

SELF-REGULATION IN AT-RISK CHILDREN:
EXPLORING FACTORS THAT AFFECT COGNITIVE FUNCTIONS IN
REFUGEE CHILDREN



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Self-Regulation in At-Risk Children:
Exploring Factors That Affect Cognitive Functions in Refugee Children

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DECLARATION OF ORIGINALITY

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ABSTRACT

Self-Regulation in At-Risk Children:

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The number of refugee children is increasing every year all around the globe, along with their suffering from psychological and cognitive problems. Refugee experience may be characterized with chaos which includes multiple extreme traumatic life events. In the present study, the primary aim was to operationally define the traumatic and chaotic components of the refugee experience and to explore their effects on children's cognitive functioning; visual working memory, inhibition, and shifting in the sample of Syrian refugee children relocated in Turkey. 34 Syrian children (7- to 13-year-old) and 40 age-matched locals participated in the study with their parents. TIFALDI Receptive Vocabulary Subscale, Color Trials Test 1-2, Heart and Flowers Task and the computerized Corsi Block Tapping Task were administered to participant children. Turkish receptive vocabulary was the strongest predictor of executive functioning. Trauma and household chaos, in addition to maternal depression and perceived social support, were significantly related to children's executive functioning. Academic and clinical implications of the study were discussed.

ÖZET

Risk Altındaki Çocuklarda Özdenetim:

Sığınmacı ve Mülteci Çocuklarda Bilişsel Fonksiyonları Etkileyen Faktörler

Dünya genelinde her geçen yıl mülteci çocukların sayısı, yaşadıkları psikolojik ve bilişsel problemlerle birlikte artmaktadır. Mültecilik içinde şiddetli travmatik deneyimler barındıran kaotik bir yaşantı olarak tanımlanabilir. Bu çalışmanın temel amacı mültecilik deneyimindeki travmatik ve kaotik etmenleri tanımlamak ve bu etmenlerin çocukların bilişsel fonksiyonlarına etkilerini Türkiye'ye yerleşmiş Suriyeli çocuklar ile araştırmaktır. Özellikle görsel işler bellek, ket vurma ve bilişsel esneklik fonksiyonları ölçülmüştür. Mültecilik deneyimindeki ev kaosunu ölçmek için bir yöntem önerilmektedir. Otuz dört 7 ve 13 yaş arası Suriyeli ve kırk Türk çocuk ebeveyni ile birlikte çalışmaya katılmıştır. Katılımcı çocuklara Children Color Trials Test, Hearts and Flowers Task ve Corsi Block Tapping Task uygulanmıştır. Çocukların Türkçe yeterliliği bilişsel fonksiyonları açıklamakta en güçlü etmendir. Travma ve ev kaosu, anne depresyonu ve algılanan sosyal desteği ile birlikte, bilişsel fonksiyonlarla ilişkili çıkmıştır. Çalışmanın sonuçlarının alana akademik ve klinik çıkarımları tartışılmıştır.

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CHAPTER 1

INTRODUCTION

According to Bronfenbrenner's ecological environment theory (1981), the person and the environment are in a reciprocal relationship; while the environment shapes humans cognitively, biologically and psychologically, people restructure the environment that they live in. In order to understand any aspect of human development, one should first correctly define and analyze the material and relational conditions which surround the human.

The ecological environment consists of a set of nested, interconnected systems (Bronfenbrenner, 1981). Microsystems are patterns of relationships, roles, places, symbols and other external factors that a person directly experiences and perceives; such as one's own home, school, and workplace. Mesosystems stand for the interrelations between microsystems that a person directly experience. Exosystems are the settings that indirectly affect a person's life; for a child, exosystems may be work place of parents and the school of a sibling. Macrosystems refer to cultures, subcultures, ideologies, and beliefs that create a ground for all other systems and settings. All children develop in this structure of ecological systems. And as they grow they are both affected by the characteristics of each system and able to change these systems. Development never takes place in a vacuum (Bronfenbrenner, 1981, p. 27); there is always a relation between the organism and environment. So in order to understand human development, each layer of the ecological environment should be taken into consideration.

Lustig (2010) explains refugee children's experience in an ecological framework. He suggested that to understand the psychological development of

refugee children one should try to define the ecological surrounding of children before, during and after refugee experience. Refugee children, maybe more than any other children, directly face with trauma, chaos, uncertainty, and unpredictability in their everyday life. At the microsystem level, they face with both traumatizing and chaotic events; their houses, cities, families break into pieces (Lustig, 2010). They have ruptures on their everyday routines which creates a sense of uncertainty and insecurity during war and migration. Also after migration in the nuclear family, relationships between parents and children may be problematic due to acculturation processes, economic problems and probable trauma-related psychological problems (Lustig, 2010; Paat, 2013). The interactions between microsystems, such as the relationships between school friends and family, also fracture; and this endangers the harmony of mesosystems (Lustig, 2010). After the migration process, refugee children suffer from disintegration between their home environment and school environment; the language they speak, the culture they need to adapt and problems that they face are different in those two crucial settings (Paat, 2013). Moreover, not only children themselves but also their parents, friends, and relatives were affected by war and migration. For instance, parents may experience a lack of social support due to changes in the neighborhood and economic problems which in return cause problems in their parenting attitudes. So children's relationships with people around them are indirectly affected by these negative processes; the exosystem also seems to be fragmented and traumatic (Lustig, 2010). Most importantly refugee experience includes drastic, rapid and traumatic transformations in macrosystem; cultures, subcultures, belief systems change through migration (Lustig, 2010). They experience a clash of their culture and the host country's culture and they are mostly expected to assimilate into this new culture (Paat, 2013).

In general, sense of insecurity and uncertainty prevail all layers of a refugee child's ecological environment. Since migration generally happens after a terrifying war, refugee experience is mostly defined as traumatic. However, as mentioned above refugee experience is not only traumatic but also excessively chaotic. In Lustig's words to define refugee experience; "Everything has changed in an instant. Their world, previously with some order, is now chaos." (2010, p. 242). So a child needs to adapt not only a new life but also the uncertainty of it while overcoming the difficulties due to traumatic experiences. Tolerating this kind of uncertainty and adapting to a changing environment requires strong self-regulation skills; children should be able to control their emotional arousal, thoughts, and behaviors (Blair & Diamond, 2008). These self-regulatory skills are seen as protective factors against adversity and these skills are also affected by traumatic life experiences (Shields, Cicchetti & Ryan, 1994). Childhood traumatic experiences weaken children's emotional regulation and this may lead to psychological and social difficulties (Shields et al., 1994). Therefore understanding the refugee experience's effect on self-regulatory skills is crucial to understand the difficulties that children experience before, during and after migration.

Similar to the general approach most of the studies about refugee's psychological and cognitive functioning focus on the traumatic components of war that leads to migration. To understand the refugee experience, explaining the traumatic effect of war is necessary but insufficient. In the present study, the primary aim is to operationally define the traumatic and chaotic components of the refugee experience and to present new variables to this area of research other than trauma exposure. Secondly, this study aims to explore the effects of the trauma and chaos related experiences on cognitive domains of self-regulation, executive functioning, in

the sample of Syrian refugee children located in Turkey. Lastly, this study explores the differences and similarities between cognitive functioning of Syrian refugee children and Turkish locals.

1.1 Executive functions: Definitions of the core elements

Self-regulation is defined as the capacity to control one's emotions, thoughts and actions to achieve a goal (McClelland & Cameron, 2011). Cognitive approach to self-regulation underlines the importance of executive functioning for regulation (Zelazo & Müller, 2002). Executive functioning (EF) is mostly defined as high-level cognitive processing, which supervises the operations of inter-related cognitive processes to regulate the goal-directed behavior (e.g., Anderson, 2002; Barkley, 2012; Friedman & Miyake, 2017). Executive skills are essential for problem solving, setting a goal and pursuing it, overcoming the obstacles of life as well as physical and mental health.

In the literature, there is a debate about the nature of EF whether it is a unitary construct or it is an umbrella term for various abilities (Best & Miller, 2010). To integrate those two opposite sides, Miyake, Friedman, Emerson, Witzki, and Howerter (2000) proposed a *unity and diversity* model; claiming that EF is composed of various cognitive functions. Both daily and experimental EF tasks are related to basic cognitive abilities and executive abilities since EF is about controlling those lower levels functions (Friedman & Miyake, 2017). On a confirmatory factor analysis Miyake et al. (2000) reveal that there are three main correlated but distinct functions to define EF; inhibitory control, working memory and cognitive flexibility (set shifting).

1.1.1 Inhibitory control

Inhibitory control refers to controlling of emotions, thoughts and impulses in order to inhibit a prepotent reaction (Diamond, 2013; Miyake et al., 2000). It enables people to choose their reactions. Inhibition, like other executive functions, is an intended process and it affects cognitive and emotional domains of life (Diamond, 2013).

Attentional inhibition means to focus on the selected stimuli and suppress others. So it enables a top-down process which is volitional and goal-directed. Cognitive inhibition is related to the control of mental representations, it may help people to suppress unwanted memories. Moreover, it supports working memory performance by preventing the distraction of unrelated mental representations. Self-control is also an aspect of inhibitory control. It allows people to control their emotions and behaviors, instead of behaving impulsively. Self-control brings about self-discipline, determination, and delaying of instant gratification for a purpose (Mischel, Shoda, & Rodriguez, 1989).

Problems in inhibition bring about lack of self-control and impulsivity (Anderson, 2002; Diamond, 2013). Most of the inhibition measures fail to distinguish inhibition from other cognitive functions, especially working memory. Carlson and Moses (2001) proposed to divide inhibition tasks by factor analysis; as delay tasks which require inhibiting prepotent response and conflict tasks which require producing a contrary response to prepotent response as well as inhibiting it. In the conflict tasks, participants are asked to remember complex rules and produce an alternative response accordingly. So those tasks fail to measure solely inhibition since working memory is also a significant part of the performance.

Different inhibition tasks display different age trajectories (Diamond & Taylor, 1996) depending on the nature and the demand of the task. Generally, inhibition

related cognitive abilities start developing during preschool years; at the age of 4 children show success for both complex and pure inhibition tasks. Inhibition abilities continue to improve especially between ages 5 to 8, especially for complex tasks which require both working memory and inhibition (Best & Miller, 2010).

1.1.2 Working memory

Working memory is defined as the ability to store and manipulate a piece of information in mind (Best & Miller, 2010). It distinguishes from short-term memory with the factor of manipulation. Short-term memory, storage of information, and working memory are linked to different neural subsystems (Diamond, 2013); working memory is an executive process which is related to the prefrontal activity.

The stimuli that are stored and manipulated may be verbal and non-verbal (visuospatial) in nature. Children tend to perform better on visuospatial working memory tasks, even though the developmental trajectories are similar for both verbal and visuospatial working memory abilities (Conklin, Luciana, Hooper, & Yarger, 2007; Luciana, M., Conklin, H.M., Hooper, C.J., & Yarger, R.S., 2005). Gathercole, Pickering, Ambridge, and Wearing (2004) revealed that working memory abilities improve linearly between ages from 4 to 14. However, the mastery at tasks is related to the executive demands. Luciana et al. (2005) in their study increased the executive demands of the tasks by increasing the number of visual locations that a target stimulus is searched by the participant. In simple conditions, the performance of the children between the ages of 4 to 8 seems to be similar. However, when children are asked to search three locations, performance maturity is not reached until the age of 6; for four locations it was adolescence and for six and more locations the performance maturity was not reached until adulthood.

1.1.3 Cognitive flexibility

Cognitive flexibility, the third core of executive functions, stands for the ability to shift between perspectives, mental sets, rules or adjusting the actions according to given feedbacks (Diamond, 2013). Cognitive flexibility performance also needs working memory and inhibition by nature. One should inhibit a previous mental set, action or a rule to create an alternative one, and maintain all of those rules to alternate between them (Best & Miller, 2010).

Cognitive flexibility like other executive skills develops and improves with age. Davidson, Amso, Anderson, and Diamond (2006) revealed that improvements in set shifting are seen between the ages of 4 to 15; these abilities reach adult-like level during adolescence. One of the important reasons of this maturation seems to be related to speed-accuracy trade off; during adolescence people, with the improvement in monitoring one's own performance, realize that if they slow down they make fewer errors in shifting tasks (Best & Miller, 2010; Davidson et al., 2006).

Improvements on acquiring new rules, memorizing different rules at the same time, monitoring feedbacks, and creating different strategies for a given task help children to perform better at shifting tasks (Best & Miller, 2010).

In general executive skills improve by age until adolescence; however, some internal and external factors affect the improvements of those skills. For example home environment, physical health, age and years of schooling, and traumatic life events seem to have an impact on cognitive functioning (e.g., Sarsour, Sheridan, Jutte, Nuru-Jeter, Hinshaw, & Boyce, 2010; Scott et al., 2015).

