RECALL MEMORY PERFORMANCE FOR REFUGEE-RELATED WORDS IN REFUGEES WITH AND WITHOUT POST-TRAUMATIC STRESS SYMPTOMS: THE EFFECTS OF EMOTIONAL VALENCE AND AGE

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ABSTRACT

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The aim of the current study was to examine whether the valence of words, the presence of post-traumatic stress disorder (PTSD) symptoms, and the aging effect influence free recall memory performance using refugee-related words across three groups, namely the refugees with PTSD symptoms, refugees without PTSD symptoms, and the control group. A total of 91 adults between the ages of 18-59 voluntarily participated in the study. The Post-Traumatic Diagnostic Scale was utilized to measure the presence of PTSD symptoms in participants. The results indicated that no emotion effect was found on memory performance. However, after refugees recategorized the words used in the study in terms of their valence, an emotion effect on recall memory performance was found. Negative and positive words were recalled better than neutral words. This finding supported previous literature on cultural differences on emotional components. Additionally, the mood congruency effect was observed in refugees aged 18-30, with refugees without PTSD symptoms recalling positive words better than refugees with PTSD symptoms. While there was no aging effect observed on memory performance, a positivity bias was observed in refugees with PTSD symptoms aged 31-59 was observed. In conclusion, the findings of the study revealed that word valence differed among refugees and Turkish individuals, positive and negative words

were recalled better than neutral words, middle-aged adults recalled more positive words compared to younger adults, and refugees without PTSD symptoms recalled positive words better than refugees with PTSD symptoms in terms of mood congruency effect.

Keywords: Memory, Free Recall, Emotion, Refugees, Post-Traumatic Stress Disorder, Aging Effect, Positivity Bias, Mood Congruency Effect

ÖZET

TRAVMA SONRASI STRES SEMPTOMLARI OLAN VE OLMAYAN MÜLTECİLERDE MÜLTECİLİKLE İLGİLİ KELİMELER İÇİN HATIRLAMA BELLEĞİ PERFORMANSI: DUYGUSAL DEĞERLİĞİN VE YAŞIN ETKİLERİ

TÜRKER, Dilara

Psikoloji Yüksek Lisans Tezi

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Bu çalışmanın amacı, mültecilerde kelimelerin değerliğinin, travma sonrası stress bozukluğu (TSSB) semptomlarının varlığının ve yaşlanma etkisinin mültecilerle ilgili kelimeleri kullanarak serbest hatırlama belleği performansını etkileyip etkilemediğini TSSB semptomları olan mülteciler, TSSB semptomları olmayan mülteciler ve kontrol grubu olmak üzere üç koşulda incelemektir. Çalışmaya 18-59 yaşları arasında 91 yetişkin gönüllü olarak katılmıştır. Katılımcılarda TSSB semptomlarının varlığını ölçmek için Travma Sonrası Tanı Ölçeği kullanılmıştır. Sonuçlar, bellek performansı üzerinde herhangi bir duygu etkisi bulunmadığını göstermiştir. Ancak, mülteciler çalışmada kullanılan kelimeleri değerliğine göre yeniden kategorize ettikten sonra, hatırlama belleği performansı üzerinde bir duygu etkisi bulunmuştur. Negatif ve pozitif kelimeler, nötr kelimeler göre daha iyi hatırlanmıştır. Bu bulgu, duygusal bileşenler üzerindeki kültürel farklılıklara ilişkin önceki literatürü desteklemiştir. Ek olarak, duygudurum tutarlılık etkisi, 18-30 yaş arası mültecilerde bulunmuştur. TSSB semptomları olmayan mülteciler, TSSB semptomları olan mültecilere göre pozitif kelimeleri daha iyi hatırlamıştır. Bellek performansı üzerinde herhangi bir yaşlanma etkisi bulunmazken, 31-59 yaş arası

TSSB semptomları olan mültecilerde olumluluk yanlılığı kaydedilmiştir. Sonuç olarak, çalışmanın bulguları, kelime değerliğinin mülteciler ve kontrol grubundaki katılımcılar arasında farklılaştığını, pozitif ve negatif kelimelerin nötr kelimelere göre daha iyi hatırlandığını, orta yaşlı yetişkinlerin genç yetişkinlere kıyasla daha fazla pozitif kelime hatırladığını ve TSSB semptomları olmayan mültecilerin, TSSB semptomları olan mültecilere göre duygudurum tutarlılığı etkisi açısından pozitif kelimeleri daha fazla hatırladığını ortaya koymuştur.

Anahtar Kelimeler: Bellek, Serbest Hatırlama, Duygu, Mülteciler, Travma Sonrası Stres Bozukluğu, Yaş Etkisi, Olumluluk Yanlılığı, Duygudurum Tutarlılık Etkisi

To all persons who have been displaced…

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APA	: American Psychiatric Association
ASAM	: Association for Solidarity with Asylum Seekers and Migrants
DSM	: Diagnostic and Statistical Manual of Mental Disorders
IGAM	: İltica ve Göç Araştırmaları Merkezi
IOM	: International Organization for Migration
NGO	: Non-governmental Organization
PANA	: Positive Activation – Negative Activation
PDS	: Post-Traumatic Diagnostic Scale
PTSD	: Post-Traumatic Stress Disorder
SPSS	: Statistical Package of Social Sciences
UNHCR	: United Nations High Commissioner for Refugees
WHO	: World Health Organization

CHAPTER 1

LITERATURE REVIEW

1.1. MIGRATION, FORCED MIGRATION, REFUGEES

1.1.1. Definitions

"A bundle of belonging isn't the only thing a refugee brings to his new country" (Albert Einstein)

"We can't deter people fleeing for their lives. They will come. The choice we have is how well we manage their arrival, and how humanely." (Antonio Guterres)

"*I truly believe the only way we can create global peace is through not only educating our minds, but our hearts and our souls."* (Malala Yousafzai)

Migration is defined by the International Organization for Migration (IOM) as "movement of a person or a group of persons, either across an international border (international migration), or within a state (internal migration)". This definition includes all forms of migration, whether it is voluntary, forced, internal, international, long-term, or short-term. The duration and cause of migration can vary, and may be due to factors such as political persecution, economic problems, environmental causes, and conflict in the country of origin, family reunification, and survival.

Forced migration, which refers to leaving country involuntarily, is converse to voluntary migration (Zetter 2014: 5). The United Nations High Commissioner for Refugees (UNHCR), which was established in 1951 with the responsibility of assisting and protecting refugees, stateless persons, and displaced persons, defines forced displacement as the act of being forced to flee people's country due to violence, fear of persecution, conflicts, and human rights violations (UNHCR Global Trends – Forced Displacement in 2021).

The UNHCR defined refugees as people who have escaped war, conflict, struggle or suppression and have gone across an international border to find protection in another country. Asylum seeker, on the other hand, is defined as a person who is looking for international protection but whose claim has not yet been

ultimately decided by the country in which the claim is submitted. The term migrant, meanwhile, is used for people who cross international borders for a variety of reasons such as economic opportunities, to improve their livelihood, family reunification, or of other purposes.

As outlined in the 1951 Convention, a refugee is specified as a person who " … owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it … ". Türkiye is one of the few countries, which signed the 1951 Refugee Convention and its 1967 Protocol, maintains so-called "geographical limitations" that restrict its protection only to people from European countries. Therefore, in Türkiye, only those who came from Europe to Türkiye are recognized as refugees (T. C. Göç İdaresi Genel Müdürlüğü 2015a).

The terms migrant, refugee, and asylum-seeker are often used interchangeably; however, these are different concepts with several discrepancies. In this study, for ease of use, the term refugees were used to refer to individuals who have sought asylum and crossed international borders for several reasons.

1.1.2. Refugees in Türkiye

Türkiye has been hosted several migration movements due to its strategic and geographical position over the years. Sometimes it has been played a role as a bridge between Middle East and Asian countries, and the European countries due to several reasons, including political and economic factors. Also, Türkiye has become final destination for individuals seeking safety from war and security risks (T. C. Göç İdaresi Genel Müdürlüğü 2015b).

UNHCR Mid-Year Trends 2022 report, which was published on 27 October 2022, represents that an estimated 103 million people were involved in forced migration due to human rights violations, conflicts, violence, and persecution in worldwide. Türkiye hosts the biggest refugee population in the world, with 3.7 million refugees.

After the Syrian crisis in 2011, international passing from the Syria to Türkiye started. As of March 2023, there are 3.500.964 registered Syrian refugees in Türkiye.

Additionally, there are 33.246 international protection applicants who are mostly Afghans (19.400 applicants), Ukrainian (7.131 applicants), Iraqis (4.083 applicants), and from other countries in Türkiye (T. C. Göç İdaresi Genel Müdürlüğü, 2015c).

1.1.3. Psychological Effects of Migration

Mental health of refugees is affected by various stages of migration, including, premigration, migration, and post migration (Kirmayer et al. 2011: E959). Asylum and resettlement processes in the host country creates stress for refugees after migration (Chen et al. 2017: 218). Duration of migration can lead to extraordinary stress in persons and families (Bhugra and Jones 2001: 216). Forced migration, traumatic experiences and adapting to a new environment lead to a risk of occurrence of psychiatric problems in refugees (Hollifield 2002: 611), and the psychological well-being of refugees is influenced by circumstances related to asylum process and policy of immigration. High rates of post-traumatic stress disorder (PTSD) and other psychological disorders are experienced by refugees (Li et al. 2016: 1). Consistent with previous studies, a meta-analysis by Fazel et al. (2005: 1312) showed that PTSD, major depression, and generalized anxiety disorder are most prevalent mental health problems experienced by refugees after post-migration phase.

Several factors can induce an increase of prevalence of psychological problems in refugees. For instance, psychological problems in refugees were highly related to challenges in social life and financial difficulties in Sweden example (Lindencrona 2008: 127). Similarly, it was explored in a study conducted in the North Korea that increased levels of depressive symptoms were related to challenges in social adaptation and experiencing discrimination (Um et al. 2015: 107). Noh et al. (1999: 193) explored that being subjected to racial discrimination increased depressive symptoms. Similarly, Southeast Asian refugees in Canada who experienced racial discrimination and employment difficulties showed more depressive symptoms (Beiser and Hou 2006: 145). In addition, sociopolitical factors including unstable political and economic regulations, cultural discontinuity, attitudes of institutions in the country of asylum can contribute to psychological problems in refugees (Porter and Haslam 2005: 608). Overall, these studies suggest that social adaptation problems, economic difficulties, discrimination, and political attitudes play role in prevalence of psychological problems in refugees.

1.1.3.1. Trauma and PTSD in Refugees

DSM-5 (American Psychiatric Association 2013) defines PTSD as a mental disorder, which can originate from traumatic events. People with PTSD show symptoms, such as disturbing feelings, thoughts, and dreams related to traumatic events. Various studies have found that PTSD is one of the most common psychological disorders among refugees (Basoglu et al. 2005: 580; Davis and Davis, 2006: 10; Eisenbruch 1991: 673; Morina et al. 2018: 19; Priebe and Saeed 1997: 75; Steel et al. 2009: 537) due to extreme stress experienced during flight, journey, and arrival, which might lead to signs of PTSD (Abbott 2016: 158). Traumatic events and stressors that refugees experienced, which lead to PTSD symptoms, can include chemical weapons (Guruge et al. 2018: 4), illnesses, torture, subjected to bombing, molestation, starving (Hinton et al. 2005: 620). In addition, it was found a positive relation between PTSD symptoms and several experiences among refugees in Australia including economic difficulties, feeling of loneliness, social problems (Chen et al. 2017: 226). Similarly, a study with refugees in Uganda found out that refugees are at risk of repeated exposure of trauma leading to PTSD symptoms and impairment in cognitive functioning Ainamani et al. (2017: 2).

1.1.4. Memory Performance related to PTSD symptoms of Refugees

Psychological disorders and cognitive dysfunctions were found to be related in several studies (Austin et al. 2001: 200; Medalia and Revheim 2002). Specifically, PTSD is related to extensive disruptions in capacity of general memory (Brewin 2011: 203). As Abbott (2016: 158) stated, refugees experience dense stress and trauma, which can cause alterations to their memory functioning (Pitman 1989: 221). Williams (1995: 257) indicated that PTSD is related to functions of over general memory, which refers to difficulties in retrieving memories of specific events. Similarly, Waldhauser et al. (2018: 4) pointed out that deficiencies in the effective control of memory retrieval are associated with symptoms of PTSD in refugees who have experienced severe trauma.

The relationship between several types of memory and PTSD was observed in various studies. For instance, short-term memory was assessed in people with PTSD in the study of Bremner et al. (1993: 1015), and according to results, their scores in immediate recall and delayed recall were significantly lower than those without PTSD, as well as total recall, storage of long-term memory, and long-term retrieval. Elzinga

and Bremner (2002: 1) stated that deficiencies in declarative memory, including difficulty in remembering events and facts and memory fragmentation are observed in people with PTSD. The longitudinal impact of PTSD on memory functioning was observed by Samuelson et al. (2009: 853) while controlling for age-related memory decline. A significant decline in delayed visual recall and recognition, delayed facial recognition was shown in patients with PTSD. Zeitlin and McNally (1991: 451) explored bias in implicit and explicit memory related to PTSD. Participants were veterans from Vietnam combat with and without PTSD. Bias in explicit memory for combat words in recall test and implicit memory for combat words in word completion test were found in participants with PTSD. Similar results were obtained by McNally et al. (1995: 619). They assessed autobiographical memory disturbances in combat-related PTSD in Vietnam combat veterans with PTSD and without PTSD. Veterans with PTSD had difficulties retrieving specific autobiographical memories. Bauman et al. (2013: 1) carried out a study, which aimed to investigate memory performance of asylum seekers with and without PTSD. They examined directed forgetting and group differences in overall recognition memory. According to results, more hits were produced by control groups than PTSD patients, and more false alarms were produced by PTSD patients than control groups.

In the light of these findings, it can be stated that refugees encounter several difficulties and experience psychological problems including trauma and post-traumatic stress disorder which lead to memory impairments.

1.2. MEMORY

1.2.1. Definition

Memory is essential for human life because it affects abilities and learning since remembering the past and anticipating upcoming events are crucial aspects (Kahana 2012: 19). Therefore, memory is one of the major topics in cognitive psychology. Various definitions and explanations have been established for the concept of memory. Baddeley (1997: 9) defined human memory as a system for storing and retrieving information acquired through our senses. Sternberg (1999) identified memory as a tool that allows people to apply past experiences and knowledge in the present. Similarly, Sherwood (2015: 157) stated that memory involves holding information over time to influence upcoming actions. Researchers have provided

categorizations, classifications and factors to better understand and explain memory comprehensively.

1.2.2. Structures of Memory & Types of Memory (Short term / Long term)

One of the models used to comprehend the structures of memory is the multistore model proposed by Atkinson and Shiffrin (1968: 92). This model is also known as a modal model. As Figure 1 represents, according to this model, human memory consists of three components: The sensory store, the short-term store (or short-term memory), and the long-term store (or long-term memory).

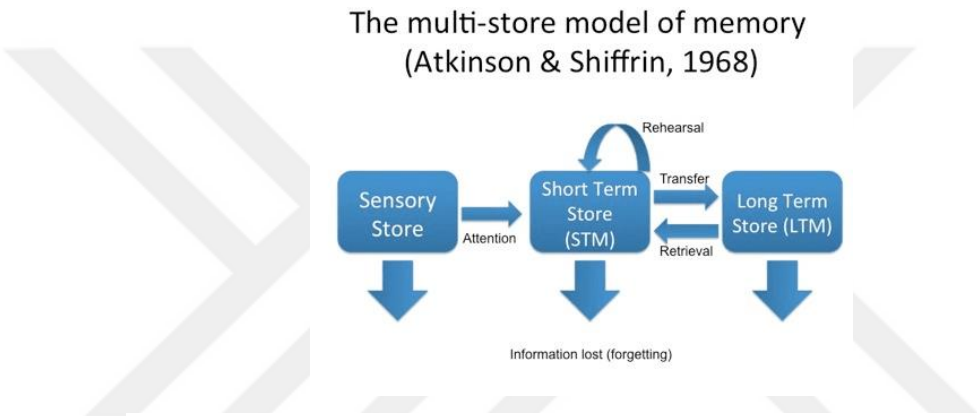


Figure 1. The Multistore Model of Memory (Atkinson and Shiffrin 1968: 93)

The sensory store, also referred to as sensory memory, involves the detection of environmental stimuli by our senses. Atkinson and Shiffrin referred to these registers as sensory buffers, because sensory registers are not responsible for the processing of sensory information, rather they only play a role in detection and holding the information temporarily for use of short-term memory. After environmental stimuli are detected by sensory buffers, transformation of information to short-term memory occurs, however this transfer only occurs when attention is given to information. When attention is not given to it, information is lost. The attended information detected by sensory buffers are transferred to the short-term store or short-term memory. In this model, the short-term store acts as a working memory which is responsible for several cognitive functions, such as reasoning, understanding, and language (Baddeley 1992: 556). The multistore model explains that short-term store has limited capacity and duration. Similar to the sensory store, information in the short-term store is lost, however the duration of short-term store is longer than sensory store. Atkinson and

Shiffrin (1968: 103) stated that duration of short-term store can be extended through rehearsal, which involves continual repetition of auditory items.

In addition to limited duration, short-term memory also has a limited capacity for holding information. Miller (1956: 90) explored that the capacity of the short-term memory is 7±2 items. Miller (1956: 93) added that a larger amount of information can be held by grouping or chunking information. For instance, a ten-digit phone number (0123456789) can be recalled better by chunking it into three groups (012 - 345 - 6789) instead of trying to remember it as a unit. Because short-term store's capacity is limited and attention may not be given to the larger amount of information, chunking helps overcome the limited capacity of the short-term store.

Contrarily, the long-term store or long-term memory has unlimited duration and capacity. The multistore model explains that information in the long-term store can be transferred to the short-term store when attention is given to it. If elaborative rehearsal occurs for the information, it is then transferred to the long-term memory. Therefore, semantic encoding typically occurs in the long-term store.

Long-term memory can be categorized into two sections (See Figure 2): explicit (declarative) and implicit (procedural) memory (Atkinson and Shiffrin 1968: 104). According to them, explicit or declarative memory refers to conscious memories. There are two types of explicit memory: episodic memory, which store personal experiences and semantic memory which stores facts (Tulving 1972: 401). In contrast to explicit memory, implicit or procedural memory does not involve conscious awareness and influences human behavior thought (Schacter 1987: 505).

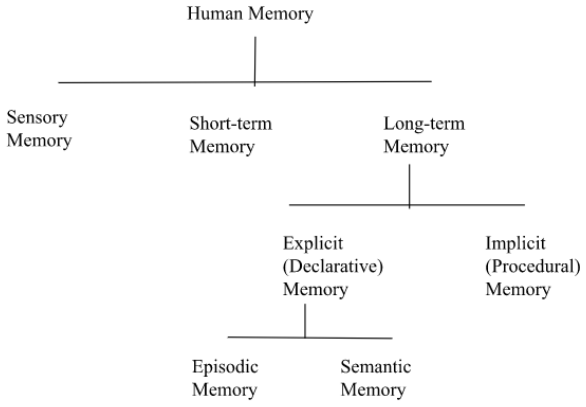


Figure 2. Categorization of Memory, Atkinson and Shiffrin (1968: 92)

1.2.3. Assessing Memory in Adults

Various tasks have been used to assess memory in both adults and children. One such task recognition. In this method, participants are presented with a list of pictures or words to study. Later, participants are shown words and pictures that are both previously presented in the study session and others that are not presented in the study session. Participants are requested to indicate whether each item is presented in the study session or not. Another method commonly used is free recall. In this method, participants are asked to study a list of words and they are subsequently requested to recall as many words they can remember. Both of these methods are employed to assess memory because they aim measure participants' conscious recollection of specific learning episodes (Schacter 1987: 501). Free recall studies, in particular, can reveal different effects and patterns.

In his study, Ebbinghaus (1913: 22) explored how the position of an item in a study list affected recall accuracy. This phenomenon is known as the serial position effect, which consists of two components: the primacy effect and the recency effect. The tendency to remember the first item in the list is called primacy effect and the tendency to remember the last item in the list is called recency effect. There are different explanations for these effects from various theories. Atkinson and Shiffrin (1968: 169) explained primacy and recency effects via their multistore model of memory. According to this theory, as above mentioned, after stimulus is recognized by sensory registry, it is transferred to short-term memory though attention. This information can be passed to long-term memory if it is rehearsed. Since short-term memory has limited duration and capacity, first items in the list tend to remain in short-term memory longer than subsequent items, increasing the likelihood of their transfer to long-term memory, which corresponds to the primacy effect. As for the recency effect, according to the model, the last items in the list are still in short-term memory during study sessions, making them easier to retrieve.

Howard and Kahana (2002: 277) explains recency effect within the framework of temporal context model. The time interval between study session and recall task affects the occurrence of recency effect. According to this model, if participants are requested to recall immediately after a study session, the likelihood of recency effect increases. This is because the current temporal context can serve as a cue for recall, facilitating the retrieval of last items.

Murdock (1962: 482) explored primacy and recency effects in this study. It was concluded that primacy and recency items were recalled better, as shown in Figure 3. He found that first items in the word list were transferred to the long-term memory through rehearsal because there was sufficient time to rehearse these early items. Latest items were in the short-term memory for recall since short-term memory capacity is typically limited to around 7 items (Miller 1956: 93), which leads to recency effect. It was stated that items in the middle of the list were less likely to be recalled because they were displaced from short-term memory during the study session and were not successfully transferred to long-term memory. Furthermore, the list length and the rate of item presentation were factors considered for understanding the primacy and recency effects. It was found that quick presentation of items reduced the primacy effect, whereas slow presentation of items enhanced the primacy effect. Apart from this, it was concluded that when the presentation list was longer, the primacy effect reduced.

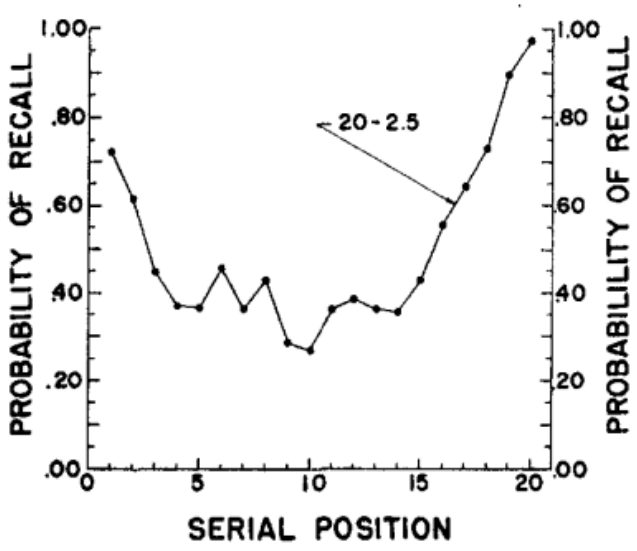


Figure 3. Primacy and Recent Effect, Murdock (1962: 487)

1.2.4. Effects for Memory

1.2.4.1. Emotion

1.2.4.1.1. Dimensions of Emotion

The classification of emotion has been approached by researchers in two viewpoints. One viewpoint suggests that emotions are discrete, while the other viewpoint proposes that emotions can be defined using dimensional models.

The most popular theory supporting the discrete view is Ekman's (1992: 34) theory of six basic emotions. According to the theory, anger, disgust, fear, happiness, sadness, and surprise are six basic emotions. On the other hand, there are dimensional models, which define emotions along one or two dimensions.

The circumplex model, the vector model, and the Positive Activation - Negative Activation (PANA) model are the most outstanding examples of two-dimensional models (Rubin and Talerico 2009: 802). Circumplex models have been chosen in this research and elaborated because these models are commonly usually used to test emotional stimuli such as words and emotional facial expressions among dimensional models (Remington et al. 2000: 287).

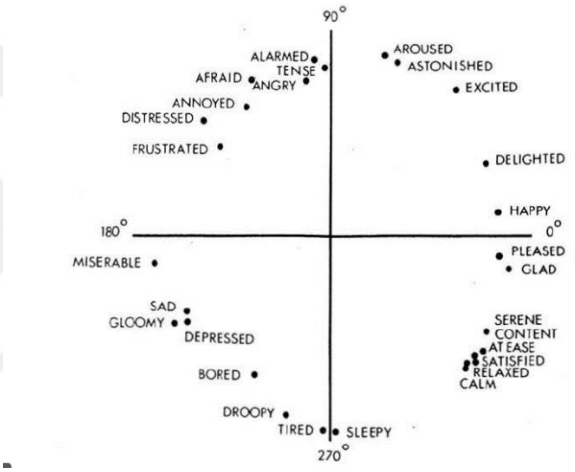


Figure 4. Direct Circular Scaling Coordinates for 28 Words by Russell (1980: 1167).

Russell (1980: 1164) developed a circumplex model of emotion which proposes that emotions are positioned in a two-dimensional circular space defined by the dimensions of: arousal and valence (see Figure 4). Russell (1980: 1164) asked participants to categorize 28 emotional words based on their perceived similarity. The rating of emotions was analyzed, leading to identification of valence and arousal dimensions. Circumplex model by Russell (1980: 1161) pointed out that arousal and valence are independent and bipolar dimensions, medium arousal and neutral valence are placed in the center. The horizontal axis (x-axis) of the model represents continuum between pleasant and unpleasant which corresponds to the valence component of the model, on the other hand the vertical axis (y-axis) of the model is continuum between high and low arousal. In this model, emotions can be defined based on their placement along these two dimensions: valence dimension (pleasantness/unpleasantness) and

arousal dimension (high/low). According to the circumplex model, each emotion can be positioned within this graphical representation. Figure 3 depicits the circumplex model of affect, with the horizontal axis corresponding the valence and the vertical axis corresponding the arousal dimension. In other words, stimuli can be in different positions in the context of arousal and valence.

1.2.4.1.2. Effect of Arousal and Valence on Memory

The effect of emotion on memory was studied in several researches and it was found that emotional stimuli are more likely to be remembered compared to neutral stimuli (Kensinger and Corkin 2003: 1169; Labar and Phelps 1998: 490; Levine and Burgess 1997: 157; Ochsner 2000: 242; Pereira et al. 2019:1).

The effect of emotion on memory was studied with different types of stimuli. Kensinger and Corking (2003: 1169) observed emotion effect on memory with words. According to the results, words with higher arousal and valence were recalled better than neutral words. In other words, negative words were more like to be remembered compared to neutral words. Similarly, emotional words were remembered better compared to neutral words in the studies of Davidson et al. (2006: 308), Gomes et al. (2013: 669), and Maddock and Frein (2009: 108). In addition to studies with words, D'Argembeau and Van der Linden (2005: 504) found out the emotion effect on memory via pictures. Findings of the study revealed that positive and negative pictures were recognized better than neutral pictures. Consistently, various studies explored that emotional pictures with high arousal and high valence were more likely to remembered than neutral pictures (Nashiro and Mather 2010: 121; Schmidt et al. 2011: 234; Schümann et al. 2018: 16). In the light of previous literature, it can be concluded that dimensions of memory including arousal and valence affect memory.

Several researchers have studied neural aspect of the emotion effect on memory. Brain imaging studies have showed that better remembrance of emotional information compared to neutral information is associated with major activity in the hippocampus, amygdala, parahippocampus, in addition to other brain areas including prefrontal and parietal areas (Dolcos et al. 2012: 80; Eichenbaum et al. 2007: 123; Hamann 2001: 394; Murty et al. 2010: 3459).

Underlying mechanisms of the emotion effect on memory have been explored in various studies. Emotional stimuli are remembered compared to neutral stimuli due to cognitive characteristics of emotional stimuli including greater more semantically

relatedness, more distinctiveness and more salience (Sommer at al. 2008: 569). Distinctiveness is one of the major differences between emotional stimuli and neutral stimuli that contributes to memory improvement (Schmidt 1991: 525). In addition, emotional stimuli receive more attention compared to neutral stimuli (Talmi and Mcgarry 2012: 105; Vuilleumier 2005: 585), which leads to memory enhancement for emotional stimuli (Kensinger and Corkin 2004: 3310; Mackay et al. 2004: 474). Consistent with these findings, the study of Talmi et al. (2007: 98) found that factors contributing to the effect of emotion for memory enhancement include greater semantic relatedness of emotional stimuli and increased attention to emotional stimuli.

1.2.4.1.3. Mood Congruent Recall

Mood congruence effect was firstly suggested in the study conducted by Bower (1981: 129). The primary aim of Bower's (1981: 129) study was to examine the influence of emotions on memory and thinking. Bower (1981: 129) proposed that human memory is composed of an associative network of concepts, which includes of emotions that are associate with daily life situations, concepts, and thought processes. Arousal of an emotion activates thought processes and concepts associated with it. This effect was defined as an associative network theory of feeling effects. In this regard, it was suggested that people tend to remember events with an emotional state similar to their current mood. More specifically, sad memories are remembered better when one is in a sad current mood, and happy memories are remembered better when one is in a happy current mood.

Moreover, Bower and Forgas (2001: 104) proposed that being in a specific mood can lead to people paying more attention to, thinking more about or expatiating on stimulus that suits their specific mood. These processes can produce better memory for such information. For instance, a person experiencing a sad mood might pay increased attention to sad parts of a conversation and elaborate on the sad parts by associating them with sad events in a person's life. The effect of emotion on memory related to mood congruent recall has been observed in both people with and without psychological disorders such as depression (Bower, 1981: 146; Bower and Cohen 1982: 328; Clark and Teasdale 1982: 93; Howe and Malone 2011: 192; Joormann 2010: 161; Moritz et al. 2005: 9; Snyder and White 1982: 160; Teasdale and Russell 1983: 168; Watkins et al. 1992: 584; Weingartner et al. 1977: 281; Wittekind et al. 2014: 606). In addition to mood congruent recall with negative mood, Wadlinger and

Isaacowitz (2006: 98) explored that positive moods in people lead to broadening attention towards positive images in their study. In the light of these studies, the aim of the current study was to investigate whether people who show post-traumatic stress disorder symptoms, characterized by a negative mood state, would demonstrate enhanced recall memory performance for negative emotional words.

1.2.4.2. Stress

The World Health Organization (WHO) defines stress as the psychological, physical, or emotional strain caused by changes in one's environment. Stress is experienced by every person to some degree; however, the amount of stress is essential for well-being since stress has an effect on neural structures for memory formation and cognitive functioning (Cavanagh et al. 2011: 315; Henckens et al. 2009: 10116; Jelici et al. 2004: 1343). Furthermore, stress affects the encoding of new memory and retrieval of stored information. The relationship between memory retrieval and psychological stress has been explored, and it has been observed that participants with stress symptoms have lower scores in free recall (Kuhlmann et al. 2005: 2979). A similar result was obtained in the study by Payne et al. (2002: 4), stating that the presence of stress affects memory functions, including false memory recognition.

When analyzing the stress effect on memory within the context of neural processes, it is observed that several adaptive hormones are stimulated during stress, including glucocorticoids and adrenaline hormones (Axelrod and Reisine 1984: 452). Brain functions, especially the hippocampus where cortisol receptors are located is also affected by repeated stress (McEwen et al. 1986: 1145), which is related to memory functioning. The influence of stress on glucocorticoids and hippocampus is essential for human memory since glucocorticoids plays a role in remembering emotional events (Pugh et al. 1997: 509) and hippocampus is responsible for memory processes (Eichenbaum et al. 1992: 2). Several studies have pointed out that increased level of glucocorticoids resulting from increased stress level in humans is associated with impairment in memory (Heffelfinger and Newcomer 2001: 491; Kirschbaum et al. 1996: 1480; Newcomer et al. 1999: 530). Specifically, increased level of glucocorticoids due to actual threat or recurrent exposure to stressful stimuli can result in impairment in hippocampus (McEwen et al. 1992: 18; Woolley et al. 1990: 225). In relation to that, impairment in functions of hippocampus is related to memory impairment in humans (Bremner et al. 1995: 547).

The effect of stress on cognitive functions, such as learning and memory is not always definite (Joëls et al. 2006: 152). Stress affects memory processes differently and several factors including intensity of stress, timing of stress, type of stress, and duration of stressor, determine how stress affects memory (Bermúdez-Rattoni 2007). For instance, a moderate level of stress can facilitate memory consolidation, while exposure to chronic stress can lead to impairment in cognitive functions, including memory processes (Sandi 2004: 917). The timing of stress is crucial to determine how stress affects memory processes. Stress can act as a facilitator when experienced during learning phase, but as a disruptive when experienced at a high level before or after the learning phase (Joëls et al. 2006: 154). Prolonged exposure to stress increases the likelihood of developing psychiatric disorders including anxiety, mood, and panic disorders (Heim and Nemeroff 1999: 1509) which results in changes in brain functions and cognitive processes (McEwen 2002: 923).

1.2.4.3. Post-Traumatic Stress Disorder

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was revised by the American Psychiatric Association (APA) in 2013. PTSD is included in the category of Trauma and Stressor-Related Disorders in the fifth version of the DSM. The criteria are provided in the Table 1.

Table 1. Diagnostic Criteria of PTSD in DSM-5

Criterion	**Definition**
Criterion A: stressor	The person was exposed to: death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, in the following way(s): Direct exposure Witnessing the trauma Learning that a relative or close friend was exposed to a trauma Indirect exposure to aversive details of the trauma, usually in the course of professional duties (e.g., first responders, medics) **one required*
Criterion B: intrusion symptoms	The traumatic event is persistently re-experienced in the following way(s): Unwanted upsetting memories Nightmares Flashbacks Emotional distress after exposure to traumatic reminders Physical reactivity after exposure to traumatic reminders **one required*
Criterion C: avoidance	Avoidance of trauma-related stimuli after the trauma, in the following way(s): Trauma-related thoughts or feelings Trauma-related external reminders **one required*
Criterion D: negative alterations in cognitions and mood	Negative thoughts or feelings that began or worsened after the trauma, in the following way(s): Inability to recall key features of the trauma Overly negative thoughts and assumptions about oneself or the world Exaggerated blame of self or others for causing the trauma Negative affect Decreased interest in activities Feeling isolated Difficulty experiencing positive affect **two required*
Criterion E: alterations in arousal and reactivity	Trauma-related arousal and reactivity that began or worsened after the trauma, in the following way(s): Irritability or aggression Risky or destructive behavior Hypervigilance Heightened startle reaction Difficulty concentrating Difficulty sleeping
Criterion F: duration	Symptoms last for more than 1 month. **required*
Criterion G: functional significance	Symptoms create distress or functional impairment (e.g., social, occupational). **required*
Criterion H: exclusion	Symptoms are not due to medication, substance use, or other illness. **required*

Depressed mood, emotional numbing, re-experiencing the event, hyperarousal reactions, avoiding reminders, and interactions of these symptoms are commonly encountered symptoms in people with PTSD (Vujanovic et al. 2012: 235). As indicated

in Criterion C in the Table W, individuals with PTSD may experience avoidance symptoms including avoidance of trauma-related stimuli. Along with avoidance of from trauma-related stimuli, people with PTSD may also suffer from other cognitive impairments, such as biased attention towards threatening events (Mcnally et al. 1990: 401). Related to that, in the study of Vrana et al. (1995: 515) Vietnam veterans were shown trauma-related words and neutral words. Veterans with PTSD symptoms demonstrated better recall and recognition of trauma-related words in the context of Vietnam and Vietnam war.

Cognitive changes resulting from PTSD are not limited to trauma related memory; PTSD is also associated with memory impairment, attention difficulties, decreased intelligence, and impaired information processing (Buckley et al. 2000: 1041; Uddo et al. 1993: 43). Studies have analyzed various memory impairments that may arise from PTSD symptoms.

Yehuda et al. (1995: 138) reported memory impairment in Vietnam veterans with PTSD symptoms. Vietnam veterans from combat and control group participants were compared using WAIS for intelligence assessment and California Verbal Learning Test for memory functioning. While no significant difference was found in attention and immediate memory between veterans and the control group, veterans with PTSD had lower recall scores at a later time when asked to remember words presented. Deficits in memory regulation and monitoring in participants with PTSD were observed in the study.

Vasterling et al. (1998: 130) also found evidence of memory impairments in Persian Gulf War veterans with PTSD diagnoses compared to veterans without PTSD diagnoses. Several tests were utilized to assess cognitive functions. In addition to memory deficit, attention impairment also was found in participants with PTSD.

Bremner et al. (1993: 1015) conducted research with Vietnam veterans to explore the effect of PTSD on cognitive functions. Intelligence and memory functions of all participants were assessed using various tests, including subtests of the Wechsler Adult Intelligence Scale—Revised (WAIS—R), Wechsler Memory Scale (WMS), and The Selective Reminding Test (SRT). According to the results, there was no difference in IQ scores between participants with PTSD and the control group, however memory deficits were observed in long term memory and delayed recall for participants with PTSD.

Bremner et al. (1995: 97) also found memory impairment in people with trauma related to childhood abuse. The early Trauma Inventory was used to differentiate the presence of traumatic event in participants. Results showed that visual memory impairment was observed in participants who had experienced child abuse trauma. Consistent with previous researches, Gil et al. (1990: 31) conducted a study with people diagnosed PTSD resulting from experiences such as battle and army trauma, car accidents, and attacks. Twelve participants with PTSD diagnosis and twelve participants from the control group were compared in terms of their cognitive functions. Participants with PTSD diagnoses demonstrated poorer scores in verbal fluency memory, attention, and intelligence.

In essence, the existing literature indicates a relationship between PTSD resulting from traumatic events such as child abuse, war, car accident, and attacks and impairment in cognitive functions including memory, attention, and intelligence. Previous studies have shown that different memory types including immediate recall, short-term memory, and long-term memory are deteriorated with occurrence of PTSD symptoms.

1.2.4.4. Aging

Some cognitive changes occur with developmental aging, including changes in memory functions (Hedden and Gabrieli 2004: 89). Several factors lead to decrease in memory functioning in normal aging, such as general slowing, deficiency in cognitive control, reduced inhibitory functions and decreased processing resources (Luo and Craik 2008: 347).

The effect of aging on memory is not uniform across all types of episodic information. In other words, all types of episodic information are not affected equally by memory decline resulting from aging (Kessels et al. 2007: 796). Several studies have displayed that episodic memory are negatively affected by normal aging, while semantic memory remains relatively stable (Allen et al. 2002: 173; Nilsson 2003: 7). Brickman and Stern (2009: 178) stated that memory decline in normal aging is not considered as undifferentiated. For instance, long-term memory performance of older adults is worse than younger adults. Furthermore, difference of declarative episodic memory performance between older adults and younger adults are more pronounced. Similarly, working memory performance tends to decrease with normal aging. In contrast, there is not a significant difference in semantic memory performance between

older and younger adults. Similarly, Bäckman et al. (2001: 370) found that aging does not affect priming effect in memory, however deficiencies in procedural memory and semantic memory are observed with aging. Similarly, a working memory decline with normal aging was reported (Light and Anderson 1985: 745).

In addition to different types of memory, all stages of memory including acquisition, retention, and retrieval, are not equally affected (Harada et al. 2013: 740). Acquisition, which involves encoding new information into memory deteriorates in normal aging (Haaland et al. 2003: 89). Severe decline in retention of information is not commonly observed in older adults (Whiting and Smith 1997: 216). On the other hand, studies have found impairment in memory retrieval, which refers to accessing newly learned information in older adults (Economou 2009: 963; Haaland et al. 2003: 89; Price et al. 2004: 531).

Older people's performance on certain learning and memory tasks is not good as that of younger people (Harada et al. 2013: 740). Researchers have conducted studies to better understand the effect of aging on emotion. Specific memory structures may be more affected by aging than others (Craik 1994: 155). Furthermore, Grady and Craik (2000: 224) stated that age-related deficits are greater in some tasks and milder in some tasks. For instance, age-related deficits are apparent in free recall, cued recall and working memory tasks, while age-related deficits are minor in tasks involve priming, short-term memory, and recognition memory. Similarly, Craik and Jennings (1992: 60) found that age-related differences are slight in tasks measuring short term memory, such as priming. For instance, difference between younger and older persons tends to be minimal when the task includes holding digit or letter series and repeating them in order. On the other hand, when the task includes re-ordering a series of presented items mentally and claiming in alphabetic order, which measures working memory, age-related memory deficit become more apparent. Craik and McDowd (1987: 474) compared the cued recall and recognition performance of younger and older participants and found that age differences were less pronounced in the recognition task compared to cued recall task. Understanding aging effect is significant since various cognitive functions are influenced and these influences are very crucial for older people's daily lives.

1.2.4.4.1. Positivity Bias in Older Adults

Cognitive functions, including attention, memory, and decision-making processes, are affected by age-related changes (Reed and Carstensen 2015: 1). In general, the possibility of recalling emotional stimuli is higher than that of neutral stimuli (Kensinger and Corkin 2003: 1169). Although several researches indicated that negative stimuli are better remembered compared to other stimuli (Dreben et al. 1979: 1763; Ohira et al. 1998: 986; Robinson-Riegler and Winton 1996: 94), older adults tend to recall positive information better than negative information. Older people have a preference for focusing on positive stimuli and exhibit fewer reactions to negative stimuli compared to younger people (Reed et al. 2014: 1). This tendency is referred to as positivity bias.

Positivity bias in people can be identified as an inclination to relate positive judgements to reality, to keep positive memories, and to prefer positive knowledge in analysis and thinking (Hoorens 2014: 4938). Age differences in emotion effect have been studied using various stimuli in the literature. Mather and Carstensen (2003: 409) used stimuli of faces, including 20 neutral, 20 sad, 20 angry, and 20 happy faces. Overall, emotional stimuli were remembered better than neutral ones in both younger and older people. Specifically, positive faces were recognized faster and more accurately in older people compared to younger people. When neutral and negative stimuli were compared, older people showed less focus on negative stimuli compared to neutral stimuli, while there was no difference in younger people between neutral and negative stimuli.

Piguet et al. (2008: 308) used neutral, positive, and negative words to explore age effect on emotion in younger and older participants. The study observed positivity effect, where older participants displayed more false memory for unseen positive stimuli and less false memory for negative stimuli. The study of Spaniol et al. (2008: 862) consisted of scenes, words, and faces. According to the results, older participants displayed more familiarity for positive stimuli compared to younger participants. These findings supported the finding of Gross et al. (1997: 595), which suggest that aging is associated with decreased negative emotional experiences and increased positive experiences.

Socioemotional Selectivity Theory, proposed by Carstensen et al. (1999: 165), is one of the theories that explain causes of positivity bias in older adults. The theory articulated that people tend to become selective and spend their time for emotionally

significant purposes and actions as they get older. According to the socioemotional theory, changes in motivation also affect cognitive processes. The theory declared that temporal context determines aims of people. In general, during their youth, people perceive time as widespread and focus on future preparations by gaining new information and appreciating innovations. On the other hand, as people grow older, they perceive time as more limited and restricted, their attention is directed to more emotional aspects of life including emotional relationships, and interconnected social connections, and desire for a meaningful life. According to the socioemotional theory, as age increases during lifespan, motivation shifts towards emotionally purposes that lead to use more cognitive and social resources. Emotional regulation and attention regulation become significant factors in older adults since their motivation becomes focused on emotional purposes. Santrock (2008: 316) supported this theory by stating that when future is perceived as expansive, focus of people is more likely to be future-oriented, whereas focus of people is more likely to be emotion or pleasance oriented when future is perceived as limited.

Cross-cultural studies on emotion and age differences are significant because, although Socioemotional Selectivity Theory (Carstensen et al. 1999: 165) postulates a positivity effect where older people focus more on positive stimuli, several studies have found contradictory results in cross-cultural studies. Grossman et al. (2014: 679) studied influence of culture and aging on emotion since knowledge of socioemotional aspect of aging in various cultures is limited (Karel et al. 2012: 184). In the study of Grossman et al. (2014: 681) young, middle and older adult participants from two different cultures, namely Americans and Japanese were compared in terms of their positive and negative emotional experiences. Past emotional experiences, social experiences, and cognitive functions were measured. According to the results, older Americans reported fewer negative experiences compared to younger Americans. On the contrary, there was no such age difference in Japanese participants. Fung et al. (2008: 443) conducted research to explore age-related effect of emotion with Chinese participants. Visual attention of younger and older participants toward happy, fearful, sad, and angry faces were compared. In contrast to previous studies related to positivity effect (Grossman et al. 2014: 681; Reed et al. 2014: 1), older participants did not prefer to look positive stimuli compared to younger participants. However, a positivity bias was observed in another study by Fung et al. (2010: 327) with Chinese participants. The results indicated that older participants recalled fewer negative stimuli, which

aligns with the articulation of Socioemotional Selective Theory (Carstensen et al. 1999: 165). Another cross-cultural study was conducted by Ko et al. (2001: 50), comparing Koreans and Americans to examine culture and age effect on emotion. The results showed that younger participants recalled more negative information than older participants regardless of their culture. A similar result was obtained from the study of Kwon et al. (2009: 748), where neutral, negative, and positive images were presented to younger and older Korean participants. The recall and recognition memory performance indicated that older participants recalled more positive stimuli compared to younger participants.

In light of previous literature, a positive bias in older adults has been observed, with a focus on positive stimuli and less attention given to negative stimuli. This effect has been examined across cultures, revealing differences among cultures. Therefore, it is significant to examine age and culture on emotion within the context of Türkiye.

1.3. PRESENT STUDY AND ITS SIGNIFICANCE

As literature review part has displayed, various studies have focused on studying with refugees in terms of their cognitive function; however, there are limited comprehensive studies related to influence of emotion, PTSD, and migration on memory processes. It is considered that examining these effects will provide a better understanding of the factors influencing recall memory performance in refugees.

The current study aimed to investigate the effects of emotional valence and age on free recall performance in refugees with and without PTSD symptoms, using refugee-related words. The main research question of the study was how emotional valence and PTSD symptoms affect free recall performance. To answer this question, an experimental design was conducted, where participants were shown words and then requested to recall them after a learning phase. Positive, negative, and neutral words were selected and utilized in the study to examine the valence of words on recall memory performance. The presence of PTSD symptoms in participants was measured using The Post-Traumatic Diagnostic Scale by Foa et al. (1997: 449) to explore the effect of PTSD symptoms on free recall memory performance. In addition, two different age group (18-30 and 31-59) were included to examine the aging effect on memory performance.

1.3.1. Hypotheses of the Study

Hypothesis 1a. Negative words would lead to better recall memory performance than neutral words.

Hypothesis 1a.1. Control group would have better recall memory performance for both negative and positive words than neutral ones.

Hypothesis 1b. Negative words would lead to better recall memory performance than positive words.

Hypothesis 1b.1. Negative words would be better recalled by participants between 18-30 age old than participants between 31-59 age old.

Hypothesis 1b.2. Refugees with PTSD symptoms would have better recall memory performance for negative words than both positive and neutral words.

Hypothesis 1b.3. Refugees aged between 18-30 who had PTSD symptoms would exhibit better recall memory performance for negative words compared to refugees aged between 18-30 who did not have PTSD symptoms.

Hypothesis 1b.4. Refugees aged between 31-59 who had PTSD symptoms would exhibit better recall memory performance for negative words compared to refugees aged between 31-59 who did not have PTSD symptoms.

Hypothesis 1c. Positive words would lead to better recall memory performance than neutral words.

Hypothesis 1c.1. Positive words would be better recalled by participants between 31-59 age old than participants between 18-30 age old.

Hypothesis 1c.2. Refugees without PTSD symptoms would have better recall memory performance for positive words than both negative and neutral words.

Hypothesis 1c.3. Refugees aged between 18-30 who did not have PTSD symptoms would exhibit better recall memory performance for positive words compared to refugees aged between 18-30 who had PTSD symptoms.

Hypothesis 1c.4. Refugees aged between 31-59 who did not have PTSD symptoms would exhibit better recall memory performance for positive words compared to refugees aged between 31-59 who had PTSD symptoms.

Hypothesis 2a. Refugees with PTSD symptoms would have poorer recall memory performance than refugees without PTSD symptoms.

Hypothesis 2a.1. Refugees between 18-30 age old with PTSD symptoms would exhibit poorer recall memory performance than refugees between 18-30 age old without PTSD symptoms.

Hypothesis 2a.2. Refugees between 31-59 age old with PTSD symptoms would exhibit poorer recall memory performance than refugees between 31-59 age old without PTSD symptoms.

Hypothesis 2b. Refugees with PTSD symptoms would have poorer recall memory performance than the control group.

Hypothesis 2c. The control group would have better recall memory performance than both refugees with and without PTSD symptoms.

Hypothesis 3a. Participants between 18-30 age would have better recall memory performance than participants between 31-59 age old.

Hypothesis 3a.1. Refugees between 31-59 age old with PTSD symptoms would exhibit poorer recall memory performance than refugees between 18-30 age old with PTSD symptoms.

Hypothesis 3a.2. Refugees between 31-59 age old without PTSD symptoms would exhibit poorer recall memory performance than refugees between 18-30 age old without PTSD symptoms.

CHAPTER II

METHOD

2.1. PARTICIPANTS

The sample of this study consisted of 91 participants: 46 adults whose ages ranged between 18 – 30 years old and 45 adults whose ages ranged between 31 – 59 years old. Arnett's Developmental Theory (2000: 469) was used to divide participants into different age groups. According to the theory, people between the ages of 18-29 are considered to be in the stage of emerging adulthood, and maturity is reached during this period (Arnett 2014: 7). Therefore, the age range of 18-30 was decided as younger adulthood, and the age range of 31-59 was decided as middle-aged adulthood. The conditions in the study were categorized according to participants' past migration experience, age group (18-30 and 31-59), and the presence or absence of PTSD symptoms. The demographic characteristics of the participants are presented in Table 2.

Table 2. The Demographic Characteristics of the Participants

Variables	*n*			
	Control group	Refugees with PTSD symptoms	Refugees without PTSD symptoms	Total
Sex				
Female	21	18	15	54
Male	10	11	15	36
Other	0	1	0	1
Age group				
18-30	16	15	15	46
31-59	15	15	15	45
Age*	32.35±8.50	30.56±7.65	30.10±7.48	31.02±7.87
PTSD Score*	1.77±2.66	20.70±7.89	2.03±3.17	8.09±10.23
PTSD Level				
None	15	0	19	34
Mild	16	0	11	27
Moderate	0	17	0	17
Moderate to severe	0	12	0	12
Severe	0	1	0	1
Nationality				
Turkish	31	0	0	31
Afghan	0	5	4	9
Iraqi	0	6	6	12

Table 2 continued

Variables	*n*			
	Control group	Refugees with PTSD symptoms	Refugees without PTSD symptoms	Total
Iranian	0	6	7	13
Somalian	0	1	1	2
Syrian	0	9	8	17
Ukrainian	0	3	2	5
Jordanian	0	0	2	2
Relationship Status				
Married	13	12	9	34
Single	13	13	16	42
In relationship	5	2	4	11
Widowed	0	2	1	3
Divorced	0	1	0	1
Working Status				
Working	30	19	21	70
Not working	1	11	9	21
Education Level				
Primary school	0	1	1	2
Secondary school	0	6	3	9
High school	2	5	6	13
University+	29	18	20	67
Wounding				
Wounded in war	0	3	1	4
Not wounded in war	31	27	29	87
Lost persons in war				
Have lost in war	0	13	11	24
Not have lost in war	31	17	19	67
Psychological Support				
Receiving psychological support	0	8	2	10
Notreceiving psychological support	31	22	28	81

*Mean±Standard Deviation

Refugees with PTSD symptoms and refugees without PTSD symptoms were reached via NGOs, the Research Centre on Asylum and Migration / İltica ve Göç Araştırmaları Merkezi (IGAM), and the Association for Solidarity with Asylum Seekers and Migrants (SGDD-ASAM) that work with refugees in Ankara. The necessary permissions were obtained from these organizations before conducting the research with refugees. Those who had migration experience were also contacted through IGAM and ASAM. Also, Turkish participants in the control group were

reached via these organizations and study announcement. Refugees who understood and spoke Turkish were included in the study since the forms and the main experiment was designed in Turkish. All of the participants participated in the study based on voluntariness. The written informed consent for participation for the study was obtained from all participants prior to conducting the study (Appendix B). The demographic information form (Appendix C) and the post-traumatic stress diagnostic scale (Appendix D) were filled out by all participants. Turkish participants with PTSD symptoms were not included in the experimental design. The threshold for post-traumatic diagnostic scale is 10 points. Therefore, according to the scores obtained from the scale, it was decided whether participants had PTSD symptoms. Participants whose PDS scale score exceed 10 were considered to have a tendency of PTSD.

2.2. MATERIALS / TOOLS

2.2.1. Demographic Information Form

This form was prepared by the researcher for this study based on existing literature. The form asked questions about various demographic factors, such as age, sex, marital status, educational level, occupation, working status, living city, and psychological support, as well as information related to any psychiatric or neurological diagnoses, and visual impairments. Additionally, the form included questions related to immigration, such as the country of origin, how long the participant lived in Türkiye, whether they had an injury in the war before immigration, and they lost someone in the war. It's important to note that questions related to migration were not answered by the control group who had no immigration experience before.

2.2.2. The Post-Traumatic Diagnostic Scale (PDS)

Foa (1995) developed and validated the post-traumatic diagnostic scale (PDS), a self-report measure. PDS was further improved by Foa et al. (1997: 449) to provide reliable and valid screening. PDS asks about traumatic event experiences, disturbance duration, and the effect of symptoms on people's functioning. The internal consistency for 17 items was .92, and the test-retest reliability score was .83 (Foa et al. 1997: 449). The Turkish version of the scale is performed by Işıklı (2006), and Cronbach's alpha is .93.

In the first section, there is a list of traumatic experiences, and participants are asked to indicate traumatic experiences they have so far. It is stated that those who do

not experience any trauma would not continue to fill out the scale. In the second part, participants with more than one traumatic experience are asked to indicate which one is most affective. Afterwards, participants answer six questions with Yes/No answers. An increase in answers with "Yes" indicates the severity of the traumatic event. In the third part, participants rate 17 items representing PTSD symptoms that are experienced in the last 30 days. Scale items are rated on a point scale from 0 to 3. 0 corresponds to not at all, 1 corresponds to once a week or less/a little, 2 corresponds to 2 to 4 times a week / half day, and 3 corresponds to 5 or more times a week / almost all day. A minimum score is 0 (zero), and a maximum score is 51. As scores get higher, the severity of symptoms increases. According to points obtained from the PDS, 0 (zero) indicates no symptoms or no tendency to have PTSD, 1-10 refers to mild, 11-20 moderate, 21-35 moderate to severe, and above 36 refers to severe PTSD symptoms. In the last part, participants answered nine questions about daily functioning with Yes/No options. As yes answers increase, disturbance in daily functioning of participants' increases. In the current study, participants who got 11 or higher points were accepted as showing PTSD symptoms. The mean and standard deviations of the scores that participants got from this scale is presented in Table 3.

Table 3. Means and Standard Deviations of the Participants' Scores from the PDS

Age group	**Condition**	*n*	*M*	*SD*
18-30	Control group	16	2.06	2.86
	Refugees with PTSD symptoms	15	20.06	4.94
	Refugees without PTSD symptoms	15	1.53	2.82
31-59	Control group	15	1.46	2.50
	Refugees with PTSD symptoms	15	21.33	10.18
	Refugees without PTSD symptoms	15	2.53	3.52

2.2.3. Turkish Emotional Word Norms for Arousal, Valence, and Discrete Emotion Categories

Kapucu et al. (2021: 188) developed the first standardized and encompassing emotional word set in Turkish. Two main dimensions of emotion (i.e., arousal and valence), concreteness dimension, and five basic emotions (i.e., happiness, sadness, anger, fear, and disgust; Ekman, 1992: 34) were based on originating the Turkish Emotional Word Norms. Kapucu et al. (2021: 188) translated a set of 2031 words from Affective Norms for English (Bradley and Lang, 1999: 28) to Turkish, and a total of 1527 participants rated words. They found similar results to Bradley and Lang's (1999:

25) study regarding dimensions. They indicated that when valence was more negative or more positive, arousal level also increased. It was found that negative emotions, including sadness, fear, disgust, and anger were positively correlated with each other. On the other hand, happiness, one of the positive emotions, was found to be negatively correlated with negative emotions.

15 positive, 15 negative, and 15 neutral words (Appendix E) were chosen for the current study. Words related to migration and refugee concepts were chosen in line with the aim of the study. Words were categorized into positive, negative, and neutral according to their valence values. The arousal and concreteness levels of words were controlled since these could be an effect on recall memory performance. Arousal, valence, and concreteness values of words that used in the current study are presented in the Table 4. A one-way ANOVA was conducted to compare levels of arousal, valence, and concreteness of 45 words separately according to their valence level (positive, negative, and neutral). The results revealed that there was a statistically significant difference on valence levels ($F(2, 42) = 171.52$, $p = .000$). Post hoc analysis was conducted using Tukey and Bonferroni methods. According to the results, the mean of positive words ($M = 6.86$, $SD = .87$) was higher than negative words ($M = 2.49$, $SD = .57$) and neutral words ($M = 4.81$, $SD = .41$). There was no statistically significant difference in terms of arousal level among positive words, negative words, and neutral words ($F(2, 42) = 2.34$, $p > .05$). Lastly, there was no statistically significant difference in concreteness level between positive words, negative words, and neutral words ($F(2, 42) = .49$, $p > .05$).

Table 4. Arousal, Valence, and Concreteness Values of Word List in the Study Session

	Positive	**Negative**	**Neutral**
Valence			
Mean, *SD* Range	6.86, .87	2.49, .57	4.81, .40
Valence Ratings	5.67 – 8.20	1.91 – 3.72	4.2 – 5.47
Arousal			
Mean, *SD* Range	5.92, .67	6.04, 1.10	5.42, .47
Arousal Ratings	4.63 – 6.97	4.23 – 7.93	4.48 – 6.4
Concreteness			
Mean, *SD* Range	47.22, 19.83	53.73, 23.95	46.83, 20.27
Concreteness Ratings	19.81 – 83.51	13.21 – 92.39	19.71 – 83.25

2.2.4. Digit Symbol Substitution Test

The digit symbol substitution test is an assessment tool for cognitive functioning. Initially, this test was a component of the Wechsler Adult Intelligence Test (WAIS) (Kaufmann and Lichtenberger 2006: 120) that measures intelligence in older adolescents and adults. The digit symbol substitution test measures attention, working memory, processing speed (Lezak et al. 2004: 371), verbal ability (Laux and Lane 1985: 115), executive functioning (Thornton and Carmody 2012: 213), and this test is sensitive to cognitive deficits (Jaeger 2018: 517).

The digit symbol test includes nine numbers that are paired with a symbol. Each number is paired with a specific symbol such as “V”, “=”, “>”, “+”, and “<”. These pairs are shown in digits on the upside of the paper. A series of numbers between 1 and 9 randomly and repeatedly continues over the paper. All participants filled out the digit symbol substitution test (Appendix F) to investigate the correlation between the result of the digit span task and memory performance. Participants are asked to write down the comparable symbol in the digit for blank digits, which only consists of numbers. A total of 90 seconds is given to the participants to fill in the corresponding symbol for each number. Participants are supposed to scan the symbol for each number at the top of the paper and fill in the correct answer for each number as soon as possible.

Before beginning the test, practice questions are completed under the observation of the researcher to ensure that the task is understood well. After 90

seconds for the test, correct responses are measured. One point for each correct response is provided to the participant. Higher scores indicate higher cognitive functioning (see Table 5).

Table 5. Means and Standard Deviations of the Participants' Scores from the Digit Symbol Substitution Test

Age group	**Condition**	*n*	*M*	*SD*
18-30	Control group	16	51.12	7.11
	Refugees with PTSD symptoms	15	31.86	9.30
	Refugees without PTSD symptoms	15	36.06	11.67
31-59	Control group	15	43.53	6.99
	Refugees with PTSD symptoms	15	37.20	7.31
	Refugees without PTSD symptoms	15	36.33	9.81

Digit symbol substitution test is one of the most frequently used tools to assess information processing speed (Smith 1982: 5). There were three conditions in the current study and participants were analyzed according to their digit symbol substitution test scores. A 3 x 2 mixed ANOVA was conducted on the digit symbol scores to explore the effect of condition (control group, refugees with PTSD symptoms, refugees without PTSD symptoms) and the effect of age group (18-30 and 31-59).

The results of ANOVA displayed that there was a main effect of condition on symbol digit score, $F(2, 78) = 16.84$, $p = .000$, $\eta_p^2 = .302$, indicating that scores of digit symbol test of the control group ($M = 47.45$, $SD = 7.94$) were higher than refugees with PTSD symptoms ($M = 34.53$, $SD = 8.66$) and also than refugees without PTSD symptoms ($M = 36.20$, $SD = 10.59$). The main effect of the age group was not statistically significant $F(1, 78) = .42$, $p > .05$, $\eta_p^2 = 005$.

In addition, an interaction effect between age group and condition was found marginally significant ($F(2, 78) = 2.91$, $p = .06$, $\eta_p^2 = .069$). Paired t-test was performed to explore an interaction effect. A total of six pairs including categories of age group and condition were used in the analysis, therefore Bonferroni correction was applied to the *p* value. Normally, *p* values less than .05 ($p < .05$) have been taken under consideration statistically significant, however *p* value was divided to six since there were 6 pairs in the analysis. As a result, *p* values less than .008 were considered statistically significant in this paired t test analysis. The results of the analysis revealed that scores of digit symbol test of the control group, whose age group was 18-30 ($M = 51.12$, $SD = 7.11$), were higher than both refugees with PTSD symptoms, whose ages

between 18-30 (*M* = 31.87, *SD* = 9.30); *t*(14) = 6.19, *p* = .000 and then refugees without PTSD symptoms whose ages between 18-30 (*M* = 36.07, *SD* = 11.67); *t*(14) = 4.46, *p* = .000. All other interaction effects were not statistically significant. Statistical analyses showed that scores digit symbol substitution test scores are higher in control group than refugees regardless of PTSD symptoms.

All results of paired samples t-tests on digit symbol scores test are presented in Table 6. below. In addition, the interaction effect between age group and condition is presented in Figure 5.

Table 6. Results of Paired Samples T-Tests on Digit Symbol Scores Test

Pairs	*t*	*df*	*p*
18-30 / Control – 18-30 / Refugee with PTSD symptoms	6.19	14	**.000***
18-30 / Control – 18-30 / Refugee without PTSD symptoms	4.46	14	**.000***
18-30 / Refugee with PTSD symptoms – 18-30 / Refugee without PTSD symptoms	-1.15	14	.270
31-59 / Control – 31-59 / Refugee with PTSD symptoms	2.37	14	.032
31-59 / Control – 31-59 / Refugee without PTSD symptoms	2.27	14	.039
31-59 / Refugee with PTSD symptoms – 31-59 / Refugee without PTSD symptoms	0.29	14	.773

*p < .008

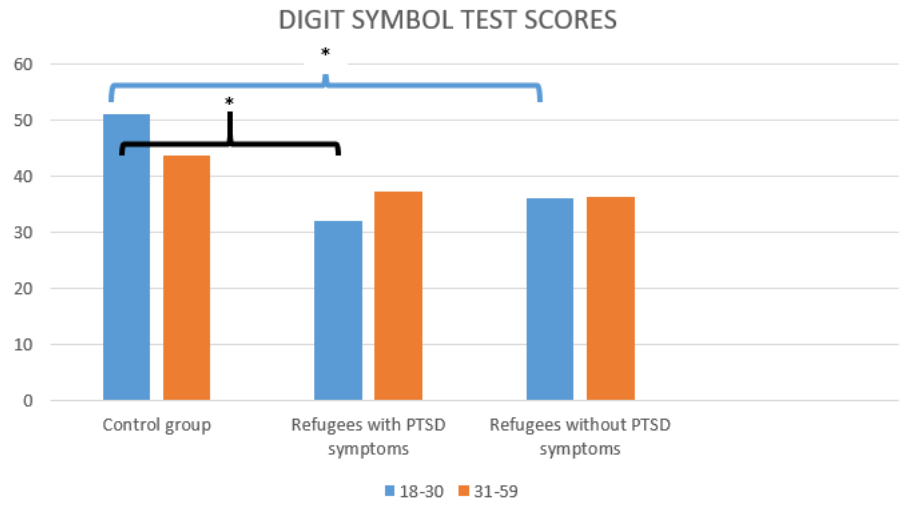


Figure 5. Interaction Effect between Condition and Age Group

*The asterisk (*) was used to display statistical significance.

2.2.5. Word Evaluation Form

A total of 45 words in the experimental design were chosen from the Turkish Emotional Word Norms list for Arousal, Valence, and Discrete Emotion Categories

(Kapucu et al., 2021: 188), and these words were rated by the Turkish population in the original study. The valence of words can be different for different cultures. Emotion is affected by some factors, including cultural situations (Lutz, 2011). Various researches indicated that some elements of emotions have been shown to be different across cultures (Markus and Kitayama 1991: 224; Matsumoto and Ekman 1989: 155; Russell 1994: 102). Valence and arousal rates can differ for refugee groups from the Turkish population since valence and arousal are dimensions of emotion. De Deyne et al. (2020: 2781) stated that the valence and arousal dimension of words could be specific to cultures and languages. Several studies pointed out that there are cultural differences in perception of valence with emotional stimuli (Erickson et al. 2020: 720; Fiske et al. 1998: 920; Lim 2016: 108; Mesquita et al. 1997: 262; Zhu et al. 2013: 261).

In the current study, it was hypothesized that positive and negative emotional words are recalled more accurately than neutral words, therefore reevaluation of words regarding valence dimension by refugees was essential to decide whether there are any cultural differences. All words (15 positive, 15 negative, 15 neutral) were evaluated in terms of valence dimension on a 9-point Likert scale. Participants were requested to evaluate each word in terms of its valence. The meaning of valence was explained to participants before the evaluation part. It was explained as the pleasantness or unpleasantness of the word.

2.3. EXPERIMENTAL DESIGN

As the experimental design, a 2 (age: younger and middle-aged adulthood) x 3 (participants group: refugees with PTSD symptoms, refugees without PTSD symptoms, and the control group without PTSD symptoms) x 3 (valence levels of words: positive, negative, neutral non-arousing) mixed ANOVA was conducted on the free recall memory test. According to this design, the variables ‘age’ and ‘participants group’ were between subjects, while the variable ‘valence levels of words’ was within subjects. The dependent variable to be measured was the total correct score obtained at the test session of the experiment. In the 2 x 3 x 3 experimental design, the number of participants in each condition and the design of the study are indicated in Table 7.

Table 7. The Experimental Design of the Study

n=91	Age group of 18-30			Age group of 31-59		
	Refugees with PTSD symptoms	Refugees without PTSD symptoms	Control group	Refugees with PTSD symptoms	Refugees without PTSD symptoms	Control group
Positive words	15	15	16	15	15	15
Negative words	15	15	16	15	15	15
Neutral words (non-arousing)	15	15	16	15	15	15

2.4. PROCEDURE

2.4.1. Preparation of Materials

Data collection procedure was started after the research ethics committee of Çankaya University approved the study (Appendix A). As a pilot study, 10 refugees were asked what they conceived when they heard the word "refugee". After these trials, appropriate words were chosen from Kapucu Turkish Emotional Word Norm List. 15 positive, 15 negative, and 15 neutral non-arousing words which are related to migration were chosen (Appendix E). Valence, arousal, and concreteness levels of words were controlled with one-way ANOVA which was explained in the section of 2.2.3.

A list of all scale-based materials was prepared for each participant. These materials included an informed consent form, a demographic information form, the PDS, the digit symbol substitution task, word revaluation form, which were filled out only by the refugee groups.

2.4.2. Preparation of the Experiment with the PsychoPy

The PsychoPy 2.0 software (Peirce et al. 2019: 195) was used for the experiment. Each word was presented for 2000 milliseconds for younger adults and 3000 milliseconds for middle-aged adults with a 700 ms. stimulus interval between words. Two different experiments were designed for younger and middle-aged adults according to the presentation duration of words.

Experiments were prepared by PsychoPy Builder 2.0. An excel sheet consisting of a list of 45 words that were used in the current study was uploaded to the PsychoPy Builder for the experiment. The order of the words was arranged randomly. Therefore, each participant saw words in random order among positive, negative, and neutral words. Younger adult participants saw each word for 2 seconds with 700 ms. stimulus interval, and middle-aged adult participants saw each word for 3 seconds with 700 ms. stimulus interval. Black color for words on a white background was used for clear reading and understanding.

2.4.3. Pilot Study

The scale-based materials and the experiment by PsychoPy were carried out with two participants for the pilot study.

2.4.4. Study Session

The current study was conducted face-to-face with each participant in a quiet room. Firstly, participants were given an informed consent form (Appendix B), in which the aim of the study was explained to the participants. After signing the informed consent form, other written forms were presented. All participants filled out the demographic information form (Appendix C) and Posttraumatic Diagnostic Scale (Appendix D) for selection criteria. Only refugees answered questions related to migration experience in the demographic information form, while participants in the control group did not. According to the results of the PDS, the experiment session continued with the participants from the control group who met the criteria of having no posttraumatic stress disorder symptoms. Thus, participants from the control group whose PDS score was below or equal to 10 continued the study. All refugees were included in the experiment regardless of their PDS score since those who showed PTSD symptoms and those who did not were in the criteria.

After filling out all materials by participants, the experimental phase started. In the study session, firstly, instructions were provided to the participants. Participants were told that they will see words and they requested to look at them. After approval from participants, the researcher displayed a computer-based presentation of the words. Each participant was presented with a set of 45 words. An appropriate version of the experiment was chosen and started according to the age groups. Hence, two different versions of the word presentation study task were administered to two

different age groups. The first version, a 2-second word presentation with a 700 ms. inter stimulus interval, was presented to the younger adult group aged 18-30. The second version a 3-second word presentation with a 700 ms. inter stimulus interval was presented to the middle-aged adult group aged 31-59. The presentation times for the words were adjusted based on cognitive abilities and information processing speed for each age group since cognitive functions tend to decrease with age (Fjell and Walhovd 2010: 204; Murman 2015: 119; Roberts and Allen 2016: 5; Salthouse 1996: 425; Schneider and Pichora-Fuller 2000: 200).

2.4.5. Distractor Session

After the study session, a distractor session was guided to prevent primacy and recency effects (Ebbinghaus 1913: 22). Following the presentation of words, a 1-minute distraction task was carried out. Participants were requested to say fruit names starting with the letters A or E.

2.4.6. Test Session (Free recall)

The free recall was used in the test session. Participants were requested to recall as many as the words which were seen in the study session. The words they recalled, including ones they said multiple times or that were not in the original list, recorded on the paper (Appendix E). Participants verbally stated words that they recalled from the word list in the study session. The number of words for each category (positive-negative-neutral words) was recorded for each participant. Each word that participants verbally stated was recorded on the paper (Appendix E). After the free recall session, refugees were asked whether there was any word that they did not know the meaning since they were not native Turkish speakers. Digit symbol institution test (Appendix F) was presented to participants after a free recall task to investigate the correlation between memory performance and scores of the digit symbol test, as previous studies suggested (Joy et al. 2003: 63; Stephens and Kaufman 2009: 226). Instruction for the digit symbol test was provided to the participants. Practice questions at the very beginning were completed under the supervision of the researcher. After the practice questions, participants were requested to fill in empty squares without skipping the order. They had 90 seconds to fill in as many empty squares as possible without skipping any. Afterwards, participants in the control group were debriefed and thanked, while refugees filled out a word revaluation form (Appendix G). Only

refugees reevaluated all words which were used in the experimental design regarding their valence since valence of words can change culturally and valence of words can be different for refugees compared to Turkish population. All words were written and refugee groups were asked to evaluate words considering their valence from 1 to 9. Refugees were requested to look at each word carefully and evaluate them in terms of their valence. The meaning of valence was explained to participants as pleasantness or unpleasantness of the word. Participants who filled out the form were informed that the study was over with the completion of this task. Afterward, they were debriefed and thanked.

CHAPTER III

RESULTS

This result section presents all findings of the current study. First, results of data screening and normality test were conducted. Tables were provided to present descriptive statistics of participants according to their condition, which included the control group, refugees with PTSD symptoms, and refugees without PTSD symptoms. After presenting the descriptive statistics, study variables of the study along with values of mean, standard deviation, minimum and maximum were presented. Later, the SPSS analyses were exhibited, including a mixed ANOVA on recall scores as a function of emotion, age group and condition, as well as related paired samples t-tests. In addition, the valence rating comparisons between refugees and the control group that corresponded to Turkish population were presented. As a result, a new categorization of valence of words was created. Last, a mixed ANOVA was conducted with the newly categorized words according to valence ratings on recall scores, along with related paired samples t-tests.

3.1. DATA SCREENING

Data analyses were analyzed using Statistical Package of Social Sciences (SPSS) for Windows, Version 26 (IBM SPSS Statistics for Windows Version 26, IBM Corp.) to investigate the effects of emotional valence and age on free recall memory performance for refugee-related words in refugees with and without PTSD symptoms.

Normality assumption was checked before analysis of data. The Kolmogorov-Smirnov normality test results revealed that data was normally distributed for total recall score ($D(91) = .08$, $p > .05$). Furthermore, normality assumption was supported for age groups which are 18-30 ($D(46) = .10$, $p > .05$) and 31-59 ($D(45) = .09$, $p > .05$) in total recall score. Additionally, further normality assumption test was conducted for PTSD levels in total recall scores according to results of PDS. There were five levels in PDS normality assumption for four of them supported. There was

one participant in a severe level of PDS, hence it has been omitted for this assumption check. It has been supported that data of participants who belong to “none” level ($D(34) = .09$, $p > .05$), “mild” level ($D(27) = .14$, $p > .05$), “moderate” level ($D(17) = .15$, $p > .05$), and “moderate to severe” level ($D(12) = .20$, $p > .05$) were distributed normally.

The shape of a distribution of data was checked using skewness and kurtosis values. Skewness measures how asymmetry the distribution is, and kurtosis measures whether the distribution has a lighter or heavier tail than the normal distribution. The values of skewness and kurtosis between -2 and +2 are took into consideration adequate for normal distribution (George and Mallery 2010). In the current data, skewness (.56) and kurtosis (.43) values are acceptable for normal distribution since they were between -2 and +2.

3.2. DESCRIPTIVE STATISTICS

3.2.1. Demographic Characteristics of the Control Group

The demographic characteristics of the 31 participants in the control group were analyzed. Of these participants, 67.7% were female and 32.3% were male, and there was no participant who stated their sex as other. The mean age of them was found to be 32.35 years ($SD = 8.50$). The mean of their PTSD score was found to be 1.77 ($SD = 2.66$). When the PTSD level of them was analyzed, of these participants, 48.4% belonged to none category, 51.6% belonged to mild category, and there was no participant belonged to moderate, moderate to severe, and severe category. In terms of relationship status, 41.9% were married, 41.9% were single, and 16.1% were in a relationship, with no participants being widowed or divorced. The vast majority of participants, 96.8%, were employed, while 3.2% were not. In terms of education level, 6.5% of had a high-school diploma, while 93.5% had at least a bachelor’s degree. These demographic findings are summarized in Table 8.

Table 8. Demographic Characteristics of the Control Group

Variables	*n*		%
Sex			
Female	21		67.7
Male	10		32.3
Other	0		0
Age*		32.35±8.50	
PTSD score*		1.77±2.66	
PTSD Level			
None	15		48.4
Mild	16		51.6
Moderate	0		0
Moderate to severe	0		0
Severe	0		0
Relationship Status			
Married	13		41.9
Single	13		41.9
In relationship	5		16.1
Widowed	0		0
Divorced	0		0
Working Status			
Working	30		96.8
Not working	1		3.2
Education Level			
Primary school	0		0
Secondary school	0		0
High school	2		6.5
University+	29		93.5

*Mean±Standard Deviation

3.2.2. Demographic Characteristics of Refugees with PTSD Symptoms

The demographic characteristics of the 30 participants in refugees with PTSD symptoms were analyzed. Of these participants, 60% were female, 36.7% were male, and 3.3% were other. The mean age of them was found to be 30.56 years (*SD* = 7.65). The mean of their PTSD score was found to be 20.70 (*SD* = 7.89). When the PTSD level of participants was analyzed, of these participants, 56.7% belonged to moderate category, 40% belonged to moderate to severe category, 3.3% belonged to severe category, and there was no participant who belonged to none and mild category. According to their nationality, of these participants, 30% were Syrian, 16.7% were Afghan, 20% were Iraqi, 20% were Iranian, 10% were Ukrainian, and 3.3% were Somalian. The results of relationship status showed that 40% were married, 43.3% were single, 6.7% were in a relationship, 6.7% were widowed, and 3.3% were divorced. When working status of the participants was explored, of these participants, 63.3% were working and 36.7% were not working. The result of the analysis of education level displayed that 3.3% were a primary school diploma, 20% were with a

secondary school diploma, 16.7% were with a high-school diploma, 60% were with at least a bachelor's degree. When wounding situation of them was analyzed, of these participants, 10% were wounded in the country of origin and 90% were not wounded in the country of origin. When their lost in war was explored, of these participants, 43.3% had lost persons in war and 56.7% did not have lost persons in war. Regarding receiving psychological support, of these participants, 26.7% were receiving psychological support and 73.3% were not receiving psychological support. The demographic analysis and frequencies were presented in the Table 9.

Table 9. Demographic Characteristics of Refugees with PTSD Symptoms

Variables	*n*	%
Sex		
Female	18	60
Male	11	36.7
Other	1	3.3
Age*	30.56±7.65	
PTSD score*	20.70±7.89	
PTSD Level		
None	0	0
Mild	0	0
Moderate	17	56.7
Moderate to severe	12	40
Severe	1	3.3
Nationality		
Afghan	5	16.7
Iraqi	6	20
Iranian	6	20
Somalian	1	3.3
Syrian	9	30
Ukrainian	3	10
Relationship Status		
Married	12	40
Single	13	43.3
In relationship	2	6.7
Widowed	2	6.7
Divorced	1	3.3
Working Status		
Working	19	63.3
Not working	11	36.7
Education Level		
Primary school	1	3.3
Secondary school	6	20
High school	5	16.7
University+	18	60
Wounding		
Wounding in war	3	10
Not wounding in war	27	90
Lost persons in war		

Table 9 continued

Variables	*n*	%
Have lost in war	13	43.3
Not have lost in war	17	56.7
Psychological Support		
Receiving psychological support	8	26.7
Not receiving psychological support	22	73.3

*Mean±Standard Deviation

3.2.3. Demographic Characteristics of Refugees without PTSD Symptoms

The demographic characteristics of the 30 participants in refugees without PTSD symptoms were analyzed. Of these participants, 50% were female and 50% were male. The mean age of them was found to be 30.10 years (*SD* = 7.48). The mean of their PTSD score was found to be 2.03 (*SD* = 3.17). According to PTSD level of participants, 63.3% belonged to none category, 36.7% belonged to mild category, and there was no participant who belonged to moderate, moderate to severe, and severe category. According to their nationality, of these participants, 26.7% were Syrian, 13.3% were Afghan, 20% were Iraqi, 23.3% were Iranian, 6.7% were Ukrainian, 6.7% Jordanian, and 3.3% were Somalian. The results of relationship status showed that of these participants, 40% were married, 43.3% were single, 6.7% were in a relationship, 6.7% were widowed, and 3.3% were divorced. When working status of the participants was explored, of these participants, 70% were working and 30% were not working. The result of the analysis of education level displayed that 3.3% were with a primary school diploma, 10% were with a secondary school diploma, 20% were with a high-school diploma, 66.7% were with at least a bachelor's degree. When wounding situation of them was analyzed, of these participants, 3.3% were wounded in the country of origin and 96.7% were not wounded in the country of origin. When their lost in war was explored, of these participants, 36.7% had lost persons in war and 63.3% did not have lost persons in war. Regarding receiving psychological support, 6.7% were receiving psychological support and 93.3% were not receiving psychological support. The demographic analysis and frequencies were presented in the Table 10.

Table 10. Demographic Characteristics of Refugees without PTSD Symptoms

Variables	*n*		%
Sex			
Female	15		50
Male	15		50
Other	0		0
Age*		30.10±7.48	
PTSD score*		2.03±3.17	
PTSD Level			
None	19		63.3
Mild	11		36.7
Moderate	0		0
Moderate to severe	0		0
Severe	0		0
Nationality			
Afghan	4		13.3
Iraqi	6		20
Iranian	7		23.3
Somalian	1		3.3
Syrian	8		26.7
Ukrainian	2		6.7
Jordanian	2		6.7
Relationship Status			
Married	9		30
Single	16		53.3
In relationship	4		13.3
Widowed	1		3.3
Divorced	0		0
Working Status			
Working	21		70
Not working	9		30
Education Level			
Primary school	1		3.3
Secondary school	3		10
High school	6		20
University+	20		66.7
Wounding			
Wounded in war	1		3.3
Not wounded in war	29		96.7
Lost persons in war			
Have lost in war	11		36.7
Not have lost in war	19		63.3
Psychological Support			
Receiving psychological support	2		6.7
Not receiving psychological support	28		93.3

*Mean±Standard Deviation

3.2.4. Study Variables

Study variables including digit symbol substitution test scores, total recall score, positive words recall score, negative words recall score, and neutral words recall score, positive word recall score after new categorization, negative word recall score after new categorization, and neutral word recall score after new categorization were presented in Table 11. for each condition group, which are the control group, refugees with PTSD symptoms, and refugees without PTSD symptoms. Additionally, recall scores by age groups and emotion were presented in the Table 12.

Table 11. Scores of the Study Variables Obtained from the Participants

N=91	**N=31** Control group				**N=30** Refugees with PTSD Symptoms				**N=30** Refugees without PTSD Symptoms			
Variables	***M***	***SD***	**Min**	**Max**	***M***	***SD***	**Min**	**Max**	***M***	***SD***	**Min**	**Max**
Digit Symbol Substitution Test Score	47.45	7.94	28	61	34.53	8.65	15	56	36.20	10.59	19	56
Total Recall Score	10.12	3.77	3	17	9.50	3	5	16	9.26	3.32	4	21
Positive Word Recall Score	2.90	1.35	0	6	3	1.61	0	7	3.23	1.63	1	9
Negative Word Recall Score	3.93	1.98	1	8	3.10	1.44	1	6	2.96	1.49	1	7
Neutral Word Recall Score	3.24	1.87	0	7	3.40	1.49	1	7	3.03	1.56	1	7
Positive Word Recall Score After New Categorization	NA	NA	NA	NA	4.43	1.69	1	8	4.60	2.04	1	11
Negative Word Recall Score After New Categorization	NA	NA	NA	NA	4.80	2.17	2	9	4.30	2.36	1	9
Neutral Word Recall Score After New Categorization	NA	NA	NA	NA	.26	.58	0	2	.36	.71	0	3

M: Mean, *SD*: Standard Deviation, Min: Minimum, Max: Maximum, NA: Not applicable

Table 12. Recall Scores by Age Groups and Emotion

Age Group	Recall Scores	*M*	*SE*
18-30	Positive word recall	2.82	.21
	Negative word recall	3.34	.25
	Neutral word recall	2.95	.24
31-59	Positive word recall	3.27	.22
	Negative word recall	3.33	.25
	Neutral word recall	3.51	.25

M: Mean, *SE*: Standard Error

3.3. ANALYSES FOR RECALL SCORES: EMOTION, CONDITION, AGE GROUP

One-way ANOVA was conducted to explore the effect of sex (female, male, other) on total recall score. The results of ANOVA showed that there was no statistically significant difference ($F(2, 88) = 1.79$, $p > .05$). Therefore, the effect of sex was not included in further analyses.

A 3 x 3 x 2 mixed ANOVA was conducted to explore the effect of emotion which corresponds to valence of words (positive, negative, neutral), the effect of condition (control group, refugees with PTSD symptoms, refugees without PTSD symptoms), and the effect of age group (18-30 and 31-59) on recall scores. *p* values less than .05 ($p < .05$) were taken under consideration statistically significant in analyses.

According to the results of ANOVA, the main effect of emotion ($F(2, 170) = 1.03$, $p > .05$, $\eta_p^2 = .012$), the main effect of condition ($F(2, 85) = .54$, $p > .05$, $\eta_p^2 = .012$), and the main effect of age group ($F(1, 85) = 1.97$, $p > .05$, $\eta_p^2 = .023$) were not statistically significant.

The results of ANOVA revealed that all 2-way interaction effects including emotion and condition ($F(4, 170) = 2.18$, $p > .05$, $\eta_p^2 = .049$), emotion and age group ($F(2, 170) = 1.04$, $p > .05$, $\eta_p^2 = .012$), and condition and age group ($F(2, 85) = .46$, $p > .05$, $\eta_p^2 = .011$) were not statistically significant. The 3-way interaction effect between emotion, condition, and age group was found statistically significant ($F(4, 170) = 3.04$, $p < .05$, $\eta_p^2 = .067$). Therefore, paired samples t-test for this interaction effect was conducted.

3.3.1. Paired Samples T-Test for Emotion * Condition * Age Group Interaction Effect

Paired samples t-test with 19 pairs was performed to explore the interaction effect between emotion and condition. Ordinarily, *p* values less than .05 ($p < .05$) have been taken under consideration statistically significant, however our alpha cut-off of 0.05 was Bonferroni-corrected to $p < .002$ (19 tests) to determine statistical significance in this step.

According to the result of the paired t-test, positive recall scores of middle-aged adult refugee group with PTSD symptoms corresponding to 31-59 age group ($M = 3.93$, $SD = 1.44$) are higher than younger adult refugee group with PTSD symptoms corresponding 18-30 age group ($M = 2.07$, $SD = 1.22$). In addition, positive recall scores of younger adult refugees without PTSD symptoms ($M = 3.40$, $SD = 1.30$) are higher than younger adult refugees with PTSD symptoms ($M = 2.07$, $SD = 1.22$). All other interaction effects were not statistically significant. According to results of analyses displayed that Hypotheses 1a, 1a.1, 1b, 1b.1, 1b.2, 1c, 2a, 2a.1, 2a.2, 2b, 2c, 3a, 3a.1, 3a.2 were not supported. On the other hand, Hypotheses 1c.1, 1c.2, and 1c.3 were supported. All results of paired samples t-test for emotion, condition, and age group are presented in Table 13.

Table 13. Pairs for The Emotion * Condition * Age Group Interaction Effect

Pairs	*t*	*df*	*p*
Refugees with PTSD symptoms, 18-30 / positive recall – Refugees with PTSD symptoms, 31-59 / positive recall	-3.84	14	**.001***
Refugees with PTSD symptoms, 18-30 / positive recall – Refugees without PTSD symptoms, 18-30 / positive recall	-3.70	14	**.002***
Refugees with PTSD symptoms, 18-30 / positive recall – Refugees with PTSD symptoms, 18-30 / negative recall	-2.74	14	.016
Refugees with PTSD symptoms, 18-30 / negative recall – Refugees with PTSD symptoms, 31-59 / negative recall	0.70	14	.494
Refugees with PTSD symptoms, 18-30 / negative recall – Refugees without PTSD symptoms, 18-30 / negative recall	0.34	14	.734
Refugees with PTSD symptoms, 18-30 / negative recall – Control group, 18-30 / negative recall	-0.90	14	.383
Refugees with PTSD symptoms, 18-30 / negative recall – Refugees with PTSD symptoms, 18-30 / neutral recall	0.14	14	.892
Refugees with PTSD symptoms, 31-59 / positive recall – Refugees without PTSD symptoms, 31-59 / positive recall	1.44	14	.170
Refugees with PTSD symptoms, 31-59 / positive recall – Refugees with PTSD symptoms, 31-59 / negative recall	2.14	14	.050
Refugees with PTSD symptoms, 31-59 / negative recall – Refugees without PTSD symptoms, 31-59 / negative recall	0.10	14	.918
Refugees with PTSD symptoms, 31-59 / negative recall – Refugees with PTSD symptoms, 31-59 / neutral recall	-1.67	14	.116
Refugees without PTSD symptoms, 18-30 / positive recall – Refugees without PTSD symptoms, 31-59 / positive recall	0.55	14	.591
Refugees without PTSD symptoms, 18-30 / positive recall – Control group, 18-30 / positive recall	0.84	14	.416
Refugees without PTSD symptoms, 18-30 / positive recall – Refugees without PTSD symptoms, 18-30 / neutral recall	1.49	14	.157
Refugees without PTSD symptoms, 18-30 / negative recall – Refugees without PTSD symptoms, 31-59 / negative recall	0.36	14	.723
Refugees without PTSD symptoms, 31-59 / positive recall – Control group, 31-59 / positive recall	0.44	14	.666
Refugees without PTSD symptoms, 31-59 / positive recall – Refugees without PTSD symptoms, 31-59 / neutral recall	-0.88	14	.394
Refugees without PTSD symptoms, 31-59 / negative recall – Control group, 31-59 / negative recall	-1.94	14	.072
Refugees without PTSD symptoms, 31-59 / negative recall – Refugees without PTSD symptoms, 31-59 / neutral recall	-1.38	14	.189

*p < .002

3.4. ANALYSES OF THE COMPARISON OF VALENCE RATINGS: REFUGEES AND TURKISH INDIVIDUALS (CONTROL GROUP)

In the study session**,** 56 refugees rated 45 words based on their valence dimension. Independent samples t-test was performed to compare the valence ratings of Turkish people (control group) and refugees. Valence ratings of Turkish participants were taken from the original study of Kapucu et al. (2021: 188). The results showed that there were statistically significant differences in the valence ratings of 26 out of

45 words and marginal significant differences in the valence ratings of 3 words out of 45 words between refugees and Turkish population. The six words (anlaşma, toplanma, ülke, vatan, zaman, hayat) were rated as neutral by the Turkish population, while refugees rated them as positive. While eight words (endişeli, gurbet, kaçak, olay, özlem, sessiz, telaş) were rated as neutral by the Turkish population, they were rated as negative by refugees. A total of two words (hatıra, yolculuk), were rated as positive by the Turkish population, however these words were rated as neutral by refugees. Results are presented in the Table 14.

Table 14. Comparisons of Word Rating

Word	*t*	*df*	*p*	*M* -T	*SD* - T	V	*M* -R	*SD*-R	V
Anlaşma	-5.47	85	.000**	5.05	2.29	Neu.	7.21	2.19	Pos.
Bomba	25.85	85	.000**	3.72	3.62	Neg.	1.14	.55	Neg.
Asker	3.14	85	.002*	4.77	2.25	Neu.	3.26	2.65	Neg.
Endişeli	6.84	85	.000**	4.51	2.89	Neu.	2.60	1.54	Neg.
Hatıra	2.10	85	.039*	6.20	1.93	Pos.	5.25	2.51	Neu.
Gurbet	5.26	85	.000**	5.11	2.53	Neu.	2.83	2.39	Neg.
Füze	19.31	85	.000**	3.18	1.73	Neg.	1.17	.57	Neg.
Kaçak	12.38	85	.000**	4.92	2.33	Neu.	1.89	1.35	Neg.
Olay	2.13	85	.036*	4.32	1.49	Neu.	3.57	1.95	Neg.
Kurtarıcı	-2.03	85	.046*	7.18	1.62	Pos.	7.78	1.65	Pos.
Sahipsiz	4.24	85	.000**	2.71	1.97	Neg.	1.67	1.34	Neg.
Özlem	2.52	85	.014*	4.20	2.24	Neu.	3.10	2.40	Neg.
Savaş	5.49	85	.000**	2.10	2.14	Neg.	1.16	.94	Neg.
Sessiz	3.45	85	.001*	4.41	2.34	Neu.	2.85	2.49	Neg.
Silah	2.69	85	.009*	2.00	1.53	Neg.	1.44	1.14	Neg.
Telaş	4.76	85	.000**	4.75	2.25	Neu.	2.76	2.31	Neg.
Tehlike	2.46	85	.016*	2.18	1.46	Neg.	1.58	1.33	Neg.
Toplanma	-3.45	85	.001*	4.58	1.93	Neu.	5.91	2.14	Pos.
Üzüntü	3.31	85	.001*	2.30	1.52	Neg.	1.64	1.10	Neg.
Ülke	-3.98	85	.000**	5.32	1.79	Neu.	7.07	2.44	Pos.
Yardım	-5.67	85	.000**	5.67	3.12	Pos.	7.51	1.80	Pos.
Yoksul	8.84	85	.000**	2.74	2.06	Neg.	1.39	.84	Neg.
Vatan	-7.10	85	.000**	5.47	2.62	Neu.	7.87	1.87	Pos.
Yolculuk	3.67	85	.000**	6.43	1.78	Pos.	4.75	2.53	Neu.
Zorluk	4.88	85	.000**	3.52	1.70	Neg.	2.07	1.64	Neg.
Zaman	-3.87	85	.000**	5.02	2.00	Neu.	6.53	2.17	Pos.
Hayat	-1.93	85	.057	5.37	2.57	Neu.	6.28	2.64	Pos.
Sağlık	-1.96	85	.054	7.35	1.76	Pos.	7.98	1.79	Pos.
Açlık	1.87	85	.064	2.02	1.51	Neg.	1.58	1.27	Neg.
Barış	-0.81	85	.418	8.02	1.79	Pos.	8.26	1.68	Pos.
Dost	0.84	85	.401	8.20	.97	Pos.	7.92	1.78	Pos.
Dünya	0.09	85	.927	5.67	1.78	Pos.	5.62	2.73	Pos.
Hürriyet	0.19	85	.851	8.00	1.26	Pos.	7.92	2.10	Pos.
İnsanlık	-1.27	85	.207	7.08	1.99	Pos.	7.60	2.30	Pos.
Koruma	-1.60	85	.113	6.17	2.07	Pos.	6.89	2.50	Pos.
Korunak	-0.60	85	.548	6.13	1.82	Pos.	6.41	2.58	Pos.
Kültür	-1.16	85	.251	6.42	1.81	Pos.	6.92	2.44	Pos.
Toprak	-1.57	85	.119	6.51	2.17	Pos.	7.19	2.42	Pos.
Umut	0.43	85	.667	7.88	1.67	Pos.	7.71	2.12	Pos.
Esaret	0.42	85	.673	1.91	1.75	Neg.	1.69	1.48	Neg.
Keder	-0.28	85	.777	2.41	1.69	Neg.	2.50	1.75	Neg.
Mağdur	1.48	85	.143	2.31	1.38	Neg.	1.89	1.56	Neg.
Ölüm	-0.22	85	.824	2.00	1.73	Neg.	2.08	2.22	Neg.
Fakirlik	1.40	85	.166	2.19	1.30	Neg.	1.82	1.46	Neg.
Hassas	-0.28	85	.777	4.35	2.00	Neu.	4.46	2.23	Neu.

M: Mean, *SD*: Standard Deviation, T: Turkish, R: Refugees, V: ValenceNeu: Neutral, Neg: Negative, Pos: Positive

*$p < .05$

**$p < .001$

3.4.1. New Categorization of Words' Valence Categories

Independent samples t-test indicated that there were differences between the Turkish population and refugees in rating the valence dimensions of 29 words. Consequently, 45 words were newly categorized again according to new valence ratings given by the refugees. The new categorization resulted in 19 words in the positive valence category, 23 words in the negative valence category, and 3 words in the neutral valence category. Then, the word checklist was regenerated (Appendix H) and recall of words from each valence category was noted for each participant from the refugee groups. Categorization of words' valence by refugees and original study are presented in the Table 15.

Table 15. Categorization of Valence of Words in The Lists

Positive words		Negative words		Neutral words	
First list	Second list	First list	Second list	First list	Second list
Barış	Barış	Açlık	Açlık	Anlaşma	Hatıra
Dost	Anlaşma	Bomba	Bomba	Asker	Hassas
Dünya	Dost	Esaret	Esaret	Endişeli	Yolculuk
Hatıra	Dünya	Fakirlik	Endişeli	Gurbet	
Hürriyet	Hürriyet	Füze	Fakirlik	Hassas	
İnsanlık	İnsanlık	Keder	Gurbet	Hayat	
Koruma	Hayat	Mağdur	Füze	Kaçak	
Korunak	Koruma	Ölüm	Keder	Olay	
Kurtarıcı	Korunak	Sahipsiz	Mağdur	Özlem	
Kültür	Kurtarıcı	Savaş	Kaçak	Sessiz	
Sağlık	Kültür	Silah	Ölüm	Telaş	
Toprak	Sağlık	Tehlike	Olay	Toplanma	
Umut	Toprak	Üzüntü	Sahipsiz	Ülke	
Yardım	Toplanma	Yoksul	Özlem	Vatan	
Yolculuk	Umut	Zorluk	Savaş	Zaman	
	Ülke		Sessiz		
	Yardım		Silah		
	Vatan		Telaş		
	Zaman		Tehlike		
			Üzüntü		
			Yoksul		
			Zorluk		
			Asker		

3.4.2. Analyses of Recall Scores in Refugees: Emotion, Condition, Age Group after New Word Categorization

A 3 x 2 x 2 mixed ANOVA was conducted to explore the effect of emotion which corresponds to new valence category of words (positive, negative, neutral), the effect of condition for refugees with PTSD symptoms, refugees without PTSD

symptoms), and the effect of age group (18-30 and 31-59) on recall scores. *p* values less than .05 ($p < .05$) were considered statistically significant in analyses.

The results of ANOVA displayed that the main effect of emotion ($F(2, 112) = 125.20$, $p < .001$, $\eta_p^2 = .691$.) was statistically significant. Pairwise comparisons pointed out that positive words ($M = 4.52$, $SD = 1.86$) were recalled better than neutral words ($M = .32$, $SD = .65$) and negative words ($M = 4.55$, $SD = 2.26$) were recalled better than neutral words ($M = .32$, $SD = .65$). There was no statistically significant difference between positive words ($M = 4.52$, $SD = 1.86$) and negative words ($M = 4.55$, $SD = 2.26$). The main effect of condition ($F(1, 56) = .08$, $p > .05$, $\eta_p^2 = .001$), and the main effect of age group ($F(1, 56) = 1.84$, $p > .05$, $\eta_p^2 = .032$) were not statistically significant.

All 2-way interaction effects including condition * age group ($F(1, 56) = 1.05$, $p > .05$, $\eta_p^2 = .018$), emotion * age group ($F(2, 112) = 1.76$, $p > .05$, $\eta_p^2 = .030$), emotion * condition ($F(2, 112) = .71$, $p > .05$, $\eta_p^2 = .013$) and 3-way interaction effect ($F(2, 112) = 1.16$, $p > .05$, $\eta_p^2 = .020$) were not statistically significant.

In the light of the results of analyses that conducted new valence categorization after refugees evaluated words' valence, Hypotheses 1a and 1c were supported.

3.4.3. Analyses of Recall Scores in Refugees with PTSD symptoms: Emotion, Age Group, and Sex after New Word Categorization

A 3 x 2 x 3 mixed ANOVA was conducted for only refugees with PTSD symptoms to explore the effect of emotion (positive, negative, neutral), age group (18-30 and 31-59), and sex (female, male, other). *p* values less than .05 ($p < .05$) were considered statistically significant in analyses.

The results of ANOVA revealed that the main effect of emotion ($F(2, 50) = 38.08$, $p < .05$, $\eta_p^2 = .604$) was statistically significant. Pairwise comparisons pointed out that positive words ($M = 4.43$, $SD = 1.69$) were recalled well than neutral words ($M = .27$, $SD = .58$) and negative words ($M = 4.80$, $SD = 2.17$) were recalled well than neutral words ($M = .26$, $SD = .58$). There was no significant difference between positive words ($M = 4.43$, $SD = 1.69$) and negative words ($M = 4.80$, $SD = 2.17$). The main effect of sex ($F(2, 25) = .90$, $p > .05$, $\eta_p^2 = .068$), and the main effect of age group ($F(1, 25) = 1.96$, $p > .05$, $\eta_p^2 = .073$) were not statistically significant. In the light of results of analyses, Hypothesis 1b.2 was supported. In addition, an interaction effect between emotion and age group was found statistically significant ($F(2, 50) = 3.68$, *p*

< .05, η_p^2 = .128). Therefore, paired samples t-test was conducted to explore interaction effect.

3.4.3.1. Paired Samples T-Test for Emotion * Age Group Interaction Effect

Paired samples t-test with 9 pairs was performed to explore the interaction effect between emotion and age group. Ordinarily, *p* values less than .05 ($p < .05$) have been taken under consideration statistically significant, however our alpha cut-off of 0.05 was Bonferroni-corrected to $p < .005$ (9 tests) to determine statistical significance in this step.

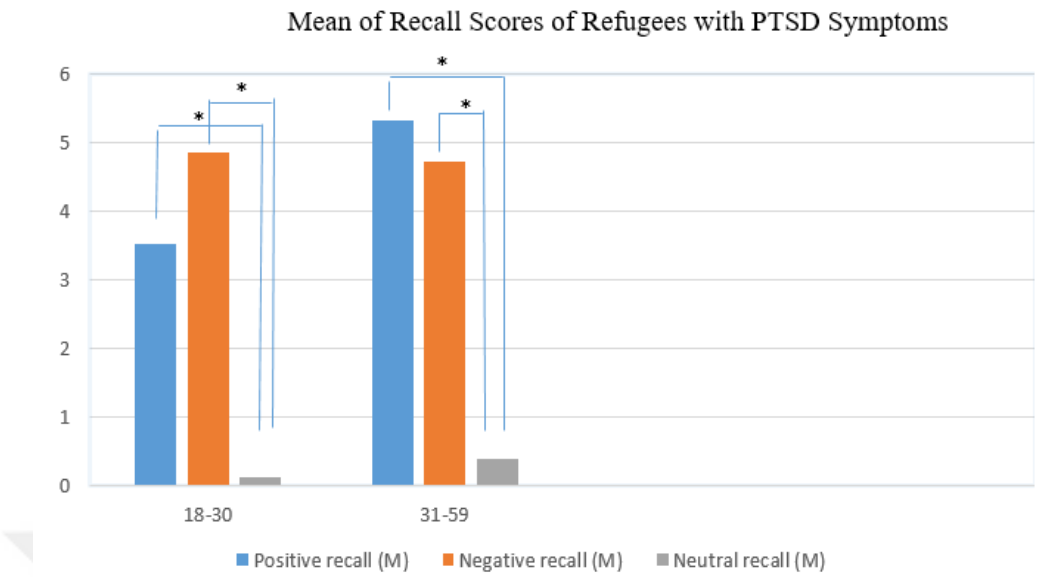
The results of the analysis revealed that positive recall scores ($M = 3.53$, $SD = 1.50$) and negative recall scores ($M = 4.87$, $SD = 2.13$) of younger adult refugees which corresponds to 18-30 age group with PTSD symptoms are better than neutral recall scores of them ($M = .13$, $SD = .35$). In addition, positive recall scores ($M = 5.33$, $SD = 1.40$) and negative recall scores ($M = 4.73$, $SD = 2.28$) of middle-aged adult refugees which corresponds to 31-59 age group with PTSD symptoms are better than neutral recall scores of them ($M = .40$, $SD = .74$). All other interaction effects were not statistically significant. All results of paired samples t-tests for emotion and age group are presented in Table 16. In addition, the interaction effect between variables were presented in Figure 6.

Table 16. Pairs for The Emotion * Age Group Interaction Effect

Pairs	***t***	***df***	***p***
Refugees with PTSD symptoms, 18-30 / positive recall – Refugees with PTSD symptoms, 18-30 / negative recall	-1.85	14	.085
Refugees with PTSD symptoms, 18-30 / positive recall - Refugees with PTSD symptoms, 18-30 / neutral recall	9.06	14	**.000***
Refugees with PTSD symptoms, 18-30 / positive recall – Refugees with PTSD symptoms, 31-59 / positive recall	-3.30	14	.005
Refugees with PTSD symptoms, 18-30 / negative recall – Refugees with PTSD symptoms, 18-30 / neutral recall	8.65	14	**.000***
Refugees with PTSD symptoms, 31-59 / positive recall – Refugees with PTSD symptoms, 31-59 / negative recall	1.03	14	.321
Refugees with PTSD symptoms, 31-59 / positive recall – Refugees with PTSD symptoms, 31-59 / neutral recall	12.85	14	**.000***
Refugees with PTSD symptoms, 31-59 / negative recall – Refugees with PTSD symptoms, 31-59 / neutral recall	7.14	14	**.000***
Refugees with PTSD symptoms, 18-30 / negative recall – Refugees with PTSD symptoms, 31-59 / negative recall	0.17	14	.865
Refugees with PTSD symptoms, 18-30 / neutral recall – Refugees with PTSD symptoms, 31-59 / neutral recall	-1.47	14	.164

*p < .005

Figure 6. Interaction Effect between Emotion and Age Group



*p < .005 (Asterisk is used to display significance result)

3.4.4. Analyses of Recall Scores in Refugees without PTSD Symptoms: Emotion, Age Group, and Sex after New Word Categorization

A 3 x 2 x 2 mixed ANOVA was conducted to explore the effect of emotion which corresponds to new valence category of words (positive, negative, neutral), the effect of age group (18-30 and 31-59), and the effect of sex (female, male) on recall scores. *p* values less than .05 ($p < .05$) were considered statistically significant in analyses.

According to the results of ANOVA, the main effect of emotion ($F(2, 52) = 58.50$, $p < .05$, $\eta_p^2 = .692$) was statistically significant. Pairwise comparisons displayed that both positive words ($M = 4.93$, $SD = 2.02$) and negative words ($M = 3.97$, $SD = 2.17$) were recalled well than neutral words ($M = .37$, $SD = .72$). There was no significant difference between positive words ($M = 4.93$, $SD = 2.02$) and negative words ($M = 3.97$, $SD = 2.17$). The main effect of age group ($F(1, 26) = .01$, $p > .05$, $\eta_p^2 = .001$), and the main effect of sex ($F(1, 26) = 2.28$, $p > .05$, $\eta_p^2 = .081$) were not statistically significant. Further, interaction effects were analyzed. All 2-way interaction effects including age group * sex ($F(1, 26) = .04$, $p > .05$, $\eta_p^2 = .001$), emotion * age group ($F(2, 52) = .28$, $p > .05$, $\eta_p^2 = .011$), emotion * sex ($F(2, 52) = .80$, $p > .05$, $\eta_p^2 = .030$) and 3-way interaction effect ($F(2, 52) = .54$, $p > .05$, $\eta_p^2 = .021$) were not statistically significant.

3.5. ANALYSES FOR RECALL SCORES: EMOTION, CONDITION, AGE GROUP; NEW VALENCE CATEGORIES FOR REFUGEES & OLD VALENCE CATEGORIES FOR CONTROL GROUP

Refugees rated words which were used in the study session at the end of the test session as it was expressed in method section. As it articulated in the section of 3.6., words' valence comparisons of refugees and Turkish population were compared and new categorization of words were executed for refugees (see section 3.6.1.). These analyses and results of them revealed that Turkish population and refugee group of the study rated same words in different valence categories. Therefore, new valence categories for refugees and previous categories (Kapucu et al. 2021: 188) for control group were used to explore the effect of emotion on recall scores in this analysis.

A 3 x 3 x 2 mixed ANOVA was reconducted to explore the effect of emotion which corresponds to valence of words (positive, negative, neutral), the effect of condition (control group, refugees with PTSD symptoms, refugees without PTSD symptoms), and the effect of age group (18-30 and 31-59) on recall scores of refugees from new categorization of valence of words. *p* values less than .05 ($p < .05$) were taken under consideration statistically significant in analyses.

The results of ANOVA displayed that the main effect of emotion ($F(2, 170) = 224.79$, $p < .001$, $\eta_p^2 = .726$) was statistically significant. Pairwise comparisons pointed out that positive words ($M = 4.60$, $SD = 1.85$) were recalled better than neutral words ($M = .31$, $SD = .59$) and negative words ($M = 4.70$, $SD = 2.26$) were recalled better than neutral words ($M = .31$, $SD = .59$). There was no significant difference between positive words ($M = 4.60$, $SD = 1.85$) and negative words ($M = 4.70$, $SD = 2.26$). The main effect of condition ($F(2, 85) = .46$, $p > .05$, $\eta_p^2 = .011$), and the main effect of age group ($F(1, 85) = 1.62$, $p > .05$, $\eta_p^2 = .019$) were not statistically significant.

All 2-way interaction effects including condition * age group ($F(2, 85) = .53$, $p > .05$, $\eta_p^2 = .012$), emotion * age group ($F(2, 170) = 1.69$, $p > .05$, $\eta_p^2 = .020$), emotion * condition ($F(4, 170) = .64$, $p > .05$, $\eta_p^2 = .015$) and 3-way interaction effect, which is emotion * age group * condition, ($F(4, 170) = 1.34$, $p > .05$, $\eta_p^2 = .031$) were not statistically significant.

The summary of the results of ANOVA on recall scores as a function of emotion, age group, and condition, and the summary of the results of ANOVA on recall scores with different valence categorizations of words are presented in Table 17.

Table 17. Summary of the Results of ANOVA Analyses in the Study

Summary of the Results of ANOVA on Recall Scores as a Function of Emotion, Age Group, and Condition						
Main Effects			2-way Interaction Effects			3-way Interaction Effect
Emotion	Condition	Age Group	Emotion * Age Group	Emotion * Condition	Age Group * Condition	Emotion * Age Group * Condition
n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	*
Summary of Results of ANOVA on Recall Scores with Different Valence Categorizations of Words						
Main Effects			2-way Interaction Effects			3-way Interaction Effect
Emotion	Condition	Age Group	Emotion* Age Group	Emotion * Condition	Age Group * Condition	Emotion* Age Group * Condition
**	n.s.	n.s	n.s.	n.s.	n.s.	n.s.

*p < .05, **p = .000, n.s. nonsignificant, m.g.s. marginally significant

CHAPTER IV

DISCUSSION

The main purpose of the current study was to explore the effect of valence of words, age, and the presence of PTSD symptoms on recall memory performance in refugees. Refugee-related words selected from the norm study of Kapucu et al. (2021: 188) were used in the study, taking into account their relevance with the context. Positive, negative and neutral words were included to the study for comparison of valence ratings of words. Two age groups were included in the study: 18-30 (representing younger adulthood) and 31-59 (representing middle-aged adulthood). The participants of the control group consisted of Turkish individuals who did not exhibit PTSD symptoms, enabling a valid comparison with other condition groups, which included refugees with and without PTSD symptoms.

Previous literature on refugees has mostly focused on the effects of depression and PTSD since these disorders are commonly observed in refugees due to their migration experience (Fazel et al. 2005: 1309). Additionally, the effect of migration experience on general memory performance and cognitive functions has been explored in previous studies (McNally et al. 1995: 619; Pitman 1989: 221; Waldhauser et al. 2018: 4). However, there is a lack of sufficient studies in the literature specifically addressing memory performance in refugees, considering several factors, such as emotion and aging effect. Given that there are approximately 3.7 million refugees in Türkiye, it is crucial to study refugees in relation to the factors affecting their lives and cognition.

In this study, participants from three different conditions were compared according to their information processing speed and attention using the digit symbol substitution test. All participants completed the digit symbol substitution test, and it was observed that the scores of participants in the control group were higher than those of participants from the refugee groups, regardless of whether they had PTSD symptoms or not. This finding is in line with the study of Ceylan et al. (2002: 9), where

they found cognitive distortions in refugees who lived in Türkiye. This study was conducted with Syrian refugees who lived in Türkiye. It was observed that refugees experience cognitive distortions after their migration processes and traumatic event they encountered. Additionally, the finding of the current study was consistent with the study of Chung and Shakra (2022: 1852) where they found that cognitive dysfunctions and trauma-related psychological distresses were common in Syrian refugees.

In addition, memory performance can be affected by various factors, including emotion, age, mood, stress, PTSD. Therefore, this current study aimed to investigate the memory performance of refugees considering factors such as PTSD symptoms, aging, and the valence of words. The study supported the effect of emotion on recall memory performance after refugees rated the words used in the study, and new valence categorization of words was conducted to account for potential cultural differences in the valence dimension of words (De Deyne et al. 2020: 2776). This discussion section presents an interpretation of the results in light of relevant literature. Additionally, limitations of the study and suggestions for future research are presented in this section.

4.1. EVALUATION OF THE EFFECT OF VALENCE OF WORDS ON MEMORY PERFORMANCE

The Circumplex model of emotion, proposed by Russell (1980: 1164), suggests that emotion can be characterized by two dimensions: valence and arousal. Valence refers to the degree of pleasantness or unpleasantness of an emotion, while arousal refers to the level of activation or intensity of an emotion, ranging from low to high. Previous literature has explored the effect of valence and arousal dimensions of emotion on memory and has found that emotional stimuli, including negative and positive valence values and/or increased levels of arousal, are better remembered compared to neutral stimuli (Cahill and McGaugh 1995: 410; Gasbarri et al. 2005: 157; Tyng et al. 2017: 1).

Words are commonly used stimuli to measure emotion effect on memory in studies (Maddox et al. 2012: 1130). In this regard, both emotional and neutral words were utilized in the current study. The words were chosen from the Turkish Emotional Word Norms developed by Kapucu et al. (2021: 188). Various variables were included in the analyses to explore emotion effect on recall scores of participants. The results

of the statistical analyses indicated that there was no significant main effect of emotion, referring to the valence of words, which included positive, negative, and neutral words. In other words, the recall scores for positive words, negative words, and neutral words did not differ significantly. The current study's hypotheses related to emotion effect on memory, specifically corresponded to the valence categories of words, were as follows: Hypothesis 1a suggested that negative words would lead to better recall memory performance compared to neutral words; Hypothesis 1a.1 suggested that control group would exhibit better recall memory performance for both negative and positive words compared to neutral ones; Hypothesis 1b posited that negative words would lead to better recall memory performance compared to positive words; Hypothesis 1b.1. suggested that negative words would be better recalled by participants aged 18-30 compared to participants aged 31-59; Hypothesis 1b.2. proposed that refugees with PTSD symptoms would have better recall memory performance for negative words compared to both positive and neutral words; Hypothesis 1c suggested that positive words would result in better recall memory performance compared to neutral words. However, the results of the analyses did not support Hypotheses 1a., 1a.1., 1b., 1b.1, 1b.2, and 1c. These unexpected results in the current study, stating that positive or negative words were not recalled better compared to neutral words, are contrary to the existing literature suggesting that emotional stimuli are remembered better than neutral stimuli.

One possible explanation for why emotional words (positive and negative) were not recalled better than neutral words is that words' valence categorization may differ among the participants condition groups since individuals from several nationalities and cultures were included in the study. For instance, a word of "country" ("ülke" in Turkish) was included in the neutral valence category in the study based on its classification in the Turkish Emotional Word Norms (Kapucu et al. 2021: 188). All participants from three conditions, including both refugees and Turkish individuals, were evaluated using the same valence categories. However, a word that is neutral for Turkish people might be positive or negative for refugees, as the emotional dimensions corresponding to valence and arousal can vary across cultures and languages (De Deyne et al. 2020: 2781). Culture plays a role in how emotions are perceived and expressed, shaping how people should feel in specific conditions and how people should express their emotions (Turner and Stets 2005: 295). Since emotion is influenced by environmental factors, including culture (Lim 2016: 108), and the

hypotheses related to emotion effect on memory were not verified as expected, the question of "What if refugees and Turkish participants perceive the valence of words differently" arose. Therefore, refugee participants in the study were asked to rate all 45 words used in the study according to the valence dimension.

4.1.1. Differentiation of Valence of Categorization of Words

As stated in method section 2.2.5., the Word Evaluation Form was filled out by refugees to explore potential differences in the valence categorization of words between refugees and Turkish control participants. The results section 3.4. revealed a significant difference in 29 out of 45 words (26 of them were significant and three of them were marginally significant). In other words, refugees and the Turkish sample rated a total of 29 words differently in terms of the valence dimension. Refugee participants in the current study rated words such as "anlaşma, toplanma, ülke, vatan, zaman, hayat" as positive, while these words were categorized as neutral in the Turkish Emotional Word Norms for Arousal, Valence, and Discrete Emotion Categories (Kapucu et al. 2021: 188). Additionally, refugees rated words such as "endişeli, gurbet, kaçak, olay, özlem, sessiz, telaş" as negative, while these words were categorized as neutral. The final discrepancy is that refugee participants rated words such as "hatıra, yolculuk" as neutral, while these words were categorized as positive in the original study (Kapucu et al. 2021: 188).

New valence categorization was originated based on the new valence ratings obtained (see the result section 3.4, and Table 14). After the new categorization, analyses for the effects of emotion, condition, and age group on recall scores were conducted using the new valence categories for refugees and the original valence categories (Kapucu et al. 2021: 188) for Turkish participants. According to the results, a significant main effect of emotion on recall scores was found. Positive words and negative words, which corresponded to emotional stimuli, were remembered better than neutral words regardless of the condition of participants. The new valence categorization for refugees supported the emotion effect on memory recall performance, in contrast to the results obtained with the original valence categories (Kapucu et al. 2021: 188). Hypotheses 1a and 1c were supported by this analysis, stating that positive words and negative words would lead to better recall memory performance than neutral words. However, since the main effect of condition on recall scores was not found to be significant, hypothesis 1a.1 and 1b.2 were not supported.

The differentiation in the categorization of words' valence between refugees from different nationalities and Turkish participants has supported previous literature that has focused on influence of culture on emotional experiences (Lutz 2011: 4; Mesquita and Frijda 1992: 179; Roseman et al. 1995: 23; Solomon 1984: 238). Emotion effect on memory has been studied in cross-cultural research by various scholars. Lu and Gilmour (2004: 269) studied the concept of positive stimuli by comparing Chinese and American participants. They found that happiness from positive emotions was concepted differently. American participants linked happiness concept with wellbeing, while Chinese participants identified happiness as being grave and cool. Tsai (2007: 242) compared Americans and East Asian cultures in terms of emotional states and behavioral effects. It was found that cultural factors shaped how people felt and what was considered as an ideal affect for them. The comparison results displayed that high-arousal emotions were valued more in Western culture. Grossman et al. (2012: 31) found the influence of culture on emotional information processing. Americans and Russians were compared in terms of their attention and memory processes. The results indicated that Russian participants preferred to look at negative stimuli corresponding to unlikeable images, while this difference was not observed in American participants.

4.2. EVALUATION OF THE EFFECT OF PTSD SYMPTOMS ON MEMORY PERFORMANCE

Three conditions were established in this current study, including a control group consisting of Turkish individuals, refugees with PTSD symptoms, and refugees without PTSD symptoms. The refugees included in the study represented different nationalities and had different motives and reasons for migration, such as security risks, financial problems, and political reasons. Refugees encounter several difficulties during processes of migration that might cause to psychological problems, such as stress, PTSD, and anxiety disorders (Bhugra and Jones 2001; Li et al. 2016). It is observed in the related literature that there is a negative effect of PTSD and stress on memory performance and cognitive functions (Bremner et al. 1993; Medalia and Revheim 2002; Pitman1989).

The hypotheses related to the effect of PTSD symptoms on recall memory performance are as follows: Hypothesis 2a suggested that refugees with PTSD symptoms would have poorer recall memory performance than refugees without PTSD

symptoms; Hypothesis 2a.1 suggested that refugees between 18-30 age old with PTSD symptoms would exhibit poorer recall memory performance than refugees between 18-30 age old without PTSD symptoms; Hypothesis 2a.2 suggested that refugees between 31-59 age old with PTSD symptoms would exhibit poorer recall memory performance than refugees between 31-59 age old without PTSD symptoms; Hypothesis 2b suggested that refugees with PTSD symptoms would have poorer recall memory performance than the control group: Hypothesis 2c suggested that the control group would have better recall memory performance than both refugees with and without PTSD symptoms. The result section (3.3) displayed that main effect of condition was not found statistically significant. In other words, migration experience did not affect memory performance compared to the control group who had no migration experience. Additionally, having PTSD symptoms did not influence recall memory performance. Since no significant effect was found on recall memory performance, hypotheses 2a, 2a.1, 2a.2, 2b, and 2c were not supported.

One possible explanation why the presence of PTSD symptoms did not influence memory recall performance could be that perceiving traumatic events is shaped by cultural factors (Baráth 2021: 5; Wilde 2020: 225; Wilson and Tang 2007: 33). Relevant with these findings, De Jong (2005: 361) and Breslau (2005: 365) stated that PTSD is not a basic concept as it is not only reflection of psychological process of persons but also it is not only culturally formed. Several traumatic events were listed, the severity of PTSD symptoms was measured, and PTSD symptom level was decided according to scores, in this current study. However, since severity and duration of PTSD symptoms can be influenced by cultural factors (Wilde 2020: 223), refugees and Turkish participants could have perceived the PDS items and questions differently. For instance, a participant from the refugee condition and a participant from the control group (Turkish individuals) may not have evaluated the traumatic event “war” in the same way. Therefore, scales to be utilized in studies should be considered for cultural differences. Adapting questionnaires, surveys, and scales to the relevant cultures can provide better understanding and accurate results in future researches.

On the other hand, it was observed in the method section (2.2.4) that digit symbol substitution test scores, which measured cognitive functioning of participants, including attention and information processing speed, were better for participants in the control group than refugees, regardless of having PTSD symptoms. This finding was consistent with the existing literature, which suggests that deficiencies in cognitive

functions, such as memory, language, and attention are often observed in refugees and trauma survivors (Kaplan et al. 2015: 89, Rabin and Willard 2014: 184, Weinstein et al. 2001: 134). These results and the discrepancy between digit symbol scores and recall scores indicate that having PTSD symptoms affected certain cognitive functions, such as attention and information processing speed, while other cognitive functions, such as recall memory performance, were relatively preserved.

4.3. EVALUATION OF THE EFFECT OF AGING ON MEMORY PERFORMANCE

Cognitive functions, including attention, language, executive functions, and memory are negatively affected by aging. Deficits in these cognitive functions are commonly observed in normal aging. However, not all aspects of memory are equally affected by aging. There is a decline in the ability to learn new information and retrieve newly learned information, while some dimensions of memory remain relatively stable in normal aging (Lezak et al. 2012). Sensory memory is generally not affected negatively by aging, as older people do not encounter challenges to mentally represent how environmental occurrences feel, smell, sound, and look. However, source memory is impaired in normal aging. That is, older people may have difficulties remembering the source of the information (Murman 2015: 119).

Incompatible with the relevant literature, age effect on memory performance in all analyses was not found. In other words, younger adults aged between 18-30 did not recall better than middle-aged adults aged between 31-59, as hypothesized in the current study. In this regard, hypothesis 3a, stating that participants aged between 18-30 would have better recall memory performance than participants aged between 31-59, hypothesis 3a.1 stating that refugees between 31-59 age old with PTSD symptoms would exhibit poorer recall memory performance than refugees between 18-30 age old with PTSD symptoms, and hypothesis 3a.2 stating that refugees between 31-59 age old without PTSD symptoms would exhibit poorer recall memory performance than refugees between 18-30 age old without PTSD symptoms, were not supported.

Since age effect on recall memory performance was not found in the statistical analyses, other factors were included in analyses. It was speculated that whether there was a relationship between the number of years that refugees has been living in Türkiye and their total word recall score, considering that in both conditions (refugees with PTSD symptoms and refugees without PTSD symptoms), refugees between the

ages of 31-59 had been living in Türkiye longer than refugees between the ages of 18-30. The number of years that refugees have been living in Türkiye is shown in Table 18.

Table 18. The Number of Years that Refugees Have Been Living in Türkiye After Migration from Their Country

	N	***M***
Refugees without PTSD symptoms, 18-30	15	6.13
Refugees without PTSD symptoms, 31-59	15	9.27
Refugees with PTSD symptoms, 18-30	15	5.13
Refugees with PTSD symptoms, 31-59	15	6.88

A Pearson correlation coefficient was conducted to evaluate the relationship between the number of years in Türkiye and refugees' total word recall score. The results displayed that the relationship between the number of years refugees have been living in Türkiye and total recall score for all words was not significant $r(48) = .091$, $p = .49$.

4.4. EVALUATION OF THE POSITIVITY BIAS FINDINGS IN MIDDLE-AGED ADULTHOOD

As age increases, expressing negative emotions decreases with normal aging (Carstensen et al. 2000: 644; Charles et al. 2001: 136; Mrozcek and Kolarz 1998: 1344). Older adults tend to focus more on positive stimuli and reduce their attention to negative stimuli (Langeslag and Van 2009: 369; Mather and Carstensen 2005: 496), as they prioritize emotional goals and enhance their psychological well-being, according to socioemotional selectivity theory Carstensen et al. (1999: 165).

In the current study, emotional words, including positive, negative, and neutral words, were used to measure positivity bias in middle-aged adulthood. The analyses for recall scores involving emotion, condition, and age group, as presented in the result section (3.3) revealed a 3-way interaction effect among emotion, condition, and age group. According to the results, positive words recall scores of refugees with PTSD symptoms, who were between 31-59, were higher than those of refugees with PTSD symptoms, who were between 18-30. The only difference between these two groups was their age. In this regard, hypothesis 1c.1, which suggested that positive words

would be better recalled by participants between the ages of 31-59 compared to between the ages of 18-30, was supported.

Positivity bias in middle-aged adulthood, which refers to a tendency to focus on positive information rather than negative information, was found only in refugees with PTSD symptoms in the current study. This finding can be explained by the significance of positivity bias is for psychological well-being and the reduction of anxiety and depression (Marsh et al. 2019: 508), as people with PTSD may experience distressing feeling and thoughts, unwanted experiences related to traumatic events (APA 2013). People with PTSD symptoms may exhibit a positivity bias as a way to enhance their psychological well-being as previous research has shown that retrieval of positive memories can help repair negative mood (McFarland and Buehler 1998: 1424). Similarly, Brown et al. (2002: 1) found that focusing on goodness is related to decreased levels of worry. The way individuals think about stressful events or strive to achieve goals can influence the attainment of those aims. For instance, focusing on positive sides of stressful events can be helpful in resolving those events (Taylor et al. 1998: 429). In light of these findings, the observation of a positivity bias only in refugees with PTSD symptoms can be explained based on these results.

4.5. EVALUATION OF THE MOOD CONGRUENCY AND MEMORY PERFORMANCE

The current mood of a person can be an indicator of their cognitive judgements (Mayer et al. 1995: 736). The mood congruence effect, proposed by Bower (1981: 129), states that emotions influence thinking and memory. According to the mood congruence effect, emotional state or current mood of an individual is related to information they are more likely to remember. In other words, people with a sad mood tend to remember sad memories, while those with happy mood tend to remember happy memories. Furthermore, several studies have explored how emotional information is processed in accordance with mood states (Blaney 1986: 231; Gotlib and Cane 1987: 199).

The mood congruence effect has also been found in people with psychiatric disorders. Macleod et al. (1997:15) found out that people with anxiety and depression tend to focus on negative information compared to positive information. A similar result was observed in the study by Anderson and Evans (2015: 237), which found that

people with a negative mood reported less positive information compared to those without a negative mood.

In light of relevant literature, hypotheses related to mood congruency effect in the current study were follows: Hypothesis 1b.3 suggested that refugees aged between 18-30 who had PTSD symptoms would exhibit better recall memory performance for negative words compared to refugees aged between 18-30 who did not have PTSD symptoms; Hypothesis 1b.4 suggested that refugees aged between 31-59 who had PTSD symptoms would exhibit better recall memory performance for negative words compared to refugees aged between 31-59 who did not have PTSD symptoms; Hypothesis 1c.2 suggested that refugees without PTSD symptoms would have better recall memory performance for positive words than both negative and neutral words; Hypothesis 1c.3 suggested that refugees aged between 18-30 who did not have PTSD symptoms would exhibit better recall memory performance for positive words compared to refugees aged between 18-30 who had PTSD symptoms; Hypothesis 1c.4 suggested that refugees aged between 31-59 who did not have PTSD symptoms would exhibit better recall memory performance for positive words compared to refugees aged between 31-59 who had PTSD symptoms. Analyses of the study indicated that positive word recall scores of refugees (18-30) without PTSD symptoms are higher than refugees (18-30) with PTSD symptoms. The results of the analyses supported Hypotheses 1c.2 and 1c.3. This finding is in line with the previous studies (Bower 1981: 146; Gaddy and Ingram 2014: 402; Snyder and White 1982: 160; Weingartner et al. 1977: 281) that have demonstrated the presence of mood congruence effect on memory in people, regardless of presence of psychological problems. However, Hypotheses 1b.3, 1b.4, and 1c.4 were not supported according to the results of analyses. The rejection of Hypothesis 1c.4 is not incompatible with the studies of Knight et al. (2002: 653) and Lawrie et al (2019: 319), which have demonstrated that mood congruency effect is observed only in middle-aged adults compared to younger adults. On the contrary, the mood congruence effect was observed in only younger adults (18-30) in this study. This differentiation supported the study of Knight and Durbin (2015: 16), which has demonstrated age-related differences in cognitive functions.

4.6. LIMITATIONS, SUGGESTIONS, CONCLUSION

This current study has several limitations. Firstly, the entire experimental process, including word presentation and recall tasks, was conducted in the Turkish language. While participants in the refugee groups had knowledge of the Turkish language, it was not their native language unlike the participants in the control group. Therefore, at the end of the experimental design, participants in the refugee group were asked if there were any words whose meanings they were unsure of. This was necessary because the meaning and associations of words can differ among participants from the control group and refugee groups. Following the newly categorization of words, these differences became evident. For example, "ülke" was rated as neutral by the Turkish sample, while it was rated as positive by refugees. Apart from that, the associations of words can differ according to language. All words were presented and explained in Turkish to refugees whose native language differed from Turkish language. Organizing the words in the native language of participants could provide contributions for future researches since some emotional information might be lost during translation (Elfenbein and Ambady 2003: 160).

Secondly, in related to the previous limitation of the study, it should be noted that Turkish was not native language of the refugees. Additionally, the study did not measure the proficiency level of each refugee participant in Turkish. Evaluating the Turkish language proficiency of the refugees and clustering participants based on their language abilities could be considered in future research.

Thirdly, no specific nationality was selected for the refugee group, all refugees from different nationalities who met the inclusion criteria of the study were included within an inclusive approach. There was a total of seven nationalities represented, including Syrian, Iraqi, Iranian, Afghan, Somalian, Jordanian, and Ukrainian in the refugee groups. Therefore, there were different cultures, experiences, and associations with words among the refugee groups. Focusing on one specific nationality in the future research may help reduce variations due to culture and nationality itself.

In addition to the previous limitations, the number of participants from each sex category, including female, male, and other, was not equal across the conditions. The majority of the participants were female overall, with only one participant identifying their sex as other. However, there was an equal representation between female and male participants in the group of refugees without PTSD symptoms, with 15 female and 15 male participants.

Another limitation is that words that the words used in the study were related to migration, and the one of the main aims was to explore the recall memory performance of refugees for these words in the context of their migration experience. However, some participants from the control group were working in the migration field. Out of 31 participants in the control group, 14 of them were involved in the migration field and might have been more familiar with words, such as "koruma, yardım, zorluk, savaş". This familiarity with the words among the control group participants could have influenced the comparison of recall memory performance between the control group and the refugee groups, as the control group participants were exposed to these words through their work in the migration field. To improve the study design, future research could consider not selecting participants for the control group who work in migration field.

Lastly, the total recall score of participants from the control group was 10.12, the total recall score of participants from the refugee condition with PTSD symptoms was 9.50, and the total recall score of participants from the refugee condition without PTSD symptoms was 9.26. There was a total of 45 words, and the maximum recall score possible was 45. During the implementation of the experiment, it was observed that some participants expressed excitement and stress for the experiment due to the novelty of the experiment. The effect of anxiety and stress on emotions, whether positive or negative, has been studied by several researchers, as stress and anxiety can affect learning and memory processes (Nugent and Mineka 1994: 147; Vogel and Schwabe 2016: 5). Similarly, Sorg and Whitney (1992: 237) found that situational stress and anxiety can decrease memory performance. Anxiety, depression and stress levels of the participants were not measured in the current study; only the PTSD symptoms of participants were measured. Including measures of anxiety and stress in future research would provide a more comprehensive understanding of their effects on memory.

In conclusion, there are approximately 3.7 million refugees in Türkiye, and cognitive processes including memory performance are influenced by migration processes (Kirmayer et al. 2011: E959). Memory performance is also influenced by several factors, such as emotion corresponding to valence and arousal level of stimuli (Kensinger and Corkin 2003: 1169), current mood (Bower, 1981: 146), stress (Jelici et al. 2004: 1343), PTSD symptoms (Buckley et al. 2000: 1041), and aging effects (Hedden and Gabrieli 2004: 89). This current study examined the influence of word

valence, PTSD symptoms, and aging effect on free recall memory performance. The emotion effect on free recall memory was not found according to the results obtained with the original valence categorization of words. In addition, based on the original categorization of words by Kapucu et al. (2021: 188), a newly word's valence categorization was generated according to evaluations of refugee participants, as the emotion's components can differ across cultures (Russell 1994: 102). Different evaluations regarding the valence of words were found among refugees and Turkish participants. After the newly generated categorization according to evaluations of refugees, an emotion effect on free recall memory performance was found. In other words, both positive and negative words were recalled better compared to neutral words. This study displayed that the presence of PTSD symptoms did not affect free recall performance regardless of the emotion effect and the aging effect. According to the current study's results, age-related decline in free recall memory performance was not demonstrated. However, the study did observe a positivity bias, which refers to older adults focusing more on positive stimuli and less negative stimuli (Reed et al. 2014: 1).

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APPENDIX B: THE INFORMED CONSENT FORM

Bilgilendirilmiş Onam Formu

Çankaya Üniversitesi Sosyal Bilimler Enstitüsü Psikoloji Anabilim Dalı Bilişsel Psikoloji Yüksek Lisans programında yürütülen bu araştırma, Dr. Öğretim Üyesi Hande Kaynak danışmanlığında, Bilişsel Psikoloji Yüksek Lisans öğrencisi Dilara Türker'in tez çalışmasının bir gereği olarak yapılmaktadır. Tez çalışması için, genç ve orta yetişkin bireylere ihtiyaç duyulmaktadır. Araştırma kapsamında, yürütülecek uygulamaların tamamı Dilara Türker tarafından yapılacaktır.

Bu tez çalışmasının amacı; genç ve orta yetişkin gruplar arasında travma sonrası stres bozukluğu olan ve olmayan mültecilerin, mültecilikle ilişkili kelimeler için bellek performanslarının incelenmesidir. Uygulamalar katılımcının ve araştırmacının uygun oldukları bir zaman içerisinde gerçekleşecektir. Görüşmeler tek oturumda gerçekleştirilecek olup oturumun yaklaşık süresi 40 dakika olacaktır. Uygulama boyunca bilgisayar ekranında katılımcıdan bazı görevler yapmaları istenecektir. Katılım sırasında sorulardan ya da herhangi başka bir nedenden ötürü rahatsızlık hisseden katılımcılar, cevaplama işini yarıda bırakabilirler. Böyle bir durumda katılımcıların çalışmayı uygulayan kişiye, çalışmayı tamamlayamayacaklarını söylemeleri yeterli olacaktır. Gerçekleştirilen görüşme sonunda uygulanan test ve ölçeklerin puanlanıp, bu puanlama doğrultusunda katılımcıya, uygulamanın bitiminde açıklama ve bilgilendirme yapılacaktır. Çalışma hakkında daha fazla bilgi almak için Psk. Dilara Türker (dilaraaturker21@gmail.com) ya da Dr. Hande Kaynak (E-posta: handek@cankaya.edu.tr) ile iletişim kurulabilir.

Görüşme sırasında katılımcının izni doğrultusunda yazılı kayıtları alınacaktır. Daha sonra bu kayıtlar, katılımcının kimlik bilgileri gizli tutularak bilimsel nitelikli çalışmalarda ve eğitim amaçlı olarak kullanılabilir. Bu amaçların dışında bu kayıtlar kullanılmayacak ve başkaları ile paylaşılmayacaktır.

(Katılımcının Beyanı)

Sayın Dilara Türker (psikolog) ve Dr. Hande Kaynak (danışman) tarafından Çankaya Üniversitesi Sosyal Bilimler Enstitüsü Psikoloji Anabilim Dalı Bilişsel Psikoloji Yüksek Lisans programında yürütülen araştırma ile ilgili bilgiler bana aktarıldı. Bu bilgilendirmenin ardından bu araştırma faaliyetine katılımcı olarak davet edildim.

Eğer bu araştırma faaliyetine katılırsam bana ait bilgilerin gizliliğine büyük bir özen ve saygıyla yaklaşılacağına inanıyorum. Toplanan her türlü verinin eğitim ve bilimsel amaçlarla kullanımı sırasında kişisel bilgilerimin ihtimamla korunacağı konusunda bana yeterli güven verildi.

Bu görüşme süresince yapılacak harcamalarla ilgili herhangi bir parasal sorumluluk altına girmiyorum. Ayrıca herhangi bir tazminat talebim olmayacaktır.

Bana yapılan tüm açıklamaları ayrıntılarıyla anlamış durumdayım. Kendi başıma belli bir düşünme süresi sonunda:

1-Yapılan görüşme kapsamında kendime ilişkin katıldığım her türlü çalışmanın ya da değerlendirmenin araştırma ve eğitim amaçlı olarak kullanılabileceğini biliyorum ve onaylıyorum.

2-Yapılan görüşme, değerlendirme ve faaliyetlere ilişkin yazılı kayıtların araştırma ve eğitim amaçlı olarak kullanılabileceğini biliyorum ve onaylıyorum.

Bu konuda yapılan daveti gönüllülük çerçevesinde kabul ediyorum.

Katılımcı

Adı, soyadı:

Adres:

Tel.

İmza

Katılımcı ile görüşen araştırmacı

Adı soyadı, unvanı:

Adres:

Tel.

İmza:

APPENDIX C: DEMOGRAPHIC INFORMATION FORM

Demografik Bilgi Formu

Katılımcı no: Uygulama Tarihi: … / … / …

1. Yaşınız:
2. Cinsiyetiniz: □ Kadın □ Erkek □ Diğer
3. Medeni haliniz: □ Evli □ Bekar □ İlişkisi var □ Dul □ Boşanmış
4. Türkiye'ye nereden geldiniz? □ Suriye □ Irak □ Afganistan □ Diğer
5. Kaç yılında göç ettiniz?
6. Kaç yıldır Türkiye'de yaşıyorsunuz?
7. Türkiye'de hangi şehirde yaşıyorsunuz?
8. Eğitim düzeyiniz:

□İlkokul (0–5 yıl) □Ortaokul (6–8 yıl) □Lise (9–12 yıl) □Üniversite (12+)

9. Mesleğiniz:
10. Çalışıyor musunuz? □Evet □Hayır
11. Çalışıyorsanız ne iş yapıyorsunuz?
12. Göç öncesi savaşta yaralandınız mı? □Evet □Hayır
13. Savaşta bir yakınınızı kaybettiniz mi? □Evet □Hayır
14. Şu anda herhangi bir psikolojik destek alıyor musunuz? □Evet □Hayır
15. Son 6 ay içerisinde psikiyatrik ve/veya nörolojik bir rahatsızlık geçirdiniz mi?

□ Evet □ Hayır

Evetse tanıyı belirtiniz.

16. Herhangi bir görme bozukluğunuz var mı? □ Evet □ Hayır

Varsa düzeltilmiş mi? □ Evet □ Hayır

APPENDIX D: THE POST-TRAUMA DIAGNOSTIC SCALE

Travma Sonrası Stres Tanı Ölçeği

1.Bölüm

Birçok kişinin başından, hayatının herhangi bir döneminde, oldukça stresli ve travmatik bir olay geçmiş ya da böyle bir olaya tanık olmuştur. Aşağıda belirtilen olaylar içinde, **başınızdan geçen ya da tanık olduğunuz** olayların hepsini yanındaki kutuyu işaretleyerek belirtiniz, **birden fazla işaretleyebilirsiniz**.

(1)	Ciddi bir kaza, yangın ya da patlama olayı (örneğin, trafik kazası, iş kazası, çiftlik kazası, araba, uçak ya da tekne kazası)	☐
(2)	Doğal afet (örneğin, hortum, kasırga, sel baskını ya da büyük bir deprem)	☐
(3)	Aile üyelerinden biri ya da tanıdığınız bir kişi tarafından cinsel olmayan bir saldırıya maruz kalma (örneğin, saldırıya uğrayıp soyulma, fiziksel bir saldırıya maruz kalma, silahlı saldırı, bıçaklanma ya da silahla rehin alınma)	☐
(4)	Tanımadığınız biri tarafından cinsel olmayan bir saldırıya maruz kalma (örneğin, saldırıya uğrayıp soyulma, fiziksel bir saldırıya maruz kalma, silahlı saldırı, bıçaklanma ya da silahla rehin alınma gibi)	☐
(5)	Aile üyelerinden biri ya da tanıdığınız bir kişi tarafından cinsel bir saldırıya maruz kalma (örneğin, tecavüz ya da tecavüze teşebbüs gibi)	☐
(6)	Tanımadığınız bir kişi tarafından cinsel bir saldırıya maruz kalma (örneğin, tecavüz ya da tecavüze teşebbüs gibi)	☐
(7)	Askeri bir çarpışma ya da savaş alanında bulunma	☐
(8)	18 yaşından daha küçük olduğunuz bir dönemde kendinizden 5 ya da daha büyük yaşta biriyle cinsel temas (örneğin, cinsel organlarla, göğüslerle temas gibi)	☐
(9)	Hapsedilme (örneğin, cezaevine düşme, savaş esiri olma, rehin alınma gibi)	☐
(10)	İşkenceye maruz kalma	☐
(11)	Hayatı tehdit eden bir hastalık	☐
(12)	Sevilen ya da yakın birinin beklenmedik ölümü	☐
(13)	Bunların dışında bir travmatik olay	☐
(14)	13. Maddeyi işaretlediyseniz aşağıda bu travmatik olayı belirtiniz:	

1

YUKARIDAKİ MADDELERDEN HERHANGİ BİRİNİ İŞARETLEDİYSENİZ, SORULARI YANITLAMAYA DEVAM EDİN. HİÇBİR MADDEYİ İŞARETLEMEDİYSENİZ, DEVAM ETMEYİN.

2.Bölüm

(15) 1. Bölümde **birden fazla** sayıda travmatik olay işaretlediyseniz, ***canınızı en çok sıkan, sizi en rahatsız eden*** olayın yanındaki kutuyu işaretleyiniz. Eğer, 1. Bölümde **yalnızca bir** travmatik olayı işaretlediyseniz, aşağıda da aynı olayı işaretleyiniz.

(a)	Kaza (araba ya da iş kazası, gibi)	☐
(b)	Doğal afet	☐
(c)	Aile üyelerinden biri ya da tanıdığınız bir kişi tarafından cinsel olmayan bir saldırıya maruz kalma	☐
(d)	Tanımadığınız biri tarafından cinsel olmayan bir saldırıya maruz kalma	☐
(e)	Aile üyelerinden biri ya da tanıdığınız bir kişi tarafından cinsel bir saldırıya maruz kalma	☐
(f)	Tanımadığınız bir kişi tarafından cinsel bir saldırıya maruz kalma	☐
(g)	Savaş	☐
(h)	18 yaşından daha küçük olduğunuz bir dönemde kendinizden 5 ya da daha büyük yaşta biriyle cinsel temas	☐
(i)	Hapsedilme	☐
(j)	İşkenceye maruz kalma	☐
(k)	Hayatı tehdit eden bir hastalık	☐
(l)	Sevilen ya da yakın birinin beklenmedik ölümü	☐
(m)	Bunların dışında bir olay	☐
(n)	Aşağıda boş bırakılan yerde yukarıda işaretlemiş olduğunuz travmatik olayı kısaca anlatınız.	

2

Anlattığınız bu olay hakkında aşağıda birkaç soru verilmiştir. Bu soruları yanıtlayınız:

(16) Bu travmatik olay **ne kadar zaman önce** meydana geldi? (**YALNIZCA BİR TANESİNİ** daire içine alınız)

(a)	1 aydan daha az
(b)	1-3 ay arası
(c)	3-6 ay arası
(d)	6 ay – 3 yıl arası
(e)	3-5 yıl arası
(f)	5 yıldan daha fazla

Aşağıdaki sorularda, **Evet** için E harfini **Hayır** için H harfini daire içine alınız.

Bu travmatik olay sırasında:

(17)	Fiziksel bir yara aldınız mı?	E	H
(18)	Başka bir kişi fiziksel bir yara aldı mı?	E	H
(19)	Hayatınızın tehlikede olduğunu düşündünüz mü?	E	H
(20)	Başka bir kişinin hayatının tehlikede olduğunu düşündünüz mü?	E	H
(21)	Kendinizi çaresiz hissettiniz mi?	E	H
(22)	Büyük bir korku duygusu yaşadınız mı?	E	H

3.Bölüm

3

Aşağıda, insanların bazen bir travmatik olayın ardından yaşadığı bazı sorunlar belirtilmiştir. Her maddeyi dikkatlice okuyun ve **GEÇTİĞİMİZ AY İÇİNDE** bu sorunun sizi ne sıklıkta rahatsız ettiğini en iyi ifade ettiğini düşündüğünüz sayıyı (0, 1, 2 ya da 3) daire içine alın.

Örneğin, söz ettiğiniz olay geçtiğimiz ay içinde aşağıda verilen sıkıntılar açısından sizi yalnızca bir kez rahatsız ettiyse 0'ı; haftada bir kez rahatsız ettiyse 1 işaretleyin. Aşağıda belirtilen olayla ilgili her sıkıntıyı **15. maddede belirttiğiniz travmatik olay açısından** değerlendiriniz.

1 Hiç ya da yalnızca bir kez
2 Haftada bir ya da daha az/kısa bir süre
3 Haftada 2 – 4 kez / yarım gün
4 Haftada 5 ya da daha fazla / neredeyse bütün gün

(23)	Bu travmatik olay hakkında, istemediğiniz halde aklınıza rahatsız edici düşünceler ya da imgelerin gelmesi	0	1	2	3
(24)	Bu travmatik olayla ilgili kötü rüyalar ya da kabuslar görme	0	1	2	3
(25)	Bu travmatik olayı yeniden yaşama, sanki tekrar oluyormuş gibi hissetme ya da öyle davranma	0	1	2	3
(26)	Bu travmatik olayı hatırladığınızda duygusal olarak altüst olduğunuzu hissetme (örneğin, korku, öfke, üzüntü, suçluluk vb. gibi duygular yaşama)	0	1	2	3
(27)	Bu travmatik olayı hatırladığınızda vücudunuzda fiziksel tepkiler meydana gelmesi (örneğin, ter boşalması, kalbin hızlı çarpması)	0	1	2	3
(28)	Bu travmatik olayı düşünmemeye, hakkında konuşmamaya ya da hissetmemeye çalışma	0	1	2	3
(29)	Size bu travmatik olayı hatırlatan etkinliklerden, kişilerden ya da yerlerden kaçınmaya çalışma	0	1	2	3
(30)	Bu travmatik olayın önem taşıyan bir bölümünü hatırlayamama	0	1	2	3
(31)	Önemli etkinliklere çok daha az sıklıkta katılma ya da bu etkinliklere çok daha az ilgi duyma	0	1	2	3
(32)	Çevrenizdeki insanlarla aranızda bir mesafe hissetme ya da onlardan koptuğunuz duygusuna kapılma	0	1	2	3
(33)	Duygusal açıdan kendinizi donuk, uyuşuk hissetme (örneğin, ağlayamama ya da sevecen duygular yaşayamama)	0	1	2	3
(34)	Gelecekle ilgili planlarınızın ya da umutlarınızın gerçekleşmeyeceği duygusuna kapılma (örneğin, bir meslek hayatınızın olmayacağı, evlenmeyeceğiniz, çocuğunuzun olmayacağı ya da ömrünüzün uzun olmayacağı duygusu)	0	1	2	3
(35)	Uykuya dalma ya da uyumada zorluklar yaşama	0	1	2	3

(36)	Çabuk sinirlenme ya da öfke nöbetleri geçirme	0	1	2	3
(37)	Düşüncenizi ya da dikkatinizi belli bir noktada toplamada sıkıntı yaşama (örneğin, bir konuşma sırasında konuyu kaçırma, televizyondaki bir öyküyü takip edememe, okuduğunuz şeyi unutma)	0	1	2	3
(38)	Aşırı derecede tetikte olma (örneğin, çevrenizde kimin olduğunu kontrol etme, sırtınız bir kapıya dönük olduğunda rahatsız olma,vb.)	0	1	2	3
(39)	Diken üstünde olma ya da kolayca irkilme (örneğin, birisi peşinizden yürüdüğünde)	0	1	2	3
(40)	Yukarıda belirttiğiniz sorunları ne kadar zamandır yaşıyorsunuz? (**YALNIZCA BİR TANESİNİ** daire içine alınız) a. Bir aydan daha az b. 1-3 ay arası c. 3 aydan daha fazla				
(41)	Bu sorunlar söz konusu travmatik olaydan ne kadar sonra başladı? (**YALNIZCA BİR TANESİNİ** daire içine alınız) a. 6 aydan daha az b. 6 ay ya da daha fazla				

4.Bölüm

3. Bölüm'de işaretlediğiniz sorunların **GEÇTİĞİMİZ AY SÜRESİNCE** hayatınızın aşağıda belirtilen alanlarından herhangi birini engelleyip engellemediğini belirtiniz. **Evet** için E harfini, **Hayır** için H harfini daire içine alınız.

(42)	İş hayatı	E	H
(43)	Evin günlük işleri	E	H
(44)	Arkadaşlarınızla ilişkiler	E	H
(45)	Eğlence ve boş zamanlardaki etkinlikler	E	H
(46)	Okulla ilgili işler	E	H
(47)	Ailenizle ilişkiler	E	H
(48)	Cinsel yaşam	E	H
(49)	Genel anlamda hayattan memnuniyet	E	H
(50)	Hayatınızın her alanında genel işleyiş düzeyi	E	H

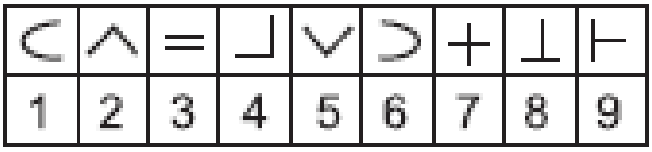
APPENDIX E: WORDS CHECKLIST LIST

Katılımcı No:

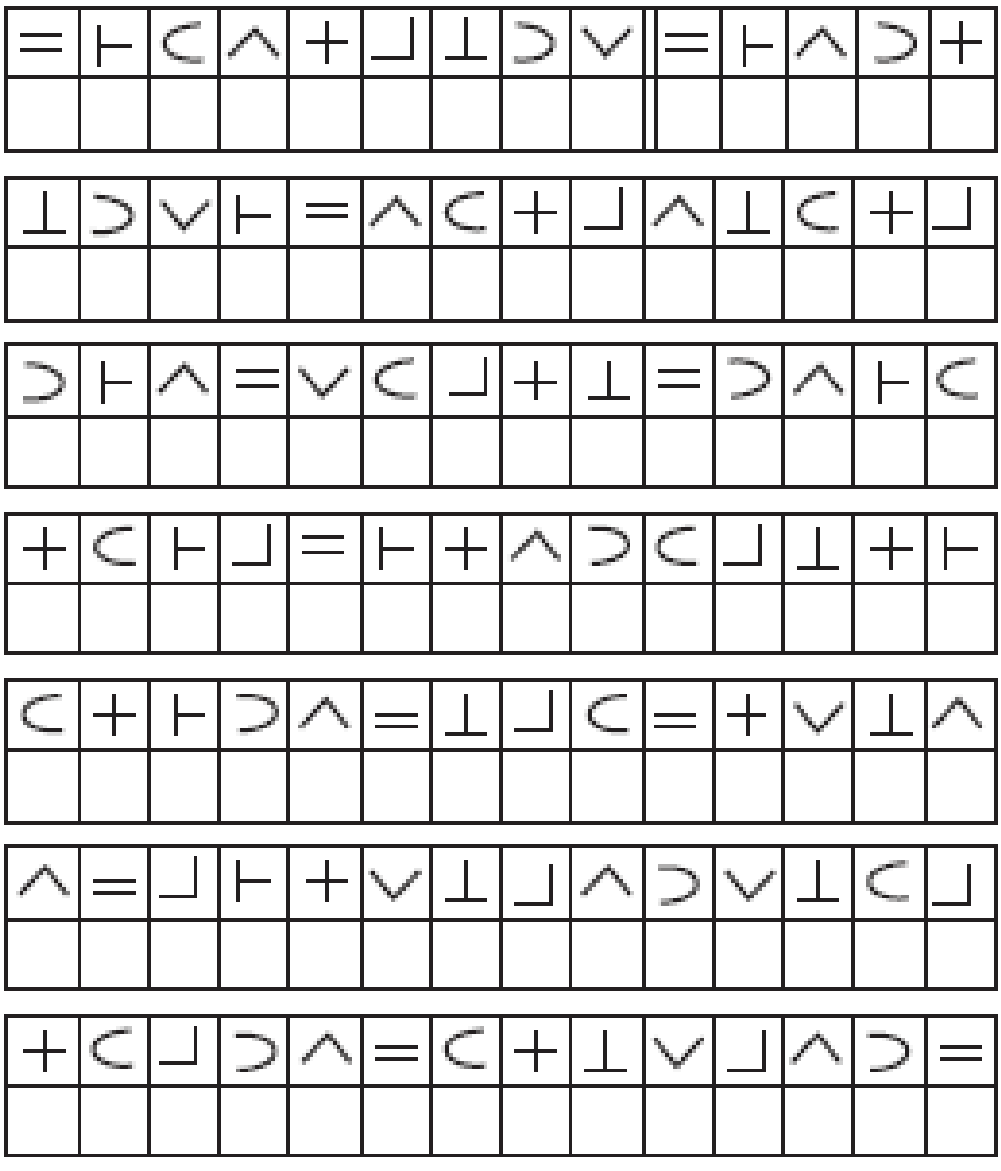
Uygulama Tarihi:

Pozitif		**Negatif**		**Nötr**	
Barış		Açlık		Anlaşma	
Dost		Bomba		Asker	
Dünya		Esaret		Endişeli	
Hatıra		Fakirlik		Gurbet	
Hürriyet		Füze		Hassas	
İnsanlık		Keder		Hayat	
Koruma		Mağdur		Kaçak	
Korunak		Ölüm		Olay	
Kurtarıcı		Sahipsiz		Özlem	
Kültür		Savaş		Sessiz	
Sağlık		Silah		Telaş	
Toprak		Tehlike		Toplanma	
Umut		Üzüntü		Ülke	
Yardım		Yoksul		Vatan	
Yolculuk		Zorluk		Zaman	

APPENDIX F: SYMBOL DIGIT SUBSTITUTION TEST



ÖRNEK _____



APPENDIX G: WORD EVALUATION FORM

KELİME DEĞERLENDİRMESİ

1-Negatif ---------- 9-Pozitif

Kelimeler	1	2	3	4	5	6	7	8	9
Barış									
Açlık									
Anlaşma									
Dost									
Bomba									
Asker									
Dünya									
Esaret									
Endişeli									
Hatıra									
Fakirlik									
Gurbet									
Hürriyet									
Füze									
Hassas									
İnsanlık									
Keder									
Hayat									
Koruma									
Mağdur									
Kaçak									
Korunak									
Ölüm									
Olay									
Kurtarıcı									
Sahipsiz									
Özlem									
Kültür									
Savaş									
Sessiz									
Sağlık									
Silah									
Telaş									
Toprak									
Tehlike									
Toplanma									
Umut									
Üzüntü									
Ülke									
Yardım									
Yoksul									
Vatan									
Yolculuk									
Zorluk									
Zaman									

APPENDIX H: NEW CATEGORIZATION WORD CHECKLIST TABLE

MÜLTECİ DEĞERLENDİRMESİNE GÖRE KELİME KATEGORİLERİ

Katılımcı No:

Uygulama Tarihi:

Pozitif		**Negatif**		**Nötr**	
Barış		Açlık		Hatıra	
Anlaşma		Bomba		Hassas	
Dost		Esaret		Yolculuk	
Dünya		Endişeli			
Hürriyet		Fakirlik			
İnsanlık		Gurbet			
Hayat		Füze			
Koruma		Keder			
Korunak		Mağdur			
Kurtarıcı		Kaçak			
Kültür		Ölüm			
Sağlık		Olay			
Toprak		Sahipsiz			
Toplanma		Özlem			
Umut		Savaş			
Ülke		Sessiz			
Yardım		Silah			
Vatan		Telaş			
Zaman		Tehlike			
Zaman		Üzüntü			
		Yoksul			
		Zorluk			
		Asker			