TRUE AND FALSE MEMORY WITH EMOTIONALLY VALENCED WORDS:
DEPRESSION, TRAIT ANXIETY AND PERSONALITY FACTORS

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ABSTRACT

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The purpose of the present study was to investigate the relationship between false memory and trait anxiety, depression and personality characteristics with emotionally valenced material (positive, depression related, threat related and neutral). Participants were 131 Middle East Technical University students. Four groups (depressed, anxious, mixed and control) were formed in order to differentiate the effects of trait anxiety and depression. Beck Depression Inventory (BDI) and Trait Form of State Trait Anxiety Inventory (STAI-I) were administered. In order to measure false memory creation, a variant of Deese-Roediger-McDermott (DRM) paradigm was used. It was hypothesized that the anxious group would produce more false memories for threat related words as compared to other groups. In addition, the depressed group was expected to display higher levels of false memory for

depression related words as compared to other groups. One-way MANOVA was used to analyze the data. The results showed that there was a group difference only in terms of threat related words' accuracy. Also people were categorized as "low" and "high" in the six personality characteristics as measured by Big Five Questionnaire. It was hypothesized that people high in openness to experience would commit less false memories as compared to people low in the trait. This was true for only positive material. Further, other personality characteristics were analyzed in order to discover the relationship between false memory and personality. The results were discussed in terms of relevant literature.

Keywords: False Memory, True Memory, Depression, Anxiety, Big Five

ÖZ

GERÇEK VE SAHTE ANI: DEPRESYON KAYGI VE KİŞİLİK FAKTÖRLERİ

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Bu çalışmanın amacı, gerçek ve sahte anılar ile depresyon, kaygı ve kişilik özellikleri arasındaki ilişkiyi, duygu çeşitlerine göre ayrılmış kelime kategorileri ile incelemektir. Sahte anıyı araştırmak amacı ile Deese-Roediger-McDermott (DRM) paradigmasının bir versiyonu kullanılmıştır. Bilgi toplama amacı ile ise Beck Depresyon Envanteri, Durumluk-Genel Kaygı Ölçeğinin Durumluk formu ve Beş Temel Kişilik Özelliği Envanteri kullanılmıştır. Bu amaçla katılımcılar sadece depresif, sadece kaygılı karışık ve kontrol olmak üzere dört gruba ayrılmıştır. Depresif grubun depresyon ile ilişkili kelimelerde daha çok sahte anı üretmesi beklenirken kaygılı grubun ise tehdit ile ilişkili kelimelerde aynı özelliği yansıtması beklenmiştir. Sonuçlar sadece tehdit ile ilişkili kelimelerde gruplar arası fark ortaya çıkarmıştır. Ayrıca katılımcılar, Beş Temel Kişilik Özelliği Envanteri kullanılarak

her özellikte "düşük" ve "yüksek" olmak üzere iki gruba ayrılmış, kişilik ile gerçek ve sahte anı ilişkisi incelenmiştir. Deneyimlere açıklık özelliğinde yüksek puan alan kişilerin daha az sahte anı üretmesi beklenmiştir. Ancak bu durumun sadece pozitif kelimeler ile geçerli olduğu bulgulanmıştır. Sonuçlar ilgili literatür dahilinde tartışılmıştır.

Anahtar Kelimeler: Sahte anı, Gerçek anı, Depresyon, Kaygı, Kişilik.

To my family

but not least, I am also thankful to my grandfather **Feyzullah Sualp** who has a special place in my childhood memories with his great intellect and heart.

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CHAPTER I

INTRODUCTION

"We all have our time machines. Some take us back, they're called memories. Some take us forward, they're called dreams."

Jeremy Irons
(in The Time Machine, 2002)

We, human beings, have a great system that can take us back and forth in time. In the pragmatic sense, human memory is a system for storing and retrieving information for future decisions, choices and creations. On the other hand, having a great storage of information and memories that can affect our present and future may sometimes be a trade off, especially if we have a great number of negative life events and schemata.

Memory is an important area to explore in order to understand human nature. There are many questions regarding the importance of memory for human beings. Is memory "who we are"? How does memory affect our present and future? How much do psychological disorders depend on our memories? If we had the chance to erase our memories, would we be depressed or anxious at present without those schemas or would we be vulnerable to construct them again due to our personality traits? Infinite number of questions concerning memory may be created. In addition to these questions, memory problems such as impairment (in depression), dissociation (in multiple personality disorder), flashbacks (in PTSD) and the disability to distinguish reality from internally generated information (in schizophrenia) play an important role in mental disorders. As Spiegel, Frischholz and Spira (1993) state "Memory, whether present, absent or disordered, has been at the heart of psychotherapy from the beginning". Therefore it is essential to figure out the general principles

underlying human memory in order to understand their effects on mental disorders and to expand our understanding of "human being".

The following sections of this study will focus on the false memory phenomenon and its relationship with personality characteristics and mood. In the first section, mood congruent memory (MCM) will be reviewed. The second section will focus on false memory. In the third section, individual differences (anxiety, depression, personality traits) that can be related to false memory production will be examined.

1.1 Mood-Congruent Memory

The question if memory can be biased and distorted by emotion has received attention since Sigmund Freud has suggested repression as an important factor for forgetting (as cited in Baddeley, 1997). One of the results of the studies on the relationship between memory and emotion is the concept of "mood congruent memory". Mood congruent memory may be defined as storing and/ or recalling affectively valenced material when one is in a particular mood (Blaney, 1986). This effect has been consistently found in depressed individuals for negatively valenced material and suggested to be a maintaining factor for depression (Watkins, Vache et al., 1996).

Most of the studies on mood congruent memory bias are based on three theoretical models. The first one is Beck's in which the schemas are basic structural components of cognitive organization. According to Beck, when specific schemas are activated, they directly affect the person's perceptions, interpretations, and memories at a given time (Beck, 1976). In depression, schemata are distorted toward loss and failure whereas in anxiety, it is distorted toward danger and vulnerability. Therefore the theory would predict a mood-congruent memory bias in depression and anxiety due to distorted schemata (Becker & Rinck, 2005).

The second model is Bower's Semantic Associative Network Model. In this model, distinct nodes represent emotions, knowledge and experiences. When a node is activated, this activation spreads automatically to other associated nodes depending on the strength of connection. The activation of concepts and experiences

associated with the activated negative emotion would be higher for depressed or anxious individuals leading to mood-congruent memory bias (Mineka & Sutton, 1992).

The third model belongs to Williams et al. who adapted Graf and Mandler's approach proposing two phases in cognitive processing: pre-attentive and elaboration phases. Pre-attentive phase is an automatic process whereas elaboration is a strategic one. Elaboration includes the association of the stimulus with other materials in the memory (Ridout et al., 2003). Threat value is evaluated at the pre-attentive phase whereas negativity is evaluated at the elaboration phase. Therefore attentional bias is expected for anxiety and memory bias is expected for depression (Mineka & Sutton, 1992). In other words, anxious individual attend to threatening material during the pre-attentive stage. On the contrary, they tend to shift attention away from threat during the elaboration stage. This may be an avoidance strategy for anxious individuals. However, depressed individuals elaborate depression related stimuli which results in improved memory for them (Becker and Rinck, 2005).

1.1.1 Mood Congruent Memory Bias in Depression

DSM-IV criteria for Major Depression includes depressed mood, loss of interest/ pleasure, significant weight loss/ gain, sleep disturbance, feelings of worthlessness and inappropriate guilt, recurrent thoughts of death/ suicide and diminished ability to think, concentrate and make decisions. In addition, depressed people have a highly interconnected self system of negative content which is suggested to be influencing the information processing (Dozois & Dobson, 2001).

Furthermore, depressed individuals are characterized by impairment in overall memory performance and mood congruent memory bias toward negative information. The depressed individual is preoccupied with the negative events of her or his life and losses which s/he associates with the negative aspects of her or his character. In addition, s/he tends to encode and recall the material that is consistent with the mood s/he is in (Caballero & Moreno, 1992). Many studies consistently revealed mood congruent memory bias even with unconscious processing (Blaney, 1986; Watkins & Vache et. al., 1996). This kind of memory bias is consistent with

Beck's Model which emphasizes the effect of schemas on information processing. As depressed individual has distorted schemas toward negative information such as loss and failure and as these schemas are more readily available, the individual tends to encode or remember negative aspects of any given information. In addition, the depressed individual has a tendency to distort information to fit with her or his schemas by using cognitive distortion mechanisms such as filtering positive information, black and white/ polarized thinking, catastrophizing and overgeneralization. In spite of negative self-schemas and recalling self-referent negative information, depressed individuals tend to identify schema consistent negative information both in relation to self and others (Johnson & DiLorenzo, 1998).

In a study (Watkins et al., 1992), positive, neutral, depression related, and physical threat related words were used as verbal stimuli to investigate the mood congruency effect in depression. Results revealed an explicit memory bias with words related to depression but not with words associated with physical threat. In explicit memory tests, the subjects are aware of being tested on memory. Conversely, implicit memory tests measure the subjects' retrieval when they are unaware of the memory test (Watkins et al., 2000). The authors concluded that this bias was specific to depression related information rather than all negative information. Hunt and Denny (1992), compared the depressed and nondepressed individuals' memory for affectively valenced words by explicit and implicit tests. In the explicit test, depressed individuals recalled significantly more negatively valenced words than positively valenced words. On the other hand, nondepressed individuals recalled significantly more positively valenced words than negatively valenced words. They did not find any difference under implicit test condition. On the other hand, another study (Ellwart et al., 2003) investigated the memory deficits and mood congruent memory in depressed inpatients. They found a mood-congruent bias in implicit memory whereas they did not find this effect in explicit memory.

Murray et al. (1999) examined mood congruence effect with subclinically depressed individuals. After studying negatively and positively valenced words, subjects were given an unexpected forced recall test. Nondepressed individuals

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confidently reported more positive words than dysphoric individuals. However, dysphoric subjects made significantly more correct guesses of positively valenced words. The authors suggested that dysphoric individuals possessed a response bias and diminished motivation rather than a deficit in encoding.

Although most of the studies on MCM memory found a tendency to recall negative information, the ones using signal detection analysis reveal a tendecy to report negative material which was not presented. In signal detection analysis, the words that were not presented but recalled (false alarms) are taken into account. The results of the studies that use signal detection analysis imply mood congruent false recognition rather than a genuine memory bias.

1.1.2 Mood Congruent Memory Bias in Anxiety

Anxiety disorders share three main factors: somatic arousal (triggered by internal or external stimuli), avoidance, and the (real or imagined) perception of threat, or threat cognition (catastrophic beliefs, subjective experience of having limited personal control over feared events, hypervigilance to feared stimuli, self focused attention). In addition, these factors affect each other reciprocally (Dozois & Westra).

Although Beck's Model predicts mood congruent memory bias in depression and anxiety, the results of the studies on mood congruent memory in anxiety is contradictory (Baddeley, 1997). Some of the studies report memory bias (Eysenck & Byrne, 1994; Richards & French, 1991; Russo, Fox, Bellinger & Nguyn-van-Tam, 2001) whereas others do not support this finding (Bradley, Mogg & Willias, 1994; Nugent & Mineka, 1994; Richards, French, Adams, Elridge & Papadopolou, 1999; Russo, Fox & Bowles, 1999). On the other hand, anxiety is associated with an attentional bias toward themes of danger and threat (Papageorgiou & Wells, 1999; Bradley, Mogg, Falla & Hamilton, 1998; Byrne & Eysenck, 1995; Mogg, Bradley & Hallowel, 1994). Attentional bias may be defined as directing attention to the stimuli that is consistent with one's mood. This bias is widely measured with Stroop Task in which the person has to name the color of the word that is semantically associated

with threat. Anxious individuals are slower at indicating the color of the stimuli as they attend to the meaning which is threatening.

In a relevant study, Becker and Rinck (2005) compared the cognitive functioning of patients with social phobia, depression and healthy subjects. They found that both disorders were related with an attentional bias for disorder-relevant words whereas only depressed patients had a preference for recalling negative material.

Russo et al. (2001) suggested that more shallow processing procedures would lead to memory bias in anxiety. They stated that intentional learning contributed to highly encoding of the material without leaving space for evaluating further emotional factors. They used a stroop task and found explicit memory bias for threat related information. On the other hand, Dowens and Calvo (2003) used signal detection analysis, in which the words that were not presented but recalled were taken into account, and found that it was not a genuine memory bias but a response bias that was observed in anxious individuals. Russo et al (2006) asserted that this finding may be due to small sample size. In their study, 80 individuals with high and low trait anxiety were recruited. Results revealed memory bias for physical threat words in high trait anxious people. However, they stated that the memory bias observed may not be seen with social threat words.

In addition to findings with high trait anxious individuals, there is evidence that some anxiety disorders such as Post Traumatic Stress Disorder, Panic Disorder and Obsessive- Compulsive Disorder are related to memory bias for threat related information (Coles and Heimberg, 2002). On the contrary, Generalized Anxiety Disorder and Social Phobia are not characterized with memory bias.

1.2 False Memory

In our daily lives, we depend on our memories for the way we think, feel or make our choices. Are these memories accurate and fully accountable? This question interests many researchers in the field of memory. "False memory" can be defined as remembering the events that has never happened or remembering them in a distorted way. Although this phenomenon has its roots in the studies of Binet on how

suggestibility affects the magnetic treatments applied by Mesmer, the current interest in the topic is due to child abuse cases (Brainerd, 2005).

Throughout 1990s, there were a high number of people who remembered to be abused as a child after undergoing psychological intervention (Strange, Garry & Sutherland, 2003). Some of the claims that were raised by these people were nearly implausible such as remembering to be abused at the age of six month or intergenerational satanic ritual abuse (Loftus, 2002). In addition, a large number of patients who came to believe they were abused as a result of therapy work, later stated that their memories were false (Loftus, 2002).

According to some researchers, our memory is affected by the post event information. Therefore memory is not a mirror of the past but includes reconstructions and distortions. Loftus, Hyman and colleagues have offered a model of memory reconstruction (Hyman & Loftus, 1998). In this model, false memory is constructed and believed in three stages. Firstly, people must regard the event to be reasonable. Then they must conclude that they were likely to have experienced the event. Lastly, they must make a source monitoring error. In other words, they must confuse their thoughts, feelings and fantasies about the event as genuine memories. Although people usually trust their memories, true and false memories share many characteristics that it is difficult to determine which memories are true and which are false (Lampinen, Neuschatz & Payne, 1998).

Two memory distortion mechanisms were offered; autosuggestion which is endogenous/ internal and suggestion which is exogenous/external (Binet as cited in Brainerd, 2005). External factors include some techniques used in therapy such as dream interpretation and guided imagery that are suggested to increase the probability of creating false memories (Lindsay & Read, 1994; Roberts, 2002). Guided imagery includes guiding the patient to form a mental image of any situation (Roberts, 2002). Although it helps the patient to recover any memories that is of importance, it also increases the rates of false memories (Hyman & Pentland, 1996). In many cases such as suggestive questioning, memories may be affected by post event information. In addition, memories that had never been experienced may be implanted. There are many examples of experimental manipulation of false

memories in which misleading information is used. For instance, in a relevant study, half of subjects became convinced by imagination that they saw a non–existent film of the car crash in which Princess Diana was killed (Ost, Vrij & Costall, 2002).

In a study (Mazzoni & Loftus, 1999), authors tried to imitate the therapy experience in their experiment. The participants were given questionnaires about the likelihood of some early childhood experiences happening to them. One of these experiences was being lost for a long period of time and feeling abondened by their family before the age of three. Half of these subjects were selected for a following study that included dream interpretation. Subjects brought their recent dreams to a radio psychologist who interpreted all these dreams as the subject was lost in a public place for a long time and felt lonely and abandoned by his family. In addition, the psychologist emphasized that traumatic experiences may be repressed in memory but they may be expressed by dreams. A couple of weeks later, they filled out the same questionnaire that was presented before dream interpretation process. Results showed that control subjects responded as they had before whereas majority of subjects who engaged in dream interpretation were confident that they were lost in a public place before the age of three (Loftus, 2001 as cited in Loftus 2002).

In addition to these suggestions made by external sources, the person may have some individual differences that increase the risk of false memory creation. High creative imagery and dissociative experiences are individual differences that were identified to be positively related with false memory vulnerability (Hyman & Billings, 1998). In addition, the schemas may lead to false memory creation as it is the case in Bartlett's (1932) famous "War of Ghosts" experiment. In this experiment, subjects were presented with a story about two men, later they were asked to remember the story at different time intervals. He found that subjects used omission, normalizing, rationalizing and reconstruction to fit the story with their existing schemas. Therefore he concluded that people reconstruct the information on the basis of their world knowledge and experience.

Furthermore, false memory phenomenon has been studied for emotionally valenced material. Kensinger (2004) compared false recall and recognition between non-clinical young and older adults. The results revealed that both young and older

adults were less likely to create false memories with emotional lures relative to the neutral ones. The authors suggested that both groups used the distinctiveness of emotional lures to reduce false recognition and recall. In addition, false memories were found to be detectable by 'know' versus 'remember' judgments (Smith, Gleaves, Pierce et al., 2003). In other words, people mostly assigned "know" responses to false memories whereas they assigned "remember" responses for truly recovered memories. On the contrary, some studies found that "remember" responses were mostly assigned to false memories (Roediger and McDermott, 1995). Remember/Know procedure was found by Tulving (1985 as cited in Pesta, Murphy and Sanders, 2001). "Remember" responses are given if the decision is based on recollection rather than a sense of familiarity and they reflect a vivid, specific memory of the item's being presented in the list (Wixted & Strech, 2004; Pesta et al., 2001). On the other hand, "know" responses indicate that the item is only familiar but there is not a specific memory of the occurrence of the item (Pesta et. Al, 2001). Although Kensinger (2004) found that emotional lures decreased false memory, they may be expected to lead to higher levels of false recognition based on the assumption that they may activate more associates in the minds of people as compared to neutral ones.

1.2.1 Deese-Roediger-McDermott Paradigm

Interest in false memory led researchers to find out new ways to study this phenomenon (McDermott & Watson, 2001). Deese-Roediger-McDermott (DRM) paradigm was adapted from Deese (1959 as cited in McDermott & Watson, 2001), who developed the technique for other purposes, in 1995 to examine false memory. This paradigm involves presenting subjects with words that are all related to a critical lure word which is not presented. In the recognition (or recall) test, subjects report critical lures as presented. For instance, the associate words of *sleep*, "*bed*, *rest*, *awake*, *tired*, *dream*, *wake*, *snooze*, *blanket*, *doze*, *slumber*, *snore*, *nap*, *peace*, *yawn*, *drowsy*" are presented to the subjects whereas the critical lure *sleep* is not. The subjects falsely recognize or recall "sleep" as presented. This effect is seen as a consequence of normal human information processing system and high levels of

false recall (and false recognition) has been consistently replicated (Roediger & McDermott, 2000). In addition, participants state being highly confident that the critical lures were presented in the list (Roediger &McDermott, 1995) and claim to recall or recognize the critical lures consciously rather than having a feeling of familiarity (Roediger & McDermott, 1995; Bredart 2000).

Furthermore, false memories drawn out by DRM paradigm are robust across diverse clinical populations including schizophrenia (Moritz et al., 2004) and Alzheimer's Disease with dementia (Balota et. al., 1999). There is a wide range of studies investigating the false memory phenomenon with taking into account different measures and materials.

Pesta, Murphy and Sanders (2001) examined if emotionally valenced critical lures led to false memory or not. They found that people made more false alarms for non-emotional lures as compared to emotional ones. However, once they have falsely recognized the emotional critical lure, they were most likely to assign "remember" judgment. This finding is important as people are found to be remembering the things they assigned "remember" responses as real once they have forgotten the source of information which is known as " a bias toward real" (Kelly, Carrol and Mazzoni, 2002).

Furthermore, in a study that investigated false memory in short term memory, false alarms to critical lures were found to be slower than hits to list items. This implies that latency data can be used to distinguish between true and false memories in DRM paradigm (Coane, McBride, Raulerson & Jordan, 2007).

There have been a wide range of theoretical frameworks suggested to explain false memory elicited by DRM paradigm such as Fuzzy Trace and Source Monitoring Models. These two models, seem contradictory in a way and promising and they are mentioned broadly in the following section. The idea behind source monitoring explanation is that during memory test, people must differentiate the words that come to mind earlier in the study session from the ones that were presented in the study lists (Johnson, Hashtroudi & Lindsay, 1993). Warning people about the false memory effect before they study the list slightly decreases the false remembering effect (McDermott & Roediger, 1998). However, providing such

warnings before the retrieval does not lead to any decreament in false memories (Gallo, Roediger & McDermott, 2001). This result is seen as evidence that the monitoring process cannot differentiate memories created during encoding as they were already formed (McDermott & Watson, 2001). On the other hand, Fuzzy-Trace Theory postulates that there ara two types of memory traces which are encoded and stored in a parallel fashion: verbatim and gist traces (Brainerd, 2005). Verbatim traces include specific details such as sound, vision etc. In other words, they include the details of the actual occuring of an event whereas gist traces encompass the meaning. At the time of the retrieval, they are used to decide whether any event occured or not. False memories that occur in DRM paradigm, is explained as "more reliance" to gist traces.

Altough experimental settings are criticized not to be same as real life situations, as Roediger and McDermott (1995) acknowledges

> Despite conditions much more conducive to veridical remembering than those that typically exist outside the lab, we found dramatic evidence of false memories. When less of a premium placed on accurate remembering, and when people know that their accuracy in recollecting cannot be verified, they may even be more easily led to remember events that never happened than they are in the lab.