1.2 Refugee experience: Trauma and chaos

Refugees are defined as people who are outside of their home country and not able to return because they are no longer safe and protected there, due to their nationality, race, religion or any kind of identity (Zimmermann, Dörschner, & Machts, 2011). According to the UN Refugee Agency (UNHCR; 2018), there are 25.3 million refugees registered worldwide; among all half is under the age of 18. And most of the refugees are forced to migrate from Syria; there are 6.3 millions of Syrian refugees registered in different host countries.

Turkey hosts the largest number of refugees worldwide, according to the Proposed Refugee Admission report of the United States and the majority of the refugees are from Syria (2017). Directorate General of Migration Management of Turkey announced that as of the end of 2017, the registered refugee population from Syria was 3.561.707 and approximately half of them were children (Food and Agriculture Organization of United Nation, 2018). As it is understood from the numbers, displacement and seeking asylum is a very significant problem that cannot be unseen.

Refugees by definitions do not migrate due to find better living conditions but escape from persecution and they seek safety. So refugee experience most likely to include witnessing armed-conflicts, uncertainty, the urgency of departure with no or little belongings, deprivation of basic needs, and accommodating in densely populated uninhabitable environments. Therefore whole refugee experience must be defined as chaos which includes multiple extreme traumatic life events (Lustig, 2010) and it brings about serious psychological problems.

1.2.1 Refugee experience and trauma

People who live in places with armed conflicts experience a lot of negativities which may result in psychological, behavioral and cognitive problems (e.g., Polak, Witteveen, Reitsma, & Olf, 2012; Scott et al., 2015; Tol, Song, & Jordans, 2013). Prevalence rates of mental disorders are higher among conflict-affected populations compared to other populations without war exposure (Tol, et al., 2013). According to the meta-analysis of Fazel, Wheeler, and Danesh (2005), in Western countries, refugees are ten times more prone to develop post-traumatic stress disorder symptoms (PTSD) compared to age-matched locals. The PTSD supervened on direct or indirect exposure to/witnessing of trauma and it is defined as the prolonged symptoms of the hyperarousal, re-experiencing and avoidance of traumatic memories (American Psychiatric Association, 2013). The prevalence rates of PTSD are around 9% for general refugee population and higher for child refugees; 7-17% of child refugees are diagnosed with the PTSD (Fazel et al., 2005). In the case of genocide survivor displaced children, these rates of the PTSD may even increase to 87% (Ahmad, Sofi, Sundelin-Wahlsten, & Von Knorring, 2000). In Turkey, 49.7% of refugee children (5-18 years old) who migrated from Afghanistan, Syria, and Iraq were diagnosed with a psychiatric disorder including depression, anxiety disorder and trauma-related disorders (Sapmaz et al., 2017).

Parental and personal exposure to violence seems to be a crucial risk factor for psychological distress among children who faced displacement following a war trauma (Fazel, Reed, Panter-Brick, & Stein, 2012). In case of a refugee experience not only pre-migration (war) trauma but also traumatic experiences during the migration process and in the host country have effects on psychological well-being (Montgomery, 2010). Witnessing dead bodies and injured people were found to

increase the risk of psychiatric disorders among refugee children (Sapmaz et al., 2017). Also, multiple relocations during the asylum-seeking process and unemployment of the father are risk factors for mental difficulties (Nielsen et al., 2008; Sapmaz et al., 2017). On the other hand, stable settlement after migration and social support in the host country were found to be protective for refugee children (Fazel et al., 2012).

1.2.1.1 Trauma and cognitive functioning

Refugee experience brings about excessive traumatic stress and as mentioned before PTSD is significantly prevalent in the refugee population (Fazel et al., 2005). It results in especially memory problems; incomplete memory of the event, immediate and unplanned flashbacks, distortion of time and the feeling of unreality (Brewin, 2001). The cognitive symptoms include time distortions, memory problems, and amnesia especially about the traumatizing event, intrusive images and thoughts and hypervigilance (Armsworth & Holaday, 1993). Related to these symptoms the PTSD is found to be related to some cognitive problems on attention, working memory, the speed of information processing, verbal learning and executive functions (Horner & Hamner, 2002; Scott et al., 2015; Woon, Farrer, Braman, Mabey & Hedges, 2017).

In the review of Horner and Hamler (2002), it was seen that the results of the studies on combat-related PTSD and cognitive dysfunction are inconsistent; however, problems on attention and immediate memory (mostly verbal rather than visuospatial) were most commonly seen. Regarding this, structural neuroimaging studies suggest a reduction in hippocampal volume which may be seen related to memory dysfunction in case of PTSD; while in functional neuroimaging studies altered regional brain activity is seen in the regions related to learning, memory and

emotional regulation (Horner & Hamler, 2002). Also, studies with non-combat related trauma (Horner & Hamler, 2002) revealed that problems in verbal and visuospatial memory, abstract verbal reasoning and attentional dysfunction may be seen in PTSD.

A meta-analytic study based on 60 studies with adult trauma survivors, reported that the relationship between trauma and different domains of cognitive functioning may be inconsistent (Scott et al., 2015). Study revealed that the largest effect sizes were seen in the studies with verbal learning ($d = -.68$), information processing speed ($d = -.59$) and attention/working memory ($d = -.50$) domains of cognitive functioning. In terms of effect sizes these three domains were followed by verbal memory ($d = -.46$), executive functions ($d = -.45$), visuospatial functioning ($d = -.38$) and visual memory ($d = -.29$) in the studies with trauma and cognitive functioning (Scott et al., 2015). Similar to this study, a recent review article proposed that attention and memory deficits, rather than executive deficits, seem to be mostly found in studies with people who exposed to war and experienced PTSD (Eren Kocak & Kilic, 2017). These results may be related to smaller numbers of EF studies and a variety of EF tasks compared to attention and memory studies and tasks (Eren Kocak & Kilic, 2017). Studies suggested that PTSD negatively affects the initial acquisition of the information on memory tasks rather than storing and retrieving already acquired information (i.e., Vasterling & Brailey, 2005); this also may be seen related to the problems of attention. Also, the speed of information processing was found to be affected by PTSD beyond the problems of working memory and attention (Scott et al., 2015). Overall it is seen that PTSD may explain difficulties mostly on verbal and executive domains compared to visual domains (Scott et al., 2015; Vasterling & Brailey, 2005).

There are many PTSD symptoms related to attention in daily life; however, people showed moderate deficit on simple attention tasks in laboratory conditions. The effect of PTSD is mostly observed in complex attention tasks which require executive skills like working memory, inhibition and sustained attention (Aupperle, Melrose, Stein & Paulus, 2012; Scott et al., 2015). Also on attention and inhibition tasks with emotionally charged stimuli people with PTSD tend to have difficulties disengaging from negative and threatening stimuli and show attentional bias to them (Aupperle et al., 2012). In a systematic review of 18 studies, it is found that adults with PTSD display significantly poorer performances on all assessed executive functioning tasks (for working memory, inhibition and cognitive flexibility) compared to non-PTSD controls (Polak et al., 2012). However executive skills such as planning and problem solving seem to be protected from the effect of trauma, especially on tasks with no time pressure (Aupperle et al., 2012).

Trauma and PTSD were also found related to the executive functioning of children and adolescents, and they are seen as problems in understanding the instructions, setting and pursuing goals, problem solving, adapting to life stressors, and planning tasks (Kaplan, Stolk, Valibhoy, Tucker, & Baker, 2016; MacDonald, Ellis, Pulsifer, & Lyons, 2015; Turley & Obrzut, 2012). MacDonald et al. (2015) in their study with children between the ages of 8 to 15 revealed that PTSD symptoms predict lower performances on cognitive flexibility, set shifting and visual-motor planning. Children with PTSD were found to be performed significantly poorer on verbal memory, sustained attention, abstract reasoning, visual motor planning, and cognitive flexibility tasks compared to children who did not expose to trauma (Kaplan et al., 2016; MacDonald et al., 2015). In a recent meta-analysis of thirty studies (Op den Kelder, Van den Akke, Geurts, Lindauer, & Overbeek, 2018), it was

found that trauma-exposed youth (aged between 2 to 25 years old) perform poorer on tasks of working memory, inhibition, and cognitive flexibility compared to non-exposed controls. Approximately 68% of traumatized children, adolescents, and young adults might perform poorer on executive functioning tasks compared to non-traumatized controls (Op den Kelder et al., 2018). Also, PTSD has an impact on learning efficiency through problems on sustained attention (Samuelson, Krueger, Burnett, & Wilson, 2010). When all these deficits in cognitive domains are considered, the decline in intellectual performance and academic achievement on children and adolescents is inevitable (Saigh, Mroueh, & Bremner, 1997; Saigh, Yasik, Oberfield, Halamandaris, & Bremner, 2006).

There are also some possible differences in the impaired cognitive domains between adults and children in the context of trauma. Some studies suggested that children with PTSD show more impulsivity and distractibility, and these findings are not seen in adult trauma survivors (Samuelson et al., 2010). Also contrary to adult findings, there was no alteration in hippocampal volume and decline in memory performance in trauma survivor children (Samuelson et al., 2010). However, there need to be more studies related to children and adult trauma survivors and their cognitive functioning. The number of studies and the sample sizes of these studies are limited especially on refugee children and adult sample (i.e., Malarbi, Abu-Rayya, Muscara, & Stargatt, 2017, Samuelson et al., 2010).

In order to understand the cognitive problems in case of trauma, several questions were proposed by researchers. An important question is the effect of comorbid depression in case of PTSD. Some studies indicate that cognitive problems should not be only explained in relation to PTSD, but generally psychopathology after trauma exposure including depression and anxiety (e.g., Polak et al., 2012;

Vasterling & Brailey, 2005), while some does not find an effect of comorbidity but only PTSD (e.g., Scott et al., 2015). A study (Polak et al., 2012) revealed that war-related traumas seem to affect the executive functioning more than non-combat related traumas. This is explained in terms of symptomseverity since the PTSD symptoms are higher for soldiers compared to other types of trauma survivors. However, even though the existence of PTSD symptoms found to have detrimental effects (Vasterling & Brailey, 2005), in their meta-analysis Woon et al. (2017) did not a find a moderating effect of symptom severity on executive dysfunction for people with PTSD. The gender of the victim seems to be important; male PTSD patients perform poorer on executive tasks compared to female patients (Polak et al., 2012).

Another important question is the sole effect of trauma exposure on cognitive problems. Some studies suggest that trauma exposure is a risk factor for cognitive functioning only in case of PTSD and/or comorbid disorders (Saigh et al., 2006; Vasterling & Brailey, 2005) while some studies suggest that trauma without any disorder has a negative impact on cognitive functioning (De Bellis, Woolley, & Hooper, 2013; Samuelson et al., 2010). In a study with maltreated children with and without PTSD, it was found that maltreated children obtain lower scores on intelligence tests, achievement tests and cognitive tasks of attention, executive functioning, visuospatial abilities compared to non-maltreated children irrespective of PTSD symptoms (De Bellis et al., 2013). In a meta-analytic study which focused on the cognitive functioning of trauma-exposed children with/without PTSD and trauma-naïve children (Malarbi et al., 2017), it was found that overall trauma-exposed children perform poorer on almost all cognitive domains compared to trauma-naïve children, with greater effect sizes on verbal abilities ($d = -0.89$),

attentional control ($d = -0.70$) and cognitive flexibility ($d = -0.68$). In the studies comparing PTSD+ and healthy controls, PTSD+ children performed poorly on all domains with greater effect sizes on goal setting ($d = -1.13$), general intelligence ($d = -0.88$) and verbal learning/memory ($d = -0.77$). However, studies comparing trauma-exposed PTSD+ and PTSD- children revealed smaller sample sizes for differences on visuospatial skills ($d = -0.42$) and general intelligence ($d = -0.22$), while in the most of the cognitive domains there was no significant difference (Malarbi et al., 2017). It was generally seen that cognitive performance of PTSD- children were found be better than PTSD+ children and worse than trauma-naïve children, suggesting that sole exposure to trauma also has a negative effect on cognition (Malarbi et al., 2017). However, the important issue is to define the nature of the trauma for this discussion. The argument that sole trauma exposure does not have an effect on cognition is mostly based on life-threatening one-time traumatic experiences (e.g., assaults, accidents) while the studies which showed trauma exposure's effect were based mostly on maltreatment-related prolonged traumatic experiences. Studies already have suggested that type of trauma, whether it is prolonged or single trauma, may have a moderating effect on problems of cognitive flexibility and inhibition (Malarbi et al., 2017; Op den Kelder et al., 2018), even though this field need more convergence evidence. Interestingly, based upon their systematic review, Polak et al. (2012) suggest that people who do not develop PTSD symptoms in case of trauma perform even better on executive functioning tasks; reminding that post-traumatic growth and resilience are also related to executive functioning capacity (Welsh, 2013).

