

EFFECTS OF INHIBITORY MECHANISMS AND THOUGHT SUPPRESSION  
TENDENCY ON THE FREQUENCY AND INTENSITY OF TRAUMATIC  
INTRUSIONS

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ORHAN FERHAT YARAR

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---

Prof. Dr. Meliha Altunışık  
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of  
Master of Science

---

Prof. Dr. Nebi Sümer  
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully  
adequate, in scope and quality, as a thesis for the degree of Master of Science.

---

Assist. Prof. Dr. Mine Mısırlısoy  
Co-Supervisor

---

Prof. Dr. Nuray Karancı  
Supervisor

Examining Committee Members

Prof. Dr. Nuray Karancı (METU, PSY) \_\_\_\_\_

Prof. Dr. Tülin Gençöz (METU, PSY) \_\_\_\_\_

Assist. Prof. Dr. Banu Yılmaz (AU DTCF, PSY) \_\_\_\_\_

**I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.**

Name, Last name : Orhan Ferhat, Yarar

Signature :

## ABSTRACT

### EFFECTS OF INHIBITORY MECHANISMS AND THOUGHT SUPPRESSION TENDENCY ON THE FREQUENCY AND INTENSITY OF TRAUMATIC INTRUSIONS

Yarar, Orhan Ferhat

M.S., Department of Psychology

Supervisor : Prof. Dr. Nuray Karancı

Co-Supervisor : Assist. Prof. Dr. Mine Mısırlısoy

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The present study investigates the effects of cognitive inhibitory mechanisms and tendency to suppress thoughts on the frequency and intensity of traumatic intrusions within the trauma film paradigm. Non clinical participants' response inhibition and proactive inhibition levels and tendency to suppress thoughts were measured prior to exposure to a trauma film. One week after seeing the trauma film, participants reported the frequency and intensity of trauma film related intrusions with an intrusion diary and Impact of Events Scale. No significant effect of response inhibition, proactive inhibition and thought suppression tendency was found on the frequency and intensity of trauma film related intrusions. Findings of the study are discussed.

Keywords: Intrusive Memories, Traumatic Stress, Response Inhibition, Proactive Inhibition, Thought Suppression

## ÖZ

### KETLEME MEKANİZMALARININ VE DÜŞÜNCE BASTIRMA EĞİLİMİNİN TRAVMATİK GİRİCİ ANILAR ÜZERİNDEKİ ETKİLERİ

Yarar, Orhan Ferhat

M.S., Psikoloji Bölümü

Danışman : Prof. Dr. Nuray Karancı

İkinci Danışman : Yard. Doç. Dr. Mine Mısırlısoy

Ocak 2011, 82 Sayfa

Bu çalışmada travma film paradigması çerçevesinde, düşünce bastırma eğiliminin ve bilişsel ketleme mekanizmalarının travmatik girici anıların şiddeti ve sıklığına olan etkisi incelenmiştir. Klinik olmayan katılımcıların tepki ketleme ve ileriye dönük ketleme seviyeleri ile düşünce bastırma eğilimleri, bir travma filmine maruz bırakılma öncesinde ölçülmüştür. Katılımcılar, travma filmine maruz kaldıktan bir hafta sonra filme ilişkin girici anıların sıklığını ve şiddetini bir girici anı günlüğü ve Olay Etkisi Ölçeği ile rapor etmişlerdir. Tepki ketleme, ileriye dönük ketleme ve düşünce bastırma eğiliminin travma filmine ilişkin girici anıların şiddeti ve sıklığına anlamlı bir etkisi bulunmamıştır. Çalışmanın bulguları tartışılmıştır.

Anahtar Kelimeler: Girici Anılar, Travmatik Stres, Tepki Ketleme, İleriye Dönük  
Ketleme, Düşünce Bastırma

To My Dearest Family



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## **CHAPTER I**

### **INTRODUCTION**

In everyday life, individuals encounter irrelevant thoughts or memories which are interfering with their task performance and intellectual aims: In non-clinical populations, the frequency of intrusive memories was 2-4 in a day (Bernsten, 1996). Despite the fact that these everyday intrusions might alter individuals' ability to engage in productive thought and decrease task performance (Saranson, Pierce, & Saranson, 1996), they do not lead to any concern for individual and they might lead to either positive or negative affect (Holmes & Bourne, 2004; Reynolds & Brewin, 1999). Although intrusive memories are described as a normal phenomenon, individual differences are observable in the frequency of experiencing intrusive memories and thoughts (Horowitz, Wilner & Alvarez, 1979).

Intrusions -described as an observable fact in everyday life- play a very important role in the aetiology of psychological disorders such as depression, obsessive compulsive disorder and psychosis (Mace, 2007; Clark, 2005), and a hallmark symptom of post-traumatic stress disorder (Davies and Clark, 2005; Brewin, 1998). Unlike the everyday intrusions, trauma-intrusions lead to significant distress. Holmes (2004) highlighted that experiencing traumatic intrusions might actually show similar properties to experiencing real trauma. Thus, experiencing trauma-intrusions is one of the three major symptoms of post traumatic stress disorder (APA, 2000).

Intrusive trauma memories consist of highly detailed sensory impressions and thoughts about the traumatic event including sounds, sights, bodily sensations and feelings (Krans, Naring, Becker & Holmes., 2009). The moment right before an earthquake occurred, the odor of the burning house when the fire had begun, the sight of a molester, the scream of a woman before being hit by a car might be examples of traumatic intrusive memories.

Among risk factors predicting the intensity and frequency of post-traumatic stress symptoms described in the literature, the predictive power of psychological risk factors is highest (Krans et al., 2009). Cognitive vulnerabilities are among the psychological risk factors. It is indicated that information processing during and after the traumatic event is very critical in terms of the frequency and the nature of post-traumatic stress symptoms (Brewin and Holmes, 2003; Ozer, Best, Lipsey, & Weiss, 2003). For this reason, identifying the underlying cognitive risk factors for the formation and maintenance of traumatic stress symptoms has great importance. Therefore, the present study focuses on the psychological risk factors that play a role in the maintenance of traumatic intrusive memories.

In the present study, it is aimed to investigate the pre-traumatic cognitive factors that might be associated with the development and maintenance of intrusive memories after a traumatic event. For this purpose, trauma film paradigm is utilized as a prospective methodology in a non-clinical sample. A trauma film was compiled consisting of scenes of horrific content in order to create an analogous trauma experience in the lab settings. Before exposing participants to the trauma film, their cognitive control abilities (Proactive Inhibition and Response Inhibition) and tendency to suppress unwanted thoughts were measured. After exposure to the



trauma film, subjects were introduced an intrusion diary to record the frequency and intensity of trauma film related intrusions during the week after the film exposure. It was expected that low cognitive control would be linked with higher frequency and intensity of trauma intrusions.

Contemporary cognitive theories investigating the nature of traumatic stress (Brewin and Dalgleish, 1996; Ehlers and Clark, 2000) make comparable predictions on the formation of the traumatic intrusions. They propose that, disrupted peri-traumatic information processing style leads to deficits in encoding information with a contextual background for the trauma memory; consequently spontaneous and distressing intrusions take place. A number of research studies prompted that investigating the role of cognitive executive functions might be essential to explore interpersonal differences in experiencing intrusive memories. Individual differences in central executive related functions such as response inhibition and proactive inhibition might play a role in the maintenance of intrusive memories according to Brewin and Beaton (2002) and Brewin and Smart (2005). Despite the fact that many studies investigated the peri-traumatic and post traumatic cognitive processing, pre-trauma information processing properties are not sufficiently investigated in the recent literature.

Post-traumatic stress syndromes emerge afterwards exposure to traumatic events that possess properties that differentiates those from ordinary life experiences. In order to understand the aetiology of traumatic stress and the nature of trauma-intrusions, the properties of traumatic events should be well understood.

The nature of a traumatic event is defined by two distinctive features according to DSM-IV-TR (APA, 2000): (1) involving actual or threatened death or

serious injury, or a threat to the physical integrity of oneself or others, (2) the person's response involves intense fear, helplessness or horror. Assault, rape, partner violence, motor vehicle accidents, life threatening illness, terrorist attacks, technological accidents, and earthquakes might have properties of traumatic events described in DSM-IV-TR (APA, 2000).

Everly and Lating (2005) described the monumental significance of traumatic events in an individual's life. According to Everly et al. (2005) a traumatic event shatters the explanatory worldviews of individuals such as the belief in a fair and just world; the need for attachment, physical safety, self-efficacy and some overarching meaning or order of life. Explanatory worldviews are assumed to be attacked during exposure to a traumatic event. The traumatic experience leads to feelings of loss, anger, betrayal, and helplessness (Van Der Kolk & MacFarlane, 1996). Research shows that experiencing traumatic events is not rare in the general population. Therefore, Posttraumatic Stress became an important research area. Breslau, Davis, Andreski and Peterson's (1991) research revealed a prevalence rate of 39.1% who reported at least one traumatic event during the span of a lifetime (Freedy & Donkervoet, 1995). Another study conducted by Norris (1992) reports that 70% of individuals experience traumatic events. Similarly, according to a study conducted by Bernat, Ronfeldt, Calhoun & Arias (1998), the prevalence rate of experiencing a traumatic event is 67% in the general population. Natural disasters, wars, violent crimes, technological accidents, refugee status and torture are widely studied as extremely distressing life events (Freedy et al. 1995).

## **1.1. Traumatic Stress and Related Mental Health Problems**

The characteristics of traumatic events described above lead individuals to experience traumatic stress in varying levels. Traumatic stress is defined as a normal response by normal people to extremely distressing events by Shiraldi (2000). The nature of traumatic event -being sudden and unexpected- which involves a death or injury threat to self or witnessing it in others leads to a cluster of symptoms after traumatic events. Acute Stress Reaction, Post Traumatic Stress Disorder and Adjustment Disorder are the major mental health problems that may occur after psychological trauma (Freedy et al., 1995).

### **1.1.1 Adjustment Disorder**

Adjustment disorder is defined as a maladaptive reaction to an identifiable stressful life event or stressor such as divorce or family crisis (DSM IV-TR, 2000). The symptoms should be exhibited within three months after the event takes place and should not exceed 6 months. Behavioral and emotional symptoms leading to significant social dysfunction or occupational impairment should be observed (p. 263-264).

### **1.1.2. Acute Stress Disorder**

Acute Stress Disorder (ASD) is characterized as a transient and abrupt condition following a traumatic event that lasts at least 2 days to 4 weeks. Three or more of the following dissociative symptoms should be observed in order to diagnose ACD: Loss of emotion, numbing and detachment; diminished awareness of surroundings, depersonalization; derealization; dissociative amnesia. The event or experience must be re-experienced as distressing recollections of the event or

experience; dreams that are reoccurring and distressful; reliving the event or experience in the form of flashbacks, hallucinations, images, illusions or thoughts; and giving reactions in a physiological manner to any aspect of the event or experience. (DSM IV-TR, 2000, p.202-203)

### **1.1.3 Post Traumatic Stress Disorder**

Post Traumatic Stress Disorder (PTSD) is an anxiety disorder that may occur after a traumatic event (Ehlers & Clark., 2000). Despite many adjustment patterns, PTSD is the most common and severe psychological disorder following a traumatic event (Freedy et al., 1995). The symptoms of PTSD include intrusive recollections of the traumatic event such as acting or feeling as if the traumatic event were recurring and confronting with the traumatic material in dreams (APA, 2000). The traumatic event, as described in the previous section, may involve the threat of death to oneself or someone else. It might also involve threats towards physical or psychological integrity. Re-experiencing the traumatic event in the form of flashback memories, intrusive images, dreams; acting or feeling as if the traumatic event is recurring; experiencing intense psychological stress while exposed to cues that resemble or symbolize an aspect of the trauma; avoiding the trauma related thoughts, feelings, conversations, activities and places; decreased interest in activities; feelings of detachment and estrangement; restricted range of affect; sense of foreshortened future and hyper arousal are the core symptoms of PTSD (APA, 2000).

As previously mentioned, approximately 70% of the population experiences a traumatic event during a lifetime; however only approximately 8% develop PTSD. Trauma severity, gender, biological background, early childhood experiences and

cognitive capacities might be considered as risk factors among individuals undergoing a traumatic event (Nemeroff, Bremner, Foa, Mayberg, North & Stein., 2006). Additionally, individuals with a previous psychiatric history are more likely to suffer from PTSD in the aftermath of a traumatic event (Scott & Palmer, 2000). The more severely traumatized individual is less likely to recover from PTSD (Scott et al., 2000). According to Scott, individuals have different thresholds for traumatic events. An individual with a low threshold might exhibit excessive traumatic stress symptoms following a moderately stressful event (Scott et al., 2000). Proximity, duration and severity of the trauma also make an impact.

According to Roth and Fonagy (2005), lifetime prevalence of PTSD is 1% - 3% in the general population. Substance abuse and depression are found to be comorbid psychological disorders with PTSD according to Roth et al. (2005). In fact, 50 % of PTSD sufferers also have three or more additional diagnosis (Kessler, 1995) and %87.5 of PTSD sample have at least one additional diagnosis (Perkonig, 2000 cited by Roth et al., 2005).