1. 2.2 Source-Monitoring Framework

One of the promising explanations for false memory phenomenon is source-monitoring framework (SMF). Source monitoring is defined as an attribution process in which the person decides on how memories, knowledge and beliefs are acquired (Johnson, Hastroidi & Lindsay, 1993). Namely, the original source of information is determined in this process (Johnson et al., 1993). SMF is an extension of Reality Monitoring Model that was suggested by Johnson and Raye (1981 as cited in Brainerd, 2005). The Reality Monitoring Model concerns the processes by which the actual and imagined memories are distinguished (e. g. Did I turn the oven off, or did I think about turning it off? Did I go to Disneyland or did I only imagine or dream about going?). The SMF includes reality monitoring and other source dimensions such as the time, place and the actors of any given event. According to SMF, people do not store memories with their sources but infer them from perceptual, semantic,

and affective content of the thoughts (Brainerd, 2005). In other words, source monitoring decision is made upon the qualitative characteristics of memories such as perceptual, affective, spatial, semantic and temporal details (Johnson et al., 1993). People distinguish between real, imagined or dreamed events and internal or external sources of memories by this process (Hoffman et al., 2001). Internal sources may comprise imagination, dreams or hallucinations whereas external sources may include written texts, pictures, verbal utterances etc. (Brainerd, 2005). Although people may sometimes be aware of SM processes, mostly they are made rapidly with little conscious effort.

According to source monitoring framework, false memory occurs when the individuals misattribute the source of internally generated information to external stimuli. For example, in DRM paradigm, the words presented in the study list cause the person to generate associated words when encoding the stimuli. As a result of source monitoring deficiency, during retrieval, the person states that self-generated words were presented in the encoding list. In addition, Roediger and McDermott (1995) suggested that if the associated words are activated nonconsciously, remember responses would not be expected to be at high levels. Therefore they stated that people may be consciously thinking about the critical lure when they are studying the list items and later they may be confusing the source at the recognition test phase.

In addition, children are more prone to source monitoring errors which are related to and raise the issues of abuse and eyewitness testimony. Increased cognitive availability, context, affect and individual differences are proposed to be related to the source monitoring errors made by children (Bourchier & Davis, 2002). Further, personality factors, mental health problems and cognitive individual differences may be influencing factors in source monitoring process (Heckanen & McEvoy, 2002).

1.2.3 Fuzzy-Trace Theory of False Memory (FTT)

Fuzzy- Trace Theory was firstly suggested by Brainerd and Kingma (1984, as cited in Brainerd, 2005). The theory states that there are two types of memories called "verbatim" and "gist" (Lindsay & Johnson, 2000). Verbatim memories include

surface level sensory information and specific details of any item whereas gist memories represent the semantic, relational and elaborative information (Brainerd, 2005). These two kinds of traces are stored in a parallel fashion. In fact, the accommodation of verbatim traces in order to construct gist memories is not necessary. It is known that people start to process and store the meaning of information after a 30-50 milliseconds of the onset (Brainerd, 2005). At the retrieval these two forms of memories act as dissociated from each other. In other words, at retrieval people may use either of them which are opposing in terms of the decision of false memories. Verbatim traces help to truly recognize/recall whereas gist traces may lead to false memories. However, verbatim traces are more prone to interference and decline over time but gist memories exist for a long time.

According to the theory, false memory occurs when people depend on the gist memories rather than verbatim. In addition, if the gist memories are very strong they may be confused as verbatim memories which leads to false memory creation (Lindsay & Johnson, 2000).

1.3 Individual Differences in the Creation of False Memories

According to Gudjonsson and Clark's (1986 as cited in MacFarland and Morris, 1998) model of interrogative suggestibility, suggestibility depends on the coping mechanisms that people use when faced with an interrogative situation. The deficits in coping and problem solving make an individual prone to suggestion (Gudjonsson, 1992 as cited in MacFarland and Morris, 1998). Deficits in coping is related to negative affect and trait domains such as depression (Gotlib, Lewinsohn, & Seeley, 1995). Therefore suggestibility would be expected to be higher in people using maladaptive coping strategies that are related to negative personality characteristics and mood. In addition to the importance of variables that may increase false memory creation, the reverse effect may be possible. In other words, cognitive variables such as false memory may be leading or maintaining factors in the case of emotional problems such as anxiety and depression (Ingram, Smith, Kendall, Donnel & Ronan, 1987). Therefore it is necessary to examine the relationship between these variables and moods.

1.3.1 Anxiety

Anxiety may be defined as self-preoccupation that includes self awareness, self-doubt, and self depreciation. These characteristics may result in the intrusions on information processing of human beings. The anxious individual may be overly worried about threats, danger, and the lack of capacity to cope with these (Sarason, 1975 as cited in Sarason & Spielberger, 1975). According to Beck, there are some cognitive distortions in anxiety disorders. These include repetitive thoughts of danger, stimulus generalization for fear and reduced ability to reason fearful thoughts (Beck & Rush as cited in Sarason & Spielberger, 1975).

Although anxiety is an area of interest in memory research, it has not been studied systematically to determine its effects on false memory production (Corson & Verrier, 2007). In a relevant study (Wenzel, Jostad , Brendle , Ferraro , Lystad, Trull & Peiffer, 2004), DRM paradigm was used to investigate whether anxious and fearful individuals display higher rates of false recall and recognition for threat relevant non-presented words than non-anxious counterparts. In the first part of the study, four word lists that were associated with the critical words "spider", "blood", "river", and "music", which were not presented in the study list, were presented to 39 spider fearful individuals, 28 blood fearful individuals, and 41 nonfearful individuals. In the second part, 48 socially anxious and 51 nonanxious individuals were presented with four lists associated with social/evaluative threat critical lures and four lists associated with neutral unpresented critical lure words. The findings showed that groups did not differ in terms of false memory production.

In an another study (Nadel, Payne, Thomas & Jacobs, 2002), half of the participants were induced stress before engaging in DRM task. Stress was induced using Trier Social Stress Test (TSST) that reliably brings about moderate levels of psychological stress (Kirschbaum et al., 1993 as cited in Nadel et. al). After mood induction, subjects were required to give a 5 minute speech in front of one-way mirror. They were told that three trained investigators were located behind this mirror who would evaluate their performance. On th other hand, control group performed a nonstressful spatial memory task in spite of giving a speech. Results

revealed that stress led to an increase in false memories produced in DRM. In addition, when the control subjects falsely recognized lure words, it took an unusually long time to do so. This was interpreted as indicating some level of differentiaton when the subjects were not induced stress.

Roberts (2002) examined the effects of trait anxiety, depression, imagery and stress on the vulnerability to false memory. Participants were presented with a series of pictures and words. Later they they were tested on the recall of the pictures. The words that were recalled as pictures were the false memories. Results showed that subjects with high vivid imagery were likely to make memory errors when they were stressed. In addition, low trait anxious participants assigned 'remember' judgement to a false memory at a high stress time. However, trait anxiety and depression were not correlated with false memory. Further, Peiffer & Trull (2000) examined the relationship between suggestibility to false memory and negative affect, as measured by Positive And Negative Affect Schedule (PANAS), in young adult women. There was a tendecy for women with negative affect to produce false memories.

1.3.2 Depression

Depression is characterized by ruminating on negative life events and their consequences for the self (Uttl et al, 2006). There is evidence that depressed or moderately sad people recall more negative autobiographical memories related to loss as compared to non-depressed (Lyubomirsky et al., 1998). There are many types of mental disorders that have depression as either central or a peripheral hallmark (Dozois & Westra, 2004). Anxiety and depression both exhibit high rates of comorbidity with axis 1 and 2 disorders (Dozois & Dobson, 2002, Hammen, 2001 as cited in Dozois & Westra, 2004). In addition, at the symptom level, the correlation between anxiety and depression is .61 on self reports (Dobson, 1985). The commonolaties that exist between them and the high comorbidity rates have led to skepticism on whether they are two distinct disorders (Cole & Truglio & Peeke, 1997; Dobson, 1985; Mineka, Watson & Clark, 1998). However, studies on the diagnostic, psychophysiological and treatment areas suggest that they are two distinct psychological problems (Foa & Foa, 1982; Roth & Mountjoy, 1982 as cited in

Ingram et al., 1987). In addition to these studies, the finding that even depressive children had lower rates of recall for positive material when the anxiety was controlled for (Gençöz & Gençöz, Voelz, Pettit & Joiner, 2001) supports the notion that anxiety and depression are distinct disorders with specific information processing patterns.

In a study (Torrens, 2005), the effect of dysphoria on mood congruent false memory was investigated. Study sample included 146 undergraduate students. They were presented with negative and positive word lists. After encoding phase, they were instructed to recall the words. According to results, dysphoria was not associated with false memory fo keywords that were negatively valenced. The author concluded that mood congruent memory biases associated with depression did not extend to mood congruent false recall for negative information.

Holtgraves and Athanassopoulu (2004, as cited in Torrens, 2005) compared mildly depressed individuals and normal controls on the memory and judgements of another person. The participants read stories that were positive or negative and they were instructed to form an impression of the story target. Later they were asked to make several judgements related to the target and to recall the stories. Depressed individuals were more likely to produce negative intrusions for both negative and positive stories. On the other hand, they did not recall more negative information correctly as compared to healthy individuals. In addition, MacFarland and Morris (1998) found that dysphoric individuals were more suggestible to false memory than non-dysphoric individuals.

Further, Moritz, Glascher and Brassen (2005) examined mood-congruent false memory in depression. He used a variant of DRM paradigm. There were four categories of words; depression-relevant (i.e, loneliness), delusion-relevant (betrayal), positive (holiday), or neutral (window). The words in each list were associated with a critical lure word that was not presented to the subjects. Depressed patients made more false recognition errors for emotionally charged words, particularly for depression-relevant ones. In addition, veridical recognition of emotional words was better than neutral words in depressed patients. Futhermore, depressed patients showed more mood-congruent false memories at a trend level and

this effect was significant with unrelated new words that were depression relevant. These findings suggest false memory proneness for negatively valenced information in depressed individuals.

1.3.3 Personality

"Personality trait" is a term used for stable behaviours and beliefs about our enduring dispositions (Matthews et al., 2003). It is based on the assumption that a person is quite consistent about her behaviours and feelings across different situations. Therefore personality is defined in terms of trait labels such as "shy", "assertive" etc. However this does not mean that every individual with the same trait posseses the same characteristics. There are individual differences within the same traits (Allen, 2000).

In 1960s, the trait theory approach to personality started to dominate personality psychology (Allen, 2000). Cattell and Eysenck were the influential names in this tradition. According to Cattel, a trait is a permanent entity that is inborn or develops during life span and manipulates behaviours. Eysenck had a similar view which emphasized the importance of hereditary factors on personality. He stated three dimensions of personality; extraversion, neuroticism, psychoticism. On the other hand, most personality theorists propose five dimensions known as Big Five; extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience.

1.3.3.1 Five Factor Model

Five Factor Model is an influential one that classifies personality in terms of neuroticism, extraversion, openness, agreeableness and conscientiousness. People who have higher scores on extraversion are usually affectionate, talkative, fun loving, active and passionate (McCrae & Costa, 1987). On the other hand, low scorers on this trait are usually reserved, quiet, passive, lonely and lack the ability to express their feelings.

Individuals who score high on neuroticism tend to be anxious, self-pitying, emotional, self-conscious, vulnerable and temperamental. These people are more

prone to experience negative emotions such as depression, anger and anxiety (McCrae & Costa, 1987). In addition, they use maladaptive coping strategies such as avoidance, self-blame, wishful thinking, hostile reactions, confrontative coping or interpersonal withdrawal (O'Brien & DeLongis, 1996).

Openness to experience is defined as seeking out new experiences. High scorers of this trait are imaginative, creative, original, curious and liberal. They tend to experience a diversity of emotions, to prefer variety, and to hold unconventional values (McCrae & Costa, 1987). People low on openness tend to be uncreative, conventional, uncurious, conservative and they prefer routine over new experiences.

Agreeable individuals are the ones who are softhearted, trusting, genereous, acceptant, helpful and altruistic (McCrae & Costa, 1987). On the other hand, individuals with low scores on this trait are ruthless, suspicious, antagonistic, critical, irritable and unfriendly.

The last factor, conscientousness is used for people who are organized, hardworking, punctual, ambitious, self-disciplined and persevering. These people use active and problem-focused coping strategies in their lives (Watson & Hubbard, 1996). These strategies include planning, problem solving, positive reappraisal, and suppression of competing activities (Watson & Hubbard, 1996). People who have low scores on this trait are usually lazy, disorganized, aimless and negligent (Feist&Feist, 2006).

These personality traits are found to be correlated with specific disorders (Bienvenu et al., 2004). For instance, low agreeableness and low conscientiousness were related to social phobia whereas neuroticism was correlated with the acuity of the disorders. Therefore personality traits are important structures for psychological well being that may be affecting certain aspects of human beings.

1.3.3.2 Personality and Memory

Neuroscientists and some cognitive psychologists state that personality is built upon the experiences stored in memory. In other words, people need memory in order to say "that is me" or "myself" (Hayward & Varela, 1992 as cited in Yao, 2006). Literature on the topic reveals that we do not have to directly remember the

actual events or experiences to know and describe our personality traits. For instance, R. J, an autistic individual whose retrieval of episodic memory is impaired but whom has consensually accurate knowledge of his personality traits, is a reported case in the literature. This fact is explained by the trait summaries stored in memory. In other words, we are able to store generalizations about ourselves and others independent of the experiential memories (e. g. Mom: often kind) (Klein, Cosmides, Murray & Tooby , 2004).

In addition, personality characteristics may be related to individual differences in memory construction and retrieval. Heffernan and Ling (2001) found that extraverted individuals were better at prospective memory (future oriented memory) as compared to introverts as measured by Big Five. Furthermore, as a personality trait, neuroticism is correlated with a recall bias for negative information (Ruiz-Cabellero & Bermudez, 2001). However, there is a high correlation between depression and neuroticism (Redman, Harris, Mahmood & Sadler et. al, 2002). Therefore it is hard to differentiate between their effects on recall. Ruiz-Cabellero and Bermudez (2001) investigated the effect of neuroticism and mood on negative personal memories. They found that neurotocism lead to an increase in retrieval of negative memories independent of depression.

In a relevant study (Bradley, Mogg & Perret, 1993), recall of positive and negative trait adjectives was examined in high and low N (neuroticism) participants who were induced either with depressed or neutral mood. Results indicated an interaction effect between mood and trait on the recall of negatively valenced information. When depressed, people with high N recalled better negative material. However, in neutral mood, high level of N was associated with relatively poorer recall of negative information.

In a study (Mayo, 1983), how extraversion, neuroticism, and extraversion × neuroticism are related to processing of pleasant and unpleasant emotional information was investigated. The results showed that extraversion was correlated positively with the processing of pleasant information. On the contrary, neuroticism was associated positively with the processing of unpleasant information. Rubin and Siegler (2004) examined the ralationship between autobiographical

memory and personality traits as measured by NEO Personality inventory. They found that openness to feelings facet was positively correlated with the belief in the accuracy of memories, recollection, sensory imagery and emotion. Higher extraversion and lower neuroticism were found to be related to better memory performance in later age (Meier, Perrig-Chiello,& Perrig, 2002).

1.3.3.3 Personality and False Memory

Ward and Loftus (1985) found that introverted and intuitive individuals, as measured by Myers-Brigg Type Indicator, alone and in combination, were more likely to accept both consistent and misleading post-event information. They have predicted that introverts would be more vulnerable to misleading information as they are characterized by higher arousal as compared to extraverts. In addition, they expected intuitives to be more prone to memory errors as they realize the world less directly whereas sensing individuals rely on their five senses to decide what is true. Findings were confusing regarding the fact that intuitive and introverted people displayed higher levels of acceptance for both consistent and misleading information.

In addition, Winograd et al. (1998) found that self report of dissociative experiences as measured by Dissociative Experiences Scale (DES, Bernsteim & Putnam, 1986) was predictor for false memory. Although there is litte agreement on the definition of dissociation, it may be defined as mental states that lack integration or associative links (Braude as cited in Radden, 2004). Furthermore, vivid imagery was found to be correlated with false memory production (Pentland & Hyman, 1996). In addition to these, Avila and Stein (2006) examined the relationship between false memory and neuroticism as measured by Big Five. The study sample was 150 college students. The results revealed that people with high levels of neuroticims were more vulnerable to produce false memories for negatively valenced words as compared to people with low levels of neuroticism. In addition, these individuals were better at remembering negatively valenced words.

Furthermore, some individual differences such as intelligence, acquiescence, and agreeableness were mainly related to immediate acceptance of misinformation,

whereas others such as imagery ability were associated with delayed acceptance of misinformation (Liebman, McKinley-Pace, Leonard et al., 2002).

Ryan (1998) claimed that there may be a relationship between personality integration and false memory. Individuals whose personality is not well integrated may have difficulty maintaining, directing and shifting attention. In addition, these individuals may have unintented semantic intrusions into awareness. These intrusions may be confused as memories. He found support for his hypothesis as open people were better at differentiating between true and false information measured by DRM. However, the words used in the study were not emotionally valenced. Therefore it is an area to explore if people high in openness to experience exhibit a difference on false memory production for emotional material.

1.3.3.4 Openness to Experience

"We cannot change anything until we accept it. Condemnation does not liberate, it oppresses."

Carl Gustav Jung, 1973

Openness to experience is a personality trait that stemmed from the psychoanalytic and humanistic approaches (Tesch & Cameron, 1987). Openness to experience take different names such as intellect, intelligence, culture. The most widely argued term is "intellect". This label implies that people who are open to experience are also intelligent. However, the correlational findings between WAIS scores and openness to experience show that these people are only slightly above the low scorers of this trait. It seems plausible to say that open people are characterized by intellectual interest rather than intellectual ability (McCrae, 1994). In other words, the term includes facets of intelligence but it is a broader one (McCrae & John, 1992; Brand, 1994).

Rogers' (1959 as cited in Pearson, 1968) definition of openness to experience includes complete availability of all experience to conscious awareness and a perceptual-symbolic process that keeps experience and symbolization congruent. On the opposite pole of openness to experience is defensiveness. Open people are able to symbolize experiences in their minds whereas defensive people are either unable to symbolize or symbolize experiences in a distorted way (Rogers, 1959 as cited in Pearson, 1968). From this perspective, openness to experience includes the acceptance and assimilation of new experiences within the individual's internal system.

Currently, openness to experience encompasses tolerance for the unfamiliar, interest in new ideas and problems, active imagination, aesthetic sensitivity, preference for variety, intellectual curiosity, and independence of judgment and appreciation of experiences feelings, actions and values (Tesch & Cameron, 1987). Open people actively search for novelty and they have a quarry to clarify, intensify and experience new things (Canaday, 1980 as cited in McCrae, 1994). They possess divergent thinking and ability to associate and incorpoorate different kinds of information (McCrae, 1994). These individuals are open to both ideas and feelings (Trapnell, 1994). They tend to use adaptive coping strategies such as humor (McCrae & Costa, 1986), positive reappraisal (O'Brien & DeLongis, 1996; Watson & Hubbard, 1996), and thinking about or planning their coping (Watson & Hubbard, 1996). In addition, they do not entrust and depend on faith (McCrae & Costa, 1986; Watson & Hubbard, 1996). Furthermore, empathetically responding to significant others is also found to a characteristic of these individuals (O'Brien & DeLongis, 1996). Open individuals tend to have need for cognition which is a construct that was introduced to examine individual differences in motivation for cognitive processing (Sadowski & Gogburn, 1997). In other words, open people tend to adore effortful thinking and not to be affected by irrelevant factors as it is the case with neurotics.

Namely, people high in openness to experience have the ability to accept a variety of external and internal experiences. High level of openness to experience was found to be correlated with identity flexibility (Whitbourne, 1986). In other words, open people may have flexible approach to any stimuli and they may be able

to enjoy the complexity of the any stimuli (Ryan, 1998). On the other hand, people low in openness to experience may have a rigid point of view and they may battle against accepting the complexity of a stimulus but may try to reduce it on the basis of most prominent features of the stimuli (Ryan, 1998).

Enhanced ability of introspection and acceptance that people high in openness to experience possess may be an advantage when discriminating between true and false memories (Ryan, 1998). On the contrary, individuals low in this trait may attempt to process information based on the most basic characteristics as they do not have a tolerance for uncertainty. In addition, low levels of openness to experience is associated with rigidity, conservatism, defensiveness, cognitive inflexibility. Their need for certainty may lead to perceptions and thoughts which are not objected but readily believed by the individual (Ryan, 1998). In this sense, those individuals may be prone to creating false memories. Intolerance for ambiguity is defined as an incapacity for tolerating conflicting emotions and values. Therefore these individuals tend to escape thinking in terms of possibilities but adopt definite and safe ways (Frenkel & Brunswick, 1949 as cited in Nedd & Marsh, 1980). These people tend to perceive ambiguous situations as threat. The responses of these people to new situations and experiences include repressioon, denial, anxiety or avoidance (Budner, 1962 as cited in Nedd & Marsh, 1980).

To summarize, open individuals are more familiar with their inner feelings, experiences and memories. This may lead to lower levels of false memory production as it was the case in Ryan's (1998) study.

1.4 Rationale and Aims of The Study

Mood, personality and memory are effective factors in the creation of "self". The relationship between these aspects needs to be explored in order to extend our knowledge about human mental system. In this regard, false memory is a current debate area which concerns psychology, law and policy. False memory is a widely settled phenomenon that offers an understanding of human information processing. The individual differences that make one vulnerable to the creation of false memory need to be determined. In addition, if false memory may be factor in maintaining the

disorders should be established for the progress of treatments. The current study aims to explore the unique effects of personality traits, depression and anxiety on false memory production as measured by DRM paradigm. In addition, this study aims to explore if people with depression or anxiety exhibit false memories or mood congruent memory bias for emotionally valenced material. To date, few studies have investigated the unique effects of anxiety and depression on information processing and cognitive organization which is important to understand the similarities and differences between two categories of disorders (Dozois & Dobson, 2001).

Namely, this study will examine mood congruent false memory among sub-clinically depressed and anxious individuals by using DRM task. Mood-congruent false recognition but not a mood-congruent memory bias is expected for depressed individuals based on the findings of Moritz et al. (2005). In addition, mood-congruent false recognition for threat related words is expected among anxious individuals as suggested by Dowens and Calvo (2003). If depressed or anxious individuals have a conservative response criterion, and there is a motivational basis for memory impairment, they will have low number of false alarms.

In addition, openness to experience is expected to be correlated with lower levels of false alarms as it is characterized by acceptance and being more familiar with internal events (Ryan, 1998). Moreover, whether the valence of the material affects false memory for open individuals will be examined. Further, whether other personality characteristics (neuroticism, extraversion, agreeableness, conscientiousness and negative valence) are related to false memory production of emotionally valenced words will be explored.

Another aim is to investigate if the reaction times differ for the groups with different types of words (i.e., positive, depression related, threat related and neutral). In addition, whether the types of material lead to differences in the total accurate or false recognition will be explored. Lastly, "remember/ know" responses for the study material will be examined.

1.5 Hypotheses

1. More mood-congruent false alarms for depression related words are expected from the depressed group as compared to the anxious and control groups.

2. More mood-congruent false alarms for threat related words are expected from the anxious group as compared to depressed and control groups.

3. The mixed group is expected to make more false alarms for depression and threat related words as compared to anxious, depressed and control groups.

4. Individuals high in openness to experience domain of personality are expected to display lower levels of false alarms as compared individuals low in openness to experience.

5. Falsely recognized items are expected to have longer reaction times as compared to truly recognized items implying indecisiveness or some kind of awareness.

6. False memory levels are expected to be higher with emotional lists as compared to the neutral list.

7. More "remember" responses for old words are expected as compared to lure words as old words are actually present in the encoding list.

CHAPTER II

2. METHOD

2.1 Participants

Participants were 133 Middle East Technical University (METU) students, consisted of 53 males (40 %) and 80 females (60 %). Two of the participants were excluded from the study as they did not fill out the Big Five Questionnaire. The data of 131 participants of which 40 % was males (n = 52) and 60 % was females (n = 79) were included in the analyses. The mean age for the males was 24.42 (SD = 2.95) and the mean age for the females was 22.98 (SD = 3.71).

2.2 Materials

2.2.1 DRM Word Lists

A variant of DRM procedure was used in this study. Firstly, a learning list was collected in a norming study, in which 76 participants was asked to offer five spontaneous associations for a set of 28 thematic words that were depression-relevant, threat-relevant, positive and neutral. These words were translated from English words that were used by other researchers (Dowens & Calvo, 2003; Denny & Hunt, 1992; Moritz et al., 2005). Three raters chose 7 words from each category. In a preliminary study, 76 Middle East Technical University students were asked to write five associates for each word (see Appendix A). In addition, another three judges rated each word on a seven point scale. One word from each category (i.e., depression-relevant, threat-relevant, positive and neutral) that was assigned the highest rate was chosen. These 4 words served as critical lure items in the test. For each critical lure, lists of 12 associates that were obtained from the norming study (Appendix B) were picked up and they were sorted in descending order according to the frequencies (or associatiative strength) of being reported by people. Repeated measures ANOVA was performed in order to examine if the four lists differed from

each other in terms of mean word length and associative strength. According to the analyses, items in the four lists did not differ in word length (Multivariate F [3, 26] = 0.49, p > .05) and associative strength (Multivariate F [3, 68] = 1.08, p > .05).

In order to choose the items for recognition test, all four word lists were divided into three equal parts (weakly related, moderately related, strongly related to the critical lure word). All parts contained four words. One word from each part was selected to be used as the lure item in the recognition test. From the remaining three words (a total of 9) in each category, two words (a total of six) were chosen to be used as old items in the recognition test. After the lures were taken out, the remaining nine words of four categories (depression related, threat related, neutral, positive) were used as encoding items. At the last step, eight recognition items were created that fit the main themes of the lists. The recognition test consisted of 24 (6 X 4) old items that were presented in the encoding list, 4 critical lures of different categories, 12 lure words (3 X 4) that are not presented but were the associates of four (depression related, threat related, neutral, positive) critical lure words, and 8 (2 X 4) thematic new words created by the experimenter (Appendix C). Namely, there were 48 words in the recognition test.

Beck Depression Inventory (BDI; Beck et al., 1961, Appendix D) was used to measure depression and Trait form of State-Trait Anxiety Inventory (STAI-I; Spielberger, 1969, Appendıx E) was used to measure anxiety. Big Five (Appendix F) was used to measure personality characteristics.

2.2.2 Beck Depression Inventory (BDI)

Depression levels of the participants were measured by Beck Depression Inventory (BDI) that was developed by Beck, Rush, Shaw and Emery (1978). BDI encompasses 21 items that measure emotional, cognitive, motivational, and somatic symptoms which are features of depression. The range of scores is 0- 3 for each item. Highest score that can be obtained from BDI is 63. The scores above 17 points out to clinical depression that needs to be treated. Turkish version of BDI was adapted by Hisli (1988). Split- half reliability of the inventory was found to be .74 (Hisli, 1988). The criterion validity of the inventory was .63 with psychiatry inpatients which was

assesed by correlating MMPI Depression Scale with BDI. In addition, criterion validity with a sample of university students was .50 (Hisli, 1988).

2.2.3 STAI-I

Trait anxiety was measured with Trait form of State Trait Anxiety Inventory (Spielberger, 1969). Trait Inventory is composed of 20 items measuring cognitive, emotional, and physiological correlates of trait anxiety. The range of scores for each item is 1-4. Highest score that can be obntained from the measure is 80. Higher scores illustrate higher levels of trait anxiety. Test- retest reliability of the inentory was assessed among different populations and it was found to be ranging between .71 and .86. The criterion validity of Trait Anxiety Inventory was assessed by comparing the scores of a sample of psychiatric inpatients and healthy subjects. The anxiety levels of the inpatient were found to be significantly higher than the healthy people (p < .01) (Öner, 1977).

2.2.4 Basic Personality Traits Inventory

The version (Basic Personality Traits Inventory) of Big Five that was adapted to Turkish population by Gençöz and Öncül (in progress) was used in the study. In a preliminary study, 100 participants were asked to write down adjectives that defined the individuals who made them feel angry, happy etc. From the 250 words obtained in the preliminary study, 226 words remained after the slang words were dropped out. The data for adaptation was collected from 474 university students. This inventory includes 47 items that are rated on a 5 point scale in which 1 represents "not suitable at all" and 5 represents "fully suitable". The items of the form converge upon 6 traits; namely, extraversion, concientiousness, agreeableness, neuroticism, openness to experience, and negative valence. The Cronbach Alphas were found to be .89 for extraversion, .84 for conscientiousness, .85 for agreeableness, .83 for neuroticism, .80 for openness to experience, and .71 for negative valence, respectively.

2.3 Procedure

Each participant was tested individually. Firstly, the participants were presented with information related to the study and they signed the material that stated the participation was on voluntary basis (see Appendix G). Then participants were informed that they would see lists of words on the computer screen and later they would have to recognize these words among distractor words. A software that was programmed by using Standard Querry Language (SQL) was used for the memory test. The lists were counterbalanced between subjects to avoid recency and primacy effects. Four lists of nine words were presented on computer screen. There were 5 filler words before and after the presentation of word lists. The words in each list were presented in the same order- from strongest to weakest associate- based on the common practice with this paradigm. Each word appeared on the screen for 1500 milliseconds. There was a 500 ms blank screen interstimulus interval between the presentation of each word. Each list was separated by a white, 1-s prompt ("List 1-2-3-4"). The words were presented in uppercase letters. After completing the encoding phase, participants were given written (Appendix H, Mısırlısoy, 2004) and oral instructions about the testing phase.

The participants took a practice test before the testing phase that included seeing five unrelated words on the screen and responding to these five words as "old/ new". They had the chance to take the practice list again by clicking on "take the test again" button. If they decided to progress, "Push any button in order to progress to the experiment" appeared on the screen which was followed by the testing phase. The recognition test was self-paced and, each item remained until the subject pressed a key labeled "old" or "new" to report if the word was new or old. All words were presented in uppercase letters. The reaction time for deciding if the item is old or new was recorded by the computer program. The participants were instructed to be as rapid and as accurate as they can be when responding. In addition, after they gave "old/ new"responses for each word, a pop- up window appeared that asked to choose among remember/know responses. If they could recall the occurence of the word during the encoding list, they were told to assign remember judgment. However, if they knew the word had been in the list but could not remember the exact

appearance, they were told to assign a know judgment (Tulving, 1985 as cited in Roediger & McDeormott, 1995). Participants also completed Beck Depression Inventory (BDI), Trait Anxiety Inventory, and Basic Personality Traits Inventory after they have completed the memory test. The time it took for completing the whole experiment varied between 20 to 45 minutes depending on the individual's speed. At the end of the experiment, an informed consent was given to participants (see Appendix I).

CHAPTER III

3. RESULTS

3.1. Descriptive Information and Group Differences

In order to find out whether any recognition differences exist between people with high or low levels of anxiety or depression, four groups (depressed, anxious, mixed- with both high levels of anxiety and depression-, and control) were formed using median split procedure. The median score was 41 for trait anxiety, as measured by STA-I, and it was 7 for Beck Depression Inventory (BDI). People with scores between 1 and 41 on trait anxiety and scores between 1 and 7 on depression were included in the control group. Participants who scored above 7 on BDI and above 41 on trait anxiety formed the mixed group. Participants with scores above 7 on BDI and scores below 42 on trait anxiety were included in the depressed group. Finally, participants who scored below 8 in BDI and above 41 on trait anxiety constituted the anxious group.

Depression and anxiety levels for the groups (i.e., depressed, anxious, mixed, control) are provided in Table 1.

Table 1. Mean Scores and Standard Deviations for Depression and Anxiety

	Depressed			Anxious			Mixed			Control			Possible Range	F (3, 127)
	N	M	SD	N	M	SD	N	M	SD	N	M	SD		
BDI	15	10.5_b	3.31	14	3.5_c	1.87	50	15.6_a	5.7	52	3.39_c	2.37	0-63	86.93*
Trait Anxiety	15	35.4_c	4.69	14	44.9_b	2.40	50	50.3_a	5.45	52	35.0_c	4.38	20-80	101.83*

Note. The mean scores that do not share the same subscript on the same row are significantly different from each other.*$p < .001$.

3.1.1. Differences between Groups in terms of Trait Anxiety and Depression

Two univariate analyses of variance (ANOVAs) were conducted to determine whether the sample was grouped appropriately. Results revealed significant group differences on the trait anxiety (F [3, 127] = 101.83, p <.001) and depression scores (F [3, 127] = 86.93, p <.001). In order to compare groups with each other, post-hoc analyses were conducted with Tukey's HSD at .05 alpha level. These post-hoc analyses revealed that among all groups, mixed group (M = 50.33) had the highest trait anxiety score which was significantly higher than the anxious (M = 44.93), depressed (M = 35.46) and control (M =. 35.02) groups. Moreover, anxious group had significantly higher trait anxiety scores than the depressed and control groups, both of which did not differ from each other on the trait anxiety measure. Similarly, post-hoc analyses for depression scores showed that the mixed group had the highest score on depression (M = 15.63) which was significantly higher than the depressed (M = 10.53), anxious (M = 3.5) and control (M = 3.39) groups. In addition, the depressed group had significantly higher depression scores than both the anxious and control groups. The control and anxious groups did not significantly differ from each other in terms of depression scores.

3.1.2. Differences between Groups in terms of Personality Characteristics

Means and Standard Deviations of personality characteristics for the whole sample are presented in Table 2.

Table 2. Means and Standard Deviations for Personality Characteristics of the Whole Sample

	Extraversion	Conscientiousness	Agreeableness	Neuroticism	Openness	Negative Valance
Mean	27.88	27.06	33.08	25.28	22.25	10.21
SD	6.16	6.42	3.71	6.55	3.69	3.20
Possible Range	1- 40	1- 40	1- 40	1- 45	1-30	1- 30

In order to examine whether four groups differed in terms of personality characteristics, Multivariate Analysis of Variance (MANOVA) was conducted with 6 personality characteristics as the dependent measures. Results revealed significant Group main effect, Multivariate F (4, 124) = 5.88, p < .001. Univariate analyses were examined to find out the group differences for different personality characteristics. As Table 3 illustrates, there were significant group differences for Extraversion (F [3, 127]= 12.6, p <.001), Conscientiousness (F [3, 127]) = 3.68, p <.05), Neuroticism (F [3, 127]= 16.75, p <.001), and Openness to experience (F [3, 127] = 13.84, p <.001). According to post- hoc analyses conducted with Tukey's HSD at .05 level, the depressed (M = 32.87) and the control (M = 29.98) groups, both of which did not differ from each other, had significantly higher Extraversion scores than anxious (M = 25.36) and mixed (M = 24.92) groups. For Conscientiousness, the control group (M = 29.15) had significantly higher scores than the mixed group (M = 25.11). However, depressed (M = 26.27) and anxious (M = 27.07) groups did not significantly differ from each other and from the other two groups on the conscientiousness dimension. For the Neuroticism dimension, the mixed (M = 29.44) group had significantly higher scores as compared to the depressed (M = 23.13), and control (M = 21.76) groups. The anxious (M = 25.79) group did not differ significantly from all other three groups in terms of neuroticism dimension of personality. For Openness to Experience, the depressed (M = 24.40) and the control (M = 23.92) groups, both of which did not differ from each other, had significantly higher scores than the anxious (M = 20.43) and mixed groups (M = 20.38). The anxious and mixed groups did not differ from each other in terms of Openness to Experience dimension of personality. Lastly, on the measures of Agreeableness and Negative Valence, the Univariate F values were not significant (see Table 3).

Table 3. Group Differences in terms of Personality Characteristics

	Depressed	Anxious	Mixed	Control	Multivariate $F_{(4, 124)}$	Univariate $F_{(3, 127)}$
Personality Characteristics					5.88**	
Extraversion	32.87$_a$	25.36$_b$	24.92$_b$	29.98$_a$		12.6**
Conscientiousness	26.27$_{ab}$	27.07$_{ab}$	25.11$_b$	29.15$_a$		3.68*
Neuroticism	23.13$_b$	25.79$_{ab}$	29.44$_a$	21.76$_b$		16.75**
Openness to Experience	24.40$_a$	20.43$_b$	20.38$_b$	23.92$_a$		13.84**
Agreeableness	33.07	32.93	32.28	33.88		1.61
Negative Valence	10.67	10.29	10.90	9.38		2.09

Note. The mean scores that do not share the same subscript on the same row are significantly different from each other, *$p < .05$, **$p < .001$.

3.1.3. Correlational Information

Correlation analysis revealed interrelatedness between the measures. As expected, the highest correlation was between trait anxiety and depression scores (r = .68, p <.001). In addition, neuroticism dimension of personality and trait anxiety were highly correlated (r = .66, p< .001). This finding was again parallel with the expectations. The highest negative correlation was between openness to experience and trait anxiety (r = -.51, p< .001). The correlation matrix for the measures is provided in Table 4.

Table 4. Correlation Matrix for the Measures

	Trait Anxiety	Extraversion	Conscientiousness	Agreeableness	Neuroticism	Openness to Experience	Negative Valance
BDI	.68***	-.35***	-.26*	-.24**	.47***	-.29**	.19*
Trait Anxiety		-.45**	-.26*	-.22*	.66***	-.51***	.22*
Extraversion			.17*	.37**	-.20*	.60***	-.01
Conscientiousness				.29**	-.073	.16	-.22*
Agreeableness					-.33**	.29**	-.49***
Neuroticism						-.30**	.26**
Openness to Experience							-.05

Note. * p < .05, ** p < .01, *** p < .001.

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3.2. Analyses for Reaction Times

The mean scores of reaction times (in milliseconds) for *positive* (see Table 5A*), depression related* (see Table 5B)*, threat related* (see Table 5C) and *neutral* (see Table 5D) words: namely, critical lure, lures and old words are presented in Table 5.

3.2.1. Group Differences on the Mean Reaction Times of Positive, Depression Related, Threat Related, and Neutral Words: Critical Lures, Lures, and Old Words

Four one-way MANOVAs were conducted to find out if the groups (i.e., depressed, anxious, mixed, and control) differed on the mean reaction times for *positive, depression related, threat related* and *neutral critical lures, lures*, and *old words*. Only the subjects who were correct in their recognition were included in these analyses. In the first MANOVA, mean reaction times for *positively valenced critical lures*, *lures* and *old words* served as dependent variables (see Table 5A). In the second MANOVA, mean reaction times for *depression related critical lure, lures* and *old words* were the dependent measures (see Table 5B). The third MANOVA included mean reaction times for *threat related critical lure*, *lures* and *old words* (see Table 5C). In the last MANOVA, mean reaction times for *neutral critical lures*, *lures* and *old words* were the dependent measures (see Table 5D). As it is illustrated in Table 5, no significant group differences were obtained from these analyses. Namely, groups did not differ on the reaction times for the *lures*, *critical lures* and *old words of* different types (i.e., positive, depression related, threat related and neutral).

Table 5. Mean Reaction Times for Positive, Depression Related, Neutral, and Threat Related Words

Reaction Times	Depressed	Anxious	Mixed	Control	Univariate F (3, 120)	Multivariate F
A. Positive Words						.98, ns
Critical Lure	1462.60	1158.43	1141.31	1579.78		
Lure Words	1519.00	1758.00	1654.20	1587.51		
Old Words	1396.94	1481.58	1525.93	1551.79		
B. Depression Related Words						1.35, ns
Critical Lure	1067.92	1099.69	1460.31	1449.54		
Lure Words	1535.19	1412.64	1560.65	1852.61		
Old Words	1512.64	1512.71	1530.75	1675.14		
C. Threat Related Words						0.98, ns
Critical Lure	1517.30	1400.20	1404.58	1753.73		
Lure Words	1593.27	1537.67	1637.38	1816.22		
Old Words	1371.55	1522.63	1383.90	1397.61		
D. Neutral Words						1.40, ns
Critical Lure	1185.60	1146.07	1237.84	1446.08		
Lure Words	1389.14	1446.78	1627.66	1729.59		
Old Words	1342.22	1618.32	1329.56	1522.32		

Note. ns = non-significant.

3.2.2 T-Test Comparison for the Reaction Times of True or False Recognition of Lure Words of Different Categories

Four paired-samples t-tests were performed to examine whether the participants' mean reaction times for *truly* and *falsely recognized lure words* of four categories (i.e., Positive, Depression Related, Threat Related and Neutral) differed from each other. The results (see Table 6) showed that mean reaction time for *falsely recognized positive lure words* ($\underline{M}$ = 1941.68) was higher than the mean reaction time of *truly recognized positive lure words* ($\underline{M}$ = 1640.61), $\underline{t}$ (87) = -2.46, $\underline{p}$ < .05. Similarly, mean reaction time for *falsely recognized depression related lure words* ($\underline{M}$ = 1921.66) was higher than the mean reaction time for *truly recognized depression related lure words* ($\underline{M}$ = 1629.11), $\underline{t}$ (92) = -2.16, $\underline{p}$ < .05. The mean reaction time for *falsely* ($\underline{M}$ = 1841.05) or *truly* ($\underline{M}$ = 1682.47) recognized *threat related lure words* did not differ from each other, $\underline{t}$ (108) = -1.16, $\underline{p}$ > .05. The mean reaction time for *falsely recognized neutral lure words* ($\underline{M}$ = 1742.51) was higher than the mean reaction time of *truly recognized lure words* ($\underline{M}$ = 1425.39), $\underline{t}$ (80) = -2.71, $\underline{p}$ < .01. As expected, results revealed that people responded in a longer time when they made false decision for *positive, depression related and neutral lure words*. However, the difference between the mean reaction times for *threat related lure words* did not reach significance for true or false recognition.

Table 6. Mean Reaction Times for Truly and Falsely Recognized Lure Words

Reaction Times	Positive	Depression Related	Threat Related	Neutral
False Recognition	1941.68$_a$	1921.66$_a$	1841.05$_a$	1742.51$_a$
True Recognition	1640.61$_b$	1629.11$_b$	1682.47$_a$	1425.39$_b$

Note. The mean scores that do not share the same subscript on the same column are significantly different from each other.

3.2.3 T-Test Comparison for the Reaction Times of True or False Recognition of Old Words of Different Categories

Four paired-sample t-test analyses were performed to examine whether the participants' mean reaction times for *truly* and *falsely recognized old words* of four categories (i.e., Positive, Depression Related, Threat Related and Neutral) differed

from each other. The results showed that mean reaction time for *falsely recognized positive old words* ($\underline{M}$ = 1983.46) was higher than the mean reaction time of *truly recognized positive old words* ($\underline{M}$ = 1553.15), $\underline{t}$ (54) = -2.37, $\underline{p}$ < .05. Similarly, mean reaction time for *falsely recognized depression related old words* ($\underline{M}$ = 2421.90) was higher than the mean reaction time for *truly recognized depression related old words* ($\underline{M}$ = 1616.24), $\underline{t}$ (38) = -3.13, $\underline{p}$ < .01. Also the mean reaction time for *falsely recognized threat related old words* ($\underline{M}$ = 2757.16) was higher than the mean reaction time of *truly recognized threat related old words* ($\underline{M}$ = 1589.78), $\underline{t}$ (40) = -3.04, $\underline{p}$ < .01. The mean reaction time for *truly* ($\underline{M}$ = 1616.24) or *falsely* ($\underline{M}$ = 1861.75) *recognized neutral old words* did not differ from each other, $\underline{t}$ (39) = -1.80, $\underline{p}$ > .05. As expected, results revealed that people responded in a longer time when they made false decision for positive, depression related and threat related old words (see Table 7). However, the mean reaction times for neutral old words did not differ for true or false recognition.

Table 7. Mean Reaction Times for Truly and Falsely Recognized Old Words

Reaction Times	Positive	Depression Related	Threat Related	Neutral
False Recognition	1983.46$_a$	2421.90$_a$	2757.16$_a$	1861.75$_a$
True Recognition	1553.15$_b$	1616.24$_b$	1589.78$_b$	1616.24$_a$

Note. The mean scores that do not share the same subscript on the same column are significantly different from each other.

3.3 Analyses for Accuracy of Recognition

For the analyses, Total Accurate Recognition Scores for different word categories (i.e., Depression related, Threat related, Positive, and Neutral) were calculated that included the accurate responses for 12 items of each category in the recognition test.

3.3.1 ANOVA for Total Accuracy Scores of Different Word Categories

A one-way within-subjects ANOVA was conducted with the factor being Word Categories (i.e., positive, depression related, threat related and neutral) and the dependent measure being the Total Accuracy scores. The results indicated a

significant Word Category effect, Multivariate $\underline{F}$ (3, 128) = 25.09, $\underline{p}$ < .001. Post hoc comparisons with Least Significant Difference (LSD) showed that the total accuracy score for positive words ($\underline{M}$ = 9.45) was significantly higher than the total accuracy score for threat related words ($\underline{M}$ = 8.41). Similarly, total accuracy score for positive words was significantly higher than the total accuracy score for depression related words ($\underline{M}$ = 8.98). Total accuracy score for depression related words was significantly higher than the total accuracy score for threat related words. Lastly, total accuracy score for neutral words (M = 9.98) was significantly higher than total accuracy scores for positive, depression related and threat related words. Namely, accuracy score was highest for neutral words which was followed by positive, depression related and threat related words, respectively (see Table 8).

Table 8. Means for Total Accuracy Scores of Different Word Categories

Positive	Depression Related	Threat Related	Neutral
9.45_b	8.98_c	8.41_d	9.98_a

<u>Note</u>. The mean scores that do not share the same subscript on the same row are significantly different from each other.

3.3.2 T-Test Comparison for the True Recognition of Thematic New Words and Lures

Four paired-samples t-test analyses were performed to examine whether the participants' true recognition was better for *thematic new words* (i.e., Positive, Depression Related, Threat Related and Neutral) that were presented in the recognition test but not in the encoding list as compared to *lures* of different categories (i.e., Positive, Depression Related, Threat Related and Neutral). The results showed that participants truly recognized more *positive new words* ($\underline{M}$ = .89) as compared *positive lure words* ($\underline{M}$ = .64), $\underline{t}$ (130) = 8.58, $\underline{p}$ < .001. Similarly, participants displayed a better recognition for *depression related new words* ($\underline{M}$ = .83) in comparison with *depression related lure words* ($\underline{M}$ = .68), $\underline{t}$ (130) = 5.51, $\underline{p}$ < .001. The means of *threat related lure words* and *new words* did not differ from each other, $\underline{t}$ (130) = .67, $\underline{p}$ > .05. Recognition of *neutral words* was better for *new words*

($\underline{M}$ = .83) as compared to *lures* ($\underline{M}$ = .75). Means for true recognition of lures and new words are presented in Table 9.

As expected, results revealed that people were better at the recognition of positive, depression related and neutral new words as compared to lure words of the same categories. However, there was not any difference in terms of true recognition between new and lure words that were threat related.

Table 9. Means for True Recognition of Lures and New Words

	Positive	Depression Related	Threat Related	Neutral
Lure Words	$.64_b$	$.68_a$	$.53_a$	$.75_b$
New Words	$.89_a$	$.83_b$	$.56_a$	$.83_a$

Note. The mean scores that do not share the same subscript on the same column are significantly different from each other.

3.3.3 Group Differences (Depressed, Anxious, Mixed and Control) on the Total Accurate Recognition Score

For the analyses, Total Accurate Recognition Scores for different word categories (i.e., Depression related, Threat related, Positive, and Neutral) were calculated that included the accurate responses for 12 items of each category in the recognition test. One- way MANOVA was conducted in order to find out whether the groups differed on the total accurate recognition of different word categories (i.e., Depression related, Threat related, Positive, and Neutral). There was a trend for a significant effect of Group on the linear combination of four dependent measures, Multivariate $\underline{F}$ = 1.59, $\underline{p}$ = .09. This result was due to the effect of Group on Total Accurate Recognition of the threat related words, $\underline{F}$ (3, 127) = 4.49, $\underline{p}$ < .01. According to post- hoc comparisons with Tukey's HSD (see Table 18), the mixed group ($\underline{M}$ = 8.98) had significantly higher Total Accurate Recognition Score for threat related words than the anxious group ($\underline{M}$ = 7.43). Depressed ($\underline{M}$ = 7.93) and control ($\underline{M}$ =8.25) groups did not differ from each other and from the other two groups in terms of total accuracy scores for threat related words (see Table 10).

Table 10. MANOVA Results for Total Accuracy Scores

Accuracy	Depressed	Anxious	Mixed	Control	Univariate F (3, 127)	Multivariate F (6, 252)
Word Categories						1.59*
Positive	9.53	9.43	9.62	9.27	0.48	
Depression Related	8.40	9.07	9.32	8.79	2.04	
Threat Related	7.93_{ab}	7.43_b	8.98_a	8.25_{ab}	4.49**	
Neutral	9.67	9.93	10.24	9.83	0.73	

Note. The mean scores that do not share the same subscript on the same row are significantly different from each other, *p < .10, ** p < .01.

3.3.4 Chi Square Analyses for the Accuracy of Recognition of Critical Lures

3.3.4.1 Pearson's Chi Square Analysis for the Accuracy of Recognition of Critical Lures

According to chi square analyses, frequencies of false recognition for *positive* (χ^2 [3, 131] = 1.18, p > .05) (see Table 11), *depression related* (χ^2 [3, 131] = 4.11, p > .05) (see Table 12) and *neutral* (χ^2 [3, 131] = .58, p > .05) (see Table 14) *critical lures* were not above the probability of occurring by chance. However, false recognition for *depression related critical lure* was highest for the depressed group as compared to other three groups (see Table 12). Recognition for *positive* and *neutral critical lures* were nearly perfect (see Table 11 and Table 14). False recognition levels for the *threat related critical lure* was different from the values that would occur just by chance, χ^2 (3, 131) = 8.53, p < .05. Follow-up analysis showed that this was due to the anxious group, χ^2 (3, 14) = 7.09, p < .01. The anxious group had higher true recognition rates than expected. In addition, the depressed group had high levels of false recognition for *threat related critical lure* that was followed by anxious, mixed and control groups (see Table 13).

Table 11. Observed and Expected Frequencies for Positive Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Old-False Recognition	0	0	2 (4 %)	2 (3.8 %)	4
New	15 (100 %)	14 (100 %)	48 (96 %)	50 (96.2 %)	127
Old-Expected	.46	.43	1.53	1.59	
New-Expected	14.54	13.57	48.47	50.41	
Total N	15	14	50	52	

Table 12. Observed and Expected Frequencies for Depression Related Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Old-False Recognition	3 (20 %)	1 (7 %)	2 (2 %)	4 (7.7 %)	10
New	12 (80 %)	13 (93 %)	48 (98 %)	48 (92.3 %)	121
Old-Expected	1.15	1.07	3.82	3.97	
New-Expected	13.85	12.93	46.18	48.03	
Total N	15	14	50	52	

Table 13. Observed and Expected Frequencies for Threat Related Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Old-False Recognition	10 (66.7 %)	5 (35.7 %)	38 (28.8 %)	37 (24 %)	90
New	5 (33.3 %)	9 (64.3 %)	12 (72.2 %)	15 (76 %)	41
Old-Expected	10.31	9.62	34.35	35.73	
New-Expected	4.69	4.38	15.65	16.27	
Total N	15	14	50	52	

Table 14. Observed and Expected Frequencies for Neutral Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Old-False Recognition	0	0	2 (2 %)	2 (1.9 %)	4
New	15 (100 %)	14 (100 %)	48 (98 %)	50 (98.1 %)	127
Old-Expected	.46	.43	1.53	1.59	
New-Expected	14.54	13.57	48.47	50.41	
Total N	15	14	50	52	

3.3.4.2 Chi Square Goodness of Fit Analyses for the Accuracy of Recognition of Critical Lures

Four one-sample chi square tests were conducted to assess whether the responses (old/ new) to critical lures were the same, higher or lower than expected. Expected frequencies were calculated by taking the mean frequencies of responses given to thematic (positive, depression related, threat related and neutral) new words that were not presented in the encoding list but were presented in the recognition test.

3.3.4.2.1 Chi Square Goodness of Fit Analysis for Positive Critical Lure

One-sample chi square test was performed to examine if the frequency of old/ new responses to *positive critical lure* differed from the frequency of the old/ new responses given to *positive new words*. The results of the test were significant, χ^2 (1, $\underline{N}$ = 131) = 9.11, $\underline{p}$ = .003. For the *positive critical lure*, "old" responses ($\underline{N}$ = 4) were given less than expected ($\underline{N}$ = 15). In other words, accuracy of recognition for *positive critical lure* was higher than expected (see Table 15). Depressed and anxious groups did not give any "old" responses to *positive critical lure*.

Table 15. Expected and Observed Frequencies for Positive Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Old-False Recognition	0	0	2	2	4
New	15	14	48	50	127
Old-Expected	1.72	2.60	5.7	6	
New-Expected	13.28	12.40	44.3	46	
Total	15	14	50	52	

3.3.4.2.2 Chi Square Goodness of Fit Analysis for Depression Related Critical Lure

One-sample chi square test was performed to examine if the frequency of responses to *depression related critical lure* differed from frequency of the responses given to *depression related new words*. The results of the test were significant, χ^2 (1, $\underline{N}$ = 131) = 7.87, $\underline{p}$ = .005. For the *depression related critical lure*, "old" responses ($\underline{N}$ = 10) were given less than expected ($\underline{N}$ = 22) (see Table 16).

Table 16. Expected and Observed Frequencies for Depression Related Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Old-False Recognition	3	1	2	4	10
New	12	13	48	48	121
Old-Expected	2.5	2.4	8.4	8.7	
New-Expected	12.5	11.6	41.6	43.3	
Total	15	14	50	52	

3.3.4.2.3 Chi Square Goodness of Fit Analysis for Threat Related Critical Lure

One-sample chi square test was performed to examine if the frequency of responses to threat related critical lure differed from frequency of the responses given to threat related new words. The results of the test were significant, χ^2 (1, $\underline{N}$ = 131) = 31.68, $\underline{p}$ = .000. For the threat related critical lure, "old" responses ($\underline{N}$ = 90) were given more than expected ($\underline{N}$ = 58) (see Table 17). A follow up test indicated that the mixed group ($\underline{n}$ = 38) gave more "old" responses than expected ($\underline{n}$ = 22.1), χ^2 (1, $\underline{N}$ = 50) = 20.40, p <.001. Similarly, the control group gave more "old" responses ($\underline{n}$ = 37) than expected ($\underline{n}$ = 23), χ^2 (1, $\underline{N}$ = 52) = 15.23, p < .001.

Table 17. Expected and Observed Frequencies for Threat Related Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Old-False Recognition	10	9	38	37	94
New	5	5	12	15	37
Old-Expected	6.6	6.2	22.1	23	
New-Expected	8.4	7.8	27.9	29	
Total	15	14	50	52	

3.3.4.2.4 Chi Square Goodness of Fit Analysis for Neutral Critical Lure

One-sample chi square test was performed to examine if the frequency of old/ new responses to *neutral critical lure* differed from frequency of the old/ new responses given to *neutral new words*. The results of the test were not significant, χ^2 (1, $\underline{N}$ = 131) = 1.44, $\underline{p}$ = .23. For the *neutral critical lure*, "old" responses ($\underline{N}$ = 2) did not differ from the expected ($\underline{N}$ = 4.5) frequency (see Table 18).

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Table 18. Expected and Observed Frequencies for Neutral Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Old-False Recognition	0	0	1	1	2
New	15	14	49	51	129
Old-Expected	.52	1.48	1.7	1.8	
New-Expected	14.48	13.52	48.3	50.2	
Total	15	14	50	52	

3.3.5 Analyses for Hits and False Alarms

For the analyses, False Alarm scores were calculated by the given "old" responses for the non-presented words whereas Hit scores were calculated by the given "old" responses to actually presented words (or old words).

3.3.5.1 ANOVA for the False Alarms of Different Word Categories

One-way within subjects ANOVA was conducted with the factor being Word Category and the dependent variable being the means of False Alarm Scores. The results for the ANOVA indicated a significant Word Category effect, Multivariate $\underline{F}$ (3, 128) = 131.87, $\underline{p}$ < .001. Post-hoc comparisons with LSD showed that false alarms for positive words ($\underline{M}$ = 1.37) were significantly higher than the false alarms for neutral words ($\underline{M}$ = 0.83). In addition, false alarms for depression related words ($\underline{M}$ = 1.38) were significantly higher than the false alarms for neutral words. False alarm score for threat related words ($\underline{M}$ = 3.41) was significantly higher than the false alarm score for positive, depression related and neutral words. However, false alarm scores for positive and depression related words did not significantly differ from each other (see Table 19).

Table 19. Means for False Alarm Scores

Positive	Depression Related	Threat Related	Neutral
1.37_b	1.38_b	3.41_a	0.83_c

<u>Note</u>. The mean scores that do not share the same subscript on the same row are significantly different from each other.

3.3.6 ANOVA for the False Alarms of Lures of Different Word Categories

One-way within subjects ANOVA was conducted with the factor being Word Category and the dependent variable being the means of False Alarm Scores of Lures. The results for the ANOVA indicated a significant Word Category effect, Multivariate $\underline{F}$ (3, 128) = 57.95, $\underline{p}$ < .001. Post-hoc comparisons with LSD revealed that false alarms for positive lures ($\underline{M}$ = 1.08) were significantly higher than the false alarms for neutral lures ($\underline{M}$ = 0.75. In addition, false alarms for depression related lures ($\underline{M}$ = 0.97) were significantly higher than the false alarms for neutral lures. False alarm score for threat related lures (M = 1.84) was significantly higher than the false alarm score for positive, depression related and neutral lures. False alarm scores for positive and depression related lures did not significantly differ from each other (see Table 20).

Table 20. Means for False Alarms of Lures

Positive	Depression Related	Threat Related	Neutral
1.08_b	0.97_b	1.84_a	0.75_c

Note. The mean scores that do not share the same subscript on the same row are significantly different from each other.

3.3.6.1 Group Differences (Depressed, Anxious, Mixed and Control) on the Hits of Different Word Categories

One way MANOVA was conducted in order examine whether there was an effect of Group on the Hit score rates for positive, depression related, threat related and neutral words. There was a trend for significance, Multivariate $\underline{F}$ (12, 328.37) = 1.69, $\underline{p}$ = .07. Therefore univariate tests were examined. The effect of Group on the threat related hits was significant, $\underline{F}$ (3, 127) = 3.92, $\underline{p}$ = .01. The mixed ($\underline{M}$ = 5.24) and control ($\underline{M}$ = 5.04) groups had more hits than the anxious group ($\underline{M}$ = 4.21) whereas the depressed group ($\underline{M}$ = 4.80) did not significantly differ from other three groups (see Table 21).

Table 21. MANOVA Results of Hits for Positive, Depression Related, Neutral, and Threat Related Words

	Depressed	Anxious	Mixed	Control	Univariate F (3, 127)	Multivariate F (6, 252)
Hits						1.69*
Positive	4.80	4.57	5.10	4.52	2.14, ns	
Depression Related	4.0	4.36	4.66	4.17	1.73, ns	
Threat Related	4.80$_{ab}$	4.21$_b$	5.24$_a$	5.04$_a$	3.92**	
Neutral	4.60	4.79	5.04	4.65	0.74, ns	

<u>Note</u>. The mean scores that do not share the same subscript on the same row are significantly different from each other, * p < 10, ** p = .01, ns = non- significant

3.3.6.2 Group Differences (Depressed, Anxious, Mixed and Control) on the False Alarms of Different Word Categories

One-way MANOVA was conducted in order to determine the group (i.e., depressed, anxious, mixed, and control) differences on the False Alarm scores of four word categories (i.e., depression related, threat related, neutral, and positive). As it is illustrated in Table 22, no significant results were obtained from the analysis (Multivariate $\underline{F}$ (12, 328.37) = 0.62, $\underline{p}$ > .05).

Table 22. MANOVA Results for False Alarm Scores of Different Word Categories

	Depressed	Anxious	Mixed	Control	Univariate F (3, 127)	Multivariate F (12, 328.37)
Positive	1.27	1.14	1.54	1.29		
Depression Related	1.60	1.29	1.34	1.39		0.62, ns
Threat Related	3.53	2.79	3.42	3.54		
Neutral	0.93	0.86	0.80	0.83		

<u>Note</u>. ns = non-significant.

3.3.6.3 Group Differences (Depressed, Anxious, Mixed and Control) on the False Alarm Scores of Lures

One-way MANOVA was performed in order to examine the group differences on the False Alarm scores for *lures* of different categories (i.e. positive,

depression related, threat related and neutral). The effect of Group on the linear combination of four dependent variables was not significant, Multivariate $\underline{F}$ (12, 328.37) = 0.56, $\underline{p}$ > .05 (see Table 23).

Table 23. MANOVA Results for False Alarm Scores of Lures

	Depressed	Anxious	Mixed	Control	Univariate F (3, 127)	Multivariate F (12, 328.37)
Positive	1.07	1.07	1.22	0.94		
Depression Related	1.00	0.86	0.96	1.00		0.56, ns
Threat Related	2.00	01.57	1.82	1.89		
Neutral	0.87	0.79	0.74	0.71		

<u>Note</u>. ns = non-significant

3.4 Signal Detection Analyses for the Groups (Depressed, Anxious, Mixed and Control)

Sensitivity (d' = Z false alarms- Z hits) and response criterion (ß = Y hits/ Y false alarms) measures were calculated for all test items of four categories (i.e., depression related, threat related, neutral, and positive words). Logarithmic transformation was applied to Response Criterion scores (Dowens & Calvo, 2003).

3.4.1 Group Differences (Depressed, Anxious, Mixed and Control) on the Sensitivity Index of Different Word Categories

A one-way MANOVA was performed in order to assess the effects of Group on the Sensitivity Index of four groups of words (i.e., threat related, depression related, positive, and neutral). As it can be seen in Table 24, no significant results were obtained (Multivariate $\underline{F}$ (12, 328.37) = 0.82, $\underline{p}$ > .05).

Table 24. MANOVA Results for Sensitivity Index of Word Categories

	Depressed	Anxious	Mixed	Control	Multivariate F (12, 328.37)
Response Criterion					0.82, ns
Positive	-3.53	-3.43	-3.56	-3.23	
Depression Related	-2.40	-3.07	-3.32	-2.79	
Threat Related	-1.27	-143	-1.82	-1.50	
Neutral	-3.67	-3.93	-4.24	-3.83	

<u>Note</u>. ns = non-significant.

3.4.2 Group Differences (Depressed, Anxious, Mixed and Control) on the Response Criterion of Different Word Categories

A one-way MANOVA was conducted in order to examine the effects of Group on the Response Criterion of four groups of words (i.e., threat related, depression related, positive, and neutral). The effect of Group on Response Criterion of four word categories was significant, Multivariate $\underline{F}$ (12, 132.58) = 1.81, $\underline{p}$ = .05. Therefore univarite tests were examined. The effect of group on the response criterion of positive words was significant, $\underline{F}$ (3, 53) = 2.74, $\underline{p}$ = .05. However, post-hoc comparisons did not reveal any group differences (see Table 25).

Table 25. MANOVA Results for Response Criterion of Word Categories

	Depressed	Anxious	Mixed	Control	Univariate F (3, 53)	Multivariate F (12, 132.58)
Response Criterion						1.81*
Positive	.49	.68	.43	.31	0.70, ns	
Depression Related	.36	.29	.44	.38	1.41, ns	
Threat Related	.11	0.00	.20	.18	2.74*	
Neutral	.52	.69	.61	.46	2.17, ns	

Note. * $\underline{p}$ = .05, ns = non-significant.

3.5 Analyses for Remember/ Know Judgments

3.5.1 T-Test Comparison for Mean Proportions of Remember/ Know Judgments for Old Words of Different Categories

Four paired sample t-tests were conducted in order to compare mean proportions of "remember/ know" responses for old words of different word categories (i.e., positive, depression related, threat related and neutral). Results revealed that "know" responses ($\underline{M}$ = .68) for positive old words were significantly higher than the "remember" responses for ($\underline{M}$ = .32) the same words, $\underline{t}$ (130) = 7.03, $\underline{p}$ < .001. Similarly, "know" responses ($\underline{M}$ = .62) for depression related old words were significantly higher than the "remember" responses for ($\underline{M}$ = .38) the old words of the same category, $\underline{t}$ (129) = 4.12, $\underline{p}$ < .001. In addition, people committed more

"know" responses ($\underline{M}$ = .76) for threat related old words as compared to "remember" responses ($\underline{M}$ = .24), t (130) = 9.91, $\underline{p}$ < .001. Also "know" responses ($\underline{M}$ = .74) for neutral old words were significantly higher than the "remember" responses for ($\underline{M}$ = .26) the old words of the same category, $\underline{t}$ (130) = 8.11, $\underline{p}$ < .001. Overall, results indicated that people usually assigned "know" responses for the old words that were actually presented in the encoding list (see Table 26).

Table 26. Mean Proportions of Remember /Know Judgments for Old Words

	Positive	Depression Related	Threat Related	Neutral
Remember	$.32_b$	$.38_b$	$.24_b$	$.26_b$
Know	$.68_a$	$.62_a$	$.76_a$	$.74_a$

Note. The mean scores that do not share the same subscript on the same column are significantly different from each other.

3.5.2 T-Test Comparison for Mean Proportions of Remember/ Know Judgments for Lure Words of Different Categories

Four paired sample t-tests were performed to compare the mean proportions of "remember/ know" responses for lure words of different word categories (i.e., positive, depression related, threat related and neutral). Results were not significant for positive ($\underline{t}$ [130] = 1.36, $\underline{p}$ > .05), depression related ($\underline{t}$ [130] = 1.87, $\underline{p}$ > .05) and neutral lure words ($\underline{t}$ [130] = 0.12, $\underline{p}$ > .05). For threat related lure words, "know" responses ($\underline{M}$ = .62) were significantly more than the "remember" responses ($\underline{M}$ = .38), $\underline{t}$ (130) = 3.39, $\underline{p}$ = .001 (see Table 27).

Table 27. Mean Proportions of Remember Know Judgments for Old Words

	Positive	Depression Related	Threat Related	Neutral
Remember	$.56_a$	$.59_a$	$.38_b$	$.51_a$
Know	$.44_a$	$.41_a$	$.62_a$	$.49_a$

Note. The mean scores that do not share the same subscript on the same column are significantly different from each other.

3.5.3 ANOVA for Mean Proportions of Remember Judgments for Old Words of Different Categories

One-way within subjects ANOVA was conducted with the factor being Word Category and the dependent variable being the mean proportion of "remember" judgments for the old words. The results for the ANOVA indicated a significant Word Category effect, Multivariate $\underline{F}$ (3, 127) = 11.42, $\underline{p}$ < .001. Post-hoc analyses with LSD revealed that mean proportion of "remember" responses for positive old words ($\underline{M}$ = .32) was significantly higher than the mean proportions of threat related ($\underline{M}$ = .25) whereas it was significantly lower than the mean proportion of depression related old words ($\underline{M}$ = .36). There was not any significant difference between the mean proportion of positive and neutral old words ($\underline{M}$ = .26). In addition, mean proportion of "remember" responses for depression related old words was significantly higher than the mean proportion of threat related and neutral old words. There was not any significant difference between the mean proportion "remember" responses of threat related and neutral old words.

Table 28. Mean Proportions of Remember Judgments for Old Words of Different Categories

	Positive	Depression Related	Threat Related	Neutral
Remember	.32$_b$	.36$_a$	.25$_c$	.26$_{bc}$

3.5.4 ANOVA for Mean Proportions of Remember Judgments for Lure Words of Different Categories

One-way within subjects ANOVA was conducted with the factor being Word Category and the dependent variable being the mean proportion of "remember" judgments for lure words. The results for the ANOVA indicated a significant Word Category effect, Multivariate $\underline{F}$ (3, 45) = 3.35, $\underline{p}$ < .05. Post-hoc comparisons with LSD revealed that mean proportion of "remember" responses for positive lure words ($\underline{M}$ = .55) was significantly higher than the mean proportion of threat related lure words ($\underline{M}$ = .37). In addition, mean proportion of "remember" responses for depression related lure words ($\underline{M}$ = .59) was significantly higher than the mean

proportion of threat related lure words. There was not any significant difference between the mean proportion "remember" responses of neutral lure words ($\underline{M}$ = .49) and other three word categories. Also other comparisons were not significant. The mean proportions for different word categories are displayed in Table 29 .

Table 29. Mean Proportions of Remember Judgments for Lure Words of Different Categories

Mean Proportions	Positive	Depression Related	Threat Related	Neutral
Remember	$.55_a$	$.59_a$	$.37_b$	$.49_{ab}$

3.5.5 T-Test Comparison for Mean Proportions of Remember Judgments for Lure and Old Words of Different Categories

Four paired sample t-tests were conducted in order to compare the mean proportion remember responses for lure and old words of four categories (i.e., positive, depression related, threat related and neutral). For positive words, mean proportion of "remember" responses of lure words ($\underline{M}$ = .56) were higher than the mean proportion of old words ($\underline{M}$ = .31, t [90] = 5.12, $\underline{p}$ < .001). Similarly, for depression related words, mean proportion of "remember" responses of lure words (M = .59) were higher than the mean proportion of old words (M = .39, t [93] = 4.00, $\underline{p}$ < .001). For threat related words, people assigned more "remember" responses to lure words (M = .38) as compared to old words (M = .25, t [122] = 4.20, $\underline{p}$ < .05). Similarly, for neutral words mean proportion of remember responses for lure words (M = .49) was significantly higher than the mean proportion of remember responses for old words (M = .29, t [80] = 3.56, $\underline{p}$ < .05) (see Table 30). Overall results indicated that mean people made assigned "remember" responses for lure words as compared to old words. This finding was operative for all word categories.

Table 30. Mean Proportions of Remember Judgments for Lure and Old Words of Different Categories

Mean Proportions of Remember Responses	Positive	Depression Related	Threat Related	Neutral
Old Words	.31$_b$	.39$_b$	.25$_b$	.29$_b$
Lure Words	.56$_a$	.59$_a$	.38$_a$	.49$_a$

Note. The mean scores that do not share the same subscript on the same column are significantly different from each other.

3.5.6 Chi Square Analyses for Remember/ Know Judgments of Critical Lure Words

One sample chi-square test was conducted to assess whether the frequencies of remember/ know responses of the Groups (i.e., depressed, anxious, mixed and control) for different categories (i.e., positive, depression related, threat related and neutral) of critical lures differed from the frequencies expected by chance.

For the *positive critical lure*, the results did not yield significance, χ^2 (6, 131) = 1.19, p > .05 (see Table 31). Similarly, results were not significant for *depression related critical lure*, χ^2 (6, 131) = 4.18, p > .05 (see Table 32). For *threat related critical lure*, frequencies of remember/ know responses were different from the frequencies that would occur just by chance, χ^2 (6, 131) = 15.64, p < .025 (see Table 33). A follow-up analysis showed that this was due the anxious group, χ^2 (6, 15) = 4.24, p < .05. The anxious group gave "new" and "remember" responses more than expected. Finally, the results were not significant for *neutral critical lure*, χ^2 (6, 131) = .11, p > .05 (see Table34).

As it can be seen in Table 31, for the Positive Critical Lure, percentages of Remember/ Know Judgments were equally distributed. In addition, for depression related critical lure, people who falsely recognized assigned *remember* judgment all the time (see Table 32). For the Threat Related Critical Lure, people who falsely recognized mostly assigned *know* responses (see Table 33). People had a tendency to assign "know" responses (70 %) once they decided the threat related critical lure to be old. Percentages of Remember (50 %) and Know (50 %) Judgments were equally distributed for neutral critical lure (see Table 34).

Table 31. Observed and Expected Frequencies for Remember/ Know Responses for Positive Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Observed					
New	15	14	48	50	127
Old-Know	0	0	1	1	2
Old-Remember	0	0	1	1	2
Expected					
New	14.54	13.57	48.47	50.41	
Old-Know	.23	.21	.76	.79	
Old-Remember	.23	.21	.76	.79	
Total	15	14	50	52	

Table 32. Observed and Expected Frequencies for Remember/ Know Responses for Depression Related Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Observed					
New	12	13	48	48	121
Old-Know	0	0	0	0	0
Old-Remember	3	1	2	4	10
Expected					
New	13.85	12.93	46.18	48.03	
Old-Know	0	0	0	0	
Old-Remember	1.15	1.07	3.82	3.97	
Total N	15	14	50	52	

Table 33. Observed and Expected Frequencies for Remember/ Know Responses for Threat Related Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Observed					
New	5	9	9	15	38
Old-Know	8	5	29	21	63
Old-Remember	2	0	12	16	30
Expected					
New	4.35	4.06	14.5	15.08	
Old-Know	7.21	6.73	24.05	25	
Old-Remember	3.44	3.21	11.45	11.91	
Total	15	14	50	52	

Table 34. Observed and Expected Frequencies for Remember/ Know Responses for Neutral Critical Lure

Responses	Depressed	Anxious	Mixed	Control	Total
Observed					
New	15	14	49	51	129
Old-Know	0	0	0	0	0
Old-Remember	0	0	1	1	2
Expected					
New	14.77	13.79	49.24	51.21	
Old-Know	.23	.21	.76	.79	
Old-Remember	0	0	0	0	
Total	15	14	50	52	

3.5.7 Group Differences (Depressed, Anxious, Mixed and Control) on the Mean Proportion of Remember/ Know Judgments for Old and Lure Words of Different Categories

One-way MANOVA was conducted in order to examine Group differences on the mean proportion of remember responses for old words of different categories (i.e., positive, depression related, threat related and neutral). As it can be seen in Table 35, no significant results were obtained, Multivariate F (4, 123) = 1.30, p > .05.

One-way MANOVA was performed for investigating the Group differences on the mean proportion of remember responses for lure words of different categories (i.e., positive, depression related, threat related and neutral), Multivariate F (12, 108.76) = 0.52, p > .05. As it can be seen from Table 36, the results were not significant.

Table 35. MANOVA Results for Remember/ Know Judgments for Old of Different Categories

Remember Responses	Depressed	Anxious	Mixed	Control	Multivariate F (6, 252)
Word Categories					1.30, ns
Positive Old Words	.32	.40	.23	.38	
Depression Related Old Words	.34	.44	.28	.47	
Threat Related Old Words	.17	.33	.17	.32	
Neutral Old Words	.26	.36	.17	.33	

Note. ns = non-significant.

Table 36. MANOVA Results for Remember/ Know Judgments for Lure Words of Different Categories

Remember Responses	Depressed	Anxious	Mixed	Control	Multivariate F (6, 252)
Word Categories					0.52, ns
Positive Lures	.73	.25	.59	.46	
Depression Related Lures	.50	.50	.70	.57	
Threat Related Lures	.38	46	.34	.38	
Neutral Lures	.50	.50	.52	.43	

Note. ns = non-significant.

3.6 Analyses for Personality Characteristics

Participants were grouped as "low" and "high" on personality dimensions of openness to experience, neuroticism, extraversion, conscientiousness, agreeableness and negative valence in order to examine if there were any differences between the groups in terms of true and false recognition.

3.6.1 Openness to Experience

Participants were grouped in terms of openness to experience dimension of personality by using median split procedure. People scoring above 22 on the openness to experience subscale were included in the "high openness to experience" group whereas people scoring 22 or below were included in "low openness to experience' group. As a result, there were 59 participants in the high openness to

experience group ($\underline{M}$ = 25.58, SD = 2.01, Range = 23-30) and 72 participants in the low openness to experience group ($\underline{M}$ = 19.53, SD = 2.22, Range = 14-22).

3.6.1.1 Group Differences (High versus Low Openness to Experience) on the Total Accurate Recognition Scores for Different Word Categories

One-way MANOVA was conducted to determine if people low or high in openness to experience differed on their True Recognition of depression related, threat related, positive and neutral words. As it is illustrated in Table 37, no significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 1.81, $\underline{p}$ > .05.

Table 37. MANOVA Results for Total Accuracy Scores of Different Word Categories

Accuracy	High Openness	Low Openness	Univariate F (1, 129)	Multivariate F (4, 126)
				1.81, ns
Positive	9.61	9.32		
Depression Related	8.93	9.01		
Threat Related	8.34	8.46		
Neutral	9.66	10.24		

Note. ns = non-significant.

3.6.1.2 Pearson's Chi Square Analysis for the Accuracy of Recognition of Critical Lures

According to chi square analyses, frequencies of false recognition for *positive* (χ^2 [1, 131] = 0.77, $\underline{p}$ > .05) (see Table 38), *depression related* (χ^2 [1, 131] = 0.12, $\underline{p}$ > .05) (see Table 39), *threat related* (χ^2 [3, 131] = 0.31, $\underline{p}$ > .05), (see Table 40) and *neutral* (χ^2 [1, 131] = .02, $\underline{p}$ > .05) (see Table 41) *critical lures* were not above the probability of occurring by chance for people having high or low levels of openness to experience.

Table 38. Observed and Expected Frequencies for Positive Critical Lure

Responses	Low Openness	High Openness	Total
Old-False Recognition	3	1	4
New	69	58	127
Old-Expected	2.20	1.80	
New-Expected	69.80	57.20	
Total	72	59	

Table 39. Observed and Expected Frequencies for Depression Related Critical Lure

Responses	Low Openness	High Openness	Total
Old-False Recognition	5	5	10
New	67	54	121
Old-Expected	5.50	4.50	
New-Expected	66.50	54.50	
Total	72	59	

Table 40. Observed and Expected Frequencies for Threat Related Critical Lure

Responses	Low Openness	High Openness	Total
Old-False Recognition	48	42	90
New	24	17	41
Old-Expected	49.47	40.53	
New-Expected	22.53	18.47	
Total	72	59	

Table 41. Observed and Expected Frequencies for Neutral Critical Lure

Responses	Low Openness	High Openness	Total
Old-False Recognition	1	1	2
New	71	58	129
Old-Expected	1.1	.90	
New-Expected	70.90	58.10	
Total	72	59	

3.6.1.3 Group Differences (High versus Low Openness to Experience) on the Hits of Different Word Categories

One-way MANOVA was conducted to determine if people low or high in openness to experience differed on their hit rates for different word categories (i.e., positive, depression related, threat related and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 1.36, $\underline{p}$ > .05 (see Table 42).

Table 42. MANOVA Results for Hits of Different Word Categories

	High Openness	Low Openness	Univariate F (1, 129)	Multivariate F (4, 126)
Hits				1.36, ns
Positive	4.78	4.78		
Depression Related	4.32	4.39		
Threat Related	5.03	4.97		
Neutral	4.51	5.06		

Note. * p < .10, ** p < .05 ns = non-significant.

3.6.1.4 Group Differences (High versus Low Openness to Experience) on the False Alarms of Different Word Categories

A one-way MANOVA was conducted in order to examine the effects of Openness to Experience on False Alarm scores of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 1.45, $\underline{p}$ > .05 (see Table 43).

Table 43. MANOVA Results for False Alarms of Different Word Categories

False Alarms	High Openness	Low Openness	Univariate F (1, 129)	Multivariate F (4, 126)
				1.45, ns
Positive	1.20	1.50		
Depression Related	1.39	1.38		
Threat Related	3.54	3.31		
Neutral	.85	.82		

Note. ns = non-significant.

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3.6.1.5 Group Differences (High versus Low Openness to Experience) on the False Alarms of Lures

A one-way MANOVA was conducted in order to examine the effects of Openness to Experience on False Alarm scores of four groups of lures (i.e., threat related, depression related, positive, and neutral). As it is illustrated in Table 44, no significant results were obtained. However there was a trend for the effect of Group on the linear combination of dependent measures, Multivariate $\underline{F}$ (4, 126) = 2.26, $\underline{p}$ = .07. Therefore Univariate tests were examined. The effect of Group on the False Alarm scores of positive words was significant, $\underline{F}$ (1, 129) = 4.78, $\underline{p}$ < .05. People low in Openness to Experience ($\underline{M}$ = .41) made more false alarms for positive words than people high in openness to experience ($\underline{M}$ = .30).

Table 44. MANOVA Results for the False Alarms of Lures

False Alarms for Lures	High Openness	Low Openness	Univariate F (1, 129)	Multivariate F (4, 126)
				2.26*
Positive	.90$_b$	1.22$_a$	4.78**	
Depression Related	.97	.97	0.002	
Threat Related	1.95	1.75	1.92	
Neutral	.75	.75	0.001	

Note. * p < .10, ** p < .05.

3.6.1.6 Signal Detection Analysis for Openness to Experience

3.6.1.6.1 Group Differences (High versus Low Openness to Experience) on the Sensitivity Index

A one-way MANOVA was performed in order to assess the effects of Openness to Experience on the Sensitivity Index of four groups of words (i.e., threat related, depression related, positive, and neutral). As it is illustrated in Table 45, the effect of Openness to Experience on the combination of the sensitivity index of four groups of words was non-significant, Multivariate $\underline{F}$ (4, 126) = 1.94, $\underline{p}$ > .05.

3.6.1.6.2 Group Differences (High versus Low Openness to Experience) on the Response Criterion

A one-way MANOVA was conducted in order to examine the effects of Openness to Experience on the Response Criterion of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained (see Table 45), Multivariate $\underline{F}$ (4, 126) = 2.04, $\underline{p}$ > .05.

Table 45. MANOVA Results for Sensitivity Index and Response Criterion of Different Word Categories

	High Openness	Low Openness	Univariate F (1, 129)	Multivariate F
Sensitivity Index				1.94, ns
Positive	-3.58	-3,28		
Depression Related	-2.93	-3.01		
Threat Related	-1.49	-1.67		
Neutral	-3.66	-4.24		
Response Criterion				2.04
Positive	.45	.40		
Depression Related	.37	.41		
Threat Related	.14	.18		
Neutral	.47	.60		

Note. ns = non-significant.

3.6.2 Neuroticism

Participants were grouped using median split procedure. People scoring above 25 on the neuroticism dimension were included in the "high neuroticism" group whereas people scoring 25 or below were included in "low neuroticism" group. As a result, there were 64 participants in the high neuroticism group ($\underline{M}$ = 30.59, SD = 3.91, Range = 26-41) and 67 participants in the low neuroticism group ($\underline{M}$ = 20.20, SD = 4.05, Range = 10-25).

3.6.2.1 Group Differences (High versus Low Neuroticism) on the Total Accurate Recognition Scores of Different Word Categories

One- way MANOVA were performed in order to examine if people low or high in neuroticism differed on their true recognition of *depression related, threat related, positive and neutral words.* The results did not yield any significance, (Multivariate $\underline{F}$ (4, 126) = 1.32, $\underline{p}$ > .05) (see Table 46).

Table 46. MANOVA Results for the Total Accuracy Scores of Different Word Categories

Accuracy	High Neuroticism	Low Neuroticism	Univariate F (1, 129)	Multivariate F (4, 126)
				1.32, ns
Positive	9.56	9.34		
Depression Related	9.08	8.88		
Threat Related	8.70	8.12		
Neutral	9.89	10.06		

Note. ns = non-significant.

3.6.2.2 Pearson's Chi Square Analysis for the Accuracy of Recognition of Critical Lures

According to chi square analyses, frequencies of False Recognition for *positive* (χ^2 [1, 131] = 0.92, $\underline{p}$ > .05) (see Table 47), *depression related* (χ^2 [1, 131] = 0.53, $\underline{p}$ > .05) (see Table 48), *threat related* (χ^2 [3, 131] = 0.59, $\underline{p}$ > .05), (see Table 49) and *neutral* (χ^2 [1, 131] = .08, $\underline{p}$ > .05) (see Table 50) *critical lures* were not above the probability of occurring by chance for people who were low or high in neoroticism.

Table 47. Observed and Expected Frequencies for Positive Critical Lure

Responses	Low Neuroticism	High Neuroticism	Total
Old-False Recognition	3	1	4
New	64	63	127
Old-Expected	2.05	1.95	
New-Expected	64.95	62.05	
Total	67	64	

Table 48. Observed and Expected Frequencies for Depression Related Critical Lure

Responses	Low Neuroticism	High Neuroticism	Total
Old-False Recognition	4	6	10
New	63	58	121
Old-Expected	5.11	4.89	
New-Expected	61.89	59.11	
Total	67	64	

Table 49. Observed and Expected Frequencies for Threat Related Critical Lure

Responses	Low Neuroticism	High Neuroticism	Total
Old-False Recognition	44	46	90
New	23	18	41
Old-Expected	46.03	43.97	
New-Expected	20.97	20.03	
Total	67	64	

Table 50. Observed and Expected Frequencies for Neutral Critical Lure

Responses	Low Neuroticism	High Neuroticism	Total
Old-False Recognition	1	1	2
New	66	63	129
Old-Expected	1.02	.98	
New-Expected	65.98	63.02	
Total	67	64	

3.6.2.3 Group Differences (High versus Low Neuroticism) on the Hits of Different Word Categories

One- way MANOVA were performed in order to examine if people low or high in neuroticism differed on their hit rates for different categories of words (i.e., positive, depression related, threat related and neutral). The results did not yield any significance, (Multivariate $\underline{F}$ (4, 126) = 1.01, $\underline{p}$ > .05) (see Table 51).

Table 51. MANOVA Results for Hits of Different Word Categories

Accuracy	High Neuroticism	Low Neuroticism	Univariate F (1, 129)	Multivariate F (4, 126)
				1.01, ns
Positive	4.84	4.72		
Depression Related	4.47	4.25		
Neutral	4.67	4.94		
Threat Related	5.11	4.90		

Note. ns = non-significant.

3.6.2.4 Group Differences (High versus Low Neuroticism) on the False Alarms of Different Word Categories

A one-way MANOVA was conducted in order to examine the effects of Neuroticism on the False Alarm scores of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 0.46, $\underline{p}$ > .05 (see Table 52).

Table 52. MANOVA Results for the False Alarm Scores of Different Word Categories

False Alarms	High Extraversion	Low Extraversion	Univariate F (1, 129)	Multivariate F (4, 126)
				0.46, ns
Positive	1.33	1.40		
Depression Related	1.39	1.37		
Threat Relate	3.27	3.55		
Neutral	.78	.88		

Note. ns = non-significant.

3.6.2.5 Group Differences (High versus Low Neuroticism) on the False Alarms of Lures

A one-way MANOVA was conducted in order to examine the effects of Neuroticism on the False Alarm scores of four groups of lures (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate F (4, 126) = 0.70, p > .05 (see Table 53).

Table 53. MANOVA Results for the False Alarm Scores of Lures

False Alarms for Lures	High Extraversion	Low Extraversion	Univariate F (1, 129)	Multivariate F (4, 126)
				0.70, ns
Positive	1.05	1.10		
Depression Related	.98	.96		
Threat Related	1.73	.1.94		
Neutral	.69	.81		

Note. ns = non-significant.

3.6.2.6 Signal Detection Analysis for Neuroticism

3.6.2.6.1 Group Differences (High versus Low Neuroticism) on the Sensitivity Index

A one-way MANOVA was conducted in order to examine the effects of Neuroticism on the Sensitivity Index of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 1.18, $\underline{p}$ > .05 (see Table 54A).

3.6.2.6.2 Group Differences (High versus Low Neuroticism) on Response Criterion

A one-way MANOVA was performed in order to assess the effects of Neuroticism on the Response Criterion of four groups of words (i.e., threat related, depression related, positive, and neutral). The effect of Neuroticism on the combination of Response Criterion of four groups of words was significant (Multivariate $\underline{F}$ [4, 52] = 2.79, $\underline{p}$ < .05). Univariate tests revealed that the effect of Neuroticism on the sensitivity index of positive words were significant, $\underline{F}$ (1, 55) = 8.87, $\underline{p}$ < .01. As it is illustrated in Table 54B, people who were high in neuroticism ($\underline{M}$ = .51) had significantly lower response criterion scores for positive words as compared to people low in neuroticism ($\underline{M}$ = .31). According to the results, people low in neuroticism used a risky response style for positively valenced words

Table 54. MANOVA Results for Sensitivity Index and Response Criterion of Different Word Categories

	High Neuroticism	Low Neuroticism	Univariate F (1, 129)	Multivariate F
A. Sensitivity Index				1.17, ns
Depression Related	3.08	2.88		
Threat Related	1.84	1.34		
Positive	3.52	3.31		
Neutral	3.89	4.06		
B. Response Criterion				2.79*
Depression Related	.41	.38	0.33	
Threat Related	.21	.12	2.89	
Positive	.51$_a$	.31$_b$	8.87**	
Neutral	.57	.52	0.60	

Note. The mean scores that do not share the same subscript on the same row are significantly different from each other, * $p < .05$, ** $p < .01$, ns = non-significant.

3.6.3 Extraversion

Participants were grouped using median split procedure. People scoring above 28 on the extraversion dimension of personality were included in the "high extraversion" group whereas people scoring 28 or below were included in "low extraversion" group. As a result, there were 60 participants in the high extraversion group ($M = 33.20$, SD = 3.23, Range = 29-40) and 71 participants in the low extraversion group ($M = 23.39$, SD = 4.11, Range = 12-28).

3.6.3.1 Group Differences (High versus Low Extraversion) on the Accuracy of Recognition of Different Word Categories

One- way MANOVA was performed in order to examine if people low or high in extraversion differed on their True Recognition of *depression related, threat related, positive and neutral words.* The results did not yield any significance for positive, depression related, threat related and neutral words. Multivariate F (4, 126) = 1.12, $p > .05$ (see Table 55).

Table 55. MANOVA Results for the Total Accurate Recognition Scores of Different Word Categories

Accuracy	High Extraversion	Low Extraversion	Univariate $F_{(1, 129)}$	Multivariate $F_{(4, 126)}$
				1.12, ns
Positive	9.37	9.52		
Depression Related	8.77	9.16		
Threat Related	8.23	8.55		
Neutral	9.72	10.20		

Note. ns = non-significant.

3.6.3.2 Pearson's Chi Square Analysis for the Accuracy of Recognition of Critical Lures

According to chi square analyses, frequencies of false recognition for *positive* (χ^2 [1, 131] = 0.72, p > .05) (see Table 56), *depression related* (χ^2 [1, 131] = 2.56, p > .05) (see Table 57), *threat related* (χ^2 [3, 131] = 0.09, p > .05), (see Table 58) and *neutral* (χ^2 [1, 131] = .01, p > .05) (see Table 59) *critical lures* were not above the probability of occurring by chance for people who were low or high in extraversion.

Table 56. Observed and Expected Frequencies for Positive Critical Lure

Responses	Low Extraversion	High Extraversion	Total
Old-False Recognition	3	1	4
New	68	59	127
Old-Expected	2.17	1.83	
New-Expected	68.83	58.17	
Total	71	60	

Table 57. Observed and Expected Frequencies for Depression Related Critical Lure

Responses	Low Extraversion	High Extraversion	Total
Old-False Recognition	3	7	10
New	68	53	121
Old-Expected	2.17	1.83	
New-Expected	68.83	58.17	
Total	71	60	

Table 58. Observed and Expected Frequencies for Threat Related Critical Lure

Responses	Low Extraversion	High Extraversion	Total
Old-False Recognition	48	42	90
New	23	18	41
Old-Expected	48.78	41.22	
New-Expected	22.22	18.78	
Total	71	60	

Table 59. Observed and Expected Frequencies for Neutral Critical Lure

Responses	Low Extraversion	High Extraversion	Total
Old-False Recognition	1	1	2
New	70	59	129
Old-Expected	1.08	0.92	
New-Expected	69.92	59.08	
Total	71	60	

3.6.3.3 Group Differences (High versus Low Extraversion) on the Hits of Different Word Categories

One- way MANOVA were conducted in order to examine if people low or high in extraversion differed on their True Recognition of different word categories(i.e., positive, depression related, threat related and neutral). The results did not yield any significance, (Multivariate $\underline{F}$ (4, 126) = 0.49, $\underline{p}$ > .05) (see Table 60).

Table 60. MANOVA Results for Hits of Different Word Categories

Accuracy	High Extraversion	Low Extraversion	Univariate F (1, 129)	Multivariate F (4, 126)
				0.49, ns
Positive	4.85	4.72		
Depression Related	4.33	4.38		
Neutral	4.67	4.93		
Threat Related	5.00	5.00		

Note. ns = non-significant.

3.6.3.4 Group Differences (High versus Low Extraversion) on the False Alarms of Different Word Categories

A one-way MANOVA was conducted in order to examine the effects of Extraversion on the False Alarm scores of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 1.51, $\underline{p}$ > .05 (see Table 61).

Table 61. MANOVA Results for the False Alarm Scores of Different Word Categories

False Alarms	High Extraversion	Low Extraversion	Univariate F (1, 129)	Multivariate F (4, 126)
				1.51, ns
Positive	1.53	1.23		
Depression Related	1.57	1.23		
Threat Related	3.60	3.25		
Neutral	.95	.73		

Note. ns = non-significant.

3.6.3.5 Group Differences (High versus Low Extraversion) on the False Alarms of Lures

A one-way MANOVA was conducted in order to examine the effects of Extraversion on the False Alarm scores of four groups of lures (i.e., threat related, depression related, positive, and neutral). The results were not significant, Multivariate $\underline{F}$ (4, 126) = 1.68, $\underline{p}$ > .05 (see Table 62).

Table 62. MANOVA Results for the False Alarm Scores of Lures

False Alarms for Lures	High Extraversion	Low Extraversion	Univariate F (1, 129)	Multivariate F (4, 126)
				1.68, ns
Positive	1.15	1.01		
Depression Related	1.02	.93		
Threat Related	2.00	1.70		
Neutral	.87	.65		

Note. ns = non-significant.

3.6.3.6 Signal Detection Analysis for Extraversion

3.6.3.6.1 Group Differences (High versus Low Extraversion) on the Sensitivity Index

A one-way MANOVA was conducted in order to find out whether Extraversion had an effect on the Sensitivity Index of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 1.41, $\underline{p}$ > .05 (see Table 63A).

3.6.3.6.2 Group Differences (High versus Low Extraversion) on Response Criterion

A one-way MANOVA was performed in order to assess the effects of Extraversion on the Response Criterion of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 52) = 1.23, $\underline{p}$ > .05 (see Table 63B).

Table 63. MANOVA Results for Sensitivity Index and Response Criterion of Different Word Categories

	High Extraversion	Low Extraversion	Univariate F (1, 129)	Multivariate F (4, 126)
A. Sensitivity Index				1.41, ns
Positive	-3.32	-3.49		
Depression Related	-2.77	-3.16		
Threat Related	-1.40	-1.75		
Neutral	-3.72	-4.20		
B. Response Criterion				**Multivariate F (4, 52)**
				1.23, ns
Positive	.41	.42		
Depression Related	.34	.45		
Threat Related	.14	.18		
Neutral	.51	.58		

Note. ns = non-significant

3.6.4 Conscientiousness

Participants were grouped using median split procedure. People scoring above 27 on the conscientiousness dimension of personality were included in the "high conscientiousness" group whereas people scoring 27 or below were included in "low conscientiousness" group. As a result, there were 63 participants in the high conscientiousness group ($\underline{M}$ = 32.49, SD = 3.19, Range = 28-40) and 68 participants in the low conscientiousness group ($\underline{M}$ = 22.02, SD = 4.12, Range = 10-27).

3.6.4.1 Group Differences (High versus Low Conscientiousness) on the Total Accurate Recognition Scores of Different Word Categories

One- way MANOVA was performed in order to examine if people low or high in conscientiousness differed on their True Recognition of *depression related, threat related, positive and neutral words.* The results did not yield any significance, (Multivariate $\underline{F}$ (4, 126) = 0.54, $\underline{p}$ > .05 (see Table 64).

Table 64. MANOVA Results for the Total Accurate Recognition Scores of Different Word Categories

Accuracy	High Conscientiousness	Low Conscientiousness	Univariate F (1, 129)	Multivariate F (4, 126)
				0.54, ns
Positive	9.44	9.46		
Depression Related	8.94	9.02		
Threat Related	8.59	8.24		
Neutral	10.05	9.91		

Note. ns = non-significant.

3.6.4.2 Pearson's Chi Square Analysis for the Accuracy of Recognition of Critical Lures

According to chi square analyses, frequencies of false recognition for *positive* (χ^2 [1, 131] = 1.21, p > .05) (see Table 65), *depression related* (χ^2 [1, 131] = 0.29, p > .05) (see Table 66), *threat related* (χ^2 [3, 131] = 0.42, p > .05), (see Table 67) and *neutral* (χ^2 [1, 131] = .33, p > .05) (see Table 68) *critical lures* were not above the probability of occurring by chance for people who were low or high in conscientiousness.

Table 65. Observed and Expected Frequencies for Positive Critical Lure

Responses	Low Conscientiousness	High Conscientiousness	Total
Old-False Recognition	1	3	4
New	67	60	127
Old-Expected	2.08	1.92	
New-Expected	65.92	61.08	
Total	68	63	

Table 66. Observed and Expected Frequencies for Depression Related Critical Lure

Responses	Low Conscientiousness	High Conscientiousness	Total
Old-False Recognition	6	4	10
New	62	59	121
Old-Expected	5.19	4.81	
New-Expected	62.81	58.19	
Total	68	63	

Table 67. Observed and Expected Frequencies for Threat Related Critical Lure

Responses	Low Conscientiousness	High Conscientiousness	Total
Old-False Recognition	45	45	90
New	23	18	41
Old-Expected	46.72	43.28	
New-Expected	21.28	19.72	
Total	68	63	

Table 68. Observed and Expected Frequencies for Neutral Critical Lure

Responses	Low Conscientiousness	High Conscientiousness	Total
Old-False Recognition	1	1	2
New	67	62	129
Old-Expected	1.04	0.96	
New-Expected	66.96	62.04	
Total	68	63	

3.6.4.3 Group Differences (High versus Low Conscientiousness) on the Hits of Different Word Categories

One- way MANOVA was performed in order to examine if people low or high in conscientiousness differed on their hit scores for different word categories

(i.e., positive, depression related, threat related and neutral). The results did not yield any significance, (Multivariate $\underline{F}$ (4, 126) = 0.40, $\underline{p}$ > .05 (see Table 69).

Table 69. MANOVA Results for the Hits of Different Word Categories

	High Conscientiousness	Low Conscientiousness	Univariate F (1, 129)	Multivariate F (4, 126)
Hits				0.40, ns
Positive	4.83	4.74		
Depression Related	4.40	4.32		
Neutral	4.97	4.66		
Threat Related	5.05	4.96		

Note. ns = non-significant.

3.6.4.4 Group Differences (High versus Low Conscientiousness) on the False Alarms of Different Word Categories

A one-way MANOVA was conducted in order to examine the effects of Conscientiousness on the False Alarm scores of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 0.62, $\underline{p}$ > .05 (see Table 70).

Table 70. MANOVA Results for the False Alarm Scores of Different Word Categories

False Alarms	High Conscientiousness	Low Conscientiousness	Univariate F (1, 129)	Multivariate F (4, 126)
				0.62, ns
Positive	1.41	1.32		
Depression Related	1.46	1.31		
Threat Related	.3.54	.3.29		
Neutral	.92	.75		

Note. ns = non-significant.

3.6.4.5 Group Differences (High versus Low Conscientiousness) on the False Alarms of Lures

A one-way MANOVA was conducted in order to examine the effects of Conscientiousness on the False Alarm scores of four groups of lures (i.e., threat related, depression related, positive, and neutral). As it can be seen in Table 71, the effect of group on the linear combination of dependent measures was significant, Multivariate $\underline{F}$ (4, 126) = 2.68, $\underline{p}$ < .05. The effect of Group on the false alarms of threat related lures was significant, $\underline{F}$ (1, 129) = 6.94, $\underline{p}$ < .01. People who were high in conscientiousness ($\underline{M}$ = 2.03) made more false alarms for threat related lures as compared to people low in conscientiousness ($\underline{M}$ = 1.66).

Table 71. MANOVA Results for the False Alarms of Lures

False Alarms for Lures	High Conscientiousness	Low Conscientiousness	Univariate F (1, 129)	Multivariate F (4, 126)
				2.68*
Positive	1.08	1.07	0.002	
Depression Related	.1.10	.85	3.54	
Threat Related	2.03$_a$	1.66$_b$	6.94**	
Neutral	.81	.69	0.98	

<u>Note</u>. ns = non-significant, * p < .05, ** p < .01.

3.6.4.6 Signal Detection Analysis for Conscientiousness

3.6.4.6.1 Group Differences (High versus Low Conscientiousness) on the Sensitivity Index

A one-way MANOVA was conducted in order to find out whether Conscientiousness had an effect on the Sensitivity Index of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) =0.17, $\underline{p}$ > .05 (see Table 72A).

3.6.4.6.2 Group Differences (High versus Conscientiousness) on Response Criterion

A one-way MANOVA was performed in order to assess the effects of Conscientiousness on the Response Criterion of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 52) =0.80, $\underline{p}$ > .05 (see Table 72B).

Table 72. MANOVA Results for the Sensitivity Index and Response Criterion of Different Word Categories

	High Conscientiousness	Low Conscientiousness	Univariate F (1, 129)	Multivariate F (4, 126)
A. Sensitivity Index				0.17, ns
Depression Related	-2.94	-3.02		
Threat Related	-1.51	-1.66		
Positive	-3.41	-3.41		
Neutral	-4.05	-3.91		
B. Response Criterion				**Multivariate F (4, 52)**
				0.80, ns
Depression Related	.35	.44		
Threat Related	.16	.16		
Positive	.41	.42		
Neutral	.51	.59		

Note. ns = non-significant

3.6.5 Agreeableness

Participants were grouped using median split procedure. People scoring above 33 on the agreeableness dimension of personality were included in the "high

agreeableness" group whereas people scoring 33 or below were included in "low agreeableness" group. As a result, there were 59 participants in the high agreeableness group ($\underline{M}$ = 36.21, SD = 1.95, Range = 33.14- 40) and 72 participants in the low agreeableness group ($\underline{M}$ = 30.51, SD = 2.71, Range = 21-33).

3.6.5.1 Group Differences (High versus Low Agreeableness) on Total Accurate Recognition Score of Different Word Categories

One-way MANOVA was conducted in order to examine if people low or high in agreeableness differed on their True Recognition of *depression related, threat related, positive and neutral words*. The results did not yield any significance, (Multivariate $\underline{F}$ (4, 125) = 1.69, $\underline{p}$ > .05) (see Table 73).

Table 73. MANOVA Results for the Total Accurate Recognition Score of Different Word Categories

Accuracy	High Agreeableness	Low Agreeableness	Univariate F (1, 129)	Multivariate F (4, 126)
				1.69, ns
Positive	9.20	9.65		
Depression Related	9.00	8.96		
Threat Related	8.07	8.68		
Neutral	9.93	10.01		

Note. ns = non-significant.

3.6.5.2 Pearson's Chi Square Analysis for the Accuracy of Recognition of Critical Lures

According to chi square analyses, frequencies of false recognition for *positive* (χ^2 [1, 131] = 1.51, $\underline{p}$ > .05) (see Table 74), *depression related* (χ^2 [1, 131] = 0.12, $\underline{p}$ > .05) (see Table 75), *threat related* (χ^2 [3, 131] = 0.34, $\underline{p}$ > .05), (see Table 76) and *neutral* (χ^2 [1, 131] = .02, $\underline{p}$ > .05) (see Table 77) *critical lures* were not above the probability of occurring by chance for people who were low or high in agreeableness.

Table 74. Observed and Expected Frequencies for Positive Critical Lure

Responses	Low Agreeableness	High Agreeableness	Total
Old-False Recognition	1	3	4
New	71	56	127
Old-Expected	2.20	1.80	
New-Expected	69.80	57.20	
Total	72	59	

Table 75. Observed and Expected Frequencies for Depression Related Critical Lure

Responses	Low Agreeableness	High Agreeableness	Total
Old-False Recognition	5	5	10
New	67	54	121
Old-Expected	5.50	4.50	
New-Expected	66.50	54.50	
Total	72	59	

Table 76. Observed and Expected Frequencies for Threat Related Critical Lure

Responses	Low Agreeableness	High Agreeableness	Total
Old-False Recognition	51	39	90
New	21	20	41
Old-Expected	49.47	40.53	
New-Expected	22.53	18.47	
Total	72	59	

Table 77. Observed and Expected Frequencies for Neutral Critical Lure

Responses	Low Agreeableness	High Agreeableness	Total
Old-False Recognition	1	1	2
New	71	58	129
Old-Expected	1.1	.90	
New-Expected	70.90	58.10	
Total	72	59	

3.6.5.3 Group Differences (High versus Low Agreeableness) on the Hits of Different Word Categories

One- way MANOVA was conducted in order to examine if people low or high in agreeableness differed on their hit scores for different categories of words. The results did not yield any significance, (Multivariate $\underline{F}$ (4, 126) = 0.44, $\underline{p}$ > .05) (see Table 78).

Table 78. MANOVA Results for the Hits of Different Word Categories

	High Agreeableness	Low Agreeableness	Univariate F (1, 129)	Multivariate F (4, 126)
Hits				0.44, ns
Positive	4.71	4.83		
Depression Related	4.27	4.43	Neutral	
Threat Related	4.88	5.10	4.83	4.79
Neutral	4.83	4.79		

Note. ns = non-significant.

3.6.5.4 Group Differences (High versus Low Agreeableness) on the False Alarms of Different Word Categories

A one-way MANOVA was conducted in order to assess the effects of Agreeableness on the False Alarm scores of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 125) = 1.99, $\underline{p}$ > .05 (see Table 79).

Table 79. MANOVA Results for the False Alarm Scores of Different Word Categories

False Alarms	High Agreeableness	Low Agreeableness	Univariate F (1, 129)	Multivariate F (4, 126)
				1.99, ns
Positive	1.56	1.21		
Depression Related	1.27	1.47		
Threat Related	3.64	3.22		
Neutral	.90	.78		

Note. ns = non-significant.

3.6.5.5 Group Differences (High versus Low Agreeableness) on the False Alarms of Lures

A one-way MANOVA was conducted in order to assess the effects of Agreeableness on the False Alarm scores of four groups of lures (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 1.16, $\underline{p}$ > .05 (see Table 80).

Table 80. MANOVA Results for the False Alarms of Lures

False Alarms for Lures	High Agreeableness	Low Agreeableness	Univariate F (1, 129)	Multivariate F (4, 126)
				1.16, ns
Positive	1.17	1.00		
Depression Related	.93	1.00		
Threat Related	1.98	1.72		
Neutral	.80	.71		

Note. ns = non-significant.

3.6.5.6 Signal Detection Analysis for Agreeableness

3.6.5.6.1 Group Differences (High versus Low Agreeableness) on the Sensitivity Index

A one-way MANOVA was conducted in order to find out whether Agreeableness had an effect on the Sensitivity Index of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained. However there was a trend for significant effect of Agreeableness on the linear combination of dependent measures, Multivariate $\underline{F}$ (4, 126) = 2.11, $\underline{p}$ > .05. (see Table 81A).

3.6.5.6.2 Group Differences (High versus Low Agreeableness) on Response Criterion

A one-way MANOVA was performed in order to assess the effects of Agreeableness on the Response Criterion of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 52) = 1.17, $\underline{p}$ > .05 (see Table 81B).

Table 81. MANOVA Results for the Sensitivity Index and Response Criterion of Different Word Categories

	High Agreeableness	Low Agreeableness	Univariate F (1, 128)	Multivariate F (4, 125)
A. Sensitivity Index				2.11, ns
Positive	-3.15	-3.63		
Depression Related	-3.00	-2.96		
Threat Related	-1.24	-1.88		
Neutral	-3.93	-4.01		
B. Response Criterion				**Multivariate F (4, 52)**
				1.17, ns
Positive	.36	.46		
Depression Related	.40	.39		
Threat Related	.12	.20		
Neutral	.52	.57		

Note. ns = non-significant.

3.6.6 Negative Valence

Participants were grouped using median split procedure. People scoring above 10 on the negative valence dimension of personality were included in the "high negative valence" group whereas people scoring 10 or below were included in "low negative valence" group. As a result, there were 52 participants in the high negative valence group ($\underline{M}$ = 13.46, SD = 2.25, Range = 11-20) and 79 participants in the low negative valence group ($\underline{M}$ = 8.06, SD = 1.42, Range = 6-10).

3.6.6.1 Group Differences (High versus Low Negative Valence) on the Total Accurate Recognition Scores of Different Word Categories

One- way MANOVA was conducted in order to examine if people low or high in negative valence differed on their True Recognition of *depression related, threat related, positive and neutral words.* The results did not yield any significance, (Multivariate $\underline{F}$ (4, 126) = 1.19, $\underline{p}$ > .05) (see Table 82).

Table 82. MANOVA Results for the Total Accurate Recognition Scores of Different Word Categories

Accuracy	High Negative Valence	Low Negative Valence	Univariate F (1, 129)	Multivariate F (4, 126)
				1.19, ns
Positive	9.58	9.37		
Depression Related	8.96	8.99		
Threat Related	8.77	8.17		
Neutral	10.08	9.91		

Note. ns = non-significant.

3.6.6.2 Pearson's Chi Square Analysis for the Accuracy of Recognition of Critical Lures

According to chi square analyses, frequencies of false recognition for *positive* (χ^2 [1, 131] = 0.19, $\underline{p}$ > .05) (see Table 83), *depression related* (χ^2 [1, 131] = 0.0004, $\underline{p}$ > .05) (see Table 84), *threat related* (χ^2 [3, 131] = 0.71, $\underline{p}$ > .05), (see Table 85) and *neutral* (χ^2 [1, 131] = 3.11, $\underline{p}$ > .05) (see Table 86) *critical lures* were not above the probability of occurring by chance for people who were low or high in negative valence dimension.

Table 83. Observed and Expected Frequencies for Positive Critical Lure

Responses	Low NV	High NV	Total
Old-False Recognition	2	2	4
New	77	50	127
Old-Expected	2.41	1.59	
New-Expected	76.59	50.41	
Total	79	52	

Table 84. Observed and Expected Frequencies for Depression Related Critical Lure

Responses	Low NV	High NV	Total
Old-False Recognition	6	4	10
New	73	48	121
Old-Expected	6.03	3.97	
New-Expected	72.97	48.03	
Total	79	52	

Table 85. Observed and Expected Frequencies for Threat Related Critical Lure

Responses	Low NV	High NV	Total
Old-False Recognition	55	35	90
New	24	17	41
Old-Expected	54.27	35.73	
New-Expected	24.73	16.27	
Total	79	52	

Table 86. Observed and Expected Frequencies for Neutral Critical Lure

Responses	Low NV	High NV	Total
Old-False Recognition	0	2	2
New	79	50	129
Old-Expected	1.21	0.79	
New-Expected	77.79	51.21	
Total	79	52	

3.6.6.3 Group Differences (High versus Low Negative Valence) on the Hits of Different Word Categories

One- way MANOVA was conducted in order to examine if people low or high in negative valence differed on their hit rates for different word categories (positive, depression related, threat related and neutral). The results did not yield any significance, (Multivariate $\underline{F}$ (4, 126) = 0.69, $\underline{p}$ > .05) (see Table 87).

Table 87. MANOVA Results for the Hits of Different Word Categories

Accuracy	High Negative Valence	Low Negative Valence	Univariate F (1, 129)	Multivariate F (4, 126)
				0.69, ns
Positive	4.77	4.79		
Depression Related	4.44	4.30		
Threat Related	5.17	4.89		
Neutral	4.89	4.76		

Note. ns = non-significant.

3.6.6.4 Group Differences (High versus Low Negative Valence) on the False Alarms of Different Word Categories

A one-way MANOVA was conducted in order to examine the effects of Negative Valence on the False Alarm scores of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 1.12, $\underline{p}$ > .05 (see Table 88).

Table 88. MANOVA Results for the False Alarm Scores of Different Word Categories

False Alarms	High Negative Valence	Low Negative Valence	Univariate F (1, 129)	Multivariate F (4, 126)
				1.12, ns
Positive	1.23	1.46		
Depression Related	1.48	1.32		
Threat Related	3.17	3.57		
Neutral	.81	.85		

Note. ns = non-significant.

3.6.6.5 Group Differences (High versus Low Negative Valence) on the False Alarms of Lures

A one-way MANOVA was conducted in order to examine the effects of Negative Valence on the False Alarm scores of four groups of lures (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 0.71, $\underline{p}$ > .05 (see Table 89).

Table 89. MANOVA Results for the False Alarm Scores of Lures

False Alarms for Lures	High Negative Valence	Low Negative Valence	Univariate F (1, 129)	Multivariate F (4, 126)
				0.71, ns
Positive	1.04	1.10		
Depression Related	.98	.96		
Threat Related	1.69	1.94		
Neutral	.73	.76		

Note. ns = non-significant.

3.6.6.6 Signal Detection Analysis for Negative Valence

3.6.6.6.1 Group Differences (High versus Low Negative Valence) on the Sensitivity Index

A one-way MANOVA was conducted in order to find out whether Negative Valence had an effect on the Sensitivity Index of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 126) = 1.71, $\underline{p}$ > .05 (see Table 90A).

3.6.6.6.2 Group Differences (High versus Low Negative Valence) on Response Criterion

A one-way MANOVA was performed in order to assess the effects of Negative Valence on the Response Criterion of four groups of words (i.e., threat related, depression related, positive, and neutral). No significant results were obtained, Multivariate $\underline{F}$ (4, 52) = 0.68, $\underline{p}$ > .05 (see Table 90B).

Table 90. MANOVA Results for the Sensitivity Index and Response Criterion of Different Word Categories

	High Negative Valence	Low Negative Valence	Univariate F (1, 129)	Multivariate F (4, 126)
A. Sensitivity Index				1.71, ns
Positive	-3.54	-3.33		
Depression Related	-2.96	-2.99		
Threat Related	-2.00	-1.32		
Neutral	-4.08	-3.91		
B. Response Criterion				**Multivariate F (4, 52)**
				0.68, ns
Positive	.44	.40		
Depression Related	.40	.39		
Threat Related	.20	.14		
Neutral	.59	.52		

Note. ns = non-significant.

CHAPTER IV

DISCUSSION

In this chapter, firstly the general findings for recognition of different types of material (i.e., positive, depression related, threat related and neutral) will be focused on. Secondly, findings about the reaction time measures will be the target. Thirdly, findings concerning the trait anxiety and depression levels and true and false memory will be discussed. Then the findings about the "openness to experience" dimension of personality and true/ false memory will be the focus. Later, the general findings for the relationship between true/ false memory and big 5 personality traits will be considered. Lastly, the limitations of the study and future suggestions will be stated.

4.1. General Findings for the Recognition of Different Word Types

When accuracy of recognition for lure words and thematic new words that were not related to the critical lure were compared, people made more accurate decisions for positive, depression related and neutral thematic new words as compared to lure words of the same type. This was consistent with the expectations as the lure words were non-presented associates of the critical lure word all of which were derived from. However, the difference was not significant when threat related lures and thematic new words were considered. In the case of threat related words, other mechanisms may be playing role. For instance, there may be an overall vigilance for threat related material that may lead to interference at recognition. Another possible explanation may be that all threat related words are related to "death" (the critical lure) in some way. Therefore there may not be a difference between the total accuracy scores of threat related lures and thematic new words. These findings are consistent with both source-monitoring framework and fuzz-trace theory. From the Source-Monitoring Framework, as thematic new words are not the associates of the critical lure and other items in the list, they do not lead to source confusion. According to Fuzzy-Trace Theory, gist traces will be stronger for the lure words as they are associated to the critical lure and to each other which will lead to

more false memories. However, threat related words do not display this pattern. From Fuzzy-trace perspective, people may have depended on gist memories more for threat related words which may have led to gist processing of "threat" rather than the critical lure itself. SMF would predict that more internal associates for threat related words would be produced that may have led to source monitoring deficiency.

When the total accuracy scores were considered, people had better recognition for neutral words that was followed by positive, depression related and threat related words. Similarly, false alarm rates were highest for threat related words that was followed by depression related and positive, both of which did not differ from each other, and neutral words. False alarms for lures of different types displayed the same pattern, too. This finding was not consistent with the Kensinger's (2004) who found more false alarm rates for neutral material as compared to emotional ones. She argued that emotional materials provided distinctiveness at the encoding of the material which in turn, decreased false alarms. The current finding is controversial to this but it was expected as it is plausible that emotional material may lead to the more internal associations that may interfere with the recognition of the words. Namely, more self generated associations for emotional words may make source monitoring more difficult for the individuals. In addition, this finding is consistent with the Easterbrook hypothesis which states that emotion narrows the cues that a person can attend to so that s/he will focus more on the central aspects not the peripheral ones (Easterbrook, 1959 as cited in Laney, Heuer & Reisberg, 2003). In this respect, emotional words may trigger corresponding emotions that leads to more false memories and less true memories. Also there is evidence that people recollect emotional events with a field perspective (his or her point of view) whereas they use observer perspective for neutral events (D'Argembeau, Comblain, Van Der Linden, 2003). More self engagement in emotional material may be the reason that decreases the accuracy of emotional material. In other words, people may be more objective regarding the neutral events and material whereas it may not be the case with emotional events and material. Namely, people may be more likely to form false memories when the material is emotionally valenced which is an important issue regarding the creation of false memories.

4.2 Findings Concerning the Reaction Times

For positive, depression related and neutral lure words, participants' mean reaction times for falsely recognized words were higher than the mean reaction times of truly recognized words. This was consistent with the expectations as it indicates indecisiveness or some kind of awareness before responding as old or new to the item. However, the difference did not reach significance for threat related lure words. People displayed some kind of different effect for threat related words. Together with the high levels of false recognition for threat related words, this finding points out that people may have used "familiarity" based decision criteria for threat related words without indecisiveness. These findings are partially consistent with the findings of Coane et al. (2007) that found that false alarms to critical lures were found to be slower than hits to list items. Different reaction times for true and false recognition of the lures imply that true and false memories may be differentiated on the basis of time for deciding an item as old or new.

For positive, depression related and threat related old words, mean reaction times for falsely recognized ones were higher than the mean reaction times of truly recognized words. This finding was again consistent with the expectations implying indecisiveness. However, the difference was not significant for neutral old words. This implies that people did not hesitate when they were assigning the wrong judgment to neutral old words.

4.3 Findings Related to Remember/ Know Judgments

Overall, results indicated that people usually assigned "know" judgments rather than "remember" judgments for the old words of different types (i.e., positive, depression related, threat related and neutral) that were actually presented in the encoding list. This finding was surprising as old words were actually presented and should be remembered as a recollection rather than having a feeling of familiarity. For threat related lure words, the rate of "know" responses were significantly higher than the "remember" responses. However, there was not any difference for positive, depression related and neutral lure words in terms of the proportion of remember/ know responses. This finding was again surprising as the lure words were non-

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presented associates of the critical lure word, "know" responses rather than "remember" responses would be expected. This finding is important as it suggests that false memories may be caused by essential memory processes (Arndt & Reder, 2003). Threat related words were exceptional again. Although, people have made their true or false decisions without hesitation, they assigned more "know" responses which reflects a familiarity feeling rather than an actual recollection. It was surprising that they have not reflected indecisiveness in their reaction times whereas they have decided on the basis of familiarity or gist of the information.

For old words, remember responses were given mostly for depression related ones followed by positive, neutral and threat related words both of which did not differ from each other in terms of remember rates. For lure words, remember responses were given mostly for positive words which were significantly higher than the mean proportion of remember responses given to threat related and neutral lure words, both of which did not differ from each other. There was not any difference between the depression related words and other three types in terms of the rate of remember responses.

Lure words of all four types (i.e., positive, depression related, threat related and neutral) were assigned more "remember" judgments as compared to old words that were actually presented. This finding was contradictory to the expectations based on the past studies (Smith, Gleaves, Pierce et al., 2003). Although, some studies report high rates of "remember" responses for false memories (Roediger and McDermott, 1995 as cited in Wixted & Strech, 2004) "remember" responses for old words should be higher as they were actually presented in the encoding list. This finding was surprising as it points out that people remember false memories as recollections with higher rates than the actual memories. This finding is consistent with the hypothesis that false recognition is due to memory processes such as encoding or representation of the stimuli rather than decision processes at the time of the testing phase (Wickens & Hirshman, 2000; Wixted & Strech, 2000 as cited in Arndt & Reder, 2003). However, there exists a possible explanation of confusion for "remember/ know" responses. Although their meaning have been stated clearly with both oral and written instructions, participants may have given "remember"

responses when they were not sure of the word's occurrence whereas they may have given "know" responses when they felt sure about the word's occurrence in the encoding list.

4.4. Findings Related to Trait Anxiety and Depression

One important aim of this study was to investigate whether personality characteristics, depression and trait anxiety levels had differential effects on either true or false recognition of emotionally valenced material. Firstly, four groups were formed; namely, depressed, anxious, mixed and control groups. The purpose was to examine the unique effects of depression and anxiety on true and false memory for emotionally valenced words. It was hypothesized that the anxious group would make more false alarms for the threat related words as compared to the control ad depressed groups. Similarly, more false alarms were expected for the depressed group for depression related words as compared to the control and anxious groups. For the mixed group, more false alarms for both depression and threat related words were expected, as they displayed higher levels of anxiety and depression, in comparison with the other groups.

For the critical lure words, only threat related critical lure word was above chance levels for the groups (depressed, anxious, mixed and control). This was due the anxious group which had higher true recognition and lower false recognition than expected. Surprisingly, anxious people were better than expected at the recognition of threat related critical lure word whereas they were not good at the total accurate recognition of threat related words.

For the positive, depression related and neutral critical lure words that all other words were related to, false alarm rates were less than expected (mean scores of false alarms for thematic new words). However, people made high levels of false alarms for the threat related critical lure. The depressed group made more false alarms which was followed by the anxious, mixed and control groups. These findings were contradictory to expectations. In fact, critical lure words did not lead to high levels of false recognition. According to literature, some DRM word lists do not produce high levels of false recognition or recall and when preparing the word lists,

backward association should be used (Roediger & McDermott, 1995). In other words, when the list words are presented to people, the other words in the list should be freely associated. In this study, backward association was not used. This may be the reason that the critical lure words did not lead to high false recognition as expected. Another explanation may be that the participants may have used the critical lures as a short-cut mnemonic device at the time of the encoding which may have led to better differentiation at the testing. However, it was not the case with the threat related critical lure word. In addition, higher level of false recognition was found for threat related new words. This may be due to the overall hypervigilance or gist processing of people for threat related material.

When hit scores are taken into consideration, there were group differences for only threat related words. Namely, the mixed and the control groups had more hits for threat related old words as compared to the anxious group. There was not any difference between groups in terms of false alarm scores for all the items and lure words. When total accurate recognition score that included 12 words of each category was taken into account, mixed group had higher levels of accuracy for threat related words than the anxious group. The difference between anxious and control groups in terms of accuracy was not significant when the all test items were taken into consideration. Mixed group had significantly higher mean scores of trait anxiety and depression as compared to anxious group. In other words, when high levels of depression and anxiety were coexisting, participants had more accurate recognition for threat related words. Depression seems to increase accuracy for threat related material when it coexists with high levels of trait anxiety. On the other hand, moderate levels of anxiety without depression may be leading to worse memory for threat related words. People who are only trait anxious may be using avoidance or suppression for threat related material which in turn may be leading to worse memory for threat. On the other hand, when depression coexists with anxiety, the defense mechanisms of avoidance and suppression may be eliminated by the effects of depression. Another explanation may be that anxiety surpasses attentional bias (Rinck & Becker, 2005) whereas comorbid depression and anxiety involve both attentional and memory bias. In other words, anxious individuals may be not be

elaborating threat related material whereas comorbid depression blocks out this process leading to more elaboration and better recognition. As the mixed group had almost clinical levels of anxiety and depression, it may point out that clinical anxiety and depression may show this memory pattern with threat related material.

As we know, depression is related to better memory for negative material. In this study it was hypothesized that depressed individuals would make more false alarms for depression related words rather than displaying genuine mood congruent memory bias. However, the depressed group did reveal neither more false alarms nor memory bias for depression related words. Higher levels of depression may be required for detecting either of them. In addition, the effect of group on the response criterion scores of four word types was significant. However, post-hoc comparisons did not reveal any group differences.

Namely, the anxious and the depressed groups did not make more false alarms for threat related and depression related material. In addition, the depressed and anxious groups were not better at the recognition of depression or threat related words. This finding seems to contradict with the studies that have found mood-congruent memory bias (Watkins et al., 2000; Watkins et al., 1992) and more false recognition for depression related material (Moritz et. al., 2005). An explanation may be that clinical levels of anxiety and depression may be required to detect mood congruent true or false memory. In addition, a larger sample size may be needed to make conclusions about this phenomenon.

In addition, there were no group differences on the mean proportion of remember responses for both old and lure words. In other words, depression and anxiety levels did not affect the rate of assigned "remember" responses for both true and false recognition.

So far, signal detection analysis revealed only significant effect of group on the positive words whereas post-hoc comparisons did not reveal group differences. Namely, sensitivity (discriminating between presented and non presented words) and response criterion for different word types were not affected by anxiety and depression levels.

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Lastly, there were not any expectations in terms of group difference on the mean reaction times of words of different types but it was examined for exploration purposes. The groups (depressed, anxious, mixed and control) did not differ on the mean reaction times for critical lures, lures and old words of different types (i.e., positive, depression related, threat related and neutral).

4.5. Openness to Experience and True/ False Memory

Two groups with individuals high and low in openness to experience were formed in order to examine if openness to experience had an effect on either true or false recognition of emotionally valenced material.

For the critical lure words, the frequencies of individuals who made hits or false alarms were not above the probability of chance. In addition, the effect of openness on the total accuracy sores and hit scores was not significant. However, there was a trend for the effect of group on the false alarms of lures of four word types. Namely, people low in openness to experience measure made more false alarms for positive lures as compared to people high in openness to experience. There was not any difference between groups in terms of sensitivity index and response criterion.

Ryan (1998) has found that people with high openness to experience displayed lower levels of false memory. However, he did not use emotionally valenced material. In the current study, lower levels of false memory production in open individuals was found for only positive lure words that were non-presented associates of the critical lure. The valence of the material seems to be important in this phenomenon.

Due to higher involvement with their inner world, acceptance and being not defensive, open individuals were expected to display lower levels of false memory (Ryan, 1998). However, this was true for only positively valenced material. There was not any significant difference between individuals high or low in openness to experience in terms of false alarms of other word types. This finding may imply other mechanisms rather than higher involvement with their inner world may be playing role. In other words, this finding may imply that open individuals may not be

prone to source monitoring deficiencies for semantically associated positive material as they may be more familiar with the positive material. The finding that they do not make more hits but less false alarms indicates that open people do not have memory bias for positive material but they are able to differentiate between positive true and false memories. In addition, they did not use a more strict response criterion for positive words. From Fuzzy-Trace Theory's point of view, people who were high in openness to experience may have used more verbatim traces for positive words. However, this did not lead to more true recognition but lowered the false recognition.

4.6. Personality Traits and True/ False Memory

In order to examine the differences of personality characteristics, two groups that included people low and high on the measures of six personality characteristics were formed.

For neuroticism, the results were not significant considering total accuracy, hits and false alarms. However, there was a group difference in terms of response criterion for positive words. Individuals who were low in neuroticism used a riskier response style for positive words as compared to people who were high in this trait. However, this did not lead to any difference between the groups in terms of true or false recognition of positive words. According to relevant studies (Ruiz-Cabellero & Bermudez, 2001; Rusting, 1999), neuroticism is related to a memory bias for negative material. Bradley, Mogg and Perret (1993) investigated the recall of negative and positive words in high and low neuroticism. The subjects were induced either neutral or depressed mood. Results revealed an interaction effect between mood and neuroticism on the recall of negatively valenced material. When depressed, people with high neuroticism recalled negative material better. On the other hand, when in neutral mood, high levels of neuroticism was related to poorer recall of negative material. The findings of the current study are not consistent with the studies that mention recall bias or deficiency for negative material.

For extraversion, there were not any group differences in terms of total accuracy, hits and false alarms. In addition, the results for sensitivity index and response criterion were not significant, too. In a study (Paddock, Terranova, Kwok &

Halpern, 2000), higher extraversion was found to be correlated with higher levels of suggestibility for remembering an earlier told event after guided visualization. The authors concluded that it was natural as extraverted people are oriented toward external stimuli rather than internal. However, current findings do not point out any differential mechanisms of memory for these individuals.

For conscientiousness, there were not any group differences in terms of total accuracy and hits. However, there was a group difference when the false alarms of lures were considered. People with high levels of conscientiousness made more false alarms for threat related lure words as compared to people who were low in this trait. There were not any group differences for sensitivity index and response criterion.

The finding that people with high conscientiousness made more false alarms for threat related lure words was surprising as there is not any study investigating and finding an effect of conscientiousness on false memory. Conscientiousness has only been found to be associated with hindsight bias; that is the tendency to overestimate how predictable was an event after learning the outcome (Musch, 2003). As we know, conscientiousness is characterized by competence, self-discipline and ambitiousness. These characteristics may be leading to hypervigilance for threat related material, which in turn may be leading to more false memory production for associated threat related material. In other words, conscientious people may be more focused on the central issue or gist of threat whereas they disregard the peripheral aspects. This may be leading them to commit more memory errors for threat related material. From an overall point of view, focusing on the central theme of "threat" may be a strategy for survival of conscientiousness people. In other words, being hypervigilant and remembering non-present threat related material may be helping them for the issues they value (i.e, ambition and competence). In a relevant study (Manzoor & Ghazala, 2003), the relationship between early collections-a projective technique used in therapy- and personality traits were examined. The results showed that "injury and illness" and "fear and anxiety provoking situations" were the most common themes of the early collections that were told by conscientious people. In addition, conscientiousness has been found to be linked with obsessive compulsive personality disorder which is a type of anxiety disorders (Furnham and Crump,

2005). From this point of view, more false alarms for threat related lure words seems plausible for conscientious people.

For agreeableness, the results were non-significant for total accuracy, hits and false alarms. In addition, there was not any difference between groups in terms of sensitivity index and response criterion. In a relevant study (Eisen, Winograd and Quin, 2002), agreeableness was related to immediate acceptance of misinformation whereas imagery ability was related to acceptance of misleading information after a delay. In addition, agreeableness was found to be associated with self reported suggestibility (Liebman, McKinley-Pace, Leonard et al., 2002). Although, the effect of agreeableness on the false memory phenomenon is not a widely explored area; the findings of this study did not reveal any difference on false memory production between people high or low on this personality measure.

For negative valence, there were not any significant results when total accuracy, hits and false alarms are taken into account. Moreover, there were not any group differences in terms of sensitivity index and response criterion.

4.7 Limitations of the Study

As depression and trait anxiety usually co-exists in individuals, the current study had a shortcoming of unequal cell sizes. There were fewer participants in the pure depressed and anxious groups due to this fact. However, the ratio was not more than 1/ 5.

Another limitation of the study was the low number of the DRM word lists. Four lists were used in this study. Due to this small range of responses, individual differences may not have been detected. However, the trend effects are important for this reason and with more lists the differences may be more salient for the groups. Most of the studies that found individual differences used more study lists (e. g. 24 lists, Roediger & McDermott, 1995).

In addition, when collecting the word lists, backward association may be used in order to create DRM lists that consist of Turkish words. This may increase the false recognition rate which may be helpful for detecting the differences among groups (Roediger and McDermott, 1995). In addition, visual presentation of the lists

may have decreased the false memories as compared to aural presentation (Smith & Hunt, 1998). Therefore aural presentation may also help increasing the false memories.

Furthermore, the participants were college students with moderate levels of anxiety and depression. Therefore these findings should be replicated with a clinical sample in order to make generalizations.

4.8 Implications and Future Directions

Overall, the findings of this study found group (depressed, anxious, mixed and control) differences for only threat related words. Mixed group had higher levels of accuracy for threat related words than the anxious group. This finding may imply that when depression coexists with anxiety, people possess more accurate recognition for threat related words. This finding should be investigated with a larger sample in future researches. In addition, lists that lead to more false alarms may be used to investigate and understand the relationship between true or false memory and, depression and trait anxiety.

In addition, two of the personality characteristics (openness to experience and conscientiousness) were related to false memory of lure words. This finding implies that there may be individual differences that affect true and false memory mechanisms. These differences may be related to the coping strategies of individuals for survival. For instance, conscientious people may be hypervigilant to threat related information which makes them produce more false memories for threat related material. Also open people may be focusing on the positive aspects of life as a coping mechanism which in turn makes them open to new experiences, feelings or thoughts. Therefore coping mechanisms may be mediating the effects of personality on true and false memory. Further research may focus on this relationship in order to extend our knowledge of memory mechanisms.

In addition, there may be some factors that need to be measured such as IQ or short-term memory. The results may be different when the effects of these variables are controlled for. However, in the current study, the students were from a homogeneous population whose IQs were probably similar to each other.

The results of the current study suggest that different personality characteristics may be playing role in memory processes. As memory and personality are important structures that influence human behavior, cognitions and emotions, they may have central roles in our understanding of psychopathology. For the current debate on the recovered memories of child abuse, the current results imply that there may be some individual differences that may lead to more false memory creation, especially with threat related material. Therefore future research should consider the effects of certain characteristics on producing false memories with threat related material as threat is the central issue in child abuse cases. Furthermore, the effects of personality characteristics on false memory creation of children need to be determined for a better understanding.

So far, false memory creation is also important for the clinical setting which heavily relies upon the relationship and rapport between the therapist and patient. The findings of this study imply that certain personality characteristics may make individuals falsely remember information which may be an obstacle for building rapport and progressing in the treatment. It may be plausible that memory tests be a part of screening instruments for the therapy work as they may help to understand possible memory distortions for the therapist as well as providing awareness for the patient herself.

Namely, the studies in the area of true and false memory should be broadened in order to find out the general principles underlying memory mechanisms. As memory is highly related to who we are and who we would be in the future, the studies in this area may help us to understand a diversity of psychological structures and disorders.

To conclude, as McGaugh (2003) states "Our memories connect the past to the present and allow us to form expectations for the future". Therefore true and false memories are an important area that may help us clarify many things regarding the human nature and psychopathology.

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APPENDICES

APPENDIX A

Aşağıda bazı kelimeler verilmiştir. Lütfen bu kelimeleri teker teker okuyup, her kelimenin size çağrıştırdığı (aklınıza ilk gelen) <u>5 adet</u> kelimeyi yazınız. Lütfen özel isim ya da yer ismi kullan**ma**yınız.

Örnek:

KOKU: kahve, çöp, parfüm, dükkan, market

CADDE:
      1.
      2.
      3.
      4.
      5.

ŞANS:
      1.
      2.
      3.
      4.
      5.

BIÇAKLANMA:
      1.
      2.
      3.
      4.
      5.

KEDER:
      1.
      2.
      3.
      4.
      5.

PENCERE:
      1.
      2.
      3.
      4.
      5.

EĞLENCE:
     1.
     2.
     3.
     4.
     5.

ÖLÜM:
     1.
     2.
     3.
     4.
     5.

ÜZGÜN:
     1.
     2.
     3.
     4.
     5.

AYAKKABI:
     1.
     2.
     3.
     4.
     5.

BAŞARI:
     1.
     2.
     3.
     4.
     5.

SAKATLANMA:
     1.
     2.
     3.
     4.
     5.

TERKEDİLMİŞ:
      1.
      2.
      3.
      4.
      5.

PUSULA:
      1.
      2.
      3.
      4.
      5.

DOST:
      1.
      2.
      3.
      4.
      5.

EZİYET:
      1.
      2.
      3.
      4.
      5.

UMUTSUZ:
      1.
      2.
      3.
      4.
      5.

GİRİŞ:
      1.
      2.
      3.
      4.
      5.

MUTLULUK:
    1.
    2.
    3.
    4.
    5.

TECAVÜZ:
    1.
    2.
    3.
    4.
    5.

YETERSİZ:
    1.
    2.
    3.
    4.
    5.

TAYFA:
    1.
    2.
    3.
    4.
    5.

NEŞELİ:
    1.
    2.
    3.
    4.
    5.

REZİL OLMA:
    1.
    2.
    3.
    4.
    5.

YALNIZ:
      1.
      2.
      3.
      4.
      5.

HAVA:
      1.
      2.
      3.
      4.
      5.

HUZUR:
      1.
      2.
      3.
      4.
      5.

REDDEDİLME:
      1.
      2.
      3.
      4.
      5.

SIKINTILI:
      1.
      2.
      3.
      4.
      5.

Threat	*Depression*	*Neutral*	*Positive*
ÖLÜM	**ÜZGÜN**	**AYAKKABI**	**HUZURLU**
Mezar	Ağlamak	Bağcık	**Mutlu**
Toprak	Yalnız	Çorap	Rahat
Son	**Mutsuz**	**Boya**	Sakin
Tabut	Gözyaşı	Topuk	Aile
Kayıp	Acı	**Deri**	Ev
Siyah	Sıkıntı	Bot	Dingin
Cenaze	**Çaresiz**	Spor	Uyku
Yokluk	Dert	Yürümek	**Sevgi**
Karanlık	**Kırgın**	Çamur	Yaşlı
Kurtuluş	Teselli	Sıcak	Memnun
Hayat	Suskun	**Parlak**	**Deniz**
Kefen	Keder	Terlik	Gülümseme

The words in the first row are critical lure words and the ones in bold are lure words. Other words are presented in the encoding list.

APPENDIX C - RECOGNITION LIST

Positive Old Words	
Rahat	*Critical Lure* → Huzur
Aile	
Ev	*Lures* → Mutlu, Sevgi, Deniz
Uyku	
Yaşlı	*Thematic New Words* → Eğlence, Şans
Gülümseme	
Depression Related Old Words	
Ağlamak	*Critical Lure* → Üzgün
Gözyaşı	
Acı	*Lures* → Mutsuz, Çaresiz, Kırgın
Dert	
Teselli	*Thematic New Words* → Melankoli, Yetersiz
Suskun	
Threat Related Old Words	
Mezar	*Critical Lure* → Ölüm
Son	
Kayıp	*Lures* → Toprak, Cenaze, Hayat
Yokluk	
Kurtuluş	*Thematic New Words* → Yangın, Mikrop
Kefen	
Neutral Old Words	
Bağcık	*Critical Lure* → Ayakkabı
Çorap	
Bot	*Lures* → Boya, Deri, Parlak
Yürümek	
Çamur	*Thematic New Words* → Bardak, Sandalye
Terlik	

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

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

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

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

4. (a) Herşeyden eskisi kadar zevk alabiliyorum.
   (b) Herşeyden eskisi kadar zevk alamıyorum.
   (c) Artık hiçbirşeyden gerçek bir zevk alamıyorum.
   (d) Bana zevk veren hiçbirşey yok. Herşey çok sıkıcı.

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 hoşnutum.

   (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 yapamam.

   (c) Kendimi öldürebilmeyi isterdim.

   (d) Bir firsatını 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 sıralarda 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) Şu 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 hissediyorum.

(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 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 tekrar uyuyamıyorum.

17. (a) Eskisine kıyasla daha çabuk yorulduğumu sanmıyorum.

    (b) Eskisinden daha çabuk yoruluyorum.

    (c) Şu sıralarda neredeyse herşey beni yoruyor.

    (d) Öyle yorgunum ki hiçbirşey 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 kaybettiğimi sanmıyorum.

    (b) Son zamanlarda istemediğim halde üç kilodan fazla kaybettim.

    (c) Son zamanlarda istemediğim halde beş kilodan fazla kaybettim.

    (d) Son zamanlarda istemediğim halde yedi kilodan fazla kaybettim.

- Daha az yemeye çalışarak kilo kaybetmeye çalışıyor musunuz? EVET( ) HAYIR( )

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 öylesine endişelendiriyor ki, artık başka hiçbirşey

       düşünemiyorum.

21. (a) Son zamanlarda cinsel yaşantımda dikkatimi çeken birşey yok.

(b) Eskisine oranla cinsel konularda daha az ilgiliyim.

(c) Şu sıralarda cinsellikle pek ilgili değilim.

(d) Artık, cinsellikle hiçbir ilgim kalmadı.

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

	Hemen hiç bir 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 hissederim.	1	2	3	4
7. Genellikle sakin, kendime 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 etkilenirim.	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 memnunumum.	1	2	3	4
17. Olur olmaz düşünceler beni rahatsız eder.	1	2	3	4
18. Hayal kırıklıklarını öylesine ciddiye alırım ki hiç unutmam.	1	2	3	4
19. Aklı başında ve kararlı bir insanım.	1	2	3	4
20. Son zamanlarda kafama takılan konular beni tedirgin eder.	1	2	3	4

YÖNERGE:

Aşağıda size uyan ya da uymayan pek çok kişilik özelliği bulunmaktadır. <u>Bu özelliklerden herbirinin sizin için ne kadar uygun olduğunu ilgili rakamı daire içine alarak belirtiniz.</u>
Örneğin;
Kendimi .... biri olarak görüyorum.

__Hiç uygun değil__	__Uygun değil__	__Kararsızım__	__Uygun__	__Çok uygun__
1	2	③	4	5

#		Hiç uygun değil	Uygun değil	Kararsızım	Uygun	Çok uygun		#		Hiç uygun değil	Uygun değil	Kararsızım	Uygun	Çok uygun
1	Aceleci	1	2	3	4	5		28	Açgözlü	1	2	3	4	5
2	Yapmacık	1	2	3	4	5		29	Sinirli	1	2	3	4	5
3	Duyarlı	1	2	3	4	5		30	Canayakın	1	2	3	4	5
4	Konuşkan	1	2	3	4	5		31	Kızgın	1	2	3	4	5
5	Kendine güvenen	1	2	3	4	5		32	Sabit fikirli	1	2	3	4	5
6	Güler yüzlü	1	2	3	4	5		33	Görgüsüz	1	2	3	4	5
7	Soğuk	1	2	3	4	5		34	Durgun	1	2	3	4	5
8	Utangaç	1	2	3	4	5		35	Kaygılı	1	2	3	4	5
9	Paylaşımcı	1	2	3	4	5		36	Terbiyesiz	1	2	3	4	5
10	Geniş-rahat	1	2	3	4	5		37	Sabırsız	1	2	3	4	5
11	Cesur	1	2	3	4	5		38	yaratıcı	1	2	3	4	5
12	Agresif	1	2	3	4	5		39	Kaprisli	1	2	3	4	5
13	Tutarlı	1	2	3	4	5		40	İçine kapanık	1	2	3	4	5
14	Çalışkan	1	2	3	4	5		41	Çekingen	1	2	3	4	5
15	İçten pazarlıklı	1	2	3	4	5		42	Alıngan	1	2	3	4	5
16	Girişken	1	2	3	4	5		43	Hoşgörülü	1	2	3	4	5
17	İyi niyetli	1	2	3	4	5		44	Düzenli	1	2	3	4	5
18	İçten	1	2	3	4	5		45	Titiz	1	2	3	4	5
19	Kendinden emin	1	2	3	4	5		46	Tedbirli	1	2	3	4	5
20	Huysuz	1	2	3	4	5		47	Azimli	1	2	3	4	5
21	Yardımsever	1	2	3	4	5								
22	kabiliyetli	1	2	3	4	5								
23	Üşengeç	1	2	3	4	5								
24	Sorumsuz	1	2	3	4	5								
25	Sevecen	1	2	3	4	5								
26	Pasif	1	2	3	4	5								
27	Disiplinli	1	2	3	4	5								

APPENDIX G

GÖNÜLLÜ KATILIM FORMU

Bu çalışma, ODTÜ Psikoloji Bölümü öğretim üyesi Doç. Dr. Tülin Gençöz ve Klinik Psikoloji yüksek lisans öğrencisi Ayşen Gündüz tarafından yürütülmektedir. Katılım gönüllü olarak gerçekleşmektedir. Çalışmanın amacı hafıza hakkında bilgi edinmektir. Cevaplarınız tamamiyle gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilecektir; elde edilecek bilgiler bilimsel yayımlarda kullanılacaktır. Anketler ve bilgisayar ekranında gösterilecek olan kelime materyali zararlı veya rahatsız edici unsurlar içermemektedir Ancak, katılım sırasında herhangi bir nedenden ötürü kendinizi rahatsız hissederseniz çalışmayı yarıda bırakıp çıkmakta serbestsiniz. Böyle bir durumda deneyi uygulayan kişiye, deneyi tamamlamadığınızı söylemek yeterli olacaktır.

Çalışma sonlandıktan sonra katılımcılar sonuçlardan ve genel bulgulardan e-posta yolu ile haberdar edilecektir. Çalışmanın sonuçları yalnızca bilimsel olarak kullanılacaktır. Kişisel bilgileriniz gizli tutulacaktır. Katılımınız için teşekkür ederiz.

Daha sonra sonuçlar hakkında bilgi edinmek için size verilen numarayı saklayınız ve e-posta adresinizi belirtmeyi unutmayınız.

Ayşen Gündüz: aysengunduz@yahoo.com (0535 502 74 52)

Doç. Dr. Tülin Gençöz-Beşeri Bilimleri Binası B-239 (210 31 31)

Lütfen aşağıda istenen bilgileri doldurunuz.

Cinsiyet : . ……
Yaş   : ....
E-Posta : ....

Herhangi bir tedavi görüyor musunuz? Görüyorsanız lütfen ne olduğunu belirtiniz.

…………………………………………………………………………………
……

....
....

Kullandığınız ilaç varsa lütfen adını ve kullanma nedeninizi belirtiniz.

....
......

....
......

Bu çalışmaya tamamen gönüllü olarak katılıyorum ve istediğim zaman yarıda kesip çıkabileceğimi biliyorum. Verdiğim bilgilerin bilimsel amaçlı yayımlarda kullanılmasını kabul ediyorum. (Formu doldurup imzaladıktan sonra uygulayıcıya geri veriniz).

İsim Soyad*   Tarih   İmza
                        ----/----/-----

*İsim bilgileriniz sadece izninizi alma amacı ile istenmiş olup hiç bir şekilde kimseyle paylaşılmayacaktır

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APPENDIX H

Lütfen deneye başlamadan önce aşağıdaki açıklamaları dikkatlice okuyunuz. Sormak istediğiniz bir şey olursa deneyi yapan kişiye danışınız.

Bir önceki bölümde bazı kelimeler gördünüz. Bu bölümde ise bir kelime hatırlama testi alacaksınız. Size ekranda sırayla 4 adet kelime listesi verilecek. Lütfen bu kelimeleri bir önceki aşamada gördüğünüzü düşünüyorsanız üzerinde "VAR" yazan tuşa basınız. Eğer görmediğinizi düşünüyorsanız ise üzerinde "YOK" yazan tuşa basınız. Kararsız kaldığınızda en uygun gelen seçeneğe ait tuşa (VAR/ YOK) basınız.

Gördüğünüzü belirttiğiniz (VAR dediğiniz) her kelime için yeni bir ekran çıkacak ve sizden "**hatırlıyorum**" ya da "**biliyorum**" seçeneklerinden birini seçmenizi isteyecektir. Bu seçeneklerden sadece birini işaretleyiniz. Seçeneklerin ifade ettikleri aşağıda açıklanmıştır.

Yargı	Açıklama	Örnek
Hatırlıyorum	Kelimeyi gördüğünüz anı veya o kelimeyi okurken kelimeyle ilgili olarak yaşadığınız bazı ayrıntıları hatırladığınızı belirtir.	Kelimenin listedeki yerini hangi kelimeden önce ya da sonra geldiğini hatırlıyorsanız ya da Kelimeyi gördüğünüzde kelimenin aklınıza getirmiş olduğu bir olayı veya düşünceyi veya bir duyguyu hatırlıyorsanız
Biliyorum	Kelime ile ilgili bir ayrıntı hatırlamadığınızı ama gördüğünüzü bildiğinizi belirtir	"Var, biliyorum" diyor ama gördüğünüz an ile ilgili bir ayrıntı hatırlamıyorsanız

Asıl teste başlamadan önce öğrenme amacı ile deneme testiniz gerçekleştirilecektir.

Deneyde mümkün olduğunca **doğru ve hızlı** karar vermeye çalışınız. Karar verme süreniz ve doğruluğu kaydedilecektir. (*Biliyorum- Hatırlıyorum* kısımlarına ait zamanlar kaydedilmeyecektir).

YARDIMLARINIZ İÇİN ÇOK TEŞEKKÜR EDERİZ.

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APPENDIX I

KATILIM SONRASI BİLGİ FORMU

Bu çalışma, daha önce de belirtildiği gibi ODTÜ Psikoloji Bölümü öğretim üyelerinden. Doç. Dr. Tülin Gençöz ve Klinik Psikoloji yüksek lisans öğrencisi Ayşen Gündüz tarafından yürütülen hafıza hakkında bilgi edinmeyi amaçlayan bir çalışmadır. Duygu durumları ve kişilik özellikleri ile hafıza arasındaki ilişki incelenecektir.

Deney esnasında gördüğünüz kelime listeleri size gösterilmeyen 4 adet kelimeden (kritik kelimeler) türetilmiş ve bu kelime ile ilişki düzeyine göre sıralanmıştır. Literatür, ilişkili kelimelerin gösterildiği listede, kişilerin gösterilmeyen kritik kelimenin de olduğunu söylediklerini göstermektedir. Bu da hafızanın ilişkiler üzerinden yürüyen bir sisteme sahip olduğuna dair bir gösterge olarak yorumlanmaktadır. Bu araştırma da üstte belirtilen özellikler ve yanlış hatırlama arasındaki ilişkiyi anlamaya yöneliktir. Hafıza testinde göstermiş olduğunuz performans, araştırma sonlandıktan sonra e-posta yolu ile size gönderilecektir. Sonuçlar herhangi bir şeyin göstergesi olmayıp sadece kişisel olarak kendi hafıza test sonuçlarınızı görmeniz amacı ile size gönderilecektir. Bu e-postada isim geçmeyecek ve verilen listede sadece size verilmiş olan katılım numarası ile kendi sonuçlarınız hakkında bilgi edinebileceksiniz

Bu çalışmadan alınacak ilk verilerin Eylül 2007 sonunda elde edilmesi amaçlanmaktadır. Elde edilen bilgiler sadece bilimsel araştırma ve yazılarda kullanılacaktır. Çalışmanın sonuçlarını öğrenmek ya da bu araştırma hakkında daha fazla bilgi almak için aşağıdaki isimlere başvurabilirsiniz. Bu araştırmaya katıldığınız için tekrar teşekkür ederiz.

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