1.2.2 Refugee experience and chaos

Chaos is defined as lack of structure, disorganization, high levels of stimulation and unpredictability in everyday life. Chaotic environments are characterized by noise, crowding and lack of routines which cause interruptions in cognitive, emotional, biological and relational processes (e.g., Evans, Lepore, Shejwal, & Palsane, 1998; Bronfenbrenner & Evans, 2000). The chaos of the refugee experience includes not only unpredictability and disorganization but also an excessive amount of traumatic life events (Lustig, 2010). Refugee children are forced to change residence and even country very often and to live in excessively crowded places without any structure. Unlike regular migration processes, refugees generally are forced to leave their country rapidly and with little or no personal belongings. They mostly do not have enough resources to remember and rely on their once organized life. They may lose parents, their caretakers may change very often and they may have to survive unaccompanied for a while. Refugees may even face with the uncertainty of the health of they left behind (Lustig, 2010). Refugee experience includes various traumatically chaotic features for both adults and children.

Chaos is studied in three components; disorganization, instability (Sameroff, 2010) and unpredictability (Bronfenbrenner & Evans, 2000). Disorganization stands for the crowd, noise, and lack of preparation for daily routines. Instability refers to changes in one's life in terms of school, job, residence and intimate relationships. Lastly, unpredictability refers to irregularity in routines and rituals in family and community; and unsettles the sense of the safe and dependable world (Vernon-Feagans, Gerrett-Peters, De Marco, & Bratsch-Hines, 2012). Even though it is difficult to objectively measure unpredictability, disorganization and instability have similar operational definitions across studies (Vernon-Feagans, Gerrett-Peters, De

Marco, & Bratsch-Hines, 2012). In factor analysis to define household conditions at especially families with rural poverty Vernon-Feagans, Gerrett-Peters, Willoughby, Mills-Koonce, and The Family Life Project key investigators (2012) grouped chaos related 10 conditions into two categories; instability and disorganization. Instability includes changes in primary and secondary caregivers, times of moving households, times of changes in household members (moving in and out), the total number of people living in the household. And disorganization includes household density (number of rooms per person), household preparation for researchers' home visits, the messiness of the house, hours of TV is on and neighborhood noise.

The chaotic home environment has important effects on different aspects of child development. Instability in the household has an important effect on the behavioral problems of children (Ackerman, Kogos, Youngstrom, Schoff, & Izard, 1999). It was found that residential and caregiver changes and recent negative life events of parents such as job losses or accidents have an impact on 5-7-year-old children's externalizing behavior. It seems that unpredictable and chaotic environments compromise children's ability to regulate emotional arousals (Ackerman et al., 1999). Disorganization in household found to be linked to various psychological and physiological outcomes related to the development of children. Results of a study in India with 10-12-year-old children suggested that household density was found to be related to difficulties in school adjustment, vulnerability to thoughts of helplessness, increased perceived parent-child conflicts and elevated blood pressure (Evans et al., 1998). There are also other biological effects of chaos that were demonstrated in studies. Evans, Hygge, and Bullinger (1995) revealed a link between chronic noise exposure and neuroendocrine markers of stress among children living in noisy neighborhoods. In a study with children aged 7 to 10, home

chaos was found to be related to the blunting of cortisol levels during the day (Doom et al., 2018). The effect of chaos on cortisol levels was explained as the mild but chronic stress due to unpredictability and uncertainty of chaos (Doom et al., 2018).

1.2.2.1 Chaos and cognitive functioning

Order in daily life, as opposed to chaos, creates a secure and predictable structure of relationship patterns, roles, and developmental trajectories for children as they grow up (Sameroff, 2010). Chaotic environments result in disruptions in parenting and confusions in roles; children may have to pretend like adults and take care of themselves when they are too young to do so; in case of war even more so. Since the environment has a crucial impact on the development, disorganization of the environment unsurprisingly leads to both biological and psychological regulatory systems of children and interfere with the social, emotional and cognitive development of children (Bronfenbrenner & Evans, 2000; Sameroff, 2010).

Chaos both has a direct and indirect effect on child's cognitive development. Directly, overstimulation of chaotic environment may lead to distractions, blocking outs and withdrawing from stimulation, since young children's attentional capacity is not developed enough to detect and ignore the unnecessary information (Evans, 2006; Vernon-Feagans, Willoughby, & Garrett-Peters, 2016). Indirectly; chaos brings about parental unresponsiveness and hinders developmental of self-regulatory systems (Vernon-Feagans et al., 2016; Sameroff, 2010). In crowded and chaotic home settings, adults suffer more from lack of social support and increased psychological stress (Leopore, Evans, & Schneider, 1991) which also negatively affect parental skills and parent-child relationship (Evans, 2006). Wachs and Çorapçı (2003) defined the relationships between household chaos and deficit in child

development as following: Chaos increases the social withdrawal of children due to high levels of noise and stimulation; also it increases the stress of caregiver. Stressful caregivers show little involvement in their children's development and adopt inappropriate harsh discipline and more restrictions in their relationships with their children. So children are both directly affected by the chaotic characteristics of the house and indirectly deprived of supportive parenting, and they may suffer from various cognitive and psychological problems.

Chaotic home environment may lead to problems of attention, inhibition, language development, reading and school achievement (e.g. Vernon-Feagans, Gerrett-Peters, Willoughby, et al., 2012; Vernon-Feagans et al., 2016; Garrett-Peters, Mokrova, Vernon-Feagans, Willoughby, Pan, & Family Life Project Key Investigators, 2016). Vernon-Feagans and colleagues (2016) in their longitudinal study, revealed a relationship between household disorganization and executive functions in 5-year-olds. Disorganization in the first 3 years of life had an effect on the quality of parenting, which in return affected the executive functioning of children when they were 3 and also as they grow up to 5. In that study, effect of instability was not found. The researchers explained these results as the limited instabilities in children's lives compared to the daily effect of disorganization, since these children are locals. However in the case of refugee children who may suffer more about instability compared to local children these results may be questionable. Also, another study which also a part of Family Life Project (Garrett-Peters et al., 2016) revealed the exploratory power of household disorganization in the relation between income poverty and children's cognitive abilities, school learning and expressive language during kindergarten.

Children who were exposed to chronic loud noise at home have difficulties on auditory discrimination and reading abilities; they make more reading errors and they are slower to learn how to read (Cohen, Glass, & Singer, 1973; Evans et al., 1995). This may be explained with the strategy of children to deal with the chronic noise by ignoring the auditory stimuli which in turn deteriorates their performance on the tasks requires attention to given stimuli (Evans, 2006). Also, children live in more noisy neighborhoods perform slightly poorer on long-term recall and short-term memory tasks (Evans et al., 1995). Hygge, Evans, and Bullinger (2002) longitudinally studied with two groups of 8 to 12-year-old children; a group of children who lived around a closed airport and another group who live around newly opened airport Munich. Both groups were tested on their reading, attention, speech perception and long-term and short-term memory before and after the airport closing/openings. The study revealed that former group's reading and memory deficits disappeared after the airport closed, and the latter group started to perform worse on these tasks after the new airport has opened. However, first group's decreased performance on speech perception did not recover after the closing of the airport. These results suggest the importance of the timing of noise exposure on speech perception and the possibility of recovery from the chronic noise effects on other cognitive domains (Hygge et al., 2002). In another study exposure to high dose of background noises at home was associated with stronger impairments in delayed and immediate recall task performances but not in reading comprehension and sustained attention task performances (Matsui, Stansfeld, Haines, & Head, 2004).

The chaotic home environment has a negative impact on school readiness and success. In a twin study which aims to explain the effect of shared environment and genes on school success, it was found that the more children perceive their home as

disorganized, confusing and chaotic the poorer they perform at school (Hanscombe, Haworth, Davis, Jaffee, & Plomin, 2011). In another study, it was found that Indian children who live in a crowded house perform worse at school compared to their counterparts who live in low-density homes (Evans et al., 1998). Also, residential instability as a part of chaotic experiences may lead to problems about school readiness (Hertzman, 2010).

1.3 Present research

The present study aimed to develop a better understanding of refugee experience by defining the experience in detail. Previous studies mostly worked with traumatic encounters of refugee experience result from armed combats and forced migration (e.g., Fazel et al., 2005; Scott et al., 2015). However as mentioned before refugee experience is not only traumatic but also extremely chaotic, and as explained above, both trauma and chaos have important effects on children's executive functioning. In this study, refugee experience was defined in terms of the traumatic encounters and the chaotic living conditions of the child before, during and after forced migration. Unfortunately, there are limited numbers of studies to explore refugee people's cognitive development and even fewer studies for refugee children's. However, the number of refugee children is increasing every year all around the globe, along with their suffering from psychological and cognitive problems (e.g., Fazel et al., 2005; Scott et al., 2015). So this field needs more explorations on the effects of refugee experience on children's cognitive functioning. And the present study aimed to contribute to this area of research. Defining the components of the experience would help to understand the refugee children's lives as a whole. Another important aim of

this research was to reveal which components of the refugee experience are related to the cognitive functioning of children.

In order to achieve these aims, whole refugee experience of Syrians who resettled in Istanbul is divided into components such as; exposure to trauma at home and host country, physical injuries, characteristics of the previous and current residences, continuity of schooling, parental social support, and differences between life quality at home and the host country. And the relationship between these experiences and cognitive functioning was assessed through various tests mostly about executive functioning. These tests were Children Color Trials Test (CCTT; Williams et al., 1995), Heart and Flowers Task (Diamond, Barnett, Thomas, & Munro, 2007; Diamond & Wright, 2014) and The Corsi Block Tapping Task (Corsi, 1972). Also, Syrian children's Turkish language proficiency and psychological reactions to trauma were controlled with Turkish Expressive and Receptive Language Test (TIFALDI; 2010) and Children's Revised Impact of Events Scale- 13 items (CRIES-13, Children and War Foundation, 2005). Lastly, maternal social support and depression were assessed by Oslo 3-Item Social Support (Dalgard, 2006) and Center for Epidemiological Studies-Depression (CES-D; Radloff, 1977).

To maintain the qualitative difference between groups, we preliminarily controlled if refugee children experienced significantly more traumatic life events compared to aged-matched locals. Because of war and migration, we hypothesized (H-1) that refugee children experience significantly higher levels of home chaos.

Even though there are limited numbers of studies to suggest these expectations, our possible hypotheses about cognitive functioning (derived from studies with adults) of children are the following:

Hypothesis 2: Refugee children are significantly slower to complete Color Trials Test-2 compared to locals after controlled for Turkish proficiency.

Hypothesis 3: Refugee children obtain significantly lower scores on Hearts and Flowers congruent task which intends to assess executive skills compared to locals after controlled for Turkish proficiency.

Hypothesis 4: Refugee children obtain significantly lower scores on Hearts and Flowers incongruent task which intends to assess executive skills compared to locals after controlled for Turkish proficiency.

Hypothesis 5: Refugee children obtain significantly lower scores on Hearts and Flowers mixed task which intends to assess executive skills compared to locals after controlled for Turkish proficiency.

Hypothesis 6: Refugee children obtain significantly lower scores on computerized Backward Corsi Block Tapping Task which intends to assess visual working memory after controlled for Turkish proficiency.

Furthermore this study suggested a new perspective to define refugee experience; so after the hypothesis testing, the reasons for these possible differences were explored related to the proposed definition of refugee experience. Since chaos has not been studied among refugee children before, its effect on cognitive functioning was explored, along with language proficiency and maternal psychological well-being.

CHAPTER 2

METHOD

2.1 Participants

The participants of Syrian group included 34 parents (30 mothers, 4 fathers) and 40 children; from four families, more than one sibling was participated in the study. However, 6 children had to be excluded from the study do to failure in completion of the tasks; 34 children (20 males, 14 females) included the analyses as seen in Table 1. The mean age of these participants was 10, ranging from 7 years and 4 months to 13 years. All of the child-participants were right handed and able to talk and understand Turkish to necessary extend. Children did not have neurological problems or psychiatric diagnosis according to their parent's declaration and researcher's observation. There was no substance abuse, all children were enrolled to formal education and none of them were working. Most of the families were located in Sultanbeyli, Istanbul and most of the children was born in and migrated from Aleppo (Halep; N= 29).

Table 1.Frequency Distributions according to Gender

	Gender		Total
	Female	Male	
Trauma Group	14	20	34
Control Group	17	23	40
Total	31	43	74

Control group was consisted of aged-matched locals without war trauma who were born and raised in Turkey. The participants of Turkish group included 36 mothers and 40 children (23 males, 17 females); from four families more than one sibling was participated in the study. All the participants completed the tasks. The

mean age of participants was 9 years 9 months, ranging between 6 years 9 months and 12 years 10 months. All participants but one were right handed and children did not have neurological problems or psychiatric diagnosis according to their parent's declaration and researchers observation. There was no substance abuse, all children were enrolled to formal education and none of them were working. Families recruited from different regions of Istanbul and most of the children was born in Istanbul (N= 34).

2.2 Instruments

2.2.1 Demographic information forms

A short child demographic form consists of questions about substance use and schooling was administered at the beginning of child sessions (Appendix A). The form was fulfilled by the researcher in Turkish according to the answers of child.

Parent demographic form included questions about participant child's physical health, living conditions at the host and home country, nature of the current home environment and traumatic experiences as well as typical demographic questions such as age, gender, number of siblings, parental education and occupation (Appendix B; Arabic form, Appendix C). To understand the possible effects of life standard gap between home and host countries, parental occupation, household conditions, and level of income were asked for both Syria and Turkey separately. Most importantly two main variables are assessed through parent reports; household chaos and exposure to trauma. For Turkish parents questions related to life in Syria were excluded, but trauma-related questions were kept.

2.2.1.1 Household chaos

In order to obtain information about home chaos, the parent demographic form included detail questions about child's home environment in Turkey and in Syria, some of those questions were adopted to understand the chaotic parts of migration. In the present study home chaos was measured in two factors based on the aforementioned index (Vernon-Feagans, Gerrett-Peters, Willoughby, et al., 2012); disorganization and instability and a combined household chaos score. In order to measure the disorganization of the household; the household density (number of person per room) and hours of the television turned on (for background noise) were asked to parents. Instability was assessed through; number residences and number of people in the house. In the study that the index was originated, internal consistencies of these two factors were reasonable; Chronbach's alphas of .76 for instability and .67 for disorganization (Vernon-Feagans, Gerrett-Peters, Willoughby, et al., 2012). And they were positively correlated with each other ($r = .38, p < .0001$). So for household chaos, this is a measure which is entirely based on solid characteristics of the environment rather than the subjective ratings which may be affected by the cultural background and the perceptions of the parents.

2.2.1.2 Traumatic life experiences of the child

The traumatic experiences of the child were asked to parents through parent demographic form. Questions which are meaningful for Syrian refugee sample were extracted from the Childhood War Trauma Questionnaire; a measure for parents to fulfill considering their child's traumatic experiences (CWTQ; Macksoud, 1990). The CWTQ was designed to describe the types of traumatic experiences of children during war and it contains a detailed list of possible traumatic experience categories

(1992). In this research the extracted categories are; exposure to combat, displacement, extreme poverty, witnessing violent acts, bereavement, separation from family, physical injury and being victim of violent acts. Questions about child soldiers were excluded, since they are not suitable for the sample. Total nine questions were asked about traumatic experiences of the child.

2.2.2 Oslo 3-Item Social Support Scale

Oslo 3-Item Social Support Scale is a short questionnaire for adults (Appendix D). It is composed of three items assessing two main factors; perceived social support from neighborhood and family-friends (Dalgard, 2006). Alpha value is 0.78 for the neighborhood factor and 0.72 for the friends-family factor (Dalgard, 2006). The sum of scores ranges from 3 to 14 with three brackets; “3-8 poor support”, “9-11 moderate support” and “12-14 strong support”. In this study the Oslo-3 scale was used in order to understand the social support that parents perceived in Turkey. The Arabic and Turkish translations of the scale were done for the purpose of this study. However during the adaptation answer choices of first and last questions were changed; the answers located in the middle “possible” and “uncertain” were eliminated. So the sum of scores in Turkish and Arabic version was ranged from 3 to 12.

2.2.3 Center for Epidemiological Studies-Depression (CES-D)

Maternal and paternal depression was measured by Center for Epidemiological Studies-Depression (CES-D; Radloff, 1977; Appendix E & F). CES-D is a 20-item, self-report scale for depressive symptoms. The participants were asked to answer the questions based on the frequency of the mentioned symptoms in the past week. Each

item had four options scored 0-3 (0 = Rarely, less than 1 day; 1 = Sometimes, 1-2 days; 2 = Occasionally, 3-4 days; 3 = Most of the time, 5-7 days); higher score meant more severe depressive symptoms. The scale has four factors, depressed affect, positive affect, somatic complaints and interpersonal sensitivity (Radloff, 1977). In the original English, translated Arabic and Turkish versions, internal consistency value of the scale was high .85 (Radloff, 1977), .84 (Kazarian & Taher, 2010) and .87 (Tatar & Saltukoğlu, 2010) respectively. And in this study Cronbach's alpha for 20 items were .84 ($N = 65$). This measure was given in Arabic and Turkish as a part of demographic form and parents were asked to fulfill the form on their own. When parents were illiterate, the translator read them the questions.

2.2.4 Children's Revised Impact of Events Scale- 13 items (CRIES-13)

Children's Revised Impact of Events Scale- 13 items (CRIES-13, Children and War Foundation, 2005) was used to assess the trauma related symptoms of children (Appendix G). CRIES-13 is a 13 items, pencil and paper self-rating measure originated from the scale of Horowitz, Wilner and Alvarez (1979). The child was asked to answer the questions based on the frequency of the mentioned symptoms in the past week (None = 0, Rarely = 1, Sometimes = 3, A Lot = 5). CRIES-13 is composed of three factors; avoidance (4 items), arousal (5 items) and intrusion (4 items) of thoughts in case of trauma. Chronbach's alphas are reported as; .70 for intrusion, .73 for avoidance, .60 for arousal and .80 for full scale (Smith, Perrin, Dyregov, & Yule, 2003). Even though there is debate on the cutoff point for clinical significance of PTSD, CRIES-13 is a sensitive and specific tool for detecting children at the risk of PTSD when the cutoff point is assigned as 30 (Perrin, Meiser-Stedman, & Smith, 2005). In this study, this measure was given to only refugee

children, given verbally and in Turkish (Sahin, Sahin, Batigun, & Yilmaz, 2000).

However, due to unforeseen problems in administration CRIES-13 results were not included to the analyses. CRIES-13 was given in Turkish, and because of the emotional and semantic challenges children had hard time understanding the questions. Also most of the children were not used to concept of likert scale questionnaires, and they could not comprehend the method so their answers were mostly misleading.

2.2.5 Turkish Expressive and Receptive Language Test: Receptive Vocabulary Sub-Scale (TIFALDI-RT)

Turkish Expressive and Receptive Language Test (TIFALDI; 2010) is an original Turkish language test for children aged between 2 to 12. It consists of two subscales; Expressive Vocabulary (TIFALDI-ET) and Receptive Vocabulary (TIFALDI-RT). In this study, only receptive language skills of the children were assessed with TIFALDI-RT. TIFALDI-RT has 104 black and white cards, arranged according to complexity level. On each card there are four pictures, and among them one is the target picture. Pictures represent some activities, adjectives, daily used objects, mathematical terms, geographic formations etc. Researcher read the name of target picture and asked child to point it. Baseline is determined with 8 consecutive correct answers and test was terminated when there were 8 errors within 10 questions. Sum of correct responses were calculated. Test-retest reliability of TIFALDI-RT is reported as .97 and Cronbach alpha is reported as .99 (2010).

2.2.6 Hearts and Flowers Task

Hearts and Flowers Task is a computerized task which was designed to assess the components of executive functions; working memory, response inhibition and set shifting (Diamond, Barnett, Thomas, & Munro, 2007; Wright & Diamond, 2014). It consisted of congruent and incongruent trials; for congruent trials, the instruction was “*Press on the same side as the stimulus (heart)*” and for incongruent trials, the instruction was “*Press on the opposite side of the stimulus (flower).*” Heart image appeared for the congruent trials, and the flower image appeared for the incongruent ones. There were three sets and total 64 trials in the task, 12 only hearts (congruent); 12 only flowers (incongruent) and 40 random hearts-flowers (mixed) trials. Each trial started with a fixation cross in the middle of the screen for 500 ms., followed by a red heart/flower on the right/left of the screen for 750 ms. The participant pressed buttons of letter “Z” or “M” accordingly to the instructions and the fixation cross appears again. The task was administered in Turkish; every instruction was both written on the screen and was read by the researcher. Reaction times and accuracy scores were recorded; accuracy scores for three sets were separately included to the analyses. The task was presented on a Lenovo laptop computer using E-prime 2 (Schneider, Eschman, & Zuccolotto, 2007).

2.2.7 The Corsi Block Tapping Task

The Corsi Block Tapping Task is a measure of spatial short-term memory (1972). The task demanded to mimic a block tapping sequence forwards and backwards. In present study, the computerized version of Corsi Task was displayed via Lenovo laptop computer using The Psychology Experiment Building Language 2.0 (PEBL2; Mueller & Piper, 2014). This computerized version was adapted from the standard

administration study of Kessels, Zandvoort, Postma, Kapelle and Haan (2000). There were 9 navy blue squares (30 mm x 4) presented on a black background, and the squares blink for 1 second. In Forward Corsi Block task the child is asked to directly reproduce the pattern by pressing the squares on the touch screen. In Backward Corsi Block task child was asked to produce the backward of the pattern by pressing the squares on the touch screen. Both tasks start with 3-blocks practice trials, followed by test trials. Test trials start with 2-blocks, each block level had two trials and the test ended in two consecutive errors in the same level. All of the instructions were given verbally in Turkish. Reaction times and accuracy were recorded; only Backward Corsi Block accuracy scores were included in the study.

2.2.8 Color Trails Test

The Color Trial Test (CTT; D'Elia & Satz, 2000) was developed as a culturally fair method for testing visual attention, executive processes and speed of mental processing. This task was widely used instead of Trial Making Test (TMT; Reitan, 1992) in culturally divergent contexts (Dugbartey, Townes, & Mahurin, 2000; Lee, & Chan, 2000). Color trials consisted of 2 subtests, which were completed in paper and pencil. In CTT-1 there were numbers from 1 to 25, circled in pink (odd numbers) and yellow (even numbers). Children were asked to sequence the numbers and completion time and errors were recorded. In CTT-2 there were two versions for each number from 1-25; both pink and yellow circles. Children were asked to sequence both colors and numbers; pink-1, yellow-2, pink-3, yellow-4, etc. The completion time was recorded; only CTT-2 completion time was included in to the analyses. All of the instructions were given in Turkish and the small practice trial was conducted in front of the child to avoid increasing verbal load.

2.3 Procedure

The study was carried out in different regions in Istanbul. The required permissions from the Bogaziçi University Ethics committee were obtained before starting the project (Appendix H). After the necessary permissions, different sampling techniques were applied. Some participants were called-up to participate to the study and some participants recruited by snowball method.

Syrian families called to be invited to a facility with a quiet room for testing in their neighborhood. Parents and children were welcomed by a researcher and a translator who is an Arabic speaking psychology undergrad student. Parents and children were placed to different rooms and their sessions held in simultaneously. First of all parents were asked to read and sign an Arabic informed consent form (Appendix I). After the consent, child session started. In parent session, parents were given a detailed demographic form, Oslo-3 item Social Support Scale, and CES-D respectively in Arabic. In sessions with an illiterate parent, translator read all the questions and wrote all answer for them. Child session started with a short demographic form, followed by TIFALDI-R, Hearts and Flowers, Corsi Block Tapping, Color Trail Test 1-2 and CRIES-13. Parent sessions last around 20 minutes, while child sessions last for approximately 45 minutes.

For Turkish participants, researcher made home visits. The procedure of the sessions was the same. After a consent form (Appendix J), parents were asked to fulfill a demographic form with Oslo-3 item Social Support Scale, and CES-D. There were no illiterate parents but two of the parents preferred researcher to read them the questions. Child session was run in a quiet room at the house; the sessions included TIFALDI-R, Hearts and Flowers, Corsi Block Tapping, and Color Trail Test 1-2.

2.4 Data analysis

First of all this exploratory research aimed to understand the aspects of refugee experience; trauma and chaos. So in order to qualitatively form a chaos factor, principal component analyses was conducted. And then to understand the relations between the variables, bivariate correlation analysis was run between independent, control and outcome variables. Furthermore one-way between subjects ANOVA test was conducted between trauma and control group. Later language proficiency groups were formed based on the TIFALDI-RT scores and another one-way between subjects ANOVA test was conducted between three language proficiency groups. Lastly a multiple regression analysis was run for each cognitive outcome separately.

CHAPTER 3

RESULTS

The first part of this chapter reveals information about the descriptive characteristics of the sample, including current and before migration life standards of refugee children. Later in this chapter factor bivariate correlations and other inferential analyses will be presented with necessary tables.

In the data, there were some missing values because of different reasons. First of all, 40 Syrian parents participated in our study however, 6 of them rescheduled the child session and unfortunately did not attend those sessions. Therefore only 34 Syrian child-parent pairs completed the study. Also within those child participants, some children failed to understand certain tasks and did not reveal an observable performance. So for CTT-2 33 children, for Hearts and Flowers (HF) congruent/incongruent trials 31 children, for HF mixed trials 33 children and lastly for Backward Corsi Task 32 children performed enough to be included to the analyses. On the other hand, all 40 local children-parent pairs completed the study while one child could not perform enough on HF incongruent trials and 3 children could not perform enough on Backward Corsi Task. None of the missing values on cognitive tasks were adjusted. However, because of the already limited sample sizes, all statistical analyses were done separately for each dependent variable. There were two participants who had Hearts and Flowers mixed trial performances that were counted as outliers and those outcomes were Winsorized. The related statistical analyses were not different before and after Winsorizing.

3.1 Descriptive characteristics of the sample

Total 74 children were included in the analyses. Syrian group (trauma group) consisted of 34 children aged between 88 months and 156 months ($M = 120.85$, $SD = 17.18$). Forty one point two percent of the participants were female (14 females, 20 males). Turkish group (control group) consisted of 40 children aged between 81 months and 151 months ($M = 116.83$, $SD = 19.59$). Also 42.5% of the participants were female (17 females, 23 males).

In terms of the family characteristics, parents of 58.8% of Syrian and 52.5% of Turkish children reported household income as average. Also, 61.8% of Syrian families reported that their income was also average before they migrated. Parents of 10 children reported a decline in their household income after migration, while 5 of them reported an increase and 16 of them reported stability. Majority of the Syrian mothers were graduated from primary school (55.9%) while 25% of the Turkish mothers graduated from primary school and rest were graduated from high school (37.5%) and university (37.5%). Also 35.2% of Syrian fathers were graduated from high school and university while this ratio was 82.5% for Turkish fathers. Syrian families had more children ($M = 4.44$, $SD = 1.73$) compared to Turkish families ($M = 2.28$, $SD = .99$).

Due to the nature and aims of this study, mobility-related questions were asked to participants, as presented in Table 2. As expected Syrian children experienced more changes in their surroundings. Syrian children and their families migrated to Turkey at various times ranging from 5 months to 60 months ago ($M = 38.82$, $SD = 13.74$). Most of the Syrian children were moved from their home city directly to Istanbul and lived in overall 2 cities (94.1%), while most of the Turkish children were born and raised in Istanbul (80%). More discrete changes were experienced in

terms of household movements. Syrian children lived in up to 12 different houses ($M = 5.18, SD = 2.83$), Turkish children lived in up to 5 different houses ($M = 2.20, SD = .91$). On average Syrian children live in their current address for 25.2 ($SD = 17$) months while Turkish children live in their current address for 64.2 ($SD = 35.09$) months. Total number of different schools that Syrian ($M = 1.8, SD = 1.1$) and Turkish ($M = 1.75, SD = .81$) children went was similar. However, it is important to note the qualitative difference between these changes since the Syrian children experienced them due to war-related migration.

Table 2. Means and Standard Deviations of Life Changes

	Number of Houses	Number of Cities	Number of Schools	Months in the current address
Trauma Group	5.06 (2.6)	2.06 (.24)	1.7 (.82)	25.2 (17)
Control Group	2.2 (.91)	1.23 (.48)	1.7 (.69)	64.2 (35.1)

The traumatic experiences of the children were asked to parents. There were no prerequisite as to be trauma-naïve, in order to participate the control group. So, two local children witnessed traumatic events. Trauma exposure rates were higher for refugee children on a 9 point trauma exposure checklist ($M = 3.03, SD = 1.89$) compared to local children ($M = .10, SD = .44$) as seen in Table 3. This difference affects the trauma exposure score variance for “all participants” ($M = 1.4, SD = 3.82$).

Table 3. Descriptive Statistics of the Scales

Group		<i>N</i>	Min	Max	Mean	<i>SD</i>
	Trauma Exposure	32	0	7	3.03	1.89
Trauma Group	Maternal Depression	30	7	53	25.17	13.11
	Social Support	34	3	11	5.60	2.11
	Trauma Exposure	40	0	2	.10	.44
Control Group	Maternal Depression	33	0	47	17.76	11.04
	Social Support	33	4	12	9.61	1.87

The living conditions of children were also asked. There was no difference between the house sizes of two groups, both groups live in 3 room apartments on average. However Syrian children live with more people in the household ($M = 6.35$, $SD = 2.43$) compared to Turkish children ($M = 4.60$, $SD = .1.39$), $t(72) = 3.87$, $p = .00$. As a result Syrian children live in denser houses ($M = 2.31$, $SD = .93$) compared to Turkish children ($M = 1.37$, $SD = .48$), $t(44.41) = 5.17$, $p = .00$. The majority of Syrian children share their rooms with siblings or other family members (88.2%), similar to Turkish children (67.5%). In Syria, children used to live in more crowded ($M = 7.15$, $SD = 3.27$) and denser ($M = 2.95$, $SD = 1.64$) houses compared to their current houses. When current everyday exposure to TV was asked; there were no significant difference between the hours of TV is on per day in Turkish houses ($M = 3.75$, $SD = 1.28$) and Syria houses ($M = 2.93$, $SD = 2.04$).

In terms of general disorganization, instability and chaos indexes groups showed differences. There was a significant difference between the disorganization levels of trauma group ($N = 33, M = .24, SD = .88$) and control group ($N = 40, M = -.14, SD = .55$). Syrian children experienced significantly more disorganization at home compared to Turkish children, $t(51.7) = 2.15, p < .05$. There was a significant difference between the instability levels of trauma group ($N = 34, M = .52, SD = .38$) and control group ($N = 40, M = -.51, SD = .48$). Syrian children experienced significantly more instability compared to Turkish children, $t(51.6) = 6.45, p < .01$. There was a significant difference between the overall chaos levels of trauma group ($N = 34, M = .37, SD = .7$) and control group ($N = 40, M = -.33, SD = .49$). Syrian children experienced significantly more chaos at home compared to Turkish children, $t(51.4) = 4.89, p < .01$.

For Syrian children, years of formal education were asked. Every child was currently enrolled in formal education in Turkey, average years of schooling was 2.34 ($SD = 1.03$). Related to their age, only 45.5% of the children were enrolled in formal education in Syria, on average children went school less than a year ($M = .77, SD = 1.14$).

Lastly, Syrian mother mothers were more depressed ($M = 26.20, SD = 12.09$) compared to Turkish mothers ($M = 17.76, SD = 11.04$). Also Syrian mothers perceived less social support ($M = 5.59, SD = 2.16$) compared to Turkish mothers ($M = 9.61, SD = 1.87$) as presented in Table 3.

3.2 Correlational analyses

3.2.1 Correlations between the aspects of living conditions

Regarding the experiences, living standards and the demographic characteristics of all participating children; associations between trauma exposure, household chaos, household income, and parental education, maternal depression and maternal social support were investigated. All of the results were also presented in Table 4.

As illustrated in the table, traumatic life experiences of children were found to be related to almost all other aspects. Traumatic life experiences were found to be positively correlated with household chaos ($r = .42, p < .00$), disorganization ($r = .25, p < .05$), and instability ($r = .48, p < .00$). And also it was negatively correlated with maternal education level ($r = -.40, p < .00$), and paternal education level ($r = -.40, p < .00$). However traumatic experiences were not correlated with household income. Household chaos was significantly correlated with paternal education level ($r = -.34, p < .00$), but not with maternal education level. Also household income was found to be positively correlated with maternal ($r = .38, p < .00$) and paternal education ($r = .25, p < .05$) levels.

As presented in Table 4, maternal depression and social support indications were related to several other aspects of children's, and consequently mothers' own lives. Data revealed significant correlations for maternal depression and perceived social support ($r = -.54, p < .00$), trauma exposure ($r = .43, p < .01$), chaos ($r = .52, p < .00$), disorganization ($r = .47, p < .00$), instability ($r = .47, p < .00$) household income ($r = -.32, p < .05$), maternal education level ($r = -.32, p < .05$) and paternal education level ($r = -.31, p < .05$). Also mother's perceived social support was correlated with trauma exposure ($r = -.65, p < .00$), chaos ($r = -.54, p < .00$),

disorganization ($r = -.41, p < .00$), instability ($r = -.56, p < .00$), maternal education level ($r = .42, p < .00$), and paternal education level ($r = .49, p < .00$).

3.2.2 Correlations between cognitive task performances

Pearson correlation coefficients were calculated to examine the relationships among the cognitive task scores. Only raw scores of all tasks were used in the statistical analysis. As represented in Table 4, all scores were found to be significantly correlated with each other. Vocabulary (TIFALDI Raw Score) was significantly correlated with Color Trail Task-2 (CTT-2), $r(68) = -.43, p < .00$, Hearts and Flowers Task congruent accuracy (HF CA), $r(66) = .51, p < .00$, Hearts and Flowers Task incongruent accuracy (HF IA), $r(64) = .46, p < .00$, Hearts and Flowers Task mixed accuracy (HF MA), $r(67) = .44, p < .00$, Backward Corsi Block Tapping Task accuracy, $r(65) = .43, p < .00$.

Completion time of CTT-2 was strongly correlated with the accuracy score of Backward Corsi Task, $r(67) = -.62, p < .00$. The relation between the accuracy scores of HF congruent and incongruent trials was also strong, $r(67) = .62, p < .00$.

3.2.3 Correlations between cognitive task performances and living conditions

As presented in Table 4, data revealed that exposure to trauma was strongly related to receptive language performance (TIFALDI) of children, $r(67) = -.66, p < .00$, and weakly related to HF CA, $r(68) = -.29, p < .05$, HF IA, $r(67) = -.31, p < .05$.

Household chaos, instability and disorganization had weak to moderate correlations with vocabulary, HF CA and HF IA scores as seen in Table 4.

Maternal depression was found to be moderately related to HF CA, $r(59) = -.48, p < .00$, HF IA, $r(58) = -.42, p < .00$. Perceived Maternal Social Support had

moderate to strong correlations with all task scores. It was most strongly correlated with vocabulary (TIFALDI Raw Score), $r(63) = .71, p < .00$. Also, maternal education level was found to be related to all cognitive outcomes that were presented in Table 4, it was most strongly correlated with vocabulary, $r(69) = .55, p < .00$. Age of the children and household income had weak to moderate correlations with some cognitive outcomes as presented in Table 4.



Table 4. Pearson Correlation Coefficients of Cognitive Task Scores and Living Conditions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.Trauma Exp.	P: Corr N	1 72														
2.Disorganization	P: Corr N	.254* 73	1 73													
3.Instability	P: Corr N	.562** 73	.911** 74	1 74												
4.Chaos	P: Corr N	.850** 73	.471** 74	.515** 74	1 63											
5.Depression	P: Corr N	.469** 62	.471** 63	.515** 63	.536** 60	1 67										
6.Support	P: Corr N	-.405** 66	-.553** 67	-.539** 67	-.536** 60	-.316* .086	1 64									
7.Income	P: Corr N	-.230 71	-.208 71	-.126 71	-.316* 61	-.086 64	.382** 71	1 74								
8.Maternal Edu.	P: Corr N	-.400** 72	-.161 73	-.099 74	-.146 74	-.321* 63	.416** 67	.382** 74	1 71							
9.Paternal Edu.	P: Corr N	-.399** 69	-.304* 70	-.301* 71	-.342* 71	-.307* 62	.489** 64	.247** 68	.744** 71	1 71						
10.Age	P: Corr N	.232 72	-.086 73	-.022 74	-.052 74	-.016 63	-.003 67	.047 71	-.013 74	-.013 74	1 74					
11.Vocabulary	P: Corr N	-.665** 67	-.192 68	-.406** 69	-.358** 69	-.179 59	.707** 63	.116 66	.567** 66	.567** 66	.002 69	1 69				
12.CTT-2	P: Corr N	.167 70	.062 71	.193 72	.155 72	.218 61	-.457** 65	-.275* 69	-.353** 69	-.386** 72	-.429** 68	-.429** 68	1 72			
13.HF CA	P: Corr N	-.290* 68	-.271* 69	-.357** 70	-.358** 70	-.475** 59	.508** 63	.161 67	.233 67	.282* 70	.506** 66	-.313** 70	1 70			
14.HF IA	P: Corr N	-.307* 67	-.359** 68	-.380** 69	-.416** 69	-.416** 58	.533** 62	.261* 66	.301* 66	.212 69	.462** 64	-.458** 68	-.458** 67	1 69		
15.HF MA	P: Corr N	-.263* 70	-.215 71	-.186 72	-.230 72	-.204 61	.358** 65	.239* 69	.310** 72	.097 69	.435** 72	-.387** 71	-.387** 70	.460** 69	1 72	
16.BCA	P: Corr N	-.182 66	-.217 67	-.120 68	-.185 68	-.261* 57	.432** 61	.185 65	.312* 65	.377** 68	.424** 65	-.613** 67	-.613** 65	.421** 63	.382** 66	1 68

Note: P: Corr: Pearson Correlation, Trauma Exp: Trauma Exposure, Maternal Edu.: Maternal Education Level, Paternal Edu.: Paternal Education Level, CTT-2: Color Trail Test-2, HF CA: Hearts and Flowers Congruent Accuracy, HF IA: Hearts and Flowers Incongruent Accuracy, HF MA: Hearts and Flowers Mixed Accuracy, BCA: Backward Corsi Accuracy. ***:p<0.01, *:p<0.05

3.2.4 Partial correlation

As seen above receptive language skills found to be correlated with all cognitive outcomes, so in order to understand the special relationship between refugee experience and cognitive functioning partial correlation analysis was run. When we controlled age and TIFALDI- Receptive Language raw scores on the relationship between cognitive task scores, chaos and trauma exposure, there was no significant relations but one (see Table 5). There was a negative correlation between disorganization and HF IA after controlling for age and vocabulary abilities, $r(53) = -.33, p < .05$.

Table 5. Partial Correlations between Cognitive Task Scores, Chaos and Trauma Exposure ($N = 53$)

	Variables	Trauma Exposure	Disorganization	Instability	Chaos
Controlling for Age & Vocabulary	CTT-2	-.05 ($p = .7$)	-.02 ($p = .9$)	-.01 ($p = .9$)	-.01 ($p = .9$)
	HF CA	.06 ($p = .7$)	-.18 ($p = .2$)	-.00 ($p = .9$)	-.09 ($p = .5$)
	HF IA	.05 ($p = .7$)	-.33* ($p < .05$)	-.02 ($p = .9$)	-.20 ($p = .1$)
	HF MA	.11 ($p = .4$)	-.08 ($p = .6$)	.19 ($p = .7$)	.05 ($p = .7$)
	BCA	-.05 ($p = .7$)	-.17 ($p = .2$)	.13 ($p = .4$)	-.02 ($p = .9$)

Note: CTT-2: Color Trail Test-2, HF CA: Hearts and Flowers Congruent Accuracy, HF IA: Hearts and Flowers Incongruent Accuracy, HF MA: Hearts and Flowers Mixed Accuracy, BCA: Backward Corsi Accuracy. **: $p < .01$, *: $p < .05$

3.2.5 Correlations for trauma and control groups

Since the characteristics of trauma and control groups were relatively different, bivariate correlations between cognitive functioning scores and living conditions were also calculated for each group separately. As seen in Table 6 and 7, not all the correlations that were seen in the general sample were observed in trauma and control groups. The sample sizes are reported for each scale in related tables.

In trauma group, vocabulary was found to be related to instability ($r = .36, p < .05$) and maternal social support ($r = .36, p < .05$). Maternal social support was also positively related to HF CA, HF IA and Backward Corsi accuracy scores as seen in Table 6. Also maternal depression was found to be negatively related to the HF CA scores of children. There were no significant relations between cognitive task scores and traumatic experiences, as well as chaotic living conditions of children. Lastly results indicated that better Turkish receptive vocabulary abilities were related to better cognitive task performances for refugee children as presented in Table 6.

In control group, vocabulary was found to be related to maternal depression ($r = -.37, p < .05$). Also higher levels of maternal depression were related to poorer cognitive task performances as seen in Table 7, while lower levels of maternal social support were related to slower performance on CTT-2 ($r = -.37, p < .05$). Lastly, better Turkish receptive vocabulary abilities were found to be related to better performances on all cognitive tasks as presented in Table 7.

Table 6. Pearson Correlation Coefficients for Trauma Group

	1	2	3	4	5	6	7	8	9	10	11	12	
1.Trauma Exp.	P.Corr	1											
	N	32											
2.Disorganization	P.Corr	.110	1										
	N	32	33										
3.Instability	P.Corr	.042	.429*	1									
	N	32	33	34									
4.Chaos	P.Corr	.095	.822**	.861**	1								
	N	32	33	34	34								
5.Depression	P.Corr	.372	.275	.168	.236	1							
	N	28	29	30	30	30							
6.Support	P.Corr	-.325	-.294	.012	-.143	-.438*	1						
	N	32	33	34	34	30	34						
7.Vocabulary	P.Corr	-.158	.035	.363*	.215	.181	.356*	1					
	N	29	30	31	31	27	31	31					
8.CTT-2	P.Corr	-.074	-.081	-.158	-.127	-.107	-.301	-.437*	1				
	N	30	31	32	32	28	32	30	32				
9.HF CA	P.Corr	.021	-.242	-.114	-.215	-.481*	.401*	.380*	-.193	1			
	N	28	29	30	30	26	30	28	30	30			
10.HF IA	P.Corr	-.083	-.321	-.156	-.282	-.268	.497**	.367	-.620**	.575**	1		
	N	28	29	30	30	26	30	27	29	28	30		
11.HF MA	P.Corr	-.096	-.277	.004	-.181	-.114	.330	.475**	-.238	.417*	.577**	1	
	N	30	31	32	32	28	32	29	31	30	30	32	
12.BCA	P.Corr	-.105	-.092	.225	.092	-.111	.471**	.494**	-.557**	.336	.589**	.316	1
	N	29	30	31	31	27	31	30	28	27	29	29	31

Note: P. Corr: Pearson Correlation, Trauma Exp: Trauma Exposure, CTT-2: Color Trail Test-2, HF CA: Hearts and Flowers Congruent Accuracy, HF IA: Hearts and Flowers Incongruent Accuracy, HF MA: Hearts and Flowers Mixed Accuracy, BCA: Backward Corsi Accuracy. **p<.01, *p<.05

Table 7. Pearson Correlation Coefficients for Control Group

	1	2	3	4	5	6	7	8	9	10	11	12	
1.Trauma Exp.	P.Corr	1											
	N	40											
2.Disorganization	P.Corr	-.028	1										
	N	40	40										
3.Instability	P.Corr	.069	.762**	1									
	N	40	40	40									
4.Chaos	P.Corr	.019	.946**	.930**	1								
	N	40	40	40	40								
5.Depression	P.Corr	.150	.637**	.739**	.722**	1							
	N	33	33	33	33	33							
6.Support	P.Corr	-.153	-.493**	-.691**	-.623**	-.585**	1						
	N	33	33	33	33	30	33						
7.Vocabulary	P.Corr	.115	-.301	-.253	-.297	-.366*	.281	1					
	N	38	38	38	38	32	32	38					
8.CTT-2	P.Corr	.082	.068	.246	.161	.404*	-.374*	-.577**	1				
	N	40	40	40	40	33	33	38	40				
9.HF CA	P.Corr	.057	-.121	-.170	-.153	-.352*	.309	.358*	-.284	1			
	N	40	40	40	40	33	33	38	40	40			
10.HF IA	P.Corr	.029	-.261	-.234	-.264	-.430*	.349	.370*	-.268	.547**	1		
	N	39	39	39	39	32	32	37	39	39	39		
11.HF MA	P.Corr	.154	.032	.016	.026	-.147	-.006	.351*	-.404**	.025	.203	1	
	N	40	40	40	40	33	33	38	40	40	39	40	
12.BCA	P.Corr	-.012	-.288	-.256	-.291	-.359	.319	.569**	-.619**	.466**	.189	.365*	1
	N	37	37	37	37	30	30	35	37	37	36	37	37

Note: P. Corr: Pearson Correlation, Trauma Exp: Trauma Exposure, CTT-2: Color Trail Test-2, HF CA: Hearts and Flowers Congruent Accuracy, HF IA: Hearts and Flowers Incongruent Accuracy, HF MA: Hearts and Flowers Mixed Accuracy, BCA: Backward Corsi Accuracy. **: p<.01, *: p<.05

3.3 Analyses based on trauma groups

3.3.1 One-Way Analysis of Variance (ANOVA) with trauma and control groups

In order to understand whether there is a difference between the cognitive performance of Syrian and Turkish children, One-Way ANOVA test was conducted. There was a significant effect of the trauma group on performances on almost all tasks as seen in Table 8.

Trauma group ($N = 32$) was significantly slower ($M = 199.48$, $SD = 69.46$) to complete CTT-2 compared to control group ($N = 38$, $M = 156.21$, $SD = 86.25$).

Trauma group ($N = 30$) gave fewer accurate results on HF Congruent trials ($M = 8.03$, $SD = 3.26$) compared to control group ($N = 40$, $M = 10.48$, $SD = 2.15$). Also they ($N = 30$, $M = 5.87$, $SD = 3.36$) gave fewer accurate answers on HF Incongruent trials compared to control group ($N = 39$, $M = 8.62$, $SD = 3.13$). And lastly they ($N = 32$, $M = 17.03$, $SD = 6.74$) gave fewer accurate answers on HF Mixed trials ($N = 40$, $M = 21.08$, $SD = 5.92$) compared to control group. There was also a marginally significant difference between the Backward Corsi Task performances of trauma ($N = 31$, $M = 5.06$, $SD = 2.32$) and control group ($N = 37$, $M = 6.11$, $SD = 2.12$) as seen in Table 8. Lastly, trauma group's receptive vocabulary skills were significantly poorer compared to control group; Syrian children gave fewer accurate answers ($N = 31$, $M = 50.61$, $SD = 21.39$) to TIFALDI-RL test, compared to Turkish children ($N = 38$, $M = 95.71$, $SD = 5.80$).

Table 8. One-Way Analysis of Variance of Cognitive Functioning Tasks by Trauma Group

	<i>Df</i>	<i>N</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>P</i>
Vocabulary	1	69	34721.902	34721.902	155.369	0.000
CTT-2	1	72	33282.226	33282.226	5.298	0.024
HF CA	1	70	102.201	102.201	14.214	0.000
HF IA	1	69	128.114	128.114	12.285	0.001
HF MA	1	72	290.701	290.701	7.336	0.008
BCA	1	68	18.370	18.370	3.749	0.057

Note: CTT-2: Color Trail Test-2, HF CA: Hearts and Flowers Congruent Accuracy, HF IA: Hearts and Flowers Incongruent Accuracy, HF MA: Hearts and Flowers Mixed Accuracy, BCA: Backward Corsi Accuracy.

3.3.2 One-Way Analysis of Covariance (ANCOVA) with trauma and control groups

Even though age and language proficiency of the child found to be related to the cognitive task performances, they were not our primary research concern. So in order to understand the effect of refugee experience on cognitive functioning we tried to adjust the effect of those variables on cognitive functioning. One-way ANCOVA was conducted to compare the cognitive task performances of Syrian and Turkish children whilst controlling for years in Turkey (years of being exposed to Turkish language) and receptive Turkish language abilities. Some participants have failed to complete some tasks, so sample sizes for each dependent variable were different. So One-Way ANCOVA rather than MANCOVA (Multivariate Analysis of Covariance) was applied to reach maximum sample sizes for each variable.

CTT-2 completion time showed a significant difference between trauma ($N = 30$) and control ($N = 38$) groups after controlled for language proficiency and months in Turkey [$F(1,64) = 8.85, p = .00$], with a rather small effect size ($\eta^2 = .122$).

HF CA score did not show a significant difference between trauma ($N = 28$) and control ($N = 38$) groups after controlled for language proficiency and months in

Turkey, $F(1,62) = 1.72, p = .19$, with a rather small effect size ($\eta^2 = .027$). HF IA score did not show a significant difference between trauma ($N = 27$) and control ($N = 37$) groups after controlled for language proficiency and months in Turkey, $F(1,60) = 1.54, p = .22$, with a rather small effect size ($\eta^2 = .025$). HF MA scores did not show a significant difference between trauma ($N = 29$) and control ($N = 38$) groups after controlled for language proficiency and months in Turkey, $F(1,63) = 1.10, p = .3$, with a small effect size ($\eta^2 = .017$).

Backward Corsi Task accuracy score showed a significant difference between trauma ($N = 30$) and control ($N = 38$) groups after controlled language proficiency and months in Turkey, $F(1,61) = 9.71, p = .00$, with a rather small effect size ($\eta^2 = .137$).

3.4 Analyses based on language competence

Since the language competence forms a distinctive grouping criterion among the participants, three language competence levels were created to assess its possible effects on cognitive functioning.

First of all, the 33.3 and 66.6 percentile cutoff points for TIFALDI-Receptive Language raw scores were determined, and three groups were formed accordingly: Low language competence, Medium language competence and High language competence (see Table 9). Only medium language competence group included both Syrian and Turkish children.

Table 9. Frequencies and TIFALDI Raw Score Means of Language Competence Groups

	Trauma Group	Control Group	Mean (SD)
Low Language Competence	21	0	40.05 (3.65)
Medium Language Competence	10	15	83.24 (2.26)
High Language Competence	0	23	99.30 (.36)

After creating three groups, a one-way between subjects ANOVA conducted to compare the effect of language proficiency on executive functioning tasks. There was a significant effect of language proficiency for the three conditions on CTT-2 completion time, $F(2, 65) = 8.53, p < .01$, on HF CA, $F(2, 63) = 7.87, p < .01$, on HF IA, $F(2, 61) = 8.35, p < .01$, on HF MA, $F(2, 64) = 6.23, p < .01$, and on Backward Corsi Task accuracy, $F(2, 62) = 5.81, p < .01$. Post hoc comparisons using the Tukey's HSD test indicated that for all tasks LLC group performed significantly poorer than the HLC group. However, as presented in Table 10, there was a significant difference between MLC group and HLC group for only CTT-2 completion time and HF IA.

In other words, for all cognitive tasks, Syrian children with low proficiency in Turkish displayed significantly poorer performances compared to Turkish children with high Turkish proficiency. To have a better understanding of the cognitive performance of Syrian and Turkish children who have similar medium proficiency, further analyses were applied. Since sample sizes are remarkably small Mann-Whitney test was preferred. There was no significant difference between Syrian and

Turkish groups of children who understand medium level Turkish on any cognitive outcome.

Table 10. Post-Hoc Comparisons (Tukey's HSD) of Cognitive Task Performances for Language Competence Groups

	Comparison		Mean Difference (I-J)	Std. Error	Sig.
	Group 1	Group2			
CTT-2	Low	Medium	41.73	22.35	.16
	Medium	High	51.81*	21.53	.05
	High	Low	-93.54*	22.78	.00
HF CA	Low	Medium	-1.81	.80	.07
	Medium	High	-1.35	.77	.19
	High	Low	3.16*	.80	.00
HF IA	Low	Medium	-1.50	.96	.27
	Medium	High	-2.42*	.91	.03
	High	Low	3.92*	.98	.00
HF MA	Low	Medium	-3.58	1.85	.14
	Medium	High	-3.03	1.79	.22
	High	Low	6.61*	1.87	.00
BCA	Low	Medium	-1.12	.65	.20
	Medium	High	-1.09	.64	.21
	High	Low	2.21*	.65	.00

CTT-2: Color Trail Test-2, HF CA: Hearts and Flowers Congruent Accuracy, HF IA: Hearts and Flowers Incongruent Accuracy, HF MA: Hearts and Flowers Mixed Accuracy, BCA: Backward Corsi Accuracy. LLC: Low Language Competence, MLC: Medium Language Competence, * $p < .05$

3. 5 Multiple regression analyses

3.5.1 Multiple regression with both control and trauma group

Multiple regression analyses for each dependent variable were adopted to predict cognitive functioning based on the trauma exposure, household chaos and Turkish receptive vocabulary ability.

A multiple regression was run to predict Color Trial Test-2 completion time from trauma exposure, household chaos and vocabulary; a significant equation was found, $F(3,63) = 5.621, p < .01, R^2 = .221$. Only Turkish vocabulary abilities

significantly contributed the equation ($\beta = -.56, p < .01$) while trauma exposure ($\beta = -.23, p = .15$) and household chaos ($\beta = .05, p = .69$) did not (see Table 11).

Table 11. Multiple Regression Analysis for Color Trial Test-2 Completion Time

Predictor	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Vocabulary	-1.700	.455	-.563	-3.734	.000
Trauma Exposure	-9.518	6.676	-.228	-1.470	.147
Household Chaos	5.807	14.702	.049	.385	.694

To predict HF Congruent trials accuracy scores from trauma exposure, household chaos and vocabulary; a significant equation was found, $F(3,62) = 9.088, p < .01, R^2 = .272$. Vocabulary significantly contributed the equation ($\beta = .528, p < .01$) while the contribution of household chaos ($\beta = -.235, p < .05$) was significant and trauma exposure's was insignificant ($\beta = .160, p = .281$) as seen in Table 12.

Table 12. Multiple Regression Analysis for HF Congruent Trials Accuracy Scores

Predictor	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Vocabulary	.057	.015	.528	3.704	.000
Trauma Exposure	.239	.220	.160	1.088	.281
Household Chaos	-1.000	.499	-.235	-2.005	.049

To predict HF Incongruent trials accuracy scores from trauma exposure, household chaos and vocabulary; a significant equation was found, $F(3,60) = 8.214, p < .01, R^2 = .256$. Vocabulary ($\beta = .419, p < .01$) and household chaos ($\beta = -.309, p < .05$) significantly contributed the equation while trauma exposure did not ($\beta = .101, p = .505$) as seen in Table 13.

Table 13. Multiple Regression Analysis for HF Incongruent Trials Accuracy

Scores

Predictor	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Vocabulary	.054	.019	.419	2.859	.006
Trauma Exposure	.180	.269	.101	.671	.505
Household Chaos	-1.563	.610	-.309	-2.562	.013

To predict HF Mixed trials accuracy scores from trauma exposure, household chaos and vocabulary; a significant equation was found, $F(3,63) = 5.218, p < .01, R^2 = .161$. Turkish language proficiency significantly contributed the equation ($\beta = .452, p < .01$) while trauma exposure ($\beta = .080, p = .610$) and household chaos ($\beta = -.102, p = .417$) did not as seen in Table 14.

Table 14. Multiple Regression Analysis for HF Mixed Trials Accuracy Scores

Predictor	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>t</i>	<i>p</i>
Vocabulary	.110	.037	.452	2.973	.004
Trauma Exposure	.269	.525	.080	.513	.610
Household Chaos	-.975	1.292	-.102	-.818	.417

Lastly, to predict Backward Corsi Block Tapping Task accuracy scores from trauma exposure, household chaos and vocabulary; a significant equation was found $F(3,61) = 5.172, p < .01, R^2 = .164$. Turkish language proficiency significantly contributed the equation ($\beta = .531, p < .01$) while trauma exposure ($\beta = .205, p = .200$) and household chaos ($\beta = -.081, p = .523$) did not (Table 15).

Table 15. Multiple Regression Analysis for Backward Corsi Block Tapping

Task Accuracy Scores

Predictor	<i>B</i>	<i>SE B</i>	B	<i>t</i>	<i>p</i>
Vocabulary	.044	.013	.531	3.447	.001
Trauma Exposure	.237	.183	.205	1.296	.200
Household Chaos	-.267	.416	-.081	-.642	.523

Therefore receptive language abilities predicted all of the cognitive scores mostly alone. Only for HF Congruent and Incongruent trials accuracy scores, household chaos was also a predictor. And trauma exposure did not predict any of the cognitive outcomes.

3.5.2 Multiple regression with only trauma group

Multiple regression analyses for each dependent variable were adopted to predict cognitive functioning based on the trauma exposure, household chaos and Turkish language proficiency. Since there are children from different ages and language exposure durations, for language proficiency TIFALDI Raw Scores were not included to the study, rather a new score was created; TIFALDI age difference. This score was created by subtracting chronological age (by month) of the child from the TIFALDI equivalent age (by month).

A multiple regression was run to predict Color Trial Test-2 completion time from trauma exposure, household chaos and TIFALDI age difference; a significant equation was not found, $F(3,24) = .163$, $p = .920$, $R^2 = -.103$.

To predict HF Congruent trials accuracy scores from trauma exposure, household chaos and TIFALDI age difference; a significant equation was not found, $F(3,24) = 1.33, p = .32, R^2 = .02$.

To predict HF Incongruent trials accuracy scores from trauma exposure, household chaos and TIFALDI age difference; a significant equation was not found, $F(3,23) = 1.49, p = .24, R^2 = .054$.

To predict HF Mixed trials accuracy scores from trauma exposure, household chaos and TIFALDI age difference; a significant equation was found, $F(3,24) = 4.029, p = .019, R^2 = .252$. As seen in Table 16, TIFALDI age difference significantly contributed the equation ($\beta = .582, p < .01$) while trauma exposure ($\beta = .071, p = .688$) and household chaos ($\beta = -1.918, p = .067$) did not. As expected there was a positive correlation between TIFALDI age difference and HF Mixed trials for refugee children ($N = 29, r = .48, p < .01$).

Table 16. Multiple Regression Analyses for HF Mixed Accuracy Scores - Only Trauma Group

Predictor	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>t</i>	<i>p</i>
TIFALDI Age Difference	.163	.050	.582	3.275	.003
Trauma Exposure	.268	.659	.071	.407	.688
Household Chaos	-3.195	1.666	-.337	-1.918	.067

TIFALDI age difference predicted HF mixed trial accuracy scores when both trauma and control group included in the analyses, $F(3,61) = 4.261, p = .008, R^2 = .133$. TIFALDI age difference significantly contributed the equation ($\beta = .485, p < .01$) while trauma exposure ($\beta = .131, p = .437$) and household chaos ($\beta = -.031, p = .809$) did not (Table 17).

Table 17. Multiple Regression Analyses for HF Mixed Accuracy Scores - Both Groups

Predictor	<i>B</i>	<i>SE B</i>	B	<i>t</i>	<i>p</i>
TIFALDI Age Difference	.088	.030	.485	2.954	.004
Trauma Exposure	.468	.598	.131	.782	.437
Household Chaos	-.319	1.314	-.031	-.243	.809

Lastly, to predict Backward Corsi Block Tapping Task accuracy scores from trauma exposure, household chaos and TIFALDI age difference; a significant equation was not found, $F(3,24) = .220$, $p = .882$, $R^2 = -.09$.

CHAPTER 4

DISCUSSION

The present study aimed to understand the effect of war and migration on the cognitive functioning of refugee children resettled in Turkey. In order to achieve this aim, various cognitive tasks and a detailed parent demographic form was given to both Turkish and Syrian refugee participants. Therefore analyses of this extensive data were multilayered and interrelated. In this chapter, results of these analyses are discussed in the light of trauma, chaos and executive functioning literature. Firstly the results related to living conditions and refugee experience of parents and their children will be discussed. Afterward, the main results of cognitive tasks will be elaborated on. Lastly, implications and limitations of the study will be discussed.

As mentioned above individual is in constant interaction with the environment, and this interaction has a crucial impact on the psychological and cognitive well-being of individuals, especially children. This study objectively revealed the differences between the concrete surroundings of refugee and local children who did not experience war. Our first hypothesis was supported by the results. As hypothesized, refugee children had more instable and disorganized households; they changed more residences, and they live in more crowded and denser houses. That means even after they migrate, they have to adapt to more changes since they are almost constantly mobile. So refugee children are not only exposed to war-related trauma but also they experience more chaotic and constantly changing living conditions during and after migration. For this sample, what quantitatively distinguishes the refugee experience from being local was the number of house moves, rather than city change. Children were forced to change multiple residences

while their parents look for a safe and convenient place to live. Even though most of the families migrated directly from their hometown to Istanbul, they had to change more than ten residences, while some of the local children were born and raised in the same familiar house.

Refugee children also lived in denser and more crowded houses. However one should be cautious about explaining household crowd only by the migration process. It is important to consider the cultural differences in the average child number and preference of extended families; Syrian children were also living in denser and more crowded houses before migration. On the one hand, refugees may have difficulty to effort bigger houses and they may be obliged to live with their relatives for economic reasons. On the other hand, Syrian participant families had more children and also they may prefer to live with their extended family and kin accordingly to their customs. Even though the percentage of extended families in Syria decreases over time, it is still a popular type of household in rural parts of the country (Olmsted, 2011). There may be various reasons for the differences between living standards of refugee and local children. Whether due to the migration process or the cultural differences between host and home countries, it is important to consider lifestyle and living standard differences in the studies rather than focusing on solely trauma exposure.

4.1 Discussion of the findings

4.1.1 Nature of household chaos

To define the nature of the household, a chaos index was adapted based on previous studies (Vernon-Feagans, Gerrett-Peters, Willoughby, et al., 2012). Some questions and scales were not suitable for this research and fit the purposes, so they were

excluded. There were no house visits, therefore the tidiness and readiness of the house and neighborhood noise levels were not assessed. Therefore the household disorganization was only assessed by the household density and hours that TV is on; in the previous study, while household density has an intense contribution to disorganization factor, hours that TV is on has one of the weakest loadings to the factor (Vernon-Feagans, Gerrett-Peters, Willoughby, et al., 2012). Also, some questions were irrelevant or too complicated for the participants considering their migration experiences. The number of primary and secondary caregiver changes and the number of people moving in and out of the household would be very confusing to track for a family who escaped from war. So for the sake and the nature of the study, we only included the total number of people living in the household and the number of household moves into our study. Therefore the index could not be replicated in this study, however provided us crucial information about the living conditions of Syrian and Turkish children.

4.1.2 Maternal depression and perceived social support

Syrian mothers reported significantly higher levels of depression and lower levels of social support compared to Turkish mothers. The effect of refugee experience on maternal mental health should be explained multidimensional. The refugee experience was operationally defined as a chaotic and traumatic experience, so both trauma and chaos may have a separate impact on maternal mental health.

Correlational analyses indicated a strong positive relationship between household chaos and maternal depression. In more disorganized and instable houses, mothers reported higher depression levels. Other studies confirm the relationship between housing instability, homelessness and mental health (Suglia, Duarte & Sandel, 2011).

In their research, Suglia et al. (2011) reported an association between maternal depression and instability over and beyond household income and traumatic experiences. They defined instability as more than two household moves in the past two years. They suggested that frequent changes in the housing may harm the social network of the parent and may lead to isolation, and may increase the stress through child-related problems. Not only instability but also residential crowd were found to be related to perceived social support among adults; people living in crowded residences were found to experience less social support and more psychological distress (Lepore et al., 1991). Our study also confirms the relationship between social isolation and instability/crowd since there was a strong correlation between household chaos and perceived social support. As families change countries, cities, and neighborhoods, women might feel more and more isolated, and this might make them feel more lonely, desperate and overwhelmed. On the other hand, maternal depression was seen as a risk factor for housing instability (Corman, Curtis, Noonan, & Reichman, 2016); depressed mothers fail to keep house environment organized and stable. In migration, household instability is mostly seen related to external reasons such as economic problems or facing discrimination during looking for a permanent house. So instability may be mostly considered as a reason for depression. However, finding a permanent shelter might be more difficult for depressed parents. So depression and household chaos may be interrelated. Moreover, the traumatic experiences have a crucial affect on the psychological well-being of refugees; major depression is one the most prevalent problems among refugee adults (Fazel et al., 2005). Even though the survey asked about the traumatic experiences of children, the answers stand for limited but important information about the trauma exposure of parents. And results indicated a positive relation between trauma exposure and

maternal depression. At this point, it is important to note that most of the relationships related to maternal well-being, trauma exposure and chaos were found when all mothers and only Turkish mothers were included in the analyses. An important reason for this was the limited sample size of the trauma group and the skewed distribution of the scores. However other explanations should be considered; there may be other factors that were not assessed in this study which have affects on maternal well-being of refugees. In the present study, only perceived social support and depression were negatively correlated in refugee mothers. In a new country the more mother felt more supported, and maybe more secure, the less they feel depressed. Lastly, data revealed that maternal and paternal education level was a protective factor for both chaos and depression. Mothers from more educated families felt less depressed, reached more social support through their social network and experience less chaos in their daily life.

4.1.3 Cognitive functioning of children

A detailed cognitive functioning test battery was presented to children. To assess visual working memory CTT-2 completion time, Backward Corsi Task, to assess baseline performance for a novel task HF congruent accuracy scores, to assess inhibition HF incongruent accuracy scores and lastly to assess shifting HF mixed accuracy scores were analyzed. As expected all cognitive outcomes were significantly correlated with each other, reminding the executive functioning as an interrelated construct of three main cognitive functions (Miyake et al., 2000). As mentioned above executive functioning enable a person to adapt novel situations and creating solutions for problems. In the case of forced migration children must adapt

drastic and adverse changes socially, emotionally and cognitively. So their executive abilities may both be affected by and shape their lives in host countries.

Correlational analyses revealed important relationships between maternal psychological health, education level, and children's cognitive functioning. These results are also supported by the literature. Maternal education, physical and psychological health effect the home environment and mother-child relationship (e.g. Vernon-Feagans& Cox, 2013). Depressed mothers who also lack social support have difficulty on maintaining a stimulus-rich environment and this may have a negative impact on verbal abilities, cognitive functioning, school success and social adaptation of children (Vernon-Feagans & Cox, 2013). Studies indicated a negative relationship between maternal depression and preschool executive functions partially mediated by parenting (Gueron-Sela et al., 2018). Studies also indicated lower school success and problems on cognitive abilities for children with highly depressed mothers at the age of 7, along with school adjustment problems for the first year of school (Campbell, Matestic, von Stauffenberg, Mohan, & Kirchner, 2007). Even though the effect of maternal depression is mostly explained in terms of the richness of the mother-child interaction, in case of forced migration this may have different meanings. Depressive symptoms and social network of the mother may also mean the family's adaptation to host culture. Depressive mothers may fail to help their children adapt to new life settings. Adaptation problems bring about disruptions in schooling and inadequate language proficiency; these factors are important for cognitive development of school-age children.

Results revealed that local children outperform refugee children in every cognitive task. However after language proficiency and months in Turkey controlled results have changed. Trauma group was significantly slower to complete CTT-2

compared to control group. And trauma group gave significantly fewer accurate answers on Backward Corsi Block Tapping Task compared to control group. Hypothesis 2 and hypothesis 6 were supported, while the rest was rejected. Controlling the receptive Turkish skills was important; even though all instructions were also given with behavioral cues the verbal instructions were in Turkish. Nonetheless not all participants exposed to Turkish for similar durations, so months in Turkey (for refugee children after migration, for local children their age) were also controlled. There were a lot of factors that differentiated refugee group from the local group; the aim of the study was to identify these factors and explore their effects on cognition. Two groups significantly differed by their trauma exposure levels, household chaos levels, and receptive Turkish abilities. Even though there were relations between all these factors and cognitive functioning, detailed analyses revealed the importance of language abilities surpassed the effect of war trauma and migration for all cognitive domains.

4.1.3.1 Language proficiency and cognitive functioning

Second language acquisition and proficiency is an important problem in forced migration. People immediately leave their home country mostly unprepared for the necessities of the host country; they lack a prepared residence, job, school and most of the time they are not familiar with the host country's language. Even though language acquisition would be generally easy for children, forced migrant children mostly have disrupted and insufficient schooling both pre- and post-migration, they may experience detention, they may be forced to change different countries and languages frequently (Clifford, Rhodes, & Paxton, 2014). In general, people need at least 5 years in the host country to fully acquire the local language (Cummins, 1980)

and in the present study; most of the participants have been living in Turkey less than 5 years. Also, the life standards of the refugee children create disruptions in schooling and consequently language acquisition. So even children spend five years in a host country, they may not reach adequate language proficiency to be a part of social and academic life.

Reports in English revealed that forced migrant children with low English proficiency tend to perform poorly on standardized cognitive tests in English speaking host countries, and may be over-diagnosed with cognitive impairment and learning difficulties (Kaplan et al., 2016). What is assumed as a learning difficulty or cognitive impairment might actually be a second language acquisition problem. Our results also suggest a significant relationship between receptive language proficiency and cognitive functioning, even though all cognitive tests were non-verbal and provided with non-verbal instructions. So it is crucial to understand the effect of language in cognitive functioning.

In terms of second language learning, there are some critical points to understand the effect of language on cognitive functioning. In general, bilingual children considered as mentally more flexible since they are better at shifting between languages (Diaz, 1983; Iluz-Cohen & Armon-Lotem, 2013). However, these results are only applied to balanced bilingual children who are equally proficient in on both languages. Children who fail to be proficient in both languages also fail to perform superior at inhibition and shifting tasks (Iluz-Cohen & Armon-Lotem, 2013). In our study, children were still on the process of learning the second language; therefore one cannot expect the superiority compared to local children on cognitive performance which is expected from balanced bilinguals according to the literature. Some studies refer to this phenomenon as the difference between

bilinguals and second language learners (Poarch, & van Hell, 2012). In their study with German-English speaking bilinguals, English learning second language learners, and German-speaking monolinguals Poarch and van Hell (2012) found that while bilinguals have an advantage on inhibition tasks compared to monolinguals, second language learners have not. Even though we cannot expect refugee children's shifting superiority compared to locals, our study supports the positive effect of second language on shifting abilities. In the regression analysis only with refugee children results revealed that as the refugee children's Turkish receptive language abilities get closer to their Turkish peers, their shifting abilities improve as well. Yet more, our study suggested that the shifting capacity of refugee children can be predicted by their second language levels compared to the local peers. It is important to note that war exposure and migration-related chaos was not related to the shifting capacity of refugee children. In our study, not all analyses with TIFALDI scores projected information about second language proficiency. No need to say that since Turkish is the first language locals, the effect of language proficiency in the analysis with all participants should be considered as the comprehension level for testing language.

Most of the studies with bilingualism and cognitive functioning present relatively neutral language-learning processes unlike the language-learning experience of a refugee child. The conditions of language learning and the attributions to the host language would have an effect on language learning (Diaz, 1983). If the host country's language is seen threatening, schooling in the second language might have a negative impact on cognitive performance (Diaz, 1983). Unfortunately, this may be the case for most of the refugee children who faced race-based discrimination in social life. The Turkish language may have negative

connotations related to pre-migration war trauma and post-migration discrimination, and this may hinder language proficiency and cognitive functioning. Executive functioning tests in host country's language may even be so emotionally charged that the results do not only reflect cold cognitive functioning but emotional regulation of children. So to understand the results of this study one should not only focus on the cognitive effect of a second language but also the social and emotional impacts. Learning the host country's language is crucial for social adaptation; understanding the language must be protective against the prolonged negative effects of trauma and migration. Therefore it may be also protective for attention, working memory, and other high-level cognitive functions. Since the receptive language abilities were not the focus of this study, these results were unpredictable. Future studies should focus more on the language abilities to acknowledge the contribution of the host country's language to the cognitive functioning of refugee children.

4.1.3.2 Household chaos and cognitive functioning

Quite but stimulus-rich houses with consistent daily routines are optimum for a child's cognitive development. Daily routines are crucial for child development and even protective in case of traumatic life experiences (la Greca & Silverman, 2009). Families who are able to maintain a daily routine, more protected against the effects of trauma compared to chaotic families. Unfortunately, in forced migration families cannot keep their everyday life from turning into chaos and as a result children do not only suffer from trauma but also loss of the order in their life.

Our results suggested that refugee children suffer from lack of order and stability in their life and those chaotic experiences had an even stronger effect on cognitive functioning compared to traumatic experiences. Household chaos had a

predictive power on explaining the inhibition abilities (HF Incongruent Trials) of children as well as the initial learning of the baseline task (HF Congruent Trials). Children who experience high levels of crowd and instability have performed poorer on both learning an expected response and later changing the response when they are told so. They had a hard time to concentrate on listening to the instructions or keeping simple rules in mind, and once they learned they may find it difficult to alter their responses according to the new instructions.

The importance of chaos compared to trauma may be explained as the effect of daily exposure to chaos rather than the limited time of stronger trauma exposure before migration. Children who live in crowded and more instable houses still experience the negativity that started before migration. Other studies support our findings of the negative effect of household chaos on executive functioning (e.g. Vernon-Feagans, Gerrett-Peters, Willoughby, et al., 2012). In the local population, the effect of chaos is explained by the interruptions in parenting, maternal stress and the withdrawal of the child due to overwhelming stimulation. Furthermore, as mentioned above chaos is also a remainder of the war, and a barrier for adaptation to the new world. In this study, chaos was defined as the number of houses, cities, and crowd in the household. Therefore chaos during forced migration may also mean perceived discrimination, life threats, and economic difficulties. So even though this study proposes a quantitative method for assessing the degree of migration-related chaos, the qualitative characteristics of chaos should be taken into consideration for explaining its effect on executive functioning.

4.1.3.3 Trauma and cognitive functioning

In the present study, trauma exposure was found to be related to the inhibition and shifting abilities rather than visual working memory. In literature there are also other studies have similar results with trauma-survivor adults and children; in meta-analyses, trauma had greater effect sizes on verbal abilities and executive skills compared to visual abilities (Malarbi et al., 2017; Scott et al., 2015). However, studies with children mostly target familial trauma and the war-related studies are only conducted with adults. This study contributes to the field as providing information about the effect of war-related trauma on children's cognitive functioning.

Results indicated that there is a negative relation between trauma exposure and cognitive performance however; when controlled for language proficiency the relationship disappeared. And also there was no a significant relation between trauma exposure and cognitive functions solely on the refugee group. The latter may be explained by the inadequate sample size and limited range in trauma exposure. The former remind us the definition of the refugee experience. As mentioned above chaos had a more strong effect on cognitive functioning compared to trauma exposure. Even though traumatic experiences create wounds in psychology and cognition of refugees, they may be somehow recovered or compensated with relatively calmer atmosphere after migration. On the other hand exposure to everyday instability while looking for a permanent residence seems to be more important in terms of cognitive functioning. And to our knowledge none of the refugee group studies have taken chaotic experiences into consideration; they have only asked about traumatic experiences and trauma-related symptoms. When the strong correlation between trauma exposure and chaos is considered, the following question remains: Is the

factor that correlates with cognitive functioning only trauma exposure or does migration chaos contribute to this relationship?

4.2 Implications of the study

There are various trauma-based intervention programs for refugee children in the field targeting their emotional, social and cognitive development. The present study suggests that the negative effects of refugee experience are not solely based on pre-migration trauma but also the chaotic living conditions during and after migration. With other future studies related to this subject, present study may have an effect on expanding the criteria for the risk groups which are included in the intervention programs. Risk group criteria may include chaotic life standards with traumatic life experiences. The prevention programs may also evolve. The results of this study underlined the importance of language acquisition in a host country for cognitive functioning and adaptation. Intervention programs may also give more space for teaching the host language; it would be more efficient compared to complex cognitive functioning enhancement programs. Lastly, present study was an extensive study which included not only cognitive functioