DM task involving a search & rescue scenario. In the task, participants had to choose the quickest route to rescue the lost people of explorers in Antarctic. Each route in the task had potential costs or benefits in terms of time. However, results revealed some subtle effects for both types of anxiety, as no global effect of trait or state anxiety was evident in participants' decisions related to rescue actions. Only trait anxiety was found to be weakly related to threat with greater attention. But this effect was not enhanced with state anxiety, since state anxiety was expected to enhance the effects of trait anxiety. However, it should be noted that the task used in this study was unrelated to the wellbeing of the participants; it may explain the subtle correlations between anxiety and DM since previous studies showed anxiety may drive people to decide and evaluate differently for themselves and for others.

To sum up, the summarized data up to this point showed some evidence that trait anxiety and under some conditions clinical levels of anxiety have an effect on DM. In line with the assumptions of cognitive theories of anxiety, individuals higher on anxiety are inclined show attentional or interpretative biases when making decisions. They have a tendency to exaggerate the possibility of negative events higher for themselves, to detect threat relevant information faster, to interpret ambiguous stimulus as more threatening and to avoid risk if possible and choose safer options. Also anxious individuals are shown to be more

pessimistic about future events which results in choosing safer and less riskier options to alleviate their anxiety. As remarked by Maner et al. (2007), as the anxious individuals keep on detecting threats, avoiding risks or choosing safer options, this behavioral avoidance may result in more anxiety, consequently ending up in a self-perpetuating cycle. By ruminating on detecting threat relevant information, they may fail to notice the overall context of decision (Buelow & Barnhart, 2017).

However, there are also some inconsistent data regarding the relationship between anxiety and DM. First of all, still more research is needed with samples with different levels of anxiety since data showed that trait anxiety and pathological levels of anxiety have different effects on DM (Giorgetta et al., 2012; Maner et al., 2007; Matthews et al., 2011). The findings also seem to be varied across studies according to the type of DM task used in the study. For instance, data from studies used GDT (a behavioral index of risky DM) and BART revealed contradictory results, in which trait anxiety level was not related to GDT performance or in a tactical DM task, in contrast to BART (Zhang et al., 2015; Matthews et al., 2011; Smith et al., 2016). The level of ambiguity in the tasks used also seems to have an impact on DM (Smith et al., 2016). Finally, state effects of trait anxiety may produce differing results, since in some studies (Matthews et al.,2011) state anxiety was shown to be ineffective on DM, however in some studies (Starcke et al., 2008) state anxiety – irrelevant to the task- impaired DM. To sum up, it may be concluded that evidence about the role of anxiety in DM is mixed, which indicates future research is needed with different samples and differentiating distinct forms of anxiety (Maner et al., 2007).

1.3.5. Iowa Gambling Task

Iowa Gambling Task (IGT) was originated by Bechara et al. (1994) to evaluate DM difficulties in people with damage to vmPFC with no disturbances in executive functioning. However it is a well validated and widely used instrument of DM to imitate real life DM by involving various gains and losses both in the short and long term under uncertain conditions (Buelow & Suhr, 2012; Werner, Duschek & Shandry; 2009). In IGT, participants are expected to increase the amount of money they are given by selecting cards from four decks, any of which have differing amounts of punishments and rewards. When

they start the task, it is unknown to the participants which deck is advantageous or disadvantageous. So, under ambiguous conditions participants are expected to develop a strategy in selection in such a way that they learn to pick from advantageous decks and avoid disadvantageous decks by trial and error.

In IGT, participants are presented with 4 decks (A, B, C, D). In the beginning; all participants are given a certain amount of fictitious money as a loan. When participants select a card; they earn a certain amount of reward and may lose, too. Deck A & B bring larger amounts of rewards whereas decks C & D produce smaller rewards. Also decks A and B result in a loss of money, on the contrary decks C and D result in a net gain. So, decks A & B are unfavorable in terms of yielding high rewards but also high monetary punishments in the short term and leading a poorer performance in the end. On the other hand, decks C & D are the favourable decks since they bring smaller rewards in the short run but yields smaller losses in the long run. Although deck A and B are different from each other since selections from deck A is punished 50% of time, whereas deck B is punished 10 % of time. Also, the losses of deck B is larger than deck A. Similar differences also exist in deck C & D, respectively. To sum up, selecting excessively from decks C & D will result in increase in the amount of money, on the contrary selecting excessively from decks A & B will yield monetary loss (İçellioğlu & Özden, 2012). Thus, choosing from decks A & B (highly risky decks) is related with lower performance at the end of the task. However selecting from decks C and D is advantageous and involves lower risk, resulting in better performance.

As stated above, IGT is used to assess DM deficits in individuals who had injuries to vmPFC region. These patients are known to have difficulty in generating somatic markers. Studies conducted with IGT provides empirical evidence that people who had difficulty in developing somatic markers had lower scores in IGT, indicating that they were not able to utilize from their emotional feedback –that is, somatic markers- to develop advantageous decisions (Bechara et al., 1994). In IGT, subjects do not have any knowledge about the deck (Starcke et al., 2008). Because the rules for rewards or punishments are implicit, participants have to rely on their emotional feedback from their previous decision and learn from trials – errors, as stated by SMH (Bechara & Damasio, 2005). It could be said that the

task is highly sensitive to the executing of somatic components –somatic markers- in DM process (Golub et al., 2016). Correspondingly, IGT can be thought as a task to evaluate individuals' ability to discern small long term benefits and over high short term benefits, and to avoid punishment over pursuing reward (Smoski et al., 2008).

Besides the distinct characteristics of each deck, IGT has many other properties as a task. Firstly, it is thought to be a task as simulating real life DM since it is not as simple as selecting one scenario over the other or a self report scale since many people may fail to report their behavior exactly (Lejuez et al., 2002). IGT is also reported to be engage in different aspects of DM. Although it is generally aimed to investigate DM under ambiguity, several research indicated that later trials of IGT, namely between trials 60 and 100- measures DM under risky conditions (Brand et al., 2006). So, it isclaimed that early trials (1 to 60, first three blocks) of IGT assesses DM under ambiguity since the rules about the decks are unclear, whereas in the blocks 4-5, the rules become explicit since the individuals develop a hunch about the decks (Golub et al., 2016).

Besides its importance in SMH, IGT is widely used with other populations than neurologically disturbed to assess DM. Over the past decade, a substantial amount of research was conducted with clinical or nonclinical populations (Dunn et al., 2006). The studies with clinical groups include individuals with damage in bilateral amygdala (Bechara et al., 2003) and epilepsy in temporal lobe (Labudda et al., 2008) in which participants showed impaired performance on IGT. Also studies with pathological gamblers (Cavedini et al., 2002), addicted individuals (Loeber et al., 2009), suicide attempters with unipolar or bipolar depression (Devantoy et al., 2016), schizophrenics (Fond et al., 2012), alcoholics (Le Berre et al., 2014) and people diagnosed with OCD (Kim et al., 2015) showed that these specific clinical groups had lower scores on IGT, indicating an impairment in DM processes. Although IGT has been shown to be sensitive in studies conducted within clinical populations to DM impairments, a large individual variability has been found in studies conducted in healthy populations (Werner et al., 2009). Also some psychological variables were studied such as personality dimensions (İçellioğlu, 2012); impulsivity (Franken & Muris, 2005), behavioral inhibition and

activation (Van Honk et al., 2002). These studies conducted to reveal personality dimensions showed an effect of these constructs on IGT performance.

1.3.5.1 Evidence from Literature which Using Iowa Gambling Task to Uncover the Link between Anxiety and Decision Making

So far, IGT has been shown to be a valid and widely used behavioral task of DM which can be used with both clinical and nonclinical samples. Up to now, although there are not many studies examining the link between anxiety and DM by using IGT, the results of these researches are contradictory.

Miu, Heilman and Houser (2008) investigated the influence of trait anxiety on DM by IGT for the first time. Individuals who were either 1 SD (standard deviation) above or below on a trait scale included (high vs. low trait anxiety groups). As a behavioral measure, IGT was used. The findings pointed that high TA group had impaired performance in IGT than low trait anxiety group. Though the sample was very limited (10 in experimental group, 10 in control), these findings seem to contradict SMH since the high trait anxiety group was not able to use the advantage of their somatic markers. The findings were also contradictory with some of the previous findings in which high trait anxiety was correlated with risk aversion (Maner et al., 2007; Giorgetta et al., 2012), since risk aversion would result in selecting from advantageous decks in IGT. To bring together the findings in line with the literature, the authors suggested that some healthy individuals might fail to benefit from the adaptive feature of their somatic signals because of the interference with cognitive processes. They also stated that individuals high on trait anxiety may focus on more on immediate rewards rather than cues in the task indicating more globally advantageous selections which may be an attentional bias. However, the small sample size and the extreme trait anxiety scores of the sample decrease the generalizability of the findings, indicating future research may be needed.

Another study by de Visser et al. (2010) explored the connection of trait anxiety to IGT as an index of DM and gender as a discriminative factor. The study revealed that the gender specific role of anxiety on DM. Going in detail, men with higher and lower levels of trait

anxiety showed impairments in IGT performance, whereas only women high on trait anxiety performed poorly. The results showed the significance of gender specific effects of anxiety on behavioral decision tasks. This data expanded the findings showing that trait anxiety, when overridden by higher cognitive processes in a complex DM task, may not be adaptive in terms of utilizing from somatic markers.

While evidence from Miu et al. (2008) and de Visser et al. (2010) showed that TA impaired performance in IGT, the study carried out by Mueller et al (2010) showed that anxiety may enhance performance in IGT. The study was conducted with participants diagnosed with Generalized Anxiety Disorder (GAD) and healthy controls. Because GAD is characterized by worry about future, it was suggested that participants with GAD would be able to sensitive to future punishments in IGT, resulting in enhanced performance. As hypothesized, findings demonstrated that participants with GAD avoided risky decks more to prevent long term losses.

Correspondingly, a study by Werner et al. (2009) compared the data from healthy individuals on trait anxiety, emotional expression and IGT. The researchers suggested that individuals with increased capacity to experience emotions would be advantageously benefit from their somatic markers and perform better than those who have lower affect, so not be biased by somatic markers. Findings revealed trait anxiety enhanced DM in IGT. The higher the trait anxiety scores, the better performance was obtained in IGT. So it may be concluded that trait anxiety in a group of healthy individuals enhanced performance, as a contradictory finding.

Research by Drost et al. (2014) investigated individuals diagnosed with GAD on IGT. They hypothesized that worry would cause quicker learning and promote advantageous selections in IGT. However the results were contradictory with the Mueller et al.'s study (2010). Individuals with GAD and healthy participants were not different from each other in the learning phase of IGT.

Up to now, the studies summarized mostly investigated the effects of trait or clinical anxiety. However, what is lacking in those studies is state anxiety. Although state anxiety

is very closely related to trait anxiety, it is not clear whether these findings are due to the state or trait features of anxiety (Miu et al., 2008) Preston et al (2007) designed a study to test whether state anxiety induced by a task irrelevant source will improve or impair DM, as measured by IGT. The sample consisted of healthy individuals splitted in groups in which the experimental group was informed to make oral presentation in front of a jury about their physical appearance after performing in a behavioral laboratory task (IGT). The stressor was successful in inducing state anxiety. It was hypothesized that task irrelevant anxiety would prevent individuals to profit from their somatic markers. The results demonstrated that individuals in the experimental group showed impaired performance on IGT, since the source of stress was irrelevant to the task and this stress prevented the activation of somatic markers. The authors suggested that because the experimental group was distracted by the anxious mood induced by the expectation of public speech, they were not able to pay attention to the contingencies of the task, indicating excessive working memory load.

1.4 Self - Esteem and Decision Making

Besides the importance of emotions in DM, several researches also conducted to understand how various personality traits change DM. For instance, Lauriola and Levin (2001) showed that Neuroticism and Openness to Experience were associated with less risky DM. Similarly, impulsivity is one of the personality dimensions shown to affect DM (Appelt et al., 2011). Further optimism, as a closely related construct to SE, is shown to impose an effect on choices under ambiguous conditions, in such a way that highly optimistic individuals were less ambiguity averse (Pulford, 2009).Although self-esteem (SE) is a very broad term, in general, it reflects the degree of self-worth and acceptance (Wray et al., 2005). Since research on SE is diverse, this study will focus on the connection between SE and DM and the degree of how SE affects DM processes. DM is assumed to be a rational, emotional and also a cognitive process at the same time. So, it may be a natural consequence that we reflect our inner parts “self” to our way of thinking, emotions and also cognitions. Whether an individual sees herself/himself from a positive or negative perspective affects how s/he behaves, thinks or feels, and in turn how to decide.

It is widely accepted fact that SE is associated with several cognitive and emotional processes (Yang et al., 2010). Findings demonstrated that people with high SE generally show higher levels of optimism, have more successful coping mechanisms and tend to experience more positive emotions and even have improved health (Baumeister, Campbell, Krueger & Vohs, 2003). On the contrary, lower SE is shown to be associated with more depressive mood and to negative feelings. It is also shown that attributional style of high SE individuals is more general and related to inner self about the positive situaitons, however low SE individuals show the same tendency towards both positive and negative events. Also they are shown to view the negative events in daily life as more personally important (Campbell, Chew & Scratchley 1991).

Contrary to other personality variables such as sensation seeking, impulsivity, personality dimensions or optimism-pessimism (Lauriola & Levin, 2001), a very few research investigated the association between SE and DM (McElroy et al., 2007). The fact that individuals are motivated to protect their SE (Josephs et al., 1992), some authors argued that individuals low on SE may be more likely to protect themselves by avoiding risks which will enable them to minimize the risks that bad things happen. On the contrary, high SE individuals are hypothesized to behave in self-promoting manners by taking more risks. It has been proposed that under risky DM contexts, because people with high SE have more positive views of themselves, they may behave in a more risk seeking manner by relying on their positive views of self, whereas low SE individuals may avoid risks in order to protect their limited self resources in the face of a threat (Yang et al., 2010).

The study of Josephs et al. (1992) investigated the effects of SE on how people decide in a monetary gamble and the motivational factors behind these decisions. In a series of experiments, they have reported that in risky DM processes, individuals lower on SE chose the way which minimized the risk of the threat, whereas individuals high on SE were risk seeking. In positively framed risk scenarios, high SE subjects took more risk than low SE subjects. However, when the "threat" was removed by experimenters, low SE subjects were seeking risk as much as high SE subjects. So, it may be inferred that the potential threat to self may motivate people to behave differently in the face of decision, in which low SE people may choose safer options to protect their SE.

The role of SE on the decision was studied by McElroy et al. (2007) to see how SE drives individuals when faced with ambiguously, positively or negatively framed decision tasks. In a series of experiments, it has been concluded that in risky-choice framing tasks low SE participants were found especially sensitive to negative frames. They argued that although DM ability of individuals was not measured in the study, level of SE may affect how they perceive situations and shape their decisions through how they frame the situation. How SE affects people's decision for themselves and for others was also investigated (Wray & Stone, 2005). It was found that SE and anxiety levels were associated with risky DM related to the self, but not for decisions related to others.

To sum up, few studies so far investigated the relationship between DM and SE. Although being related constructs, more investigation is needed to understand their relationship. The tasks used in the previous studies were mainly simple risky decision making tasks. However, no study was found which explored the link between SE & DM in a complex behavioral DM task like IGT.

1.5 The Present Study

This study mainly intends to understand the link between DM and anxiety in an experimental design by manipulating state anxiety. The question is whether incidental anxiety is beneficial or destructive to DM. The impact of different forms of anxiety will be examined since the data is contradictory. The question is whether anxiety induced – irrelevant to the task- will affect DM in a group of healthy university students. In the light of SMH and previous literature (Preston et al, 2007; Starcke et al. 2008), the manipulated state anxiety irrelevant to the task is expected to impair the performance on IGT in the experimental group. Also it is expected that task-irrelevant state anxiety will retard the learning phase (the first 3 blocks of IGT) of experimental group, in which experimental group will learn slowly (Preston et al., 2007; Smoski et al., 2008). In terms of trait anxiety, it is expected that those high on TA will show lower performance in IGT, due to excessive working memory load. Also it is expected that anxious mood induced group will pick more from unfavorable decks and fewer from favorable decks (Zhang et al., 2015; Buelow & Suhr; 2013).

Besides, the role of SE in DM will be investigated, since no study up to now included SE as a factor contributing to IGT performance.

The experimental manipulation is chosen to be irrelevant to the task since in daily life, we have to make many decisions while we are stressful because of many other things. For instance, one may decide to have a surgery or not while worrying about the presentation to boss the other day.

As a measure of DM, a behavioral task will be used since it provides some advantages over self reports. As Lejuez et al. (2002) stated, self reports may not reflect the multidimensional nature of DM and some respondents may not have the insight. Among other behavioral tasks, IGT is more beneficial since it enables to examine both DM under risk and ambiguity (Brand et al, 2006).

In Turkey, there is not much study investigating the role of anxiety on DM (Taşkın, 2015). Also, even though IGT is a widely used measure, in Turkey there is not much studies it is used (İçellioğlu, 2015; İçellioğlu & Özden, 2012). So, this study will be a contribution to the literature of DM, too.

The hypotheses of the present study are as following:

Hypothesis 1: The experimental group will have significantly lower scores than control group in IGT total score.

Hypothesis 1(a): There will be significant differences between experimental and control group in the first three blocks of IGT, especially.

Hypothesis 1(b): The experimental group will show a lower rate of improvement in the first 3 blocks; assessed as the difference between 2^{nd} block – 1^{st} block and 3^{rd} block – 2^{nd} blocks.

Hypothesis 1(c): The experimental group will choose more cards from unfavorable decks (decks A or B).

Hypothesis 1(d): The experimental group will choose fewer cards from favorable decks (decks C or D).

Hypothesis 2: There will be a significant difference between high trait anxiety group and low trait anxiety in IGT total score.

Hypothesis 2 (a): The effects of trait anxiety will remain significant after controlling for the influence of depression.

Hypothesis 2 (b): The high trait anxiety group will choose significantly more cards from disadvantageous decks (decks A or B).

Hypothesis 2 (c): The high trait anxiety group will choose fewer cards from advantageous decks (decks C or D).

Hypothesis 3: There will be a significant correlation between Self Esteem and DM.

Hypothesis 3 (a): There will be a significant negative correlation between Self Esteem and IGT total scores.

Hypothesis 3 (b): There will be significant positive correlations between Self Esteem and selections from Deck A & B.

Hypothesis 3 (c): There will be significant negative correlations between Self Esteem and selections from Deck C & D.

2. METHOD

2.1. Participants

Data were collected from 103 participants. Five participants were omitted out of the analysis due to missing data (3 participants) and reported neurological disorders (2 participants). The final sample involved 98 participants whose age range was between 20 and 38 (M = 22.85, SD = 2.35). The participants were assigned to groups randomly. The distribution of gender according to groups is presented in Table 2.1.

Table 2.1 Distribution of gender according to experimental manipulation

Gender	Experimental Group	Control Group	Total
Female	41 (41.83%)	40 (40.81%)	81 (82.7%)
Male	9 (9.18%)	8 (8.16%)	17 (17.3%)
Total	50 (51.02%)	48 (41.97%)	98

The vast majority of the sample was from Dogus University (3 participants from other universities). The participants from Dogus University took course credit in return of their participation. The socio-demographic information about other variables (marital status, socioeconomic status, education level and monthly family income) is also presented in detail in Table 2.2

Table 2.2 Distribution of the Socio-Demographic Characteristics within the Sample

		Frequency	Percentage
Marital Status	**single**	94	95.9
	married/cohabit	4	4.1
Socioeconomic Status	**upper class**	5	5.1
	upper-middle class	37	37.8
	middle class	48	49
	middle-low class	7	7.1
	low class	1	1
Education Level	**student in college**	95	96.9
	college graduate	3	3.1
Monthly Family Income	**0-2999 TL**	11	11.2
	3000-4999 TL	27	27.6
	5000-6999 TL	24	24.5
	7000-9999 TL	12	12.2
	10000-14999 TL	7	7.1
	15000-19999 TL	7	7.1
	> 20000 TL	9	9.2

2.2. Measures

In total, eight instruments were used in the study. Firstly, the subjects gave consent (Appendix A) to participate in the study. Then, they filled out Demographic Information Form (Appendix B). Besides demographic information and consent form, Rosenberg Self-Esteem Scale (Appendix C), Beck Depression Inventory (Appendix D), Positive and Negative Affect Schedule (Appendix E), State-Trait Anxiety Inventory-State Form (Appendix F), State-Trait Anxiety Inventory-Trait Form (Appendix G) and visual analog scales (Appendix H) were also filled out. Finally, participants were asked to take Iowa Gambling Task.

2.2.1 Demographic Information Form

In this form, participants gave information about their gender, age, civil status, educational level, socioeconomic level, monthly family income and information about current health conditions such as use of medication, or receiving any kind of psychiatric treatment, etc.

2.2.2. Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965 cited in Martin-Albo et al., 2007; Akdemir et al., 2013) is an instrument to evaluate self-worth and self- acceptance of individuals. The original form developed by Rosenberg (1965) consisted of 11 subscales with a total number of 63 items. As widely used in the literature (Al Nima, Rosenberg, Archer, & Garcia, 2013; Noyan, Onen Sertoz, Elbi, Kayar, & Yılmaz, 2006) in the present study, self-esteem subscale was used which is consisted of 10 items of which five items (# 1, 3, 4, 7 and 10) were worded positively and 5 (# 2, 5, 6, 8 and 9) negatively (Corwyn, 2000). Rating is on a 4 point Likert-type scales (Martin-Albo, et al. 2007) from 1 –totally disagree- to 4 –totally agree-. Because SE is accepted to be a unidimensional construct, a total score of the scale is calculated, in which higher scores shows higher SE (Corwyn, 2000).

The reliability of RSES was reported to be ranging from .72 to .90 by many studies conducted in various samples across different cultures (Gray-Little, Williams, & Hancock, 1997). In their study, Martin-Albo et al. (2007) reported Cronbach's alphas .85 and .88 in the first and second sessions respectively, showing RSES has high internal consistency. Martin-Albo et al. (2007) also stated test-retest reliability as .85. Research studying the validity of RSES mainly focused on the relationship between self-esteem and personality traits such as neuroticism, extraversion, since SE, personality traits and self-concept dimensions are strongly correlated with each other (Robins et al., 2001). Findings from Robins et al. (2001) study revealed significant negative associations between SE and neuroticism, positive associations with Extraversion, Conscientiousness, and Agreeableness and Openness. In Sinclair et al.'s (2010) study, the negative association

between overall RSES scores and depression, anxiety and stress was reported to show RSES was a clinically valid measurement tool.

The Turkish adaptation of RSES was conducted by Çuhadaroğlu (1986; as cited by Akdemir et al., 2013 and Büyükgöze-Kavas, 2009). For test-retest reliability, the correlation of scores in a 4 week interval was found to be .75. (Çuhadaroğlu, 1986; as cited by Akdemir et al., 2013 and Büyükgöze-Kavas, 2009). The correlation of RSES scores and psychiatric interviews was also reported as. 71 in the original study by Çuhadaroğlu (1986; as cited by Akdemir et al., 2013 and Büyükgöze-Kavas, 2009). In this study, the Cronbach Alpha coefficient was .89.

2.2.3. Beck Depression Inventory

Beck Depression Inventory is a widely used instrument to assess depressive symptomatology (BDI: Beck, Rush, Shaw, & Emery, 1979; Eack, Singer, & Greeno; 2008). BDI is consisted of 21 items assessing the psychological (such as pessimism, guilt or sadness) and somatic (such as insomnia or loss of appetite) manifestations of depression (Van Hemert et al., 2002). Participants rate one of the four statements in each item varying from 0 to 3. Internal consistency is reports to be ranging from .79 to .90 in many studies (Beck & Steer, 1984; cited in Robinson & Kelley, 1996). Also, Robinson and Kelley (1996) reported coefficients as .69 for validity when BDI scores were compared to anxiety and .49 to locus of control.

Studies for the Turkish version of BDI originated in 1961 was conducted by Tegin (1980, as cited in Hisli, 1989). Later, Hisli (1989) conducted another study for the BDI version originating in 1979. In these studies split-half reliability coefficients were reported as .78 in college sample (Tegin, 1980; as cited in Hisli, 1989), and .74 in Hisli's study (1989). In validation analyses, correlations of participants' scores from depression subscale of MMPI and BDI were found to be .50 in a college sample and .61 in a clinical population (Hisli, 1989). In this study, the Cronbach Alpha coefficient was .89.

2.2.4. Positive and Negative Affect Schedule

The Positive and Negative Affect Schedule (PANAS) is an instrument to assess the positive and negative affect dimensions of mood (Watson, Clark & Tellegen; 1988). The scale is consisted of 10 items to assess positive affect (PA) and 10 for negative affect (NA), which are single-words representing emotions, feelings and sensations. Participants report their experience of specific affective states on a 5 point Likert scale (Lightsey, et al., 2009). The scoring of the scale is obtained by adding the scores for positive and negative dimensions separately (Lightsey, et al., 2009). The maximum score that can be obtained is 50, whereas minimum score is 10 for each dimension

Watson et al. (1988) stated the Cronbach Alpha's coefficient for internal consistency was .89 and .85 (when the time frame was given as "for the moment" as used in the present study) for both dimensions, respectively. Test-retest reliability was found as .54 and .45 (when time frame was given as "for the moment" as used in the present study) for both dimensions, respectively. For external validity, the correlation of scores from BDI – depression and depressive mood as a closely related construct to positive/negative affect- and PANAS were calculated. The correlation between BDI and PANAS scores was -.35 and .56 (when the time frame was given as "past few days") for PA and NA, respectively. Also, the correlation of scores from a state anxiety scale was reported as -.35 (PA) and .51 (NA).

Gençöz (2000) adapted PANAS into Turkish. According to Gençöz (2000), for internal consistency Cronbach Alpha's coefficient was .83 (PA) and .86 (NA). Test-retest reliability analyses revealed a correlation coefficient as .54 (PA) and .40 (NA) in a 3-week interval. For the external validity analyses, correlations of the scores from BDI and Beck Anxiety Inventory (BAI) and PANAS were calculated. The correlations coefficients were -.48 (PA) and .51 (NA) with BDI scores and -.22 (PA) and .47 (NA) with BAI scores. In this study, the Cronbach Alpha coefficientfor PANAS - PA was .85 and .87 for PANAS - NA.

2.2.5. State Trait Anxiety Inventory

State Trait Anxiety Inventory (STAI), a measurement tool to assess trait and state characteristics of anxiety, was originally developed by Spielberger et al. (1983). The scale involves of 40 items, of which the first 20 items assess how a person feels at a particular time –indicating State Anxiety (SA) - and the other 20 items to assess the individual differences in how anxiety becomes apparent over time as a stable personality construct – indicating Trait Anxiety (TA) - (Barnes, Harp & Jung, 2002). That is, the State form of STAI evaluates individuals' "current" feelings about the extent in which they perceive their environment as threatening whereas Trait form aims to assess how they feel "in general" and their potential to feel stressed under stressful conditions (Spielberg et al., 1983). In the SA form, the respondents rate their "current" feelings on a 4 point Likert type scale varying from 1=not at all to 4= very much so, whereas in TA form "general" feelings are rated as 1=almost never to 4=almost always. For each form, lowest and the highest score that could be obtained are 20 and 80. A total score is calculated by adding a constant (50 for SA form, 35 for TA form) to the difference of the total scores of negatively worded items from the total score of positively worded items (items #1, 2, 5, 8, 10, 11, 15, 16, 19 and 20 for SA form; items # 1, 6, 7, 10, 13, 16 and 19 for TA form). Higher scores indicate higher levels of anxiety (Barnes, Harp & Jung, 2002; Öner and Le Compte, 1983).

Gaudry, Vagg and Spielberger (1975) reported Cronbach Alpha's coefficient as varying from .83 to .94 for SA form and .86 to .92 for TA form in a sample of students as an index of internal consistency (as cited by, McDowell, 2006). They also determined the test-retest coefficients as .84 (male) and .76 (female) in TA form, whereas .33 (male) and .16 (female) in SA form. Being lower than TA form, the test-retest coefficient of SA form is evaluated as "expected" due to the conceptual formulation SA (Barnes, Harp & Jung, 2002). Kabacoff, et al . (1997) reported item total correlations as varying from .49 to .64 for the SA form and .38 to .69 for the TA form. In the original manual of STAI, Spielberger and colleagues (1970) reported correlations between the scores of TA form and the scores of Taylor's Manifest Anxiety Scale (TMAS, 1953) ranging from .79 to .83 (as cited by Mc Dowell, 2006). Kabacoff et al. (1997) also demonstrated correlations between

BAI scores and STAI as .52 for SA form and 0.44 for TA form, as an index of convergent validity.

The Turkish validation of STAI was studied by Oner and Le Compte (1983). The authors reported the Pearson Correlation coefficient as ranging from .26 to .68 for SA form and .71 to .86 for TA form for test-retest reliability. The internal consistency coefficient was between .83 and .87 for SA from and .94 and .96 for TA scale (Oner & Le Compte, 1983; Aydemir & Köroğlu; 2000). For construct validity, correlations between scores of TA form and other measures of anxiety was reported to be between .52 and .80 for female students and .58 and .79 for male students (Oner & Le Compte, 1983). In this study, the Cronbach Alpha coefficient was .86 and .93 for TA and SA subscales, respectively.

2.2.6. Visual Analogue Scale

Visual Analogue Scale (VAS; Albersnagel, 1988) is a widely used measure to assess the current mood of respondents by indicating how they feel by putting a mark on a line for each of various emotion-related adjectives (Slyker & McNally, 1991). In this study, only 2 adjectives "Anxious" and "Tense" were used. The participants rated "how anxious they feel right now" and "how tense they feel right now" on a 7 point Likert type line (1=not at all to 7=extremely).

2.2.7. Iowa Gambling Task

As mentioned in the introduction part, IGT is a behavioral task originated to evaluate the DM processes through reward, punishment and uncertainty by simulating real life decision making. In the computerized IGT, subjects are offered with four decks of cards (A, B, C, D) on a gray background. Decks A and C have more frequently smaller punishments in terms of loss of money, whereas decks B and D have less frequent higher punishments.

In the task, participants choose cards from decks by using the left button of the mouse. After each selection, they win or lose money. After selecting a card, information about the amount of money gained (upper number) and the loss (lower number) are displayed on the

screen. As a start, 2000 € is loaned to participants. During the task, the current amount of money is continuously exhibited on the screen. Before starting, the participants are instructed verbally and presented by written instruction on the screen. They are told to "maximize the amount of money as much as possible and avoid losing as possible in order to increase the loaned amount of money. After 100 trials, the task finishes, which is unknown to subjects.

The Turkish adaptation of the task and normative studies were conducted by Serra İçellioğlu (2015). In the Turkish version of IGT, the monetary unit was transformed from Dollar ($) to Turkish Lira (TL) with translating the English words into Turkish. Besides these small changes, the task was similar to the standardized computerized version of IGT.

The scoring of the task was carried out by calculating three different scores. Firstly, as seen in the literature, a total score is obtained by subtracting the amount of selections from unfavorable decks from the amount of selections from favorable decks to examine the general task performance *[(C+D) – (A+B)]* (Zhang et al., 2015; Miu et al., 2008). After the total score, trials were grouped into 5 blocks as each involved 20 trials. The *[(C+D) – (A+B)]* formulation was used for each sub-blocks to see whether decision making changed throughout the task. Finally, the number of selections from each deck was calculated separately for 100 trials to see deck preferences (Zhang et al., 2015).

2.3. Mood Induction

In the literature, there are many different procedures to induce particular mood in a controlled manner (Westermann, et al., 1996). These procedures include listening to music, watching movie clips, imagining, watching slides of affective statements or recalling past events (Westermann, et al., 1996; Slyker & McNally, 1991; Ridley & Clifford, 2004; Wegbreit, Franconeri & Beeman; 2014; Blagden & Craske, 1996). A meta-analysis of the effectiveness of mood induction procedures showed that Film/Story mood induction procedure with or without instructions to get into the mood demanded was found to be the most potent procedure for negative mood states (Westermann, et al., 1996). For the present study, anxious mood induction procedure based on visual stimuli (movie clips) was

preferred due to its effectiveness in inducing negative mood states and being less sensitive to demand effects (Kuijsters, de Ruyter & Heynderickx, 2015). To select anxiety inducing movie clips, the relevant literature was reviewed and a pilot study was run with five participants. According to the review, short clips from the movie "*Silence of the Lambs*" (basement chase scene, 2' 46''), "*The Eye*" (elevator scene, 3' 4'') and "*The Shining*" (pursuing wife with an axe scene, 3' 21'') were selected (Wegbreit, Franconeri & Beeman; 2014; (Kuijsters, de Ruyter & Heynderickx, 2015). After the pilot study and consultation with the participants, movie clip from "*The Shining*" (pursuing wife with an axe scene, 3' 21'') was excluded (results of pilot study can be seen in Appendix I). The total duration of the movie clips used in anxious mood induction was 5' 50''.

In the present study, mood induction procedure was carried out on a between-subjects basis. Subjects were assigned to experimental (anxious mood induction) or control condition (neutral condition to compare the effect of mood manipulation) randomly. The mood induction procedure was conducted individually, in a testing room on the floor of the Psychology Department of Doğuş University. Both the experimental group (EG) and control group (CG) watched the relevant visual stimuli from a laptop screen with earphones, when the lightening was off (all participants were checked whether they were comfortable with the lightening off and gave consent). The clip, of which duration was 5' 17'', presented to the control group was taken from a documentary about paper manufacturing. Both EG and CG were blind to the condition they were assigned to. Before watching clips, participants were instructed that they were required to watch a clip. No information was given about the mood induction procedure in order to prevent demand effect. After completing the measures, the participants in EG group were checked for their current mood states. No participant was allowed to leave the testing room before turning to their baseline mood state. Also, a funny video clip from a stand up show was offered for the participants in EG to elate their mood.

2.4. Procedure

This study is approved by the ethics committee in Doğus University. All subjects were given information about their rights and asked to sign an informed consent on paper. After giving informed consent, participants are randomly assigned to EG or CG and taken by the experimenter to the testing room individually. After completing a set of questionnaires, which were presented in a counterbalanced manner, including demographic information form, RSE, DOSPERT, BDI and STAI-TA form, the participants were given STAI-SA form. In the literature, STAI-SA form is usually given before STAI-TA form (Oner & Le Compte, 1983). In the present study, because STAI-SA form was served as baseline measure before mood induction procedure, it was filled after STAI-TA. Subsequent to STAI-SA, participants filled PANAS and VAS (Baseline measurement – T_1) in a counterbalanced manner before manipulation. After the manipulation, all participants filled out STAI-SA form, PANAS and VAS (T_2). Following T_2 measurement, all participants were asked to take IGT. After finishing IGT, a final measurement (T_3) was obtained by STAI-SA form, PANAS and VAS. To sum up, to trace the changes in mood states, STAI-SA form, PANAS and VAS was used three times before mood induction (T_1), after mood manipulation (T_2) and after completing IGT (T_3). The experimenter was in the testing room during the whole process. The responses and data were collected and saved anonymously. Each administration took approximately 45-50 minutes. The participants were given credits for one of Psychology courses if they were a student of Doğuş University.

3. RESULTS

The Results section consists of 4 parts. In the first section, analyses related to SA , TA and IGT will be presented. In the second part, analyses conducted to explore the relationship between SE and IGT will be presented. In the third section, the correlations between DOSPERT, IGT, SE and TA will be presented. Lastly, correlations between BDI, RSES and STAI – TA will be presented.

3.1. Comparison of Pretest Measures and Differences between Experimental and Control Group before Mood Induction

In order to compare the EG and CG's pretest measures before the mood manipulation, an *Independent Samples t-test* was applied. The groups were similar to each other before mood induction with regard to measures to assess mood, namely PANAS – PA, PANAS – NA, STAI – SA and visual analog scales.

Other than mood assessing scales, the other baseline measures, namely STAI-TA, RSES and BDI were compared to see whether there is a difference between the groups. Analysis revealed that EG and CG were similar to each other, except BDI scores. The BDI scores were significantly different between EG and CG, t (95) = 2.06, p <.05; in which EG had lower BDI scores (M = 9.51; SD = 7.85) than CG (M = 13.21; SD = 9.77). The detailed results can be seen below, Table 3.1.

Table 3.1. Differences between experimental and control group before mood induction

	Control Group *M (SD)*	Experimental Group *M (SD)*	*t* Value (*df*)
Panas - PA (at T_1)	27.71 (7.43)	29.00 (7.25)	- 0.87 (95)
Panas - NA (at T_1)	16.50 (7.25)	15.94 (5.97)	0.42 (95)
TA	47.96 (5.07)	47.70 (5.43)	0.24 (96)
SA (at T_1)	38.85 (5.70)	39.47 (4.90)	- 0.61 (95)
Anxious (at T_1)	1.77 (1.07)	1.63 (0.97)	0.66 (95)
Tense (at T_1)	1.50 (0.99)	1.39 (0.89)	0.59 (95)
RSES	29.44 (6.56)	31.52 (6.56)	- 1.57 (96)
BDI	13.21 (9.77)	9.51 (7.85)	**2,06* (95)**

* significant at $p<0.05$

3.2. Examination of the Efficacy of Mood Induction between Experimental and Control Group

To examine the efficacy of mood manipulation and posttest levels of mood assessing scales, several Independent Samples t-tests were applied for each dependent variable regarding, PANAS – PA, PANAS – NA, STAI – SA, VAS items (Anxious & Tense) at times T_1, T_2 and T_3. The results revealed that EG was significantly different from CG at T_1 and T_2 in scales except STAI – SA. The effects of mood induction procedure was not observed at T_2 STAI –SA scores, t (96) = 0.84, p >.05. However, participants in the EG rated more negative feelings after the mood induction, t (94) = - 3.57, p =.001, η^2= .18. Also, participants in EG rated themselves as more anxious [t (96) = - 2.89, p =.005, η^2 = .08] and more tense after the mood manipulation [t (96) = - 5.12, p = .001, η^2= .21]. The detailed results can be found below, Table 3.2.

Table 3.2. Comparison of mood assessing scales at T_1, T_2 and T_3

		Control Group *M (SD)*	Experimental Group *M (SD)*	*t* Value (*df*)
T1	**SA**	38.85 (5.10)	39.47 (4.90)	- 0.61 (95)
	PANAS PA	27.71 (7.43)	29.00 (7.25)	- 0.87 (95)
	PANAS NA	16.50 (7.24)	15.94 (5.98)	0.42 (95)
	Anxious	1.77 (1.08)	1.63 (0.97)	- 0.66 (95)
	Tense	1.50 (0.98)	1.39 (0.89)	0.59 (95)
T2	**SA**	37.33 (5.29)	37.24 (5.66)	- 0.84 (96)
	PANAS PA	26.85 (7.61)	26.98 (7.77)	- 0.08 (94)
	PANAS NA	13.04 (5.43)	17.24 (6.08)	**- 3.57 (94)****
	Anxious	2.27 (1.39)	3.16 (1.63)	**- 2.89 (96)***
	Tense	2.04 (1.20)	3.66 (1.82)	**- 5.12 (96)****
T3	**SA**	41.75 (8.08)	40.48 (10.40)	- 0.67 (96)
	PANAS PA	25.87 (6.60)	26.92 (7.76)	- 0.71 (94)
	PANAS NA	14.13 (5.43)	14.86 (5.02)	- 0.68 (94)
	Anxious	2.77 (1.53)	2.52 (1.37)	0.85 (96)
	Tense	2.65 (1.39)	2.54 (1.51)	0.36 (96)

* significant at $p<0.005$, ** significant at $p<0.001$

3.3. Differences Between Experimental and Control Group in IGT Scores

To perform analyses for exploring the differences between EG and CG both due to SA or TA, several IGT scores were calculated. As stated in the Method section, IGT total score, IGT scores for 5 blocks and the # of cards selections from each deck were included in the analyses.

3.3.1 Differences Between Experimental and Control Group in IGT Total Scores

In order to examine whether IGT total scores were different between two groups, as stated in Hypothesis 1, an *Independent Samples t-test* is applied. The data showed a non-significant relationship between groups and IGT total score, t (96) = 0.71, p >.05. Though it was non-significant, the EG exhibited lower performance (M = -2.40; SD = 17.19) than CG (M = 0.38; SD = 21.02).

Due to the fact that SD values in each group were higher than expected, the IGT total scores were transformed into log values after adding +100 on each value (for converting the scores which were below 0 to positive values). The *Independent Samples t-test* was not significant, t (96) = 0.59, p >.05; indicating that the EG (M = 1.98; SD = 0.89) was similar to CG (M = 1.99; SD = 0.91). This finding demonstrated that SA that was unrelated to the task did not have an effect on IGT total scores.

3.3.2 Differences Between Experimental and Control Group in IGT Total Scores for Each Block

An additional *independent samples t-test* was done to determine the influence of decision processes on IGT scores in terms of blocks; in other words, to detect whether two groups differed from each other in any of the blocks. However, in none of the blocks, were the groups different, indicating performance of participants in both groups were similar to each other like they were in IGT total scores, indicating no differences The t values, M and SD are presented in the Table 3.3.2, in detail.

Table 3.3.2 IGT scores of each blocks in EG and CG

	Block 1 ***M* (*SD*)**	**Block 2** ***M* (*SD*)**	**Block 3** ***M* (*SD*)**	**Block 4** ***M* (*SD*)**	**Block 5** ***M* (*SD*)**
Control Group	- 1,88 (5,01)	0,33 (5,43)	1,21 (5,47)	0,63 (7,98)	0,21 (7,61)
Experimental Group	- 2,68 (5,14)	0,94 (4,89)	- 0,68 (5,22)	- 0,80 (5,22)	0,80 (6,95)
***t* (*df*)**	0,78 (96)	0,28 (96)	1,75 (96)	0,52 (96)	- 0,40 (96)

3.3.3 Effects of Blocks on IGT Performance for EG and CG

To examine the effects of blocks on IGT scores for each of the groups, two-way repeated measures *Analysis of Variance (ANOVA)* was used, in which blocks (1, 2, 3, 4, and 5) were repeated measures factor and group (EG vs. CG) as the between-subjects factor. This analysis was conducted to detect if the groups increased their net scores progressively.

Before reporting the results of ANOVA, Mauchly's test was significant for the main effect of blocks, X^2 =54.22, p<0.001. So, *df* values were corrected using Greenhouse-Geisser estimates of sphericity (ε = .74, for the main effect of blocks). The 2x5 repeated measures ANOVA revealed that the main effect of blocks on IGT performance was significant, F (4, 384) = 5.03, p = 0.002, partial η^2 = .05. However, neither the main effect of groups [F (1, 96) = 0.64, p > 0.05] nor the interaction between groups and blocks [F (4, 384) = 0.75, p > 0.05] was significant. These results demonstrated that, the performance of each group changed significantly throughout the task. However, their rate of change in the performance did not differ according their experimental condition. The pairwise comparisons showed that participants' performance in the first block (M = -2.29; SD = 5.81) was significantly lower from their performances in 2nd, 3rd, 4th and 5th block. The differences between 2nd, 3rd, 4th and 5th blocks were not significant [(M = .18; SD = 5.14), [(M = .24; SD = 5.4), (M = .27; SD = 6.69), (M = .51; SD = 7.25); respectively].

3.3.4 Comparison of the Improvement Rate in Learning between EG and CG

As Preston et al (2007) suggested, due to the fact that the mood manipulation might influence subjects differently especially in the learning phase (1st, 2nd and 3 rd blocks) of IGT and to examine the rate of improvement in the IGT performance after mood manipulation,, further calculations of the scores from these blocks were made. To reveal whether participants were different from each other in the rate of improvement of IGT scores in the beginning of the task as a result of state effects, a *2 x 2 repeated measures ANOVA* was carried out. The group was the between subjects variable whereas the IGT score differences between the early blocks (3-2) and (2-1) were within subjects variable.

Analysis revealed a main effect of improvement between the blocks, F (1, 96) = 5.83, p < 0.05, partial η^2 = .06. However, neither main effect of groups [F (1, 96) = 0.88, p > 0.05] nor the interaction [F (1, 96) = 0.14, p > 0.05] was significant; indicating that both EG and CG improved their performance in the first blocks of IGT. Although not significant, it is striking that CG has a steeper learning performance whereas in EG, participants showed a steeper learning from blocks 1 to 2, but showed a decreased performance from 2nd block to 3rd.

Table 3.3.4 Mean and Standard Deviations of IGT 2-1 and IGT 3-2 Scores

IGT Score	Group	M	SD
IGT 2-1	**EG**	2.21	5.35
	CG	2.72	5.86
	Total	2.47	5.59
IGT 3-2	**EG**	.87	5.93
	CG	-.72	5.49
	Total	.06	5.74

3.3.5 Comparison of EG and CG according to Individual Deck Preferences in IGT

To see whether the groups were different from each other in their preferences of different decks throughout the task, several *independent samples t test*s were conducted. Analysis demonstrated that EG significantly picked fewer cards from deck C (M = 21.72; SD = 5.13) than CG did (M =25.73; SD = 10.45), t (96) = 2.40, p < .05, η^2 = .06. Except deck C, two groups did not differ from each other; for deck A [t (96) = 0.83, p >.05], deck B [t (96) = - 1.24, p >.05] and deck D [t (96) = - 1.24, p >.05]. The mean scores of deck preferences for each group can be seen in Figure 3.3.5 below.

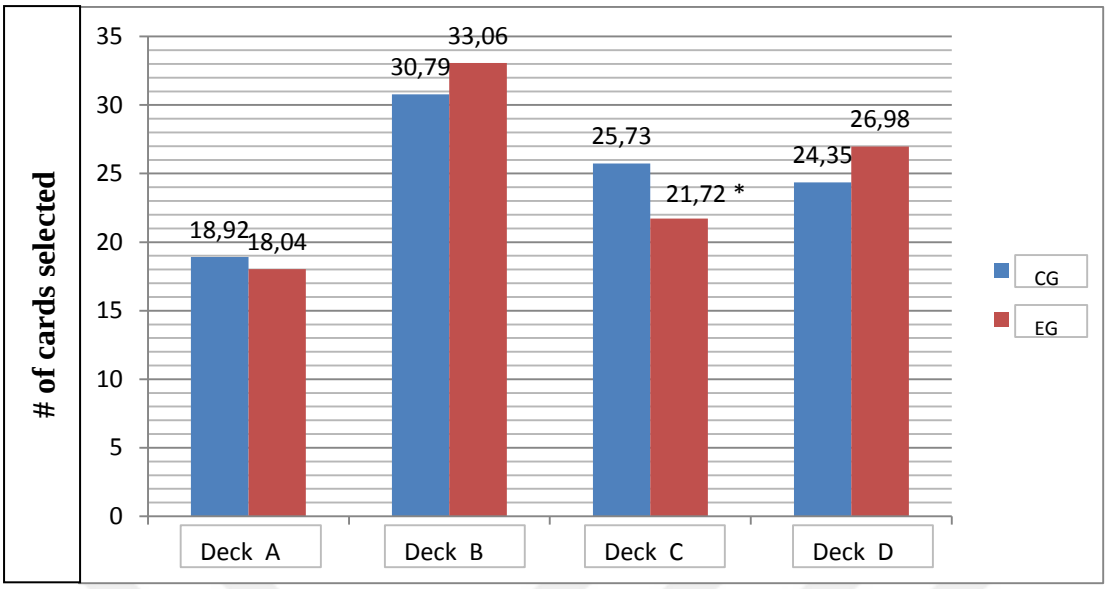

Figure 3.3.5 Deck preferences according to groups

3.4. Effects of Trait Anxiety on IGT Scores

Before conducting the analyses to investigate the influence of TA on IGT, both groups were divided into two subgroups according to their TA scores on STAI- TA. Although the sample's mean TA scores (M = 47.83, SD = 5.24) on the STAI- TA was higher than the scores (mean range was reported to be between 36 - 41) reported in the study conducted by Öner & Le Compte (1983), the median values of the both groups were calculated and the samples in each group was divided accordingly as previous studies did (Stöber, 1997; Wray et al., 2005; Peters & Slovic, 2000). The median was 48 for the both groups.

After the median split, a *2 x 2 between subjects ANOVA* was carried out, as group (EG vs. CG) and TA (High TA group –scores equal or higher than 48- vs. low TA group –scores lower than 48-) as between subjects variables whereas IGT total score was dependent variable. Results revealed a main effect of TA on IGT total scores, F (1, 94) = 6.56, p < 0.05, partial η^2 = .07, indicating that regardless of state mood effects TA seems to affect IGT total scores in such a way that participants low on TA (M = 4.05; SD = 17.88), scored significantly lower from participants high on TA (M = -5.54; SD = 19.22), on IGT. However, the groups [F (1, 94) = 0.60, p > 0.05, *ns*] and the interaction between groups

and TA [F (1, 94) = 1.90, $p > 0.05$, *ns*] did not have an effect on IGT total scores. On the Table 3.4, the detailed means and standard deviations of each level can be found.

Table 3.4 Means and standard deviations of IGT scores according to TA groups and experimental groups

	TA Group	M	SD	N
Control	**low TA**	8.09	21.70	23
	high TA	-6.72	18.02	25
	Total	.37	21.03	48
Experimental	**low TA**	.00	12.18	23
	high TA	-4.44	20.54	27
	Total	-2.40	17.19	50
Total	**low TA**	4.04	17.87	46
	high TA	-5.54	19.21	52
	Total	-1.04	19.11	98

3.4.1 Effects of Trait Anxiety on IGT Total Score with Depression as Covariate

Due to the fact that depression level is shown to affect DM (Stöber, 1997) and IGT scores (Smoski et al., 2008), an *Analysis of Covariance* was conducted. In the analysis, TA levels (high vs. low) were entered as between subjects variable with BDI scores as covariate and IGT total score as dependent variable. Results showed that depression levels had no main effect on IGT total scores, F (1, 94) = 2.88, $p > 0.05$. However, TA has a main effect on IGT total scores when controlling the effects of depression level, F (1, 94) = 4.50, $p < 0.05$, partial η^2 = .046; indicating subjects low on TA (M = 4.18; SD = 18.06) had outscored the ones high in TA (M = -5.54; SD = 19.22) in IGT total score.

3.4.2 Effects of Trait Anxiety on Individual Deck Preferences in IGT

In order to examine whether high TA and low TA groups made different individual deck preferences, several *independent samples t test* were conducted. Results showed that participants who were high on TA tended to make significantly more selections from deck B (M = 34.08; SD = 10.03) than those low on TA did (M = 29.54; SD = 7.31), t (96) = -2.53, $p < .05$, $\eta^2 = .06$. On the contrary, those higher on TA selected significantly fewer cards from deck C (M = 21.48; SD = 5.80), than those lower on TA (M = 26.72; SD = 10.06), t (96) = 2.87, $p < .05$, $\eta^2 = .08$. The selections from Deck A and Deck D were similar each other [t (96) = -0.06, p >.05 for deck A; t (96) = 0.19, p >.05 for deck D.]. The mean and standard deviations are listed below in detail in Table 3.4.2.

Table 3.4.2 Means and standard deviations of low TA and high TA groups according to deck preference

	TA Groups	***M***	***SD***	***t (df)***
Deck A	**low TA**	18,43	5,13	-.06 (96)
	high TA	18,50	5,39	
Deck B	**low TA**	29,54	7,31	**-2.53 (96)***
	high TA	34,08	10,03	
Deck C	**low TA**	26,17	10,07	**2.87 (96)****
	high TA	21,48	5,8	
Deck D	**low TA**	25,85	7,31	.19 (96)
	high TA	25,56	7,86	

***** significant at p < 0.05, ****** significant at p < 0.01

3.5. The Correlation between Self-Esteem and IGT Total Scores

The analysis revealed that the correlations between SE scores from RSES and IGT total scores and individual deck preferences were found to be non-significant. The correlation coefficients can be seen in Table 3.5.

Table 3.5 The correlation coefficients of the analyses between SE and IGT Scores

	1	2	3	4	5	6
1. SE						
2. IGT Total Score	,07					
3. Deck A	-,14	-,36*				
4. Deck B	,01	-,84*	-,19			
5. Deck C	,012	,65*	-,17	-,59*		
6. Deck D	,08	,54*	-,27	-,41*	-,28*	

*significant at $p < 0.01$

3.5.1. The Effects of Self-Esteem on IGT Total Score and Individual Deck Preferences

Besides these analyses, a further analysis was conducted by splitting the sample into two according to their RSES scores as high SE group and low SE group. The median of the sample according to their RSES scores was 32. This analysis was conducted to see if low SE and high SE individuals showed any differences in IGT total scores and deck preferences, regardless of their experimental condition. Between subjects t-tests were run as the SE levels were the grouping variable. Results showed that low and high SE individuals showed statistically similar performances on IGT (t (96) = 0.36, p >.05, *ns*) and picked similar amounts of cards from each deck [t (96) = - 1.06, p >.05, *ns* for deck A; t (96) = .34, p >.05, *ns* for deck B; t (96) = .62, p >.05, *ns* for deck C and t (96) = -.09, p >.05, *ns* for deck D]. The detailed information about the *M* and *SD* are presented in the Table 3.7.1 below.

Table 3.5.1. Means and standard deviations of low SE and high SE groups in IGT total score and deck preference

Groups		M	SD	*t (df)*
IGT Total Score	**High SE**	-,36	21,54	.36 (96)
	Low SE	-1,75	16,41	
Deck A	**High SE**	17,92	5,40	-1.06 (96)
	Low SE	19,04	5,06	
Deck B	**High SE**	32,26	9,82	.34 (96)
	Low SE	31,63	8,37	
Deck C	**High SE**	24,20	9,91	.62 (96)
	Low SE	23,15	6,47	
Deck D	**High SE**	25,62	8,82	-.09 (96)
	Low SE	25,77	6,08	

3.6. Correlations between Baseline Measures

An additional correlation among baseline measures was conducted. The correlation coefficients of baseline measures are presented in Table 3.6.

Table 3.6 Correlation coefficients of baseline measures

	1	2	3	4	5	6
1. TA		-,15	,29**	-,091	,21*	,115
2. SE			-,55**	,43**	-,34**	,157
3. BDI				-,49**	,56**	-,167
4. PANAS - PA at T_1					-,27**	,39**
5. PANAS - NA at T_1						,143
6. SA at T_1						

* significant at $p < .05$, ** significant at $p < .01$

4. DISCUSSION

The present study tried to explore mainly the nature of the connection between anxiety and DM, since the relevant literature has presented contradictory findings. Besides this main concern, the association between SE –as a personality trait- and DM is also examined. So, in this section, each research question and the relevant findings will be discussed.

4.1 Effects of Anxious Mood on Decision Making

Although considerable amount of research investigated the role of TA on DM, few studies have gone over the potential effects of anxious mood on DM. A limitation of previous studies was that measures of SA or current mood were not included in many of the studies conducted with individuals high on TA. However, TA is known to be highly correlated with SA, so it remained unclear whether the reported effects is merely caused by trait or state effects of anxiety. So, in the present study by experimentally inducing anxious mood and measuring mood several times, it is aimed to control for the potential effects of emotional states on DM. It is hypothesized that incidental anxious mood which is irrelevant to the DM task would impair DM as measured by IGT.

Before interpreting the findings, it is important to examine whether mood induction was successful as a precondition. In the study, 3 different measures for mood assessment were used, namely STAI – SA, PANAS and visual analog scales. Results showed that EG and CG were similar with regards to mood assessment ratings in the pretest phase. After mood induction, the EG was significantly higher on visual analog scales and negative affect assessed by PANAS. However, STAI – SA ratings of EG and CG were similar. This finding have indicated that mood induction procedure was successful in inducing negative mood, however, this effect did not observed in the STAI- SA ratings of participants.

Before giving some possible explanations for this finding, it is beneficial to recall that the sample's average score for STAI – TA is slightly above the population's average in the original study conducted by Öner and Le Compte (1983). Although many other studies

conducted in Turkey also reported similar averages like in our study, it might be argued that high TA levels should potentiate SA more easily and readily.

In the study, the mood manipulation procedure by watching video clips altered the participants' mood according to self-reports but ratings of STAI - SA did not differ after manipulation. It is safe to say that the manipulation was successful in inducing negative mood as assessed by PANAS and visual analog scales ("How anxious/tense are feeling right now?). One possible explanation for this may be that the visual stimuli used in the study may not be highly effective in inducing anxious mood. However, the video clips, which were shown to induce anxious mood, were selected after a literature review and pilot study (results can be seen in Appendix I). In the literature, the most effective method to induce a particular mood was stated as using visual stimuli with instructions (e. g. "Try to get into the mood as possible") (Westermann et al., 1996). In the present study, in order to prevent demand effects participants were not instructed to get into anxious mood as possible, which may hinder mood induction. As a second possible explanation, the visual material used in the mood manipulation was selected from familiar movies. A potential familiarity with the movies may cause a decrease in its efficiency, since it had not been checked. As stated before, studies by Starcke et al. (2008) and Preston et al. (2007) used "public speech" as a stressor, which implies a direct threat to the well being of the subjects. However, visual stimuli as used in the present study may fail to pose a hypothetical threat to participants' well-being. Furthermore, parallel with the some studies (Miu et al., 2008; Starcke et al., 2008; Preston et al., 2007) some physiological recordings such as electrocardiogram ratings would be helpful in extricating the pure effect of anxiety. Also, due to the fact that too many instruments were used 3 times to trace mood changes in a very short time interval, we may fail to find significant anxious mood changes in STAI - SA ratings, since the previous ratings might interfere with the next. To sum up, although the mood manipulation was successful in inducing a negative mood state, one should be cautious about the findings since the effects of mood manipulation was not observable in STAI –SA ratings.

As the first assumption of the present study it has been hypothesized that incidental task irrelevant anxiety would deteriorate the performance in IGT. We expected to find that,

because IGT is heavily rely on the development of somatic signals and the processing of these signals, it was hypothesized that task irrelevant anxious mood will hinder the processing of these signals, as proposed by SMH. Under anxious mood states, as happening frequently in daily life, individuals may become exhausted because of the anxiety, which impairs their executive functioning and especially the working memory capacity, in turn (Arnsten, 1998). Because the anxiety presumes the cognitive and attentional resources of the individuals through stress related hormones, the orbitofrontal parts of PFC become excessively activated (Starcke & Brand, 2012). This excessive activation of PFC –also known to be central for information processing- and load in working memory might lead the participants to fail in comprehending the contingencies of the four decks, the rewards and punishments for the short or long term. The analyses, however, failed to support the Hypothesis 1 which suggested anxious mood might impair the performance in DM as measured by IGT total score. Our results showed that participants in the EG and CG did not differed from each other in their IGT total scores. This contradicts with the findings of Starcke et al. (2008) who found out that task irrelevant anxiety impaired DM, whereas in line with the Matthews et al.'s study (2011) who reported no differences between anxious mood induced and control group in a tactical DM task and with Preston et al.'s (2007) who reported no differences between anxious and control group in IGT total score.

Also, another interesting conclusion of this study which may contribute to the non-significant difference between EG and CG on IGT total scores, is the high values of standard deviations. Both the EG and CG's standard deviation values for IGT total scores were higher than the expected and the reported values in the literature indicating a large inter-individual variability in the sample (Smoski et al., 2008; Bechara & Damasio, 2005). Besides this, the total scores obtained in this study showed a general low performance in IGT compared to the original study (Bechara & Damasio, 1994), although healthy individuals were also shown to perform similar to ones who have DM impairments by several studies (İçellioğlu, 2015; Bechara et al., 2001). However, although lower than the original study, the total scores and the standard deviation values are similar to the ones reported by İçellioğlu (2015) in their study conducted to generate the normative data of IGT in Turkey. To sum up, another possible explanation to non-significant difference

between EG and CG could be this large inter-individual variability and general lower performance in IGT. A further analysis was also conducted for the potential effect of inter-individual variability, after checking for potential outliers in IGT total scores. The net scores were converted into log values and further analysis conducted. This step was taken to see whether the groups would differ from each other when the large inter-individual variability is balanced. Nonetheless, these analyses also showed a non-significant effect.

In the literature, it has been argued that taking IGT total score as the only parameter for DM performance may be misleading since each block and deck have been shown to exhibit specific properties (Buelow & Suhr; 2013). Due to this fact, two groups in the experiment were also compared on the basis of each block whether one group outperformed the other. However, the present findings did not support the Hypothesis 1(a) that EG would get lower scores than CG, especially in the first 3 blocks of IGT. The groups were similar to each other in all blocks. However, it should be noted that the EG had lower scores than CG in the first block of IGT.

One possible explanation for the findings of similar performance in IGT total scores and scores from each block may be that mood induction was not effective enough in eliciting anxious mood state. Because the EG might not be anxious enough to perform as expected, they performed similar to the CG. Recall that although non-significant, EG performed lower scores than CG in the IGT total scores; so, more effective and potential threat relevant methods to induce anxiety such as public speech may reveal more substantial findings. Also, a larger sample could demonstrate more tangible results.

Previous studies reported that participants who took IGT started with net scores below 0 – disadvantageous choices- and by gradually improving their performance, they ended up positive values –advantageous choices- (Smoski et al., 2008; Miu et al., 2008). In this study, however, scores of EG varied from -2.68 to .80 from block to block, whereas CG was between -1.88 and 1.21. These scores may be thought to be varied in a restricted range. This condition raises the question whether the participants perform the task effectively. To understand this, the effects of blocks on IGT performance were analyzed. Results showed a main effect of blocks, indicating both groups, regardless of their

experimental condition, improved their performance throughout the task although the rate of improvement did not chance as a function of experimental condition. This finding showed that even if the mean scores of both groups were in a restricted range and below from the values as previous studies reported, participants were aware of the nature of the IGT when the task finished. Additionally, the motivation of participants in performing IGT is not explicitly checked, which can be taken into consideration by future studies since motivation may help to enhance IGT performance.

In hypothesis 1 (b); it was suggested that EG would show a delayed learning curve due to the anxious mood induction. However, results revealed that both of the groups showed an improvement in their scores from 1st to 3rd block. But, the interaction and the main effect of experimental condition were non-significant. This implies that EG learned the nature of the task similar to CG did. It is also interesting that -though it is not significant- CG showed a linear improvement from 1st block to 3rd whereas EG showed an increase in their performance from 1st block to 2nd, but showed an interruption in the transition from 2nd block to 3rd block. Although this difference is non-significant, EG had an interruption in the learning phase of IGT, a parallel finding with of Preston et al. (2007). The task irrelevant anxious mood may be hold responsible for intervening with the somatic markers and hinders the individuals benefitting from them. To sum up, hypothesis 1(b) is also not supported.

Finally, individual deck preferences were also examined according to experimental condition to see whether participants in EG preferred different decks. It has been hypothesized that individuals in an anxious mood (EG) would pick from more from disadvantageous decks (A & B) [Hypothesis 1 (c)] and less from advantageous decks (C & D) [Hypothesis 1 (d)] since anxious mood will intervene with the executive functioning and prevent them to realize the rewards and losses in the long term. As in line with our prediction, participants form CG picked fewer cards from deck C. Deck C yields small gains and losses 50% of selections resulting in a net gain. So, as proposed by SMH, we can imply that EG seemed to lose the advantage of benefitting from their somatic markers due to the irrelevant stimuli. They seemed to fail to recognize the advantageous selections from deck C, and maybe incapable of realizing the overall rewards. However, the same effect of

anxious mood was not observed in the selections between decks A & B. The number of picks from deck A & B was not statistically different between decks, however, the EG selected more cards from deck B than CG. In a larger and more representative sample (rather than college students in a restricted age range), this difference may become statistically significant.

4.2 Effects of Trait Anxiety on Decision Making

The effect of TA on DM is much further studied than effect of anxious mood on DM. To summarize briefly, SMH proposes that increased levels of TA have a capacity to experience affective states more intensely. This capacity enables individuals to develop and activate their somatic signals more effectively. So, higher levels of TA can be advantageous by enhancing the performance in IGT (Werner et al., 2009). Because IGT involves highly ambiguous and uncertain rules, the individuals high on TA may be expected to detect these rules more easily and benefit from their capacity for processing somatic signals more readily. So, this capacity may help them to develop more risk aversive strategy in IGT, which will result in better performance. However, Bechara and Damasio (2006) also suggested that some individuals may obliterate the adaptive effects of somatic signals by higher cognitive processes. Also, the cognitive theories of anxiety propose that high TA is linked to risk aversion, which may result in enhanced performance in IGT. Giorgetta et al. (2010) showed that participants with GAD and PAD made less risky choices in a "risky choice paradigm". On the contrary, Miu et al. (2008) revealed that individuals with higher levels of TA in a normal range (not extreme levels of anxiety such as GAD or PAD) showed poorer performance on IGT. Parallel with the findings of Miu et al.(2008) and Bechara and Damasio (2005), it has been hypothesized the participants with higher levels of TA would show impaired performance in IGT compared to those low on TA, even after controlling for the effect of depression. Also, we hypothesized that high on TA individuals would select more from unfavorable decks and less from favorable decks.

Data revealed that TA had an effect on IGT total scores even after controlling for depression, by which Hypothesis 2 and 2 (a) are supported. The participants who were high on TA showed lower performance than those low on TA. Keeping in mind that the mean of

scores for TA in the present study is quite higher, this finding is a further contribution to the literature that proposes TA may have detrimental effects on DM under ambiguous/uncertain conditions. In line with Miu et al.'s (2008) and de Visser et al.'s (2013) study, this finding demonstrated that people with high TA levels may not benefit from their potential to experience affective states intensely and somatic markers in an advantageous manner.

On the other hand, this finding also seems to contradict with SMH, which suggested TA enhances DM in IGT. One possible explanation for the finding may be that individuals high on TA might give attention to a restricted set of information about the decks and implicit rules in a complex DM paradigm. Their high levels of anxiety might prevent them to attend all of the cues, both the consequences in the long and short term. Regarding the finding that highly anxious participants preferred more deck B and less deck C, high levels of TA -supporting Hypothesis 2 (b) and 2 (c) - may cause them to value short term larger gains instead of long term rewards (Miu et al., 2008). Another possible explanation could come from the fact that anxiety is demonstrated to have detrimental effects on cognitive functioning (see section 1.3.3). It has been shown that anxiety impacts the shifting (capacity to maintaining attention on changing demands of tasks) and inhibiting (capacity to control and sustaining attention against interferences) processes of attention (Eysenck et al., 2007). In IGT, participants are expected to use these attentional processes in a balanced manner, since shifting is suggested to be disrupted in highly anxious individuals in IGT (Zhang et al., 2015). It could be speculated that because higher levels of TA prevents individuals to shift their attentional resources to all decks and cues related to them, they may fail to see overall context of the task. Additionally, it may be inferred that high TA may cause high autonomus reactivity in which too much somatic signaling may deteriorate the performance. Although these findings seems to contradict with SMH, Bechara and Damasio (2005) discussed that higher levels of TA may potentiate high autonomic reactivity, which results in obliteration of somatic signals by higher cognitive processes. These findings öay also be taken as a contribution to the finding that anxiety has a U shaped effect on cognitive performance, in which higher or lower levels may deteriorate the performance rather enhancing it as happens in more moderate levels.

It is also important that, besides the IGT total score, individual deck preferences were found to be affected by TA levels. Similar to the study of Zhang et al. (2015), levels of TA were found to cause different deck preferences. In our study, participants high on TA are shown to select more cards from deck B and fewer from deck C. In the present study, deck B and deck C are shown to be affected by different levels of TA. Deck B is known to be a disadvantageous deck which has high losses in low frequencies whereas deck C is known to be an advantageous deck with high frequency but low in magnitude losses. So, picking fewer from deck C and more from deck B could be seen as impairment in DM, since avoiding deck B is assumed to be a "good decision" in IGT Manual. Few studies up to date analyzed the individual deck preferences in IGT and its relation to TA (Buelow & Suhr, 2012; Zhang et al., 2015). However, the findings from this study indicate the importance of examining deck preferences is also important as IGT total scores, since each deck has unique references for DM. As discussed above, these findings contradict with SMH and cognitive theories of anxiety which suggest that anxiety favors risk aversion in IGT by choosing more from advantageous decks, but in line with the previous findings (Zhang et al., 2015) indicating that high TA may influence negatively DM by interfering the evaluation process of disadvantages and advantages of the decks n IGT.

4.3 The Link between Self-Esteem and Decision Making

Up to now, no study looked for the potential association between self-esteem and DM as measured by IGT. So it is targeted to find a potential link between SE and DM, in such a way that low self-esteem individuals may behave more risk aversive under uncertain conditions to protect themselves from potential threats and individuals high on SE, on the contrary, may take more risk for self-promoting.

To examine the association between SE and IGT, two analyses were conducted. As a first step, the correlations between SE scores and IGT total scores and deck preferences were examined. However, none of the variables were correlated to SE. As a second step, participants with low and high on SE scores were compared according to their IGT total scores and deck preferences. The results of these analyses were also non-significant, indicating that low and high SE individuals were similar to each other in a complex

behavioral task. Yang et al. (2010) demonstrated that high SE individuals showed more emotional signals than low SE individuals in a blackjack gambling task, indicating that during DM, variance in SE may be reflected in the choices. The study by Josephs et al. (1992) also demonstrated that low SE participants were risk aversive in a positively framed DM task for self-protection. However, in IGT –which is a complex task having implicit rules- these potential effects were not obtained.

One possible explanation for the non-existent association between SE and DM could be that IGT is a too complex measurement of DM in such a way that low SE participants failed to develop a strategy to protect themselves, since the statistically significant effect of previous studies came from basic and simple tasks such as gambling scenarios (Josephs et al., 19992). Additionally, because the standard version of IGT may not pose a direct threat to self, the participants may not have to protect themselves. A modified version of IGT involving a direct threat to SE may help to obtain more concrete connections between IGT and SE by future studies. Furthermore, in the literature, pessimism –as a very closely related construct to SE- is shown to affect DM under ambiguity (Pulford, 2009) and risk (Lauriola & Levin, 2001). However, in the present study, pessimism was not included as a possible mechanism to mediate the relationship between SE and DM. Future investigation of the role of SE by including related constructs such as optimism-pessimism, self-efficacy or neuroticism will be beneficial to uncover the possible association between SE and DM as measure by different and simpler tasks.

4.4. Strenghts

The present study may contribute to the literature by examining DM with a complex and well-validated behavioral task in an experimental design. With the involvement of control group and the manipulation of state mood provided opportunity to explore the interaction of distinct types of anxiety, individually. Also, the assessment of mood throughout the experiment repeatedly enabled us to draw more causal links between the variables. Maybe the most essential conclusion of the present study is to show the non-adaptive role of TA in DM processes, especially the extreme levels. Besides, examination of individual deck preferences may provide insight to the future studies and be beneficial in illuminating the

contradictory findings in the literature. Also, controlling the effects of depression in this study is also worth to mention since this demonstrated the effects anxiety on DM independent of depression. Finally, SE is also a recent construct in DM literature although shown to be non-correlated, would provide insight to the future studies.

4.5. Limitations

The present study also has some limitations. First of all, larger samples would produce more generalizable conclusions, although the size of the sample is larger than most studies (Miu, et al., 2008; Preston et al., 2007). Also the sample was not representative enough to examine for the gender effects. The experiments were conducted mostly with Doğuş University students who are mostly from middle or upper-middle SES within a restricted age group, which decreases the generazilibity of the results. Besides restriction in gender and SES representativeness, the sample is similar in TA levels (although higher than population level). Since the sample does not involve clinical levels of anxiety, the findings are limited in generalizability for clinical populations. It is also noteworthy that the mood induction procedure used in the present study may be not highly effective in inducing anxious mood. As a final comment, it is hard to find the circumstances in which rewards and punishments are related to each other that closely in human daily life, as in IGT in the present study.

4.6. Future Directions

The future studies exploring the link between anxiety and DM may use more effective methods to induce state anxiety, which is a limitation in the present study. Secondly, physiological measures such as heart beat index or cortisol levels will be very informative in assessing state anxiety since some individuals have difficulty in reporting themselves. Also, samples involving participants with extreme or clinical levels of anxiety will provide more generalizable and concrete findings related to DM. Additionally, although IGT is a well-validated task to assess real-life DM, other DM such as GDT or BART would be beneficial to reach more generalizable findings. As a final point, modified versions of IGT

designed as posing a direct threat to self may be helpful to ascertain the possible link between SE and DM.

4.7. Conclusions

It is a striking finding how TA is reflected in even in simple decisions people make in daily life. The results of the present study showed that decisions people make may be helpful in understanding the etiology and maintenance of anxiety. Individuals' unfavorable decisions made persistently may cause them to face with more threatening environments more frequently. Also, paying attention to short term rewards may contribute to anxious pathology by choosing safer options - short term rewards, in a way. As a therapeutic intervention, these basic and simple DM biases caould be targeted in cognitive therapies of anxiety and specialist may be cautious about the DM biases -as presented in the present study- as a vulnerability factor to anxious pathology.

So far, the link between anxiety and DM is much more complicated than it seems. Results of this study showed that rather than state features of anxiety, trait anxiety seems to affect DM negatively in a behavioral task. Our findings showed that TA seems to affect individuals' cognitive capacity in a detrimental way by interfering with their attentional resources. It shows the importance to examine different levels of anxiety with different DM tasks. However, it should be stated that the relationship between anxiety and DM still has much to discover, since it is not clear whether anxiety is enhancing or impairing DM. multidisciplinary approaches to DM also may be helpful to merge inconsistent findings since none of the existing theories have clarified the role of anxiety in DM. Furthermore, as showed by the present study too, the effects of anxiety change dramatically among different types of anxiety which necessitates to investigation of SA and TA individually.

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Appendix A

Turkish Version of the Consent Form

KATILIMCI ONAM FORMU

Araştırmanın Adı: Karar Verme Becerileri ve Duygular
Araştırmacı: Seha Ata & Yrd. Doç. Dr. Hasan Galip Bahçekapılı

Seha Ata & Yrd. Doç. Dr. Hasan Galip Bahçekapılı tarafından yürütülmekte olan bu proje bireylerin kişilerin gerçek hayattaki karar verme becerileriyle duyguları arasındaki ilişkiyi incelemeyi amaçlamaktadır.

Bu çalışmada sizden duygu durumunuzu, davranışlarınızı ve düşüncelerinizi değerlendirmenize yönelik bir dizi ölçeği doldurmanız istenecektir. Çalışmanın tamamı yaklaşık 40 dakika sürmektedir. Bu çalışmada vermiş olduğunuz tüm cevaplar tamamen gizlidir ve sadece bu araştırmanın kapsamı içinde kullanılacaktır. Tüm veriler size verilecek bir katılımcı kodu ile girilecek, hiç bir yerde kimliğinize ilişkin herhangi bir bilgi sorulmayacaktır. Ayrıca, isminizi ya da imza gibi kimliğinizi belirtecek herhangi bir bilgiyi bu onam formu dışındaki hiçbir yazılı forma yazmamalısınız. Bu çalışmadan herhangi bir neden belirtmeksizin istediğiniz an çekilebilirsiniz. Çalışmadan çekilmeniz durumunda herhangi bir cezai yaptırımla karşılaşmayacaksınız.

Bu çalışma ile ilgili herhangi bir endişeniz ya da sorunuz olursa bu projenin araştırmacısı olan Seha Ata (seha.ata@gmail.com) ile iletişim kurabilirsiniz.

Eğer bu çalışmaya katılmayı istiyorsanız lütfen aşağıdaki onay formunu okuyarak imzalayınız.

Seha Ata ve Yrd. Doç. Dr. Hasan Galip Bahçekapılı tarafından yürütülmekte olan bu çalışmaya katılmayı kabul ediyorum. Bilgi-Onam metnini okudum ve bu çalışmaya katılmakla ilgili olarak sormak istediğim soruları araştırmacının kendisine ya da asistanına sorarak öğrenme fırsatım olduğunu biliyorum. Çalışmadan herhangi bir neden belirtmeksizin istediğim her aşamada çekilebileceğimi biliyorum. Herhangi bir gerekçe ile bilgi almak istediğimde araştırmacılara başvurabileceğim konusunda bilgilendirildim.

Eğer bu bilgiler doğrultusunda araştırmaya katılmak istiyorsanız lütfen onam formunu imzalayınız.

Katılımcının Adı-Soyadı (lütfen yazınız): _____
Tarih: _____
Katılımcının İmzası: _____

Araştırma projesine vermiş olduğunuz destek ve yardım için teşekkür ederiz.

Appendix B

Turkish Version of Demographic Information Form

DEMOGRAFİK BİLGİ FORMU

Sizden diğer ölçekleri cevaplandırmadan önce, aşağıda kişisel bilgilerinizle ilgili olan soruları cevaplandırmanızı rica ediyoruz. Lütfen bu soruları sizi en iyi ifade seçeneği yuvarlak içine alarak cevaplayınız.

1. Cinsiyetiniz: (1) Erkek (2) Kadın

2. Yaşınız: _____(yıl olarak)

3. Medeni Durumunuz:

(1) Bekar (2) Evli/Birlikte Yaşıyor (3) Ayrılmış/ Boşanmış (4) Dul

4. Hayatınızda en uzun süreyle hangi sosyo-ekonomik dilimde yer aldınız? (birini işaretleyiniz)

(1) Üst Sınıf (2)Üst-Orta Sınıf (3) Orta Sınıf

(4) Düşük-Orta Sınıf (5)Düşük Sınıf

5. Şimdiki sosyo-ekonomik düzeyiniz nedir (birini işaretleyiniz)?

(1) Üst Sınıf (2)Üst-Orta Sınıf (3) Orta Sınıf

(4) Düşük-Orta Sınıf (5)Düşük Sınıf

6. Eğitim Seviyeniz:

(1) Okuryazar
(2) İlkokul mezunu
(3) İlköğretim mezunu (ilkokul ve ortaokul)
(4) Lise Mezunu
(5) Yüksekokul Mezunu
(6) Üniversite Öğrencisi
(7) Üniversite mezunu
(8) Lisansüstü Öğrencisi
(9) Lisansüstü Mezun

7. Ailenizin aylık gelir miktarınızı işaretleyiniz.

(1) 0 - 2999 TL
(2) 3000 - 4999 TL
(3) 5000 - 6999TL
(4) 7000 - 9999 TL
(5) 10000 - 14999 TL
(6) 15000 - 19999 TL
(7) 20000 TL ve üzeri

8. Sağlık Durumunuz:

a. Şu anda tedavi görmenizi gerektiren herhangi bir ciddi bedensel rahatsızlığınız var mı? (Organ yetmezliği, kanser, otoimmün rahatsızlıklar, vs.)

( ) Evet ( ) Hayır

Evet ise belirtiniz:_____

b. Şimdiye kadar herhangi bir nörolojik rahatsızlık geçirdiniz mi? (Epilepsi, felç, MS…)

( ) Evet ( ) Hayır

Evet ise belirtiniz:_____

c. Şimdiye kadar herhangi bir kafa travması ya da baş bölgenizden yaralanma olayı yaşadınız mı?

( ) Evet ( ) Hayır

Evet ise belirtiniz:_____

d. Şu anda herhangi bir ilaç kullanıyor musunuz?

( ) Evet ( ) Hayır

Evet ise belirtiniz:_____

e. Şimdiye kadar herhangi bir psikiyatrik bozukluk tanısı aldınız mı?
(Majör Depresyon, Bipolar Bozukluk, Obsesif-Kompulsif Bozukluk, Panik Bozukluk, Şizofreni, vs)

( ) Evet ( ) Hayır

Evet ise belirtiniz:_____

f. Şu anda sizi profesyonel yardım almaya yönlendiren ruh sağlığınızla ilgili bir probleminiz var mı?

( ) Evet ( ) Hayır

Evet ise belirtiniz:_____

g. Şimdiye kadar herhangi bir psikiyatrik tedavi aldınız mı?

( ) Evet ( ) Hayır

Evet ise belirtiniz:
( ) İlaç (Evet ise adını belirtiniz):_____
( ) Terapi

h. Alkol ya da madde bağımlılığınız var mı?
( ) Evet ( ) Hayır

Appendix C

Turkish Form of Rosenberg Self-Esteem Scale

Rosenberg Benlik Saygısı Ölçeği

Aşağıdaki maddeler, kendiniz hakkında ne düşündüğünüz ve genel olarak nasıl hissettiğinize ilişkin olarak hazırlanmıştır. Lütfen her bir maddeyi dikkatlice okuyun ve kendiniz hakkında nasıl hissettiğinizi size uygun gelen ifadenin altına işaretleyerek belirtin.

	Hiç Katılmıyorum	**Katılmıyorum**	**Katılıyorum**	**Tamamen Katılıyorum**
1.Kendimi en az diğer insanlar kadar değerli buluyorum.	(a)	(b)	(c)	(d)
2.Bazı olumlu özelliklerim olduğunu düşünüyorum.	(a)	(b)	(c)	(d)
3.Genelde kendimi başarısız bir kişi olarak görme eğilimindeyim.	(a)	(b)	(c)	(d)
4.Ben de diğer insanların birçoğunun yapabildiği kadar bir şeyler yapabilirim.	(a)	(b)	(c)	(d)
5. Kendimde gurur duyacak fazla bir şey bulamıyorum.	(a)	(b)	(c)	(d)
6. Kendime karşı olumlu bir tutum içindeyim.	(a)	(b)	(c)	(d)
7. Genel olarak kendimden memnunum.	(a)	(b)	(c)	(d)
8. Kendime karşı daha fazla saygı duyabilmeyi isterdim.	(a)	(b)	(c)	(d)
9. Bazen kesinlikle bir işe yaramadığımı düşünüyorum.	(a)	(b)	(c)	(d)
10. Bazen kendimin hiç de yeterli bir insan olmadığını düşünüyorum.	(a)	(b)	(c)	(d)

Appendix D

Turkish Form of Beck Depression Inventory

Beck Depresyon Ölçeği

Aşağıda, kişilerin ruh durumlarını ifade ederken kullandıkları bazı cümleler verilmiştir. Her madde, bir çeşit ruh durumunu anlatmaktadır. Her maddede o ruh durumunun derecesini belirleyen 4 seçenek vardır. Lütfen bu seçenekleri dikkatle okuyunuz. Son bir hafta içindeki (şu an dahil) kendi ruh durumunuzu göz önünde bulundurarak, size en uygun olan ifadeyi bulunuz.

1. a. Kendimi üzgün hissetmiyorum.
   b. Kendimi üzgün hissediyorum.
   c. Her zaman için üzgünüm kendimi bu duygudan kurtaramıyorum.
   d. Öylesine üzgün ve mutsuzum ki dayanamıyorum.

2. a. Gelecekten umutsuz değilim.
   b. Geleceğe biraz umutsuz bakıyorum.
   c. Gelecekten beklediğim hiçbir şey yok.
   d. Benim için bir gelecek yok ve bu durum düzelmeyecek.

3. a. Kendimi başarısız görmüyorum.
   b. Çevremdeki birçok kişiden fazla başarısızlıklarım oldu sayılır.
   c. Geriye dönüp baktığımda, çok fazla başarısızlığımın olduğunu görüyorum.
   d. Kendimi tümüyle başarısız bir insan olarak görüyorum.

4. a. Her şeyden eskisi kadar zevk alabiliyorum.
   b. Her şeyden eskisi kadar zevk almıyorum.
   c. Artık hiçbir şeyden gerçek bir zevk alamıyorum.
   d. Bana zevk veren hiçbir şey yok.

5. a. Kendimi suçlu hissetmiyorum.
   b. Arada bir kendimi suçlu hissettiğim oluyor.
   c. Kendimi çoğunlukla suçlu hissediyorum.
   d. Kendimi her an için suçlu hissediyorum.

6. a. Cezalandırıldığımı düşünmüyorum.
b. Bazı şeyler için cezalandırılabileceğimi hissediyorum.
c. Cezalandırılmayı bekliyorum.
d. Cezalandırıldığımı hissediyorum.

7. a. Kendimden hoşnudum.
b. Kendimden pek hoşnut değilim.
c. Kendimden hiç hoşlanmıyorum.
d. Kendimden nefret ediyorum.

8. a. Kendimi diğer insanlardan daha kötü görmüyorum.
b. Kendimi zayıflıklarım ve hatalarım için eleştiriyorum.
c. Kendimi hatalarım için çoğu zaman suçluyorum.
d. Her kötü olayda kendimi suçluyorum.

9. a. Kendimi öldürmek gibi düşüncelerim yok.
b. Bazen kendimi öldürmeyi düşünüyorum, fakat bunu yapamıyorum.
c. Kendimi öldürebilmeyi isterdim.
d. Bir fırsatını bulsam kendimi öldürürdüm.

10. a. Her zamankinden daha fazla ağladığımı sanmıyorum.
b. Eskisine göre şu sıralarda daha fazla ağlıyorum.
c. Şu sıralarda her an ağlıyorum.
d. Eskiden ağlayabilirdim,ama şu sırlarda istesem de ağlayamıyorum.

11. a. Her zamankinden daha sinirli değilim.
b. Her zamankinden daha kolayca sinirleniyor ve kızıyorum.
c. Çoğu zaman sinirliyim.
d. Eskiden sinirlendiğim şeylere bile artık sinirlenemiyorum.

12. a. Diğer insanlara karşı ilgimi kaybetmedim.
b. Eskisine göre insanlarla daha az ilgiliyim.
c. Diğer insanlara karşı ilgimin çoğunu kaybettim.
d. Diğer insanlara karşı hiç ilgim kalmadı.

13. a. Kararlarımı eskisi kadar kolay ve rahat verebiliyorum.
b. Bu sıralarda kararlarımı vermeyi erteliyorum.
c. Kararlarımı vermekte oldukça güçlük çekiyorum.
d. Artık hiç karar veremiyorum.

14. a. Dış görünüşümün eskisinden daha kötü olduğunu sanmıyorum.
b. Yaşlandığımı ve çekiciliğimi kaybettiğimi düşünüyor ve üzülüyorum.
c. Dış görünüşümde artık değiştirilmesi mümkün olmayan olumsuz değişiklikler olduğunu düşünüyorum.
d. Çok çirkin olduğumu düşünüyorum.

15. a. Eskisi kadar iyi çalışabiliyorum.
b. Bir işe başlayabilmek için eskisine göre kendimi daha fazla zorlamam gerekiyor.
c. Hangi iş olursa olsun yapabilmek için kendimi çok fazla zorluyorum.
d. Hiçbir iş yapamıyorum.

16. a. Eskisi kadar rahat uyuyabiliyorum.
b. Şu sıralarda eskisi kadar rahat uyuyamıyorum.
c. Eskisine göre 1 veya 2 saat erken uyanıyor ve tekrar uyumakta zorluk çekiyorum.
d. Eskisine göre çok erken uyanıyor ve uyuyamıyorum.

17. a. Eskisine kıyasla daha çabuk yorulduğumu sanıyorum.
b. Eskisinden daha çabuk yoruluyorum.
c. Şu sıralarda neredeyse her şey beni yoruyor.
d. Öyle yorgunum ki hiçbir şey yapamıyorum.

18. a. İştahım eskisinden pek farklı değil.
b. İştahım eskisi kadar iyi değil.
c. Şu sıralarda iştahım epey kötü.
d. Artık hiç iştahım yok.

19. a. Son zamanlarda pek fazla kilo kaybettiğim söylenemez.
b. Son zamanlarda istemediğim halde üç kilodan fazla kaybettim.
c. Son zamanlarda istemediğim halde beş kilodan fazla kaybettim.
d. Son zamanlarda istemediğim halde yedi kilo verdim.

20. a. Sağlığım beni pek endişelendirmiyor.
b. Son zamanlarda ağrı, sızı, mide bozukluğu,kabızlık gibi sorunlarım var.
c. Ağrı, sızı, gibi bu sıkıntılarım beni epey endişelendirdiği için başka şeyleri düşünmek zor geliyor.
d. Bu tür sıkıntılar beni öyle endişelendiriyor ki, artık başka hiçbir şey düşünemiyorum.

21. a. Son zamanlarda cinsel yaşantımda dikkatimi çeken bir şey yok.
b. Eskisine oranla cinsel konularla daha az ilgileniyorum.
c. Şu sıralarda cinsellikle pek ilgili değilim.
d. Artık, cinsellikle bir ilgim kalmadı.

Appendix E

Positive and Negative Affect Schedule

Pozitif ve Negatif Duygu Ölçeği

Bu ölçek farklı duyguları tanımlayan bir takım sözcükler içermektedir. Şu anda nasıl hissettiğinizi düşünüp her maddeyi okuyun. Uygun cevabı her maddenin yanında ayrılan yere (puanları daire içine alarak) işaretleyin. Cevaplarınızı verirken aşağıdaki puanları kullanın.

	Çok az veya hiç	**Biraz**	**Ortalama**	**Oldukça**	**Çok fazla**
1. İlgili	1	2	3	4	5
2. Sıkıntılı	1	2	3	4	5
3. Heyecanlı	1	2	3	4	5
4. Mutsuz	1	2	3	4	5
5. Güçlü	1	2	3	4	5
6. Suçlu	1	2	3	4	5
7. Ürkmüş	1	2	3	4	5
8. Düşmanca	1	2	3	4	5
9. Hevesli	1	2	3	4	5
10. Gururlu	1	2	3	4	5
11. Asabi	1	2	3	4	5
12. Uyanık	1	2	3	4	5
13. Utanmış	1	2	3	4	5
14. İlhamlı (yaratıcı düşüncelerle dolu)	1	2	3	4	5
15. Sinirli	1	2	3	4	5
16. Kararlı	1	2	3	4	5
17. Dikkatli	1	2	3	4	5
18. Tedirgin	1	2	3	4	5
19. Aktif	1	2	3	4	5

20. Korkmuş	1	2	3	4	5

Appendix F

State Trait Anxiety Inventory - State Anxiety Form

Durumluk Sürekli Kaygı Ölçeği - Durumluk Kaygı Formu

Aşağıda kişilerin kendilerine ait duygularını anlatmada kullandıkları bir takım ifadeler verilmiştir. Her ifadeyi okuyun, sonra da o anda nasıl hissettiğinizi ifadelerin sağ tarafındaki parantezlerden uygun olanını işaretlemek suretiyle belirtin. Doğru ya da yanlış cevap yoktur. Herhangi bir ifadenin üzerinde fazla zaman sarf etmeksizin **anında** nasıl hissettiğinizi gösteren cevabı işaretleyin.

		HİÇ	**BİRAZ**	**ÇOK**	**TAMAMİYLE**
1	Şu anda sakinim	(1)	(2)	(3)	(4)
2	Kendimi emniyette hissediyorum	(1)	(2)	(3)	(4)
3	Su anda sinirlerim gergin	(1)	(2)	(3)	(4)
4	Pişmanlık duygusu içindeyim	(1)	(2)	(3)	(4)
5	Şu anda huzur içindeyim	(1)	(2)	(3)	(4)
6	Şu anda hiç keyfim yok	(1)	(2)	(3)	(4)
7	Başıma geleceklerden endişe ediyorum	(1)	(2)	(3)	(4)
8	Kendimi dinlenmiş hissediyorum	(1)	(2)	(3)	(4)
9	Şu anda kaygılıyım	(1)	(2)	(3)	(4)
10	Kendimi rahat hissediyorum	(1)	(2)	(3)	(4)
11	Kendime güvenim var	(1)	(2)	(3)	(4)
12	Şu anda asabım bozuk	(1)	(2)	(3)	(4)

13	Çok sinirliyim	(1)	(2)	(3)	(4)
14	Sinirlerimin çok gergin olduğunu hissediyorum	(1)	(2)	(3)	(4)
15	Kendimi rahatlamış hissediyorum	(1)	(2)	(3)	(4)
16	Şu anda halimden memnunum	(1)	(2)	(3)	(4)
17	Şu anda endişeliyim	(1)	(2)	(3)	(4)
18	Heyecandan kendimi şaşkına dönmüş hissediyorum	(1)	(2)	(3)	(4)
19	Şu anda sevinçliyim	(1)	(2)	(3)	(4)
20	Şu anda keyfim yerinde	(1)	(2)	(3)	(4)

Appendix G

State Trait Anxiety Inventory - Trait Anxiety Form

Durumluk Sürekli Kaygı Ölçeği - Sürekli Kaygı Formu

Aşağıda kişilerin kendilerine ait duygularını anlatmada kullandıkları bir takım ifadeler verilmiştir. Her ifadeyi okuyun, sonra da o anda nasıl hissettiğinizi ifadelerin sağ tarafındaki parantezlerden uygun olanını işaretlemek suretiyle belirtin. Doğru ya da yanlış cevap yoktur. Herhangi bir ifadenin üzerinde fazla zaman sarf etmeksizin **anında** nasıl hissettiğinizi gösteren cevabı işaretleyin.

		Hemen Hemen Hiçbir Zaman	**Bazen**	**Çok Zaman**	**Hemen Her Zaman**
1	Genellikle keyfim yerindedir	(1)	(2)	(3)	(4)
2	Genellikle çabuk yorulurum	(1)	(2)	(3)	(4)
3	Genellikle kolay ağlarım	(1)	(2)	(3)	(4)
4	Başkaları kadar mutlu olmak isterim	(1)	(2)	(3)	(4)
5	Çabuk karar veremediğim için fırsatları kaçırırım	(1)	(2)	(3)	(4)
6	Kendimi dinlenmiş hissediyorum	(1)	(2)	(3)	(4)
7	Genellikle sakin, kendine hakim ve soğukkanlıyım	(1)	(2)	(3)	(4)
8	Güçlüklerin yenemeyeceğim kadar biriktiğini hissederim	(1)	(2)	(3)	(4)
9	Önemsiz şeyler hakkında endişelenirim	(1)	(2)	(3)	(4)
10	Genellikle mutluyum	(1)	(2)	(3)	(4)
11	Her şeyi ciddiye alır ve endişelenirim	(1)	(2)	(3)	(4)

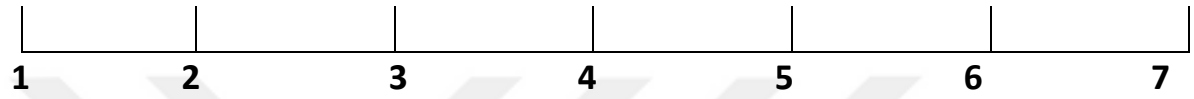
12	Genellikle kendime güvenim yoktur	(1)	(2)	(3)	(4)
13	Genellikle kendimi emniyette hissederim	(1)	(2)	(3)	(4)
14	Sıkıntılı ve güç durumlarla karşılaşmaktan kaçınırım	(1)	(2)	(3)	(4)
15	Genellikle kendimi hüzünlü hissederim	(1)	(2)	(3)	(4)
16	Genellikle hayatımdan memnunum	(1)	(2)	(3)	(4)
17	Olur olmaz düşünceler beni rahatsız eder	(1)	(2)	(3)	(4)
18	Hayal kırıklıklarını öylesine ciddiye alırım ki hiç unutamam	(1)	(2)	(3)	(4)
19	Aklı başında ve kararlı bir insanım	(1)	(2)	(3)	(4)
20	Son zamanlarda kafama takılan konular beni tedirgin ediyor	(1)	(2)	(3)	(4)

Appendix H

Visual Analog Scale

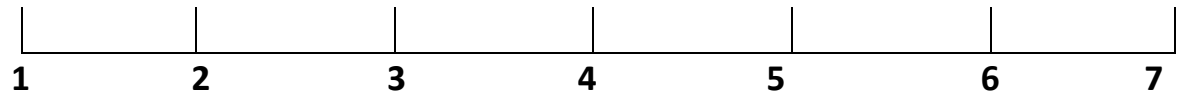
Görsel Analog Ölçek

Şu anda kendinizi ne kadar **kaygılı** hissediyorsunuz?



Hiç **Çok Fazla**

Şu anda kendinizi ne kadar **gergin** hissediyorsunuz?



Hiç **Çok Fazla**

Appendix I

Results of the Pilot Study Conducted for Mood Indcution

To decide the movies scripts to use in the study, a pilot study with 5 participants conducted. After watching scripts, the articipants were asked to rate each piece on a visual analog scale which was 10 point Likert Type ranging from 1 = Not at all to 10 = Extremely for the items below:

1. How much anxious are you feeling right now?
2. How much tense are you feeling right now?

		Subject #1	**Subject #2**	**Subject #3**	**Subject #4**	**Subject #5**	**M**
The Silence of Lambs	**Anxious**	6	9	5	6	4	**6**
	Tense	8	5	5	7	8	**6.6**
The Eye	**Anxious**	8	9	5	5	6	**6.6**
	Tense	6	7	7	7	5	**6.4**
The Shining	**Anxious**	2	2	4	4	3	3
	Tense	3	2	3	3	5	3.2

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