Williams and Poijula (2002) proposed three domains that predict the development of PTSD: Pre-trauma factors, peri-trauma factors and post-trauma factors. Previous exposure to severe adverse life events, earlier depression or anxiety, ineffective coping skills, family instability, early substance abuse, absence of social support, being a woman, being young, and having genetic predisposition can be considered as pre-trauma factors that predict the development of PTSD (Williams et al., 2002). Additionally, geographic proximity to the event, level of exposure to the event, the event's meaning for the survivor, being a victim of multiple traumatic incidents, duration of the traumatic event, the existence of an ongoing threat that the

trauma will continue, being involved in an intentionally caused traumatic event and participation in an atrocity as a perpetrator or witness can be considered as peri-trauma factors that predict the development of PTSD (Williams et al., 2002). Lastly, the absence of good social support, not being able to do something about what happened, indulging in self-pity while neglecting yourself, feeling passive rather than active, inability to find meaning in the suffering, developing Acute Stress Disorder, having immediate reaction that includes physiological arousal can be considered as post-trauma factors that predict the development of PTSD (Williams et al., 2002).

Both the nature and the psychological outcome of a traumatic event differ across genders. Women and men come across with different types of traumas. Sexual abuse and molestation are experienced more by women, whereas men get exposed to fights, accidents and weapon related traumatic events including war more than women (Nemeroff, et al., 2006). Even when women and men are subjected to the same type of trauma with similar properties, women are approximately twice more likely to develop PTSD symptoms afterwards. Furthermore, symptom persistence is more likely in women as compared to men (Nemeroff et al, 2006). Therefore being a female can be considered as a risk factor for developing PTSD. Furthermore, comorbidity of PTSD with other psychological disorders is also different in men and women. Kessler's study (1995) showed that women with PTSD had higher rates of comorbid panic disorder (12.6% vs. 7.3%) and agoraphobia (22.4% vs. 16.1%) compared to men; whereas men with PTSD had higher rates of comorbid alcohol abuse (27.9% vs. 51.9%).

## **1.2. Traumatic Stress and Intrusive Memory**

Intrusive recollections are identified as a part of the psychopathology including depression, anxiety, obsessive-compulsive disorder and PTSD (Reynolds & Brewin., 1998). PTSD is characterized with significant impairment in the capacity to integrate traumatic experiences as coherent stories; instead the trauma memory consists of intense emotions or somatosensory impressions which are aroused by the reminders of the trauma (Van Der Kolk et al., 1996). However, after a while, the triggers of a traumatic intrusive memory might be very subtle and generalized; an irrelevant stimulus might act as the reminder of the traumatic event (Van Der Kolk, et al., 1996).

Trauma intrusions are accompanied by wide variety of emotions such as guilt and sadness; hence, the DSM diagnostic criteria concerning feelings of helplessness and horror may be associated with the majority of these intrusions (Steel and Holmes., 2007). Traumatic memories are in the forms of flashbacks; intense emotions; somatic sensations; nightmares; interpersonal reenactments; character styles; and pervasive life themes (Steel et al., 2007). Because of the disintegrated nature of traumatic memories, victims tend to perceive the traumatic event as if it is a present event rather than perceiving it as a memory from the past (Van Der Kolk et al., 1996).

The meta-analysis conducted by Ozer, Best, Lipsey & Weiss (2003) highlights the significance of peri-traumatic processes such as perceived life threat during trauma, peri-traumatic emotional responses and dissociation as stronger predictors of PTSD symptomatology than the type of trauma or demographic factors.

Hence, intrusive memories which are resulting from the peri-traumatic cognitive processes are most commonly endorsed symptoms of PTSD; therefore intrusions are a central theme in psychological characteristics of Post Traumatic Stress Disorder (Regambal & Alden., 2009). Understanding the processes that lead to the development of intrusive memories is of both theoretical and clinical importance. A number of studies have been conducted on the emotional and cognitive processes that contribute to PTSD; relatively few studies have considered the effects of these processes on intrusive memory development (Regambal et al., 2009).

### **1.2.1 Intrusive Recollections**

As mentioned earlier, intrusions play a central role in the development and maintenance of Post Traumatic Stress Disorder (Laposa & Alden, 2008; Brewin, 1996). Intrusive recollections are described as unintentionally retrieved vivid and high sensory detailed materials (Holmes & Bourne, 2008) which are usually triggered by perceptual cues that are associated with those present at the time of traumatic event (Halligan, Clark & Ehlers., 2002). Intrusive memories are typically experienced in a range of sensory modalities and represent segments of the traumatic episode rather than the whole event (Halligan et al., 2002).

According to cognitive theories of PTSD, intrusive traumatic content originates from information processing style during the event. (Laposa & Alden, 2006). Intrusive thoughts and images are results of a deficit in encoding trauma memory according to several researchers (Brewin, Dalgleish & Joseph, 1996; Ehlers & Clark, 2000). The overwhelming nature of traumatic experiences prevents



individuals from fully processing the event at the time of the traumatic event.

(Brewin, Dalgleish & Joseph, 1996; Ehlers & Clark, 2000).

Steel et al. (2007) highlights the significance of processes which occur during encoding in forming subsequent intrusions of trauma memory. According to Grey, Holmes and Brewin (2001) trauma related intrusions are associated with the worst moments of traumatic event. The worst moments –which are also called hot spots, depend on the individual’s appraisals of the traumatic event. Hot spots lead to the highest level of emotional distress and those are hard to recall deliberately.

Steel et al. (2007) concentrate on the process they call “contextual integration” to explain trauma related intrusions. Contextual integration is defined as the combination of essential processes including processing and storing of incoming information within a meaningful and coherent memory. Effective contextual integration produces strong associations between co-occurring stimuli: the recall of a specific stimulus facilitates the recall of an associated context and effective contextual integration enables memories to be placed and recalled in a meaningful order (Steel et al., 2007). Normally, hippocampus is responsible for the deep level processing that takes time to integrate information into a meaningful context. However, during the periods of intense stress, amygdala takes over this responsibility to fasten the reaction such as releasing of stress hormones in order to facilitate a quicker response. Therefore, during the periods of intense stress, hippocampus cannot integrate a spatial and temporal context for the event (Brewin., 2001). Therefore, traumatic hotspots are memories which are not processed in the same manner as the information received by the organism in times of low stress. The

contextual integration is disrupted during the time a traumatic event is experienced due to excessive emotional load of the experience.

Intrusive memories are characterized by some properties which can be distinguished from typical autobiographical memories. These characteristics are mainly automatic retrieval with cues, involuntarily and spontaneously and high perceptual detail with forms of images and somatic sensations as previously mentioned (Regambal et al., 2009). Regambal et al. (2009) highlighted specific factors that could contribute to the development of intrusive memories: preexisting emotions, peri-traumatic emotional reactivity, peri-traumatic cognitive processing and post-event maladaptive coping strategies. In terms of preexisting emotions; a history of depression and trait anxiety might increase the likelihood of developing PTSD, therefore intrusive recollections. Additionally, emotional response during the traumatic event is believed to affect how the event is later experienced. Majority of emotional reactivity research has been focused on peri-traumatic levels of fear or anxiety, with greater levels often predicting more severe PTSD. Changes in anxiety, depression, happiness and anger during a distressing movie have some of the strongest relationships with movie-related intrusive memories. Change in anger was one of the strongest predictors of intrusive memories. Lastly, heightened emotional states increase the likelihood that events will be processed more in terms of sensory information than meaning according to Regambal et al. (2009).

There needs to be more research done investigating the individual differences in experiencing intrusive memories in a prospective fashion (Laposa & Alden, 2008). Laposa et al. (2008) points out that, researchers often have to rely on reports collected several years following a traumatic event in clinical studies. Therefore, the

retrospective style of this type of methodology might not be the best way, since the current PTSD symptoms can increase reports of emotional responses and make it harder to elicit responses without extraneous properties. Similarly; Candel and Merckelbach (2004) also stated that studies that investigate peri-traumatic and post-traumatic variables mostly relied on data gathered from clinical samples in a retrospective fashion. The retrospective nature of these studies leads to limitations about participants' ability to give correct information about the past events. (Holmes et al. 2008). Studying traumatic stress in non clinical samples with a prospective design might provide increased control, and prospective & timely assessment of variables.

### **1.2.2. Cognitive Factors and Intrusive Memories**

The ability to control thoughts in accordance with goals, including the ability to stop unwanted thoughts from rising to consciousness is defined as cognitive control (Anderson, 2009). Cognitive control is a very deep-seated capacity in order to engage in complex and long-term goals (Miller, 2000). It is a distinctive quality of human cognitive system that achieves adaptations such as proper adjustments in perceptual selection, response biasing and on-line maintenance of contextual information (Botvinick, Braver, Barch, Carter & Cohen, 2001). Baddeley and Della Sala (1996) have anticipated central executive function and phonological loop – components of the working memory model proposed by Baddeley and Hitch (1974) - that gives a baseline to explain how cognitive control is achieved. A brief description of working memory is provided in the next part in order to get familiarized with the concepts and theory.

### **1.2.2.1 Working Memory and Cognitive Control**

The ability to actively keep information in the mind that is required to complete tasks such as reasoning, comprehension and learning is called working memory (Baddeley, 2009). Working memory tasks necessitate the target oriented active monitoring or management of information or behaviors in the face of interfering processes and distractions. The cognitive processes involved include the executive and attention control of short-term memory which provide for the temporary integration, processing, disposal, and retrieval of information.

Baddeley and Hitch (1974) proposed a model of working memory with three components. In recent years, the model is improved by Baddeley and other researchers and it dominates the field of working memory. The major component of Baddeley's model is the central executive that controls the flow of information from and to its slave systems, namely phonological loop, visuo-spatial sketchpad and relatively recently added third slave system called episodic buffer (Baddeley, 2009).

Rosen and Engle (1998) proposes that utilizing the individual differences approach while studying working memory capacity echo differential abilities to bring domain-free, focused attention to bear on cognitive tasks such as (1) maintaining information for a brief period of time in the face of distraction or interference, (2) strategic, controlled search beneficial for the task, (3) monitoring for errors, (4) suppression or inhibition of inappropriate thoughts and behaviors for the current task. Engle's inhibitory control theory uses the individual differences approach to understand what capacities and processes underlie the working memory span and cognitive functions. Similarly, According to Brewin and Smart (2005), individual

differences in working memory capacity might lead to varied success in performing tasks such as exclusion of unwanted or irrelevant material from consciousness. Brewin et al (2005) proposes that in terms of Baddeley and Hitch's working memory model mentioned above, inhibition is reflected in the operation of the central executive together with the short-term storage of the phonological loop. Rosen and Engle (1998) attribute the same function to working memory in terms of suppressing unwanted material. In accordance with this, Brewin & Beaton (2002) proved that high working memory capacity leads to better suppression of unrelated thoughts. Similarly, Friedman and Miyake (2004) discussed that differences in reported cognitive failures and performance on WMC tasks were related to functioning of inhibitory mechanisms. Klein and Boals (2001) study found that the frequency of intrusive memories and attempts to avoid such memories are relatively high in individuals who have low working memory capacity. Verwoerd et al. (2007) showed that self reports of involuntary memories were significantly related to cognitive failures reported in different cognitive domains of perception and memory; additionally measures of working memory capacity were related with individual differences in reported involuntary thoughts and memories.

#### **1.2.2.2 Inhibition and Intrusions**

General inhibitory capacity is the level to which an individual can suppress distracting thoughts or behaviors (Baddeley, 2009). Inhibition might serve for different purposes and might consist of several independent mechanisms (Friedman & Miyake, 2004). Nigg (2000) classified inhibitory processing into four types: (a) interference control is the suppression of interference due to source of stimulus competition; (b) cognitive inhibition is the suppression of irrelevant information

from working memory; (c) behavioral inhibition is the suppression of prepotent responses and (d) oculomotor inhibition is the suppression of reflexive saccades.

Among the mechanisms described by Nigg, (a) suppression for interference due to source of stimulus competition, (b) suppression of irrelevant information from working memory and (c) behavioral inhibition is the suppression of prepotent responses might be related to post traumatic intrusions.

Intrusive memories are thought to be profound examples of experiencing irrelevant interference (Verwoerd et al. 2009). In the present study, a link between properties of trauma intrusions and inhibitory processing mechanisms, namely (a) suppression for interference due to stimulus competition, and the combination of (b) suppression of irrelevant information from working memory and (c) behavioral inhibition is investigated. (a) is operationalized as proactive inhibition and the combination of (b) and (c) is operationalized as response inhibition.

When past memories inhibit an individual's full potential to retain new memories proactive interference occurs. The proactive inhibition (PI) is defined as the tendency for earlier information to compete at retrieval with the information to be recalled. PI occurs when past memories inhibit an individual's potential to retain new memories (Baddeley, 2009). Paired Associates Task (Engle and Rosen, 1998), which examines individuals' abilities to resist proactive interference requires participants to learn a list of cue-target word pairs to the determined criterion level; then participants learn new target words with the same cue words. New target words interference with the old list is used to create an index of proactive inhibition when

participants are required to recall the target words in the first list after learning the second list.

Response inhibition is measured by stroop task in the present study. Stroop Task was first introduced by John Ridley Stroop in 1935. In his classic series of experiments, variations of an essential procedure were utilized. Participants were required to identify the ink color of a color word by saying aloud. The ink colors were presented under three conditions: congruent (the word “blue” printed with blue ink), incongruent (the word “red” printed with blue ink) and neutral (row of squares printed with blue ink). Stroop (1935) found that performance on naming the ink color was worse in the incongruent condition compared to two other conditions. Recently, stroop task is very widely used in cognitive research. It aims to measure an interference effect while naming the ink color of a word while presented with a compatible or incompatible color name printed. Recent versions of the stroop task use the variations of the original Stroop study; however most of the stroop research is now carried out with computer software instead of printed cards.

### **1.2.3 Thought Suppression**

As previously mentioned, trying to avoid trauma related stimuli is a diagnostic criterion for PTSD. In this sense, thought suppression is an avoidance style that is characterized by intentional attempts to avoid unwanted thoughts from consciousness (Wegner, 1994). Thought suppression was put forward by Wegner, Schneider, Carter and White (1987) with a series of experiments which demonstrated that trying not to think about a white bear increased preoccupation with the white bear. In other words these experiments highlighted the paradoxical nature of thought

suppression: the more subjects attempt to suppress unwanted cognitions from consciousness they are more preoccupied with the unwanted material. Efforts to suppress thoughts led to increased frequency of intrusions (Wegner et al., 1987). They found two distinct outcomes indicating an unexpected increase in target thoughts. The tendency to suppress thoughts led to an immediate enhancement effect, where the frequency of target thoughts increased during the interval when suppression is occurring and the frequency of target thoughts increased after deliberate suppression. In accordance with the Wegner et al. (1987) studies; Rassin, Merkelbach and Murris (1997) exposed subjects to an emotional movie and instructed one group of participants to suppress the film related material afterwards whereas the other group received no instruction. They found that, suppression group had more intrusive thoughts about the film.

Thought suppression is received attention for investigating cognitive intrusions linked to several psychological disorders including Obsessive Compulsive Disorder and PTSD. A number of studies examined the effect of tendency to suppress thoughts on intrusion frequency in PTSD and OCD. A rebound effect has been demonstrated in Davies & Clark., 1998; Harvey & Bryant., 1998; McNally & Riccardi., 1996. These studies revealed that attempting to suppress thoughts might inhibit emotional processing of the traumatic event and contribute to the maintenance of intrusions. (Beck, Gudmundsdottir, Palyo, Miller & Grant., 2006). Beck and colleagues (2006) state that trauma related thoughts and feelings could not be processed adequately when suppression takes place; therefore suppression increases the risk for developing PTSD. A study by Brewin and Beaton (2002) used Wegner et al.'s paradigm (1987), which demonstrated the inadequacy of attempts to deliberately



suppress thoughts, in the case of a white bear. During the suppression period participants were instructed not to think about a white bear and to indicate the thought's return with verbal report or bell-rings. During the expression period they had to think of a white bear and express via bell rings each instance of the thought in the same way as before. The results revealed that; higher working memory capacity and higher fluid intelligence were related to fewer intrusions in the suppression period. Vazques, Hervas & Perez-Sales (2008) studied the effects of thought suppression on developing PTSD in individuals witnessed Madrid terrorist attack in 2004. They found that participants with higher thought suppression tendency exhibited higher levels of PTSD symptoms and high thought suppression tendency was positively correlated with the use of avoidant coping strategies after attacks. Nixon, Menne, Kling, Steele, Barnes, Dohnt, Ball and Tyler (2008) examined factors that relates to thought suppression ability in trauma populations. They found that participants with ASD experienced difficulties in suppressing memories of the traumatic experience.

### **1.3. Psychological Theories of Post Traumatic Stress Disorder**

Dual Representation Theory (Brewin, Dalgleish, & Joseph., 1996) and Cognitive Model of PTSD (Ehlers & Clark., 2000) provide explanations about the nature of intrusive memories. In this section; each of these theories will be explained.

#### **1.3.1 Dual Representation Theory**

According to the dual representation theory, proposed by Brewin et al. (1996), memories of the traumatic experience are represented in a distinctive way in the memory system. Since the trauma memories are dissociated from the ordinary

memory system PTSD develops (Brewin, C. R. & Holmes, E. A., 2003). Brewin et al. (1996) proposed two memory systems that operate analogously: Verbally Accessible Memory (VAM) and Situationally Accessible Memory (SAM). Oral or written narratives of a trauma reveal the operation of VAM system. In VAM System; the trauma is integrated with other autobiographical memories and can be intentionally retrieved when required. VAM contains information that individual attended before, during and after trauma. Additionally, the content of the VAM is deeply processed memory that is transferred to LTM. However, the amount of information contained by VAM is limited to processed and elaborated material. VAM registers conscious evaluations of trauma both during and after the traumatic event. On the contrary, the operations of situationally accessible memory (SAM) are proposed to be revealed by flashbacks. Flashbacks are triggered involuntarily by stimuli that remind traumatic event to the patient. Shallow processed material during the traumatic event such as sights, sounds and images are registered by SAM. Additionally, SAM stores information about person's bodily response to trauma such as heart rate, flushing, temperature changes, etc. As opposed to VAM, SAM does not use verbal code; therefore the contents of SAM are difficult to communicate to others. SAM information does not necessarily interact with autobiographical knowledge. According to Dual Representation Theory, the more trauma information is encoded in SAM system than the VAM system, intrusive trauma memories occur: The cued activation of SAMs cannot be inhibited by VAMs (Brewin et al., 1996).

### **1.3.2. Cognitive Model**

The cognitive model that is developed by Ehlers et al. (2000) proposes two elementary processes that end up with a sense of current threat in PTSD: (1)

Individual differences in the appraisal of the trauma and its sequel; (2) individual differences in the nature of the traumatic memory and its link to other autobiographical memories.

In PTSD, patient processes traumatic information in a way that produces a sense of current threat whereas trauma lies in the past. Two major mechanisms lead to such process: Negative appraisals of the trauma and the nature of traumatic memory. Negative appraisals such as “others can see I am a victim”, “I deserve bad things happen to me”, “I’ll never be able to relate to people again”, “they think I am too weak to cope on my own” might lead to the development of PTSD according to the cognitive model pursued by Ehlers et al. (2000). Thought processes during the traumatic event and prior beliefs and experiences might increase the likelihood of negative appraisals. Cognitive model gives one of the most detailed explanations for the maintenance and treatment of PTSD (Brewin et al., 2003).

#### **1.4 Trauma Film Paradigm**

Trauma film paradigm is utilized as a prospective methodology that creates an analogue of the traumatic event by exposing non-clinical subjects to short films of traumatic content. The use of films with traumatic content was pioneered by Lazarus and colleagues (Lazarus & Alfert., 1964; Lazarus & Opton., 1964; Lazarus, Opton, Nomikos & Rankin., 1965). In these initial studies, physiological stress responses such as heart rate and skin conductance during exposure to the film were studied. These studies revealed that physiological stress responses can be induced in the lab settings with a film stimulus. In 1970’s, the use of trauma films were extended to study the impact of the movies on the frequency of intrusive thoughts. (Horowitz,

1969., 1975; Horowitz and Becker., 1971; Horowitz and Wildner, 1976). The effect of the nature of the stimuli, sample populations, cognitive processing instructions on intrusion frequency was investigated in these studies. Recently, trauma film paradigm has been utilized by many researchers to investigate the nature of intrusive memories in a prospective fashion.



Figure 1 Basic Procedure for Trauma Film Paradigm

### 1.5. Research Questions and Hypotheses

The literature suggests that cognitive control has an effect on intrusive memories and individual differences in inhibition capacity might be related to frequency of intrusions. In the light of reviewed literature, the essential aim of this study is to investigate the relationship between the inhibitory capacity and frequency & intensity of experiencing post trauma intrusions in a non clinical sample utilizing the trauma film paradigm. The hypotheses of the study are as follows:

(1) The frequency and intensity of intrusions following a trauma analogous laboratory stressor will be lower in individuals having greater resistance to proactive inhibition

(2) The frequency and intensity of intrusions following a trauma analogous laboratory stressor will be lower in individuals having greater response inhibition capacity.

(3) The frequency and intensity of intrusions following a trauma analogous laboratory stressor will be lower in individuals having high tendency to suppress thoughts.

## **CHAPTER II**

### **METHOD**

#### **2.1. Participants**

Fifty three freshmen taking the Introduction to Psychology course at the Department of Psychology, Middle East Technical University in 2009/2010 Fall Term were signed in to participate in the study. Among the 53 participants who initially signed in to participate, 6 participants did not attend the second session of the study; 3 participants decided to leave during exposure to the trauma film , and 3 participants were excluded due to their previous traumatic experiences and/or current psychological problems. Three participants were also excluded during the data screening procedure. The analysis was made with 38 participants. Thirty three participants were female (86.84 %), and 5 were male (13.16%). The age range of participants was between 17 and 21 ( $M=19.29$ ,  $SD=0.74$ ). All participants received extra course credit for participating in the study. Participants were asked for previous traumatic experiences, and the ones with a prior traumatic experience were excluded from the study. The researcher's contact details were provided in case the participants required further psychological assistance due to the enduring distress caused by the content of the trauma film in the experiment. Please see Appendix A for Informed Consent Form and Appendix B for Debriefing Form.

## **2.2. Instruments**

### **2.2.1 Demographic Information**

A set of questions (see Appendix C) were asked to the participants in order to gather demographic information including age, gender, department, and class.

### **2.2.2. State-Trait Anxiety Inventory (STAI)**

STAI is a 40 item, 4-point Likert type scale ranging from 1 (not at all) to 4 (very much so). It aims to measure how anxious a person generally feels, and how anxious a person feels in a specific moment in time. It was developed by Spielberger, Gorsuch and Lushene (1970). STAI has two subscales namely, state and trait anxiety subscales. Each of these subscales consists of 20 items.

The test-retest reliability of the scale ranged from .16 to .54 for state anxiety subscale and from .73 to .86 for trait anxiety subscale (Spielberger et al., 1970). The internal consistency for the state anxiety subscale varied between .83 and .92; and for the trait anxiety subscale it varied between .86 and .92 (Spielberger et al., 1970). The Turkish adaptation of STAI was done by Öner and LeCompte (1985) with clinical and nonclinical samples. In Turkish adaptation study (Öner et al., 1985), test-retest reliability was between .71 and .86 for trait anxiety inventory; test-retest reliability was between .26 and .68 for state anxiety inventory. The internal consistency was between .83 and .87 for trait anxiety subscale, and the internal consistency of state anxiety subscale ranged from .94 to .96 (Öner et al., 1985). Öner et al. (1985) revealed satisfactory and comparable construct and criterion validity values to original study by Spielberger et al. (1970).

In the present study, both state and trait subscales of the instrument was used in different phases of the research. State Anxiety Inventory and Trait Anxiety inventory is provided in Appendix D and Appendix E respectively.

### **2.2.3 Positive and Negative Affect Schedule (PANAS)**

PANAS is a 20 item self-report measure of positive and negative affect developed by Watson, Clark and Tellegen (1988). It aims to investigate feelings at a certain time. It provides independent measures of positive affect and negative affect with positive and negative affect subscales each consisting of 10 items. Two distinct scores are derived from PANAS for negative affect and positive affect. Positive affect represents the extent to which individual experiences enthusiasm and alertness whereas negative affect represents lethargy and sadness. The Cronbach Alpha is .88 for the positive affect subscale and .85 for the negative affect subscale (Watson et al., 1988). The test-retest reliability of the scale is .47 (Watson et al., 1988). The Turkish adaptation study of PANAS was conducted by Gençöz (2000) who also found similar internal consistency coefficients to Watson et al. (1988): .83 for the positive affect subscale and .86 for the negative affect subscale. The test-retest reliability of the Turkish version was .40 for the positive affect subscale, and .54 for the negative affect subscale (Gençöz, 2000). PANAS is provided in Appendix F.

### **2.2.4 Impact of Events Scale-Revised (IES-R)**

The Impact of Events Scale (Horowitz, Wilner & Alvarez., 1979) is a 5-point Likert type scale that consists of 15 questions. It assesses intrusions and avoidance symptoms over the past seven days as a result of an exposure to a traumatic event. The Cronbach Alpha of IES is .94 (Horowitz et al., 1979). The Cronbach Alpha for intrusion subscale is .78 and .82 for avoidance subscale (Horowitz et al., 1979). Test



re-test reliability was found. 87. The Turkish reliability and validity study of IES-R was made by Güneş in 2001. The Cronbach Alpha was found .77 for the intrusion subscale and .68 for the avoidance subscale.

### **2.2.5. White Bear Suppression Inventory (WBSI)**

WBSI was developed by Wegner and Zanakos (1994). It is a 5-point (1=strongly disagree, 5=totally agree) Likert type self-report scale with 15 items. It aims to evaluate people's inclinations toward thought suppression. The score range of WBSI is from 15 to 75, and higher scores indicate higher tendency for thought suppression. WBSI was adapted to Turkish by Altın and Gençöz (2009). Cronbach Alpha coefficient was found to be .90 and test-retest reliability was .80, (Altın et al. 2009). (WBSI is provided in Appendix I).

### **2.2.6. Trauma Film**

A 10-minute 40-seconds film that contained traumatic event footages was compiled by the researcher. The film was shown on a 17 inch computer screen with headphones, and it consisted of 8 footages of horrific content. Seven of the scenes were taken from videos promoting road safety. The footage showed the aftermath of road traffic accidents including the moment of a car crash, emergency service personnel working to take out the trapped victims, injured victims screaming, dead bodies being moved, and body parts among car wreckage. One scene was taken from videos promoting workplace safety. The scenes also included a brief contextual background to each accident, and the people involved. With respect to the ethical issues of showing a film with traumatic content, the author would like to note that previous studies using similar trauma films (Brewin & Saunders, 2001; Murray,

1997; Holmes, Brewin & Hennesy, 2004., Davies & Clark, 1998) found that no participants reported ongoing distress after the experiment. Furthermore, the film content is similar to those shown in television news coverage of road traffic accidents or programs about police or ambulance service work. All the selected footages were shown on TV during primetime. Participants were informed in the consent form and at the experiment prior to viewing the trauma film. They were also informed that they can terminate the experiment at any point. As mentioned previously, all participants were encouraged to contact the experimenter before the follow up session if they feel distressed.

### **2.2.7 Paired Associates Task**

The task was developed and modified by the researcher in the SuperLab-Pro by utilizing the paired-associates learning procedure that is developed by Rosen and Engle (1998) to investigate the differences in proactive inhibition among participants. This learning procedure was also used by Verwoerd, Wessel, and Jong in 2009. In paired associates task; participants learn two lists - respectively AB and AC lists- containing pairs of cue-target words. The pair words such as *wool – jacket*, *gas- heat*, *donkey-olive* are presented together in the study phase. When presented *wool* participants are required to recall *jacket* accurately and as soon as possible in the test phase. *Wool*, *gas* and *donkey* are referred to as cue words (A), whereas *jacket*, *heat* and *olive* are referred to as target words (B), (C). The first list (AB) is composed of highly associated cue-target word pairs whereas the second list (AC) is composed of weakly associated cue-target word pairs. In each list the cue words are identical but target words are different (i.e. AB pair consisting of highly associated words such as *wool- jacket*, whereas AC list pair *wool-bribe*). Lists are presented in

AB-AC-AB order. Proactive inhibition is measured by the increase in the delay of recall in the AB list when presented after AC list. Only the trials with correct responses were taken into account.

In the present study, two lists of cue-target word pairs were constructed in accordance with the Rosen and Engle (1998). Each list consisted of twelve independent cue words and twelve associate words which were chosen from Turkish category and norms (Peynircioğlu, 1988) as target words for the first list, and second list, respectively. In the first list (AB), cue-target word pairs are strongly associated, while in the second list (AC) the cue words remain the same but this time they are accompanied by a weakly associated target word. The two lists are presented to participants in AB-AC-AB order. (See Appendix J for the AB, and AC lists). Therefore, the participants studied the same 12 cue words in each of the lists with strongly and weakly associated target words. The task consists of 6 phases described below. Each phase starts with an instruction of the tasks.

(1) Practice Phase: The practice phase consisted of a short representative of the real experimental procedure described in following five phases. In the first phase of practice, each word pair in AB Practice List consisting of 3 word pairs appeared in the center of the computer screen for 2 seconds. Participants were instructed to study each word pair during this phase of the practice. In the second phase of the practice, participants were instructed to say out loud the target word accurately and as soon as possible when given its cue word. Each of the three cue words appeared three times in the same sequence on the computer screen for every participant. Subject's vocal response accompanied by a hit to spacebar made the word disappear from the screen. After each vocal response, the cue-target word

pair was presented on the screen for 2 seconds in order to provide feedback and additional study time. In the third phase of the practice, three word pairs in the AC Practice List appeared in the center of the computer screen for 2 seconds in the same sequence for all participants. Before the presentation of each cue-target word pair, a black fixation cross appeared at the center of white screen for 500 milliseconds. Participants were instructed to study each pair of words during this phase. In the fourth phase of the practice, participants were instructed to say out loud the target word when given a cue word accurately, and as soon as possible. Each of the 3 cue words appeared three times in the same sequence on the computer screen for all participants. After a black fixation cross on the white screen was presented in the middle computer screen for 500 milliseconds, a cue word appeared in the same location. In the fifth phase, participants were instructed to say out loud the target word in the AB list when given a cue word accurately, and as soon as possible. Each of the 3 cue words appeared once on the computer screen. The practice phase ended upon the completion of the fifth practice phase.

- (2) AB List Study Phase: Each of the 12 word pairs in AB List appeared in the center of the computer screen for 2 seconds in the same sequence for all participants. Before the presentation of each cue-target word pair, a black fixation cross appeared at the center of white screen for 500 milliseconds. Participants were instructed to study each word pair during this phase.
- (3) AB List Test Phase: Participants were instructed to say out loud the target word accurately and as soon as possible when given its cue word. Each of the 12 cue words appeared three times in the same sequence on the computer screen. After a

black fixation cross appeared at the center of white screen for 500 milliseconds, a cue word appeared in the same location. Subject's vocal response accompanied by a hit to spacebar made the word disappear from the screen. After each vocal response, the cue-target word pair was presented on the screen for 2 seconds in order to provide feedback, and additional study time. The experimenter coded the response of the subject (correct – incorrect) before the feedback is given (the coding sheet is provided in Appendix K). Each 12 cue word is presented 3 times which adds up to 36 trials.

- (4) AC List Study Phase: Each word pair in AC List appeared at the center of the computer screen for 2 seconds in the same sequence. Before the presentation of each cue-target word pair, a black fixation cross appeared on the center of white screen for 500 milliseconds. Participants were instructed to study each pair of words during this phase.
- (5) AC List Test Phase: Participants were instructed to say out loud the target word when given a cue word accurately, and as soon as possible. Each of the 12 cue words appeared three times on the computer screen. After a black fixation cross on the white screen was presented in the middle computer screen for 500 milliseconds, a cue word appeared in the same location. Subject's vocal response accompanied by a hit to spacebar made the word disappear from the screen. After each vocal response, the cue-target word pair was presented on the screen for 2 seconds in order to provide feedback and additional study time. The experimenter coded the response of the subject (correct – incorrect) before the feedback was given (the coding sheet is provided in Appendix K). Each 12 cue word was presented 3 times that led to 36 trials.

(6) AB List Final Test Phase: AB List Test Phase: Participants were instructed to say out loud the target word when given a cue word accurately, and as soon as possible. Each of the 12 cue words appeared three times on the computer screen. After a black fixation cross on the white screen was presented in the middle computer screen for 500 milliseconds, a cue word appeared in the same location. Subject's vocal response accompanied by a hit to spacebar made the word disappear from the screen. The experimenter coded the response of the subject (correct – incorrect) before the feedback was given (the coding sheet is provided in Appendix K). Each 12 cue word was presented 1 time in this phase. Proactive Inhibition Index was calculated by subtracting the reaction times in the last 12 trials of the second phase from the trials in the sixth phase.

### **2.2.8 Stroop Task**

As a measure of response inhibition, a computerized Stroop task was developed in SuperLab-Pro. The original Stroop task was developed in 1935. Participants were required to name the printed color of a word and ignoring the dominant tendency to read the words. The computerized versions of Stroop Task are used to measure response inhibition by Friedman & Miyake (2004) and, Verwoerd et al. (2009). The words “red”, “blue”, “pink”, “black”, “green” were represented in congruent and, incongruent colors in the 17 inch computer screen. Additionally strings of asterisks (\*\*\*\*\*) were also represented in one of the former five colors.

A black fixation point appeared at the center of the 17 inch white computer screen for 500 ms, and then the stimulus was presented to the participants until the participants respond by saying aloud the color of the stimulus. The participants were also instructed to hit the spacebar as they say the color out loud. Hitting the spacebar

determined the reaction time in the Stroop task. After the participant's response, the screen remained white for 1000 milliseconds. Participants were instructed to name the color of the word as soon as possible with accuracy and without being distracted by the tendency to read the words. Following a practice trial to introduce the task to participants, 90 trials divided into three different conditions were presented:

- a) 30 neutral trials – asterisks printed with above mentioned 5 colors
- b) 30 congruent trials – colors of the words are congruent with the color words (i.e. green printed in green)
- c) 30 incongruent trials – colors of the words are incongruent with the color words (i.e. green printed in pink)

The trials were presented in the same sequence, and the participants received 10 practice trials prior to testing. Stroop Effect was calculated by subtracting the reaction time for neutral trials from incongruent trials.

### **2.2.9 Intrusion Diary**

Participants were asked to keep an intrusion diary for the next five days following the exposure to the trauma film, and record the date and time for every spontaneous intrusive thought/image of the trauma film they had, rate how distressing the intrusion was in a 10-point scale, give a description of its content, and indicate whether the intrusion was a thought, image or a combination of the two. (Holmes & Steel., 2004; Laposa, & Alden., 2006). The numbers of distressing intrusions were counted to create an intrusion frequency total score for each of the participants. Additionally, the number of thought intrusions and the number of imagery intrusions are calculated to create indexes of thought intrusion and imagery

intrusion respectively. Lastly, the mean of stress scores are calculated to create an index of distress caused by trauma film. Diary compliance ratings were also received from the participants on a 10-point scale ranging from 1(not at all) to 10 (always), (See Appendix L).

### **2.3. Procedure**

Prior to the study, the researcher applied to Middle East Technical University (METU)'s Human Participants Ethics Committee. Upon the approval of the study by the committee, the study was announced to the freshman students studying at the Department of Psychology at METU. Students were visited during a class hour, and they were informed about the fundamental aims of the study. They were given a sheet demonstrating available lab sessions. They signed in for the experiment using the lab sessions slot sheet, and they were granted extra course credit (1 point) if they showed up for the specified lab session. The experimental procedure took place at the cognitive psychology lab located at the Department of Psychology, first floor.

When participants appeared in the lab, they were given an informed consent form and the experimenter gave a detailed instruction about the course of the experimental procedure. Afterwards, the participants were assessed in terms of previous trauma history and recent mood/anxiety problems. Participants having a trauma or psychopathology history were excluded from the study. They were told that they were free to leave the experiment whenever they wanted. Prior to the experimental procedure, each subject was asked to fill in a demographic questions sheet, the Trait Anxiety Inventory, the State Anxiety Inventory, the Positive and Negative Affects Scale and the White Bear Suppression Inventory. The order of



questionnaires was counterbalanced among participants. Following the completion of the first part of the procedure, the participants were presented the Stroop task and Proactive Inhibition task. The order of Stroop task and Proactive Inhibition task was counterbalanced in the sample. Upon the completion of the two tasks, the participants were presented the 10-minute 40-second trauma film in a 17 inch monitor with headphones. They were instructed to watch the film attentively. As soon as the participant finished watching the trauma film s/he was asked to fill in PANAS, and STAI-S once again. The delivery order of PANAS and STAI-S was counterbalanced. Afterwards, the participant was introduced the intrusion diary and given an appointment for 7 days later. Participants were instructed to call the experimenter in case they feel extreme distress due to the content of the film. When participants arrived at the laboratory 7 days later, PANAS and STAI-S was filled in once again. After collecting PANAS and STAI-S, IES was given and the intrusion diaries were collected. Participants were asked to rate their compliance to the intrusion diary in a 10-point scale. Upon the completion of all tasks of the experimental procedure, the participants were debriefed. Please check Table 2.1 for the flow of process in the present research.

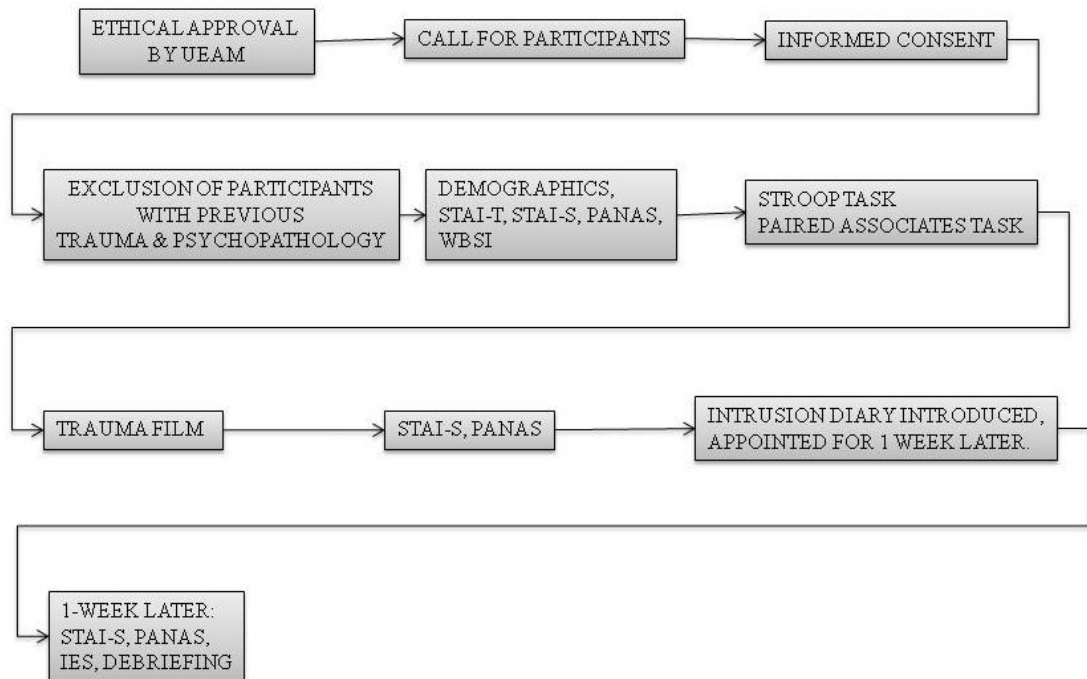


Figure 2. Flow of Process

#### 2.4. Data Screening

Data screening was conducted prior to statistical analyses. The data set was evaluated in terms of outliers, missing values and homogeneity of variance (Tabachnick & Fidell., 2007). For proactive interference task and Stroop task, any reaction time greater than 2.5 standard deviations from the mean score were replaced with the value corresponding with a value of exactly 2.5 standard deviations above or below the mean (Verwoerd et al., 2009). For the rest of the scales, raw scores corresponding to  $z$  scores greater than  $\pm 3.29$  were considered as univariate outliers and mean substitution was applied for the univariate outliers. (Tabachnick et al., 2007). The missing values were replaced with mean substitution method, as they were less than 5% (Tabachnick et al., 2007). Levene test indicated homogeneity of variance assumption was met for every variable in the study. Skeweness and kurtosis

values for each variable were within +/- 1 range. Therefore, the dataset was found to be satisfactory for conducting parametric tests. Univariate Analysis of Variance was conducted with 38 subjects for hypothesis testing.

## **CHAPTER III**

### **RESULTS**

#### **3.1. Statistical Analysis**

In this section, the results of the study will be given in five parts. Descriptive properties of the data, Pearson moment-product correlations between variables, manipulation check for the trauma film (i.e. whether viewing the trauma film induced stress), validity of measurements, and lastly analysis of variance testing for the hypotheses of the study will be given. Median split method was used in order to convert continuous variables into categorical variables when required. The interpretation of the results will be provided in Chapter IV.

#### **3.2. Descriptive Statistics for the Main Measurements**

The descriptive properties of intrusive material following viewing the trauma film are as follows: Within 5 days after the subjects were shown the trauma film the mean number of total intrusions was 3.15 (SD=2.37) ranging from 0 to 9. Mean number of imagery intrusions was 2.18 (SD=1.98) ranging from 0 to 7 whereas mean number of thought intrusions were 1.37 (SD=1.68) ranging from 0 to 7. In a 10-point scale, the mean value for stress caused by the intrusions was 2.57 (SD=1.54) and diary compliance rating was 7.76 (SD=1.3). Table 3.1 provides further descriptive properties of the intrusions. Additionally, in order to provide general information

about the other variables used in the study, central tendency and dispersion scores were calculated and presented in Table 3.2.

Table 3.1 Intrusion Characteristics Following the Exposure to the Trauma Film

	Number of Intrusions	Number of Imagery Intrusions	Number of Thought Intrusions	Stress caused by Intrusions	Diary Compliance Rating
Mean	3.15	2.18	1.36	2.57	7.76
Median	3	2	1.00	2.58	7.50
Mode	3	.00	.00	2.00	7
Std. Deviation	2.37	1.98	1.68	1.54	1.30
Variance	5.65	3.93	2.83	2.39	1.69
Minimum	.00	.00	.00	.00	6.00
Maximum	9	7	7	6.83	10

### 3.3. Descriptive Statistics for other Variables in the Study

Table 3.2 Descriptive Properties of Measurements

	Stroop Effect	Proactive Inhibition	* STAI-S	** STAI-S	*** STAI-S	STAI-T	IES IES	IES Avoid	IES Intrusion	WBSI
Mean	92.07	922.6	43.02	58.72	45.90	50.57	7.63	3.05	3.34	49.71
Median	82.17	648.41	41	58	45.90	49	7	3	2.5	49
Mode	-1.05	121	41	54	45	45	4	0	2	39
Std. Dev.	56.47	686.16	5.03	8.8	11.69	7.56	5.32	2.52	2.28	9.06
Variance	3189.53	470825	25.38	77.44	136.88	57.27	28.4	6.37	5.2	82.21
Skewness	.33	.36	.67	.23	-.55	.34	.63	.59	.46	.11
Kurtosis	-.25	.75	-.21	-.59	3.45	-.76	-.3	-.41	-.74	-.85
Minimum	-1.05	121	35	43	8	38	0	0	0	33
Maximum	235.62	2583.33	55	78	77	65	21	9	8	66
Cronbach Alpha	.98	.88	.80	.92	.91	.87	.79	.56	.60	.84

\* Pre-Test

\*\* Post-Test

\*\*\* Follow-up

Table 3.2 (continued) Descriptive Properties of Measurements

	PAS *	PAS**	PAS***	NAS*	NAS**	NAS***
Mean	29.71	26.07	26.19	18.73	21.86	17.27
Median	31.5	24	27	18.5	20	16
Mode	24	23	27	18	17	11
Std. Dev.	5.62	6.49	6.19	5.18	6.95	5.41
Variance	31.67	42.18	38.39	26.848	48.33	29.29
Skewness	-.5	.17	.04	.32	.7	.93
Kurtosis	-.86	-.83	-.34	-.80	-.13	.45
Minimum	17	14	14	11	11	10
Maximum	38	38	38	29	39	32
Cronbach Alpha	.79	.80	.84	.75	.87	.85

\* Pre-Test

\*\* Post-Test

\*\*\* Follow-up

Positive Affect Schedule (PAS)

Negative Affect Schedule (NAS)

### **3.4. Pearson Product-Moment Correlation Coefficients among the Variables**

Table 3.3 shows the Pearson Product-Moment Correlation Coefficients among the variables of the present study. It is observed that the number of intrusions experienced the week following the trauma film is positively correlated with the level of stress experienced due to traumatic intrusions ( $r = .42, p < .01$ ). It is also shown that the number of imagery intrusions is positively correlated with the level of stress experienced due to traumatic intrusions ( $r = .50, p < .01$ ), whereas thought intrusions were not correlated with the level of stress experienced due to trauma intrusions. Therefore, compared to thought intrusions; imagery intrusions are more correlated to psychological distress in the sample. Additionally, the number of thought intrusions was positively correlated with the perceived impact of the trauma film measured by Impact of Events Scale ( $r = .36, p < .05$ )

It is found that; the tendency to suppress thoughts (WBSI) is positively correlated with the level of stress following the trauma film exposure ( $r = .32, p < .05$ ). The more subjects tended to suppress thoughts, the more they are reported to be stressed following the trauma film exposure. The tendency to suppress thoughts was negatively correlated with trait anxiety scale ( $r = -.53, p < .01$ ).

Lastly, the tendency to suppress thoughts (WBSI) was positively correlated with Proactive Inhibition Index ( $r = .35, p < .05$ ). Table 3.3 presents all Pearson product moment correlations between variables of the present study.



Table 3.3 Pearson Product-Moment Correlations

	1	2	3	4	5	6	7	8
1. Gender								
2. Age	-.491(**)							
3. Number of Intrusions	-0.007	-.400(*)						
4. Number of Imagery Intrusions	-0.162	-0.205	.761(**)					
5. Number of Thought Intrusions	0.18	-.330(*)	.667(**)	0.092				
6. Stress caused by Intrusions	-.435(**)	0.201	.424(**)	.504(**)	0.161			
7. Diary Compliance Rating	-0.011	0.074	-0.11	-0.202	0.065	-0.172		
8. Pre PANAS Positive	-0.301	0.172	0.07	-0.164	0.228	0.306	0.167	
9. Pre PANAS Negative	-.355(*)	0.078	0.074	-0.003	0.086	0.19	-0.005	0.073
10. Post PANAS Positive	-0.141	-0.011	-0.038	-0.173	0.007	-0.095	0.261	.697(**)
11. Post PANAS Negative	-.393(*)	0.279	0.09	0.162	0.106	.459(**)	-0.015	0.229

\*Correlation is significant at .05 level (two-tailed), \*\*Correlation is significant at .01 level (two-tailed)

Table 3.3 (continued) Pearson Product-Moment Correlations

	1	2	3	4	5	6	7	8
12. Follow-up PANAS Positive	-0.224	0.187	0.146	-0.061	0.241	0.247	0.234	.798(**)
13. Follow-up PANAS Negative	0.006	-0.084	0.21	-0.032	0.328	0.296	0.132	0.298
14. STAIT	-0.095	0.096	-0.173	-0.198	-0.125	0.08	-0.273	-0.137
15. Pre STAI-S	-.342(*)	-0.002	0.182	0.264	-0.141	0.241	-0.201	-0.16
16. Post STAI-S	0.089	0.035	-0.003	0.105	-0.011	0.186	-0.071	-0.172
17. Follow-up STAI-S	0.011	0.053	-0.118	0.006	-0.255	0.105	-0.258	-0.177
18. WBSI	-0.291	0.176	0.008	-0.013	0.03	.323(*)	-0.095	0.05
19. IES	0.062	-0.048	0.199	-0.034	.359(*)	0.303	-0.122	.420(**)
20. IES Intrusion Subscale	0.128	-0.126	0.204	-0.068	.389(*)	0.142	-0.017	.437(**)
21. IES Avoidance Subscale	-0.023	0.079	0.134	-0.083	0.301	.331(*)	-0.152	.376(*)
22. Stroop Effect	0.134	-0.003	0.208	0.172	0.19	0.144	0.096	-0.158
23. Proactive Inhibition	-0.05	0.207	-0.027	-0.035	-0.032	0.205	-0.004	-0.108

\*Correlation is significant at .05 level (two-tailed), \*\*Correlation is significant at .01 level (two-tailed)

Table 3.3 (continued) Pearson Product-Moment Correlations

	9	10	11	12	13	14	15	16
1. Gender	-.355(*)	-0.141	-.393(*)	-0.224	0.006	-0.095	-.342(*)	0.089
2. Age	0.078	-0.011	0.279	0.187	-0.084	0.096	-0.002	0.035
3. Number of Intrusions	0.074	-0.038	0.09	0.146	0.21	-0.173	0.182	-0.003
4. Number of Imagery Intrusions	-0.003	-0.173	0.162	-0.061	-0.032	-0.198	0.264	0.105
5. Number of Thought Intrusions	0.086	0.007	0.106	0.241	0.328	-0.125	-0.141	-0.011
6. Stress caused by Intrusions	0.19	-0.095	.459(**)	0.247	0.296	0.08	0.241	0.186
7. Diary Compliance Rating	-0.005	0.261	-0.015	0.234	0.132	-0.273	-0.201	-0.071
8. Pre PANAS Positive	0.073	.697(**)	0.229	.798(**)	0.298	-0.137	-0.16	-0.172
9. Pre PANAS Negative								
10. Post PANAS Positive	0.138							
11. Post PANAS Negative	.433(**)	-0.069						

\*Correlation is significant at .05 level (two-tailed), \*\*Correlation is significant at .01 level (two-tailed)

Table 3.3 (continued) Pearson Product-Moment Correlations

	9	10	11	12	13	14	15	16
12. Follow-up PANAS Positive	-0.042	.468(**)	0.031					
13. Follow-up PANAS Negative	.370(*)	0.148	.412(*)	0.064				
14. STAIT	.364(*)	-0.086	0.146	-0.193	0.16			
15. Pre STAI-S	.461(**)	-0.031	0.161	-0.223	0.133	0.281		
16. Post STAI-S	0.012	-.436(**)	.573(**)	-0.245	0.23	0.269	0.071	
17. Follow-up STAI-S	0.186	-0.026	0.073	-0.283	0.325	.385(*)	.333(*)	0.122
18. WBSI	.373(*)	-0.086	.425(**)	-0.017	.364(*)	.526(**)	0.244	.376(*)
19. IES	0.024	0.052	0.298	0.23	.633(**)	-0.026	-0.134	0.161
20. IES Intrusion Subscale	0.006	0.179	0.201	0.217	.611(**)	-0.153	-0.201	-0.013
21. IES Avoidance Subscale	0.119	0.049	0.265	0.222	.537(**)	0.104	0.008	0.136
22. Stroop Effect	-0.17	-0.104	-0.049	-0.104	0.194	-0.127	-0.001	0.201
23. Proactive Inhibition	.357(*)	0.016	-0.016	-0.054	0.259	0.292	0.26	-0.001

\*Correlation is significant at .05 level (two-tailed), \*\*Correlation is significant at .01 level (two-tailed)

Table 3.3 (continued) Pearson Product-Moment Correlations

	17	18	19	20	21	22	23
1. Gender	0.011	-0.291	0.062	0.128	-0.023	0.134	-0.05
2. Age	0.053	0.176	-0.048	-0.126	0.079	-0.003	0.207
3. Number of Intrusions	-0.118	0.008	0.199	0.204	0.134	0.208	-0.027
4. Number of Imagery Intrusions	0.006	-0.013	-0.034	-0.068	-0.083	0.172	-0.035
5. Number of Thought Intrusions	-0.255	0.03	.359(*)	.389(*)	0.301	0.19	-0.032
6. Stress caused by Intrusions	0.105	.323(*)	0.303	0.142	.331(*)	0.144	0.205
7. Diary Compliance Rating	-0.258	-0.095	-0.122	-0.017	-0.152	0.096	-0.004
8. Pre PANAS Positive	-0.177	0.05	.420(**)	.437(**)	.376(*)	-0.158	-0.108
9. Pre PANAS Negative	0.186	.373(*)	0.024	0.006	0.119	-0.17	.357(*)
10. Post PANAS Positive	-0.026	-0.086	0.052	0.179	0.049	-0.104	0.016
11. Post PANAS Negative	0.073	.425(**)	0.298	0.201	0.265	-0.049	-0.016

\*Correlation is significant at .05 level (two-tailed), \*\*Correlation is significant at .01 level (two-tailed)

Table 3.3 (continued) Pearson Product-Moment Correlations

	17	18	19	20	21	22	23
12. Follow-up PANAS Positive	-0.283	-0.017	0.23	0.217	0.222	-0.104	-0.054
13. Follow-up PANAS Negative	0.325	.364(*)	.633(**)	.611(**)	.537(**)	0.194	0.259
14. STAIT	.385(*)	.526(**)	-0.026	-0.153	0.104	-0.127	0.292
15. Pre STAI-S	.333(*)	0.244	-0.134	-0.201	0.008	-0.001	0.26
16. Post STAI-S	0.122	.376(*)	0.161	-0.013	0.136	0.201	-0.001
17. Follow-up STAI-S							
18. WBSI	0.236						
19. IES	0.046	0.308					
20. IES Intrusion Subscale	0.02	0.036	.840(**)				
21. IES Avoidance Subscale	0.115	.361(*)	.931(**)	.663(**)			
22. Stroop Effect	0.261	0.108	0.122	-0.061	0.164		
23. Proactive Inhibition	0.13	.352(*)	-0.062	-0.097	0.03	0.052	

\*Correlation is significant at .05 level (two-tailed), \*\*Correlation is significant at .01 level (two-tailed)

### **3.5. Impact of the film: Manipulation Check**

The trauma film shown to the participants was assumed to induce negative affect and anxiety. In order to test this assumption PANAS and STAI-S were given to subjects before and after exposure to the trauma film. Paired Samples t-test results revealed a significant increase in state anxiety and negative affect whereas a significant decrease in positive affect after being exposed to the trauma film. According to the paired samples t-test results, there was a significant increase in the negative mood between pre film assessment (M=18.73, SD= 5.18) and post film assessment (M=21.86, SD=6.95) conditions;  $t(37)=-2.91, p<.05$ . Additionally, there was a significant decrease in the positive mood between pre-film assessment (M=29.71, SD=5.62) and post film assessment (M=26.07, SD=6.49) conditions;  $t(37)= 4.67, p<.001$ . Similarly, there was a significant increase in the state anxiety between pre-film assessment (M=43.02, SD=4.51) and post-film assessment (M=58.72, SD=7.89) conditions;  $t(37)=-9.85, p<.000$ . Therefore, the trauma film indeed had the intended effect and increased anxiety and negative affect whereas decreased positive affect.

### **3.6. Potential Relationships between Independent Variables & Validation of Independent Variables**

In order to identify potential relationships between the independent variables of the study, a series of ANOVAs were conducted. A one-way between subjects ANOVA was carried out to compare the effect of proactive inhibition capacity on the tendency to suppress thoughts measured by WBSI. A significant effect of proactive inhibition on the tendency to suppress thoughts was found [ $F(1,36)=4.83, p<.05$ ],  $\eta^2$

= .11. The significant effect of proactive inhibition capacity on the tendency to suppress thoughts indicates that when the ability to suppress thoughts increases the tendency to suppress thoughts also increase. Participants in low proactive inhibition group (M=46.63, SD=7.14) had higher tendency to suppress thoughts than participants in high proactive inhibition group (M=52.78, SD=9.89). Additionally, a significant effect of proactive inhibition was found on trait anxiety [ $F(1,36)=7.16$ ,  $p<.05$ ],  $\eta^2=.16$ . Participants in low proactive inhibition group (M=47.63, SD=5.64) scored lower on trait anxiety than participants in high proactive inhibition group (M=53.52, SD=8.21).

The computerized Stroop task utilized in the present study showed similar properties to Stroop tasks used in several other studies as a measure of response inhibition (Friedman & Miyake, 2004., MacLeod, 2005., Verwoerd et al., 2009). Several researchers calculated Stroop Effect by subtracting the reaction times for incongruent items from congruent items whereas others calculated Stroop Effect by subtracting reaction times for neutral items from incongruent items. The Stroop Effect is calculated by subtracting reaction times for neutral items from incongruent items in the present study. The mean Stroop Effect was found to be 92.07 (SD=56.47) milliseconds. The distribution of scores was normal with slight positive skewness (.33) and kurtosis (-.25) which did not exceed the +/-1.00 threshold. Internal consistency for the computerized Stroop task is found to be very high (Cronbach Alpha= .98). However, Stroop Effect did not reveal any significant relationship with any of the variables used in the study. A one-way between subjects ANOVA was carried out to compare the effect of proactive inhibition on response inhibition measured by Stroop task in low and high proactive inhibition groups.



There was no significant effect of proactive inhibition on response inhibition [ $F(1,36)=.34, p>.05$ ]. Additionally, a one-way between subjects ANOVA was carried out to compare the effect of response inhibition on the tendency to suppress thoughts measured by WBSI with low and high response inhibition groups. There was no significant effect of response inhibition on WBSI scores [ $F(1,36)= 2.91, p>.05$ ].

### **3.7. Analysis of Variance for Main Hypotheses**

Median split method was used in order to convert continuous variables into categorical variables when required.

#### **3.7.1 The Effect of Response Inhibition (Stroop Effect) on Intrusion Properties**

A one-way between subjects ANOVA was carried out to compare the effect of response inhibition on intrusive memories after being exposed to trauma film in low and high response inhibition groups. There was no significant effect of response inhibition on the total frequency of intrusive memories [ $F(1,36)=1.19, p>.05$ ], imagery intrusions [ $F(1,36)=.53, p>.05$ ], thought intrusions [ $F(1,36)=.92, p>.05$ ], on the level of stress due to intrusions after film exposure [ $F(1,36)=1.86, p>.05$ ] and impact of the trauma film measured by IES [ $F(1,36)=.23, p>.05$ ].

#### **3.7.2 The effect of Proactive Inhibition on Intrusion Properties**

One-way between subjects ANOVAs were carried out to compare the effect of proactive inhibition on intrusive memories after being exposed to trauma film in low and high proactive inhibition groups. There was no significant effect of proactive inhibition on the total frequency of intrusive memories [ $F(1,36)=.02, p>.05$ ]; on the frequency of imagery intrusions [ $F(1,36)=.00, p>.05$ ]; on the frequency of thought

intrusions [ $F(1,36)=.00, p>.05$ ]; on the impact of the trauma film [ $F(1,36)=.06, p>.05$ ] and on the level of stress due to intrusions after film exposure [ $F(1,36)=.60, p>.05$ ].

### **3.7.3. The effect of Tendency to Suppress Thoughts (WBSI) on Intrusion**

#### **Properties**

One way between subjects ANOVAs were carried out to compare the effect of tendency to suppress thoughts on intrusion properties in low and high tendency groups. No significant effect of tendency to suppress thoughts on the total frequency of intrusions [ $F(1,36)=.06, p>.05$ ], on the frequency of imagery intrusions [ $F(1,36)=.14, p>.05$ ], on the frequency of thought intrusions [ $F(1,36)=.09, p>.05$ ], on the impact of the film [ $F(1,36)=2.33, p>.05$ ], and on the level of stress due to intrusions was found [ $F(1,36)=1.22, p>.05$ ]. However, a significant effect of tendency to suppress thoughts on trait anxiety was found [ $F(1,36)=8.99, p<.005$ ],  $\eta^2=.200$ . Participants in low tendency to suppress thoughts group ( $M=3.07, SD=.34$ ) scored lower on trait anxiety than participants in high tendency to suppress thoughts ( $M=2.70, SD=.40$ ). Please note that lower scores on trait anxiety scale refer to higher trait anxiety.

### **3.7.4. The effect of Avoidance on Intrusion Properties**

One-way between subjects ANOVAs were conducted to compare the effect of avoidance subscale of the impact of events scale on intrusion properties in low and high avoidance groups. A significant effect of avoidance on the level of stress due to intrusions was observed [ $F(1,36)=5.38, p<.05$ ],  $\eta^2 = .130$ . Participants on low avoidance group ( $M=2.10, SD=1.18$ ) scored higher on the level of stress due to intrusions than participants on high avoidance group ( $M=3.22, SD=1.78$ ).

Additionally, a significant effect of avoidance on tendency to suppress thoughts was observed [ $F(1,36)=7.74, p<.05$ ],  $\eta^2= .119$ . Participants in low avoidance group ( $M=46.5, SD=7.13$ ) scored higher on the tendency to suppress thoughts ( $M=54.12, SD=9.77$ ). No significant effect of avoidance on the total frequency of intrusions [ $F(1,36)=5.38, p<.05$ ]; frequency of imagery intrusions [ $F(1,36)=5.38, p<.05$ ]; frequency of thought intrusions [ $F(1,36)=5.38, p<.05$ ] was found.

### **3.7.5. The effect of Intrusion Scores of IES on Intrusion Properties**

One-way between subjects ANOVAs were conducted to compare the effect of intrusion subscale of the impact of events scale on intrusion properties in low and high intrusion groups. No significant effect of intrusion subscale on the total frequency of intrusions [ $F(1,36)=5.38, p<.05$ ]; frequency of imagery intrusions [ $F(1,36)=5.38, p<.05$ ]; frequency of thought intrusions [ $F(1,36)=5.38, p<.05$ ], level of stress experienced due to intrusions was found.

### **3.7.6. Effect of Number of Intrusions Experienced on the Level of Stress**

One-way between subjects ANOVA was conducted to compare the effect of number of intrusions on how distressing the intrusions was. A significant effect of number of intrusions experienced on the level of stress due to intrusions was observed [ $F(1,36)=4.62, p<.05$ ],  $\eta^2= .119$ . Participants in low intrusion quantity group ( $M=2.13, SD=1.55$ ) had lower stress scores than the participants in high intrusion quantity group ( $M=3.17, SD=1.36$ ).

## **CHAPTER IV**

### **DISCUSSION**

The present study aims to investigate the cognitive factors that contribute to development and maintenance of trauma intrusions within trauma film paradigm framework. The trauma film used in the present study led to desired effect by inducing negative mood and distress. As a result, intrusive memories about the content of the trauma film could be observed. Brewin et al. (2001), Halligan et al. (2002), Laposa et al. (2006) have also shown that trauma films can induce analogue PTSD symptoms such as intrusions, fear, avoidance and arousal. However, the debate about the effects of trauma film on developing traumatic stress symptoms continues (Pfefferbaum, Pfefferbaum, North, & Neas, 2002). Exposing participants to trauma films should also be ethically considered and the level to which a trauma film could induce trauma symptoms should be discussed. Several precautions are taken in the present study such as not including participants with mental health difficulties and previous trauma history, providing detailed information about the content of the film before showing it and letting extremely overwhelmed participants leave the session whenever they wanted. Additionally, researchers contact details such as mobile phone number and e-mail address were also provided in case of any concerns regarding to prolonged stress due to trauma film exposure. None of the participants contacted the researcher due to prolonged stress following weeks after

film exposure. Therefore, it is thought that the film had no permanent effects on the participants.

In the present study, participants' proactive inhibition capacity, response inhibition capacity, and tendency to suppress thoughts were investigated. Empirical findings of the present study will be discussed in the light of relevant literature in this section.

#### **4.1. Evaluation of the Main Hypotheses**

In the present study, contrary to predictions no significant difference was found between high and low response inhibition groups on the frequency and intensity of intrusions. Additionally, no significant difference was found between high and low proactive inhibition groups on the frequency and intensity of trauma intrusions. Lastly, tendency to suppress thoughts did not reveal any significant difference on the frequency and intensity of trauma intrusions.

Previous studies have shown that low cognitive control is related to high frequency and intensity of trauma intrusions (Verwoerd et al., 2009, Brewin et al., 2002). Interestingly, none of the variables measuring inhibitory capacity and thought suppression tendency was found related to the frequency and intensity of trauma film related intrusions in the present study. As mentioned in the results section; stroop task, paired associates task and WBSI showed great reliability and validity in the present study. Therefore, it is assumed that the intrusion diary method might not be sufficient to measure the trauma film related intrusions in the present study.

#### **4.2. Strengths of the Study**

The study was conducted in a non-clinical sample in a prospective design. Most of the research investigating psychological trauma relies on retrospective data collected from participants experiencing traumatic stress. Laposka et al (2008), Candel et al. (2004) and Holmes et al. (2008) highlights shortcomings of relying on retrospective data while investigating pre-trauma and peri-trauma variables. Participants inability to give correct information about pre-trauma and peri-trauma phases is a limitation. Especially if pre-trauma cognitive functions are being investigated in retrospective designs, participants' reports cannot be relied on. Therefore, it is best to measure cognitive variables before the traumatic event. This is the unique function of research utilizing the trauma film paradigm. Therefore, in the present study inhibitory capacities were measured prior to exposure to trauma film.

#### **4.3. Limitations of the Study**

Conducting research in lab settings is renowned for providing high experimental control; correspondingly it was observed by the researcher that the data collected in lab settings provided high reliability and validity properties. However, intrusion diaries which were introduced after the first lab session were filled in by participants after exposure to the trauma film in their daily settings. Therefore, poor control over the quality of data collected with intrusion diaries was achieved. It is observed that, the intrusion diary -which is the major instrument to measure trauma film related intrusions in the present study- was not filled in properly by most of the participants. The intrusion diaries collected from the participants were lacking convenient information such as the frequency and intensity of trauma intrusions.

Despite instructions to fill in the diary was provided both verbally and written forms, it was observed that participants did not fill in the diaries in accordance with the instructions.

Secondly, despite the fact that the participants' mother tongue was Turkish; the trauma film shown to the participants was in English. Even though, participants of the study speak English as a second language, being exposed to a movie in a language other than the mother tongue might have extraneous effects such as misunderstanding and not being able to comprehend the content of the trauma film fully. Therefore, the desired effect of the trauma film might be confounded.

Thirdly, the data collection period was limited to two weeks. Total lab hours required for one participant was 2 hours. Therefore, the study is conducted with a limited number of participants. The data collected in the present study is not feasible to conduct regression analysis because of the limited number of participants.

Additionally, the paired associates learning procedure utilized in this study have shortcomings. In the original Rosen et al. (1998) paired associates task, a modified drop out method was used while testing the AB list for the first time. After presenting each of the 12 cue words 2 times, only the cue words which were still not correctly matched with the target word by the participant were presented again. Therefore, each of the participants learned the whole AB list in the original Rosen et al. study (1998). However, the stimulus presentation software used in the present study- SuperLab- did not have the utilities to use the modified dropout method. Therefore, while testing the AB list for the first time, each of the cue words was presented three times to make sure that, participants learned each of the pairs.

However, a small number of participants could not learn the AB word pairs after 3 presentations. The reaction times for the unlearned items were omitted from the statistical analysis for this reason.

Lastly, all the trials in the stroop task and paired associates task was given in the same sequence due to limitations in the stimulus presentation software utilized in the present study. As a result, sequence effect could not be eliminated.

#### **4.5. Directions for Future Research**

The trauma film paradigm is a convenient and useful methodology investigating the cognitive factors related to traumatic stress symptoms. However, the intrusion diary is not found sufficient in reporting trauma film related intrusions in the present study. Therefore, instruments to measure trauma film related intrusions should be developed and improved. Participants of such studies might be contacted on a daily basis after exposure to trauma film to gather better measurements of intrusion frequency and intensity.

Investigating the effect of inhibitory mechanisms, working memory and intelligence on the levels of traumatic stress will be very beneficial in understanding the cognitive risk factors. Despite the high number of research on the risk factors for traumatic stress, studies focusing on cognitive vulnerabilities and risk factors are lacking. Utilizing prospective methods will provide a framework in studying traumatic stress. Additionally, individuals who are under risk of experiencing traumatic events such as soldiers, policemen, firemen and emergency service personnel can be monitored prior to their exposure to trauma to study cognitive factors in a prospective design without utilizing the trauma film paradigm.



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## APPENDICES

### APPENDIX A – INFORMED CONSENT FORM

#### Gönüllü Katılım Formu

##### Değerli Katılımcı

Bu çalışma, ODTÜ Psikoloji Bölümü Yüksek Lisans Programı Öğrencisi Orhan Ferhat Yazar tarafından Prof. Dr. Nuray Karancı ve Yard. Doç Dr. Mine Mısırlısoy danışmanlığında, olumsuz yaşam olaylarının bireylerde yarattığı psikolojik zorlukların bilişsel değişkenlerle ilişkisini incelemek amacıyla yapılmaktadır. Kişilerin yaşadıkları olaylara ilişkin algı ve deneyimleri değişiklik göstermektedir. Bu sebeple doldurduğunuz anketlerin doğru ya da yanlış cevapları yoktur. Bu çalışma kapsamında vereceğiniz tüm bilgiler tamamen gizli kalacaktır. Çalışmanın hiçbir bölümünde isminiz veya kimliğinizi ortaya çıkaran herhangi bir soru sorulmamaktadır. Çalışmanın objektif olması ve elde edilecek sonuçların güvenilirliği bakımından anket uygulamalarında içtenlikle duygu ve düşüncelerinizi yansıtacak şekilde yanıtlar vermeniz, deney uygulamalarında en iyi performansınızı sergilemeye çabalamanız önem kazanmaktadır. Çalışmamıza katılımınız tamamen gönüllülük temeline dayanmaktadır. Cevaplarınız tamamıyla gizli tutulacak ve sadece araştırmacılar tarafından değerlendirilecektir; elde edilecek bilgiler bilimsel yayımlarda kullanılacaktır.

Bu çalışmaya katılımınız anket soruları yanıtlamayı, 12.5 dakikalık bir video klip seyretmeyi ve bilgisayar ortamında bazı testlere tabi tutulmayı gerektirmektedir. Deneye katılımınız iki seanstan oluşacak ve ilk seans 30 dakika ikinci seans 10 dakika sürecektir.

Deney öncesinde sorulan sorulardan, izleyeceğiniz film içeriğinden ya da herhangi başka bir nedenden ötürü kendinizi rahatsız hissederseniz katılımınızı sonlandırmakta serbestsiniz. Böyle bir durumda, deney yürütücüsüne katılımınızı sonlandırmak istediğinizi söylemeniz yeterli olacaktır. Çalışma sonunda, bu çalışmayla ilgili sorularınız cevaplanacaktır. Değerli katılımınız için çok teşekkürler.

Çalışma hakkında daha fazla bilgi almak için ODTÜ Psikoloji Bölümü Yüksek Lisans öğrencisi Orhan Ferhat Yazar (Tel: 0 506 596 5251; E-posta: [e137246@metu.edu.tr](mailto:e137246@metu.edu.tr)) ile iletişim kurabilirsiniz.

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

İsim Soyad

Tarih

İmza

Alınan Ders

## APPENDIX B – DEBRIEFING FORM

### KATILIM SONRASI BİLGİ FORMU

Değerli Katılımcı,

Bu çalışma, ODTÜ Psikoloji Bölümü Yüksek Lisans Programı Öğrencisi Orhan Ferhat Yarar tarafından Prof. Dr. Nuray Karancı ve Yard. Doç. Dr. Mine Mısırlısoy danışmanlığında, olumsuz yaşam olaylarının bireylerde yarattığı psikolojik zorlukların bilişsel değişkenlerle ilişkisini incelemek amacıyla yapılmaktadır.

Araştırma bulguları göstermektedir ki, toplumdaki bireylerin büyük bir kısmı hayatları boyunca en az bir travmatik olay yaşamaktadırlar. Bernat, Ronfeld, Calhoun ve Arias (1998) tarafından 900 üniversite öğrencisiyle yapılan çalışmada katılımcıların %67'si en az bir travmatik olay yaşadıklarını belirtmişlerdir. Fakat travmatik olay yaşayan her kişi travmatik belirtiler göstermemektedir. Travmatik olayların ertesinde yaşanan psikolojik zorlukların niteliğini travmatik olay öncesi ve esnasındaki bilişsel süreçlerin etkilediğine dair bulgular vardır. Bu açıdan bakıldığında Travma Sonrası Stres Bozukluğu'nu (TSSB) anlamada kişiler arası bilişsel işleme farklılıklarını anlamak önem kazanmaktadır. Travmatik olay sonrası yaşanan psikolojik zorluklardan önemli bir kısmına olaya ilişkin girici nitelikteki anıların katkı sağladığı düşünülmektedir. Holmes ve Bourne (2007) aşırı duygu yüklü girici anıların travma sonrası stres bozukluğunun önemli bir özelliği olduğunu vurgulamışlardır. Girici anıların temel özelliği farkında ve istekli olarak geri çağırılmadan, ortamda bulunan çeşitli ipuçları tarafından ya da içsel süreçlerden uyarılarak istem dışı olarak ortaya çıkmalarıdır. Girici anılar duyumsal imgeler olarak ortaya çıkabileceği gibi sözel düşünceler olarak da ortaya çıkabilmektedir. (Holmes et al. 2007). Yapılan çalışmada bireylerin travmatik olay öncesi bilişsel kapasitelerinin, genel kaygı ve duygu durumlarının travma sonrası girici anı şiddeti ve sıklığını ne ölçüde etkilediği incelenmektedir. Önerilen araştırma neticesinde elde edilen bulgular, girici anılara etki edebilecek travmatik olay öncesi ve esnasındaki bilişsel süreçlerle ilgili fikir sahibi olunmasını sağlayacaktır. Önerilen araştırmanın önemli bir katkısı, prospektif deseni sayesinde travmatik olay öncesi ölçüm almayı mümkün kılmaktır. Katıldığınız çalışmadan alınacak veriler, araştırmacı tarafından yüksek lisans tezi için kullanılacaktır. Çalışmanın sonuçlarını öğrenmek ya da daha fazla bilgi sahibi olmak için Orhan Ferhat Yarar ( Tel: 0 506 596 5251, e-posta: [e137246@metu.edu.tr](mailto:e137246@metu.edu.tr)) ile iletişime geçebilirsiniz. Araştırmaya katıldığınız için çok teşekkür ederiz.

## APPENDIX C – DEMOGRAPHIC QUESTIONS AND TRAUMA CHECKLIST

Yaşınız:

Cinsiyetiniz:

Bölümünüz:

Sınıfınız:

Aldığınız Ders:

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

## APPENDIX D – STATE ANXIETY INVENTORY

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

	Hiç	Biraz	Çok	Tamamiyle
1. Şu anda sakinim.	1	2	3	4
2. Kendimi emniyette hissediyorum.	1	2	3	4
3. Şu anda sınırlarım gergin.	1	2	3	4
4. Pişmanlık duygusu içindeyim.	1	2	3	4
5. Şu anda huzur içindeyim.	1	2	3	4
6. Şu anda hiç keyfim yok.	1	2	3	4
7. Başıma geleceklerden endişe ediyorum.	1	2	3	4
8. Kendimi dinlenmiş hissediyorum.	1	2	3	4
9. Şu anda kaygılıyım.	1	2	3	4
10. Kendimi rahat hissediyorum.	1	2	3	4
11. Kendime güvenim var.	1	2	3	4
12. Şu anda asabım bozuk.	1	2	3	4
13. Çok sinirliyim.	1	2	3	4
14. Sınırlarımın çok gergin olduğunu hissediyorum.	1	2	3	4
15. Kendimi rahatlamış hissediyorum.	1	2	3	4
16. Şu anda halimden memnunum.	1	2	3	4
17. Şu anda endişeliyim.	1	2	3	4
18. Heyecandan kendimi şaşkına dönmüş hissediyorum.	1	2	3	4
19. Şu anda sevinçliyim.	1	2	3	4
20. Şu anda keyfim yerinde.	1	2	3	4

## APPENDIX E – TRAIT ANXIETY INVENTORY

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

	Hiç	Biraz	Çok	Tamamiyle
1. Genellikle keyfim yerindedir.	1	2	3	4
2. Genellikle çabuk yorulurum.	1	2	3	4
3. Genellikle kolay ağlarım.	1	2	3	4
4. Başkaları kadar mutlu olmak isterim.	1	2	3	4
5. Çabuk karar veremediğim için fırsatları kaçıırım.	1	2	3	4
6. Kendimi dinlenmiş hissedirim.	1	2	3	4
7. Genellikle sakin, kendime hakim ve soğukkanlıyım.	1	2	3	4
8. Güçlüklerin yenemeyeceğim kadar biriktiğini hissedirim.	1	2	3	4
9.Önemsiz şeyler hakkında endişelenirim.	1	2	3	4
10. Genellikle mutluyum.	1	2	3	4
11. Her şeyi ciddiye alır ve etkilenirim.	1	2	3	4
12. Genellikle kendime güvenim yoktur.	1	2	3	4
13. Genellikle kendimi emniyette hissedirim.	1	2	3	4
14. Sıkıntılı ve güç durumlarla karşılaşmaktan kaçınırım.	1	2	3	4
15. Genellikle kendimi hüzünlü hissedirim.	1	2	3	4
16. Genellikle hayatımdan memnunum.	1	2	3	4
17. Olur olmaz düşünceler beni rahatsız eder.	1	2	3	4
18. Hayal kırıklıklarını öylesine ciddiye alırım ki hiç unutmam.	1	2	3	4
19. Akli başında ve kararlı bir insanım.	1	2	3	4
20. Son zamanlarda kafama takılan konular beni tedirgin eder.	1	2	3	4

## APPENDIX F – PANAS

Bu ölçek farklı duyguları tanımlayan bir takım sözcükler içermektedir. Geçtiğimiz hafta nasıl hissettiğinizi düşünüp her maddeyi okuyun. Uygun cevabı her maddenin yanına ayrılan yere puanları daire içine alarak işaretleyin. Cevaplarınızı verirken aşağıdaki puanları kullanın

1. Çok az veya hiç
2. Biraz
3. Ortalama
4. Oldukça
5. Çok fazla

1) ilgili	1.....	2.....	3.....	4.....	5.....
2) sıkıntılı	1.....	2.....	3.....	4.....	5.....
3) heyecanlı	1.....	2.....	3.....	4.....	5.....
4) mutsuz	1.....	2.....	3.....	4.....	5.....
5) güçlü	1.....	2.....	3.....	4.....	5.....
6) suçlu	1.....	2.....	3.....	4.....	5.....
7) ürkmüş	1.....	2.....	3.....	4.....	5.....
8) düşmanca	1.....	2.....	3.....	4.....	5.....
9) hevesli	1.....	2.....	3.....	4.....	5.....
10) gururlu	1.....	2.....	3.....	4.....	5.....
11) asabi	1.....	2.....	3.....	4.....	5.....
12) uyanık	1.....	2.....	3.....	4.....	5.....
13) utanmış	1.....	2.....	3.....	4.....	5.....
14) ilhamlı (yaratıcı düşüncelerle dolu)	1.....	2.....	3.....	4.....	5.....
15) sinirli	1.....	2.....	3.....	4.....	5.....
16) kararlı	1.....	2.....	3.....	4.....	5.....



- 17) dikkatli 1..... 2..... 3..... 4..... 5.....
- 18) tedirgin 1..... 2..... 3..... 4..... 5.....
- 19) aktif 1..... 2..... 3..... 4..... 5.....
- 20) korkmuş 1..... 2..... 3..... 4..... 5.....

## APPENDIX G – IES

Aşağıda travmatik bir olayın ardından insanların yaşayabileceği bazı sorunlar belirtilmiştir. Her maddeyi dikkatlice okuyunuz ve **GEÇTİĞİMİZ HAFTA İÇİNDE** bu sorunun **sizi ne sıklıkta** rahatsız ettiğini en iyi gösteren sayıyı (0, 1, 2 ya da 3) daire içine alınız.

Aşağıda belirtilen olayla ilgili her sıkıntıyı **ÖNCEKİ HAFTA DENEY ESNASINDA İZLEDİĞİNİZ FİLM ACISINDAN** değerlendiriniz.

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'i işaretleyin.

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

(1)	Film hakkında, istemediğiniz halde aklınıza rahatsız edici düşünceler ya da hayallerin gelmesi	0	1	2	3
(2)	Filmle ilgili kötü rüyalar ya da kabuslar görme	0	1	2	3
(3)	Film içeriğindeki olayı yeniden yaşama, sanki tekrar oluyormuş gibi hissetme ya da öyle davranma	0	1	2	3
(4)	Filmi hatırladığınızda duygusal olarak altüst olduğunuzu hissetme (örneğin, korku, öfke, üzüntü, suçluluk vb. gibi duygular yaşama)	0	1	2	3
(5)	Filmi hatırladığınızda vücudunuzda fiziksel tepkiler meydana gelmesi (örneğin, ter boşalması, kalbin hızlı çarpması)	0	1	2	3
(6)	Filmi düşünmemeye, olay hakkında konuşmamaya ya da olayın yarattığı duyguları hissetmemeye çalışma	0	1	2	3
(7)	Size filmi hatırlatan etkinliklerden, kişilerden ya da yerlerden kaçınmaya çalışma	0	1	2	3
(8)	Filmin önem taşıyan bir bölümünü hatırlayamama	0	1	2	3
(9)	Önemli etkinliklere çok daha az sıklıkta katılma ya da bu etkinliklere çok daha az ilgi duyma	0	1	2	3
(10)	Çevrenizdeki insanlarla aranızda bir mesafe hissetme ya da onlardan koptuğunuz duygusuna kapılma	0	1	2	3
(11)	Duygusal açıdan kendinizi donuk, uyuşuk, taşlaşmış gibi hissetme	0	1	2	3

	(örneğin, ağlayamama ya da sevecen duygular yaşayamama)				
<b>(12)</b>	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
<b>(13)</b>	Uykuya dalma ya da uyumada zorluklar yaşama	0	1	2	3
<b>(14)</b>	Çabuk sinirlenme ya da öfke nöbetleri geçirme	0	1	2	3
<b>(15)</b>	Düşüncenizi ya da dikkatinizi belli bir noktada toplamada sıkıntı (örneğin, bir konuşma sırasında konuyu kaçırma, televizyondaki bir öyküyü takip edememe, okuduğunuz şeyi unutma)	0	1	2	3
<b>(16)</b>	Aşırı derecede tetikte olma (örneğin, çevrenizde kimin olduğunu kontrol etme, sırtınız bir kapıya dönük olduğunda rahatsız olma,vb.)	0	1	2	3
<b>(17)</b>	Diken üstünde olma ya da kolayca irkilme (örneğin, birisi peşinizden yürüdüğünde, ani ve yüksek sesler duyduğunuzda)	0	1	2	3

## APPENDIX I – WBSI

Bu anket düşüncelerle ilgilidir. Soruların doğru ya da yanlış cevapları yoktur bu yüzden lütfen her birini dürüstçe yanıtlayınız. Lütfen her bir soruyu yanındaki harflerden uygun olanını işaretleyerek cevaplayınız.

A	B	C	D	E
Kesinlikle Katılmıyorum	Katılmıyorum	Fikrim Yok ya da Bilmiyorum	Katılıyorum	Kesinlikle Katılıyorum

- A B C D E 1. Bazı şeyleri düşünmemeyi tercih ederim
- A B C D E 2. Bazen düşündüğüm şeyleri neden düşündüğümü merak ederim.
- A B C D E 3. Kendimi düşünmekten alıkoyamadığım düşüncelerim var.
- A B C D E 4. Aklıma geliveren ve bir türlü kurtulamadığım imgeler/görüntüler var.
- A B C D E 5. Dönüp dolaşıp yine aynı şeyi düşünüyorum.
- A B C D E 6. Keşke bazı şeyleri düşünmekten vazgeçebilsem
- A B C D E 7. Bazen düşüncelerim o kadar hızlı değişiyor ki onları durdurmak istiyorum
- A B C D E 8. Her zaman sorunları aklımdan çıkarmaya çalışırım
- A B C D E 9. Sürekli aklıma takılan düşünceler var
- A B C D E 10. Düşünmemeye çalıştığım bazı şeyler var.
- A B C D E 11. Bazen gerçekten aklımdakileri düşünmekten vazgeçebilsem diyorum.
- A B C D E 12. Sık sık kendimi düşüncelerimden uzaklaştıracak şeyler yaparım.
- A B C D E 13. Uzaklaşmaya çalıştığım düşüncelerim var
- A B C D E 14. Kimseye söylemediğim bir sürü düşüncem var.
- A B C D E 15. Bazen bazı düşüncelerin zihnimi meşgul etmesini önlemek için başka şeylerle uğraşırım

**APPENDIX J – WORD LIST USED IN THE PROACTIVE INHIBITION TASK**

**AB LIST**

<b>A</b>	<b>B</b>
Roman	Dergi
Nehir	Yayla
Tabanca	Bomba
Koltuk	Kitaplık
Piyano	Gitar
Çekiç	Testere
Serçe	Bülbül
Pantolon	Kazak
Kömür	Odun
Tencere	Bıçak
Zümrüt	Yakut
Köpek	Tavşan

**AC LIST**

<b>A</b>	<b>C</b>
Roman	Bebek
Nehir	Çocuk
Tabanca	Duvar
Koltuk	Ispanak
Piyano	Amca
Çekiç	Tango
Serçe	Keten
Pantolon	Saniye
Kömür	Marul
Tencere	Duvar
Zümrüt	Otobüs
Köpek	Çınar

**APPENDIX K– CODING SHEET FOR PI TASK**

	AB1	AC	AB2
1			
2			
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36			

APPENDIX L- CODING SHEET FOR STROOP TASK

1	kirmizi		36	kirmizi		71	kirmizi	
2	sari		37	sari		72	siyah	
3	yesil		38	siyah		73	kirmizi	
4	sari		39	kirmizi		74	siyah	
5	yesil		40	mavi		75	yesil	
6	sari		41	siyah		76	siyah	
7	siyah		42	yesil		77	yesil	
8	kirmizi		43	siyah		78	sari	
9	mavi		44	sari		79	siyah	
10	sari		45	kirmizi		80	sari	
11	kirmizi		46	yesil		81	yesil	
12	yesil		47	sari		82	mavi	
13	mavi		48	mavi		83	sari	
14	yesil		49	kirmizi		84	siyah	
15	siyah		50	yesil		85	mavi	
16	sari		51	sari		86	siyah	
17	kirmizi		52	siyah		87	sari	
18	mavi		53	sari		88	yesil	
19	kirmizi		54	siyah		89	sari	
20	mavi		55	kirmizi		90	mavi	
21	yesil		56	siyah		91	siyah	
22	siyah		57	yesil		92	mavi	
23	kirmizi		58	siyah		93	kirmizi	
24	mavi		59	sari		94	mavi	
25	kirmizi		60	mavi		95	yesil	
26	sari		61	sari		96	mavi	
27	mavi		62	mavi		97	kirmizi	
28	yesil		63	yesil		98	mavi	
29	sari		64	mavi		99	kirmizi	
30	siyah		65	yesil		100	mavi	
31	kirmizi		66	kirmizi				
32	siyah		67	yesil				
33	yesil		68	mavi				
34	kirmizi		69	yesil				
35	siyah		70	sari				

**APPENDIX M – INTRUSION DIARY is provided in the following pages**



Günlüğü tamamladığınız için teşekkür ederiz, girici anı yaşamamış bile olsanız, günlüğü tutmanız bizim için önemli. Katkımız bizim için çok değerlidir. Takip seansına bu günlüğü getirmeyi lütfen unutmayın, çalışma ancak bu günlüğün tarafınızdan düzgün tutulmasıyla mümkün olacaktır. Takip seansına geldiğinizde çalışmanın amacıyla ilgili bilgilerlendirileceksiniz.

## **Teşekkürler!!!**

### **Takip Seansı Randevu Kartı**

Tarih:

Saat:

Süre:

*Eğer bir sorunuz ya da probleminiz olursa, lütfen benimle 0(506) 596 5251'den iletişime geçmekten çekinmeyin.*

Eğer deney içeriğindeki filme dair konuşmak istediğiniz bir şey olursa, lütfen iletişime geçmekten çekinmeyin. Deney yürütücüsü, Ferhat Yazar'a filmi izledikten sonraki haftalarda 0 (506) 596 52 51'den ulaşabilirsiniz.

Özgül formu bu makalede kullanılmıştır: Holmes, E. A., James, E. L., Coode-Bate, T., & Deerprouse, C. (2009). Can Playing the Computer Game 'Tetris' Reduce the Build-up of Flashbacks for Trauma? A Proposal from Cognitive Science. *PLoS ONE*, 4 (1), e4153 doi:10.1371/journal.pone.0004153.

### **Katılımcı Günlüğü**

**Katılımcı No.:**

**Başlama Tarihi:**

**Bitiş Tarihi:**

## Giris

- ❖ Eğer önmüzdeki bir hafta boyunca, katıldığınız deney esnasında izlediğiniz filme ilgili olarak kendiliğinden ortaya çıkan girici anılarınız/düşünceleriniz olursa bunları günlüğe not etmenizi rica ediyorum.
- ❖ Lütfen bu günlüğü sadece kontrolünüzde olmadan kendiliğinden aklınıza gelen anı ve düşünceleri not etmekte kullanın. Kendi isteğinizle filmi düşündüğünüz zamanları buraya not etmeyin.
- ❖ Aklınızdan geçenler, kelimeler ve cümleler gibi sözel düşünceler olabileceği gibi ses ve görüntü gibi zihinsel imgeler de olabilir. Zihinsel imgeler genellikle resim biçiminde olmakla beraber, her beş duyuyu da içerebilir.
- ❖ Her girici anı için; anyı deneyimlediğiniz zamanı da not ederek, Z (Zihinsel imge), D (Düşünce), ZD (Her ikisi) olarak not düşününüz. Eğer bir zaman diliminde hiç girici anı deneyimlemediyseniz o dilime 0 yazınız.
- ❖ Eğer detayları kaydedemeyeceğinizi düşündüğünüz bir durumda, lütfen yine de bir girici anı/ düşünce olduğunda bunu mutlaka tarihiyle kaydedin.

**LÜTFEN BU GÜNLÜĞÜ  
DOLDURUN- DENEY İÇİN  
ÖNEM TAŞIMAKTADIR.  
TEŞEKKÜRLER!!!!**

Tarih / Gün	İmge(İ) mi, Düşünce(D) mi, her ikisi mi (ID)	Girici materyalin içeriği nedir? (ör. filmin içinden bir sahne)	Eğer girici materyali başka birşey tetiklediyse nedir?	Girici materyal zihninizde belirttiğinde ne derece stres yaşadınız? 0 (hiç) - 10 (aşırı)

Tarih / Gün	Zihinsel İmge(Z) mi, Düşünce(D) mi, her ikisi mi (ZD)	Girici materyalin içeriği nedir? (ör. filmin içinden bir sahne)	Eğer girici materyali başka birşey tetiklediyse nedir?	Girici materyal zihninizde belirlediğinde ne derece stres yaşadınız? 0 (hiç) - 10 (aşırı)

Her girici içerik için, sadece zihinsel imge ise Z, düşünce ise D yazın. Eğer ikisinin birleşimiye ZD yazın. Eğer girici içerik yoksa lütfen ilintili zaman çizelgesine 0 yazın.

Örnek Gün		Tarih:	
Sabah	0		
Öğleden Sonra	I T		
Akşam	T		

Birinci Gün		Tarih:	
Gündüz			
Öğleden Sonra			
Akşam			

İkinci Gün		Tarih:	
Gündüz			
Öğleden Sonra			
Akşam			

Üçüncü Gün		Tarih:	
Gündüz			
Öğleden Sonra			
Akşam			

Lütfen zaman çizelgesinde işaretlediğiniz her girici anı/düşünce için detay sayfasını doldurmayı unutmayınız.  
Teşekkürler

Detay Sayfası

İzlediğiniz filme ilişkin girici anlar zihinsel imgeleri (zihninizde sesler ya da görüntüler canlanması) ve/veya sözel düşünceleri (iç sesinizle düşünmek gibi) içerebilir.

s5

Tarih / Gün	Zihinsel İmge(Z) mi, Düşünce(D) mi, her ikisi mi (ZD)	Girici materyalin içeriği nedir? (ör. filmin içinden bir sahne)	Eğer girici materyali başka birşey tetiklediyse nedir?	Ne derece stres yaşadınız? 0 (hiç) - 10 (aşırı)
Day 1	Z	Kırmızı arabanın mağaza camına çarpışını ve kasıyetrin yüzündeki şaşkınlık ifadesini hatırladım.	Ana caddede üzerinde mağaza vitrinlerine bakarakız.	4
Day 2	D	Sarımsak bir şekilde araba kullanılmaktadır.	Hiç birşey	2

5. Gün	Tarih:
Gündüz	
Öğleden Sonra	
Akşam	

7. Gün	Tarih:
Gündüz	
Öğleden Sonra	
Akşam	

4. Gün	Tarih:
Gündüz	
Öğleden Sonra	
Akşam	

6. Gün	Tarih:
Gündüz	
Öğleden Sonra	
Akşam	

Lütfen zaman çizelgesinde işaretlediğiniz her girici anı/düşünce için detay sayfasını doldurmayı unutmayınız.  
Teşekkürler

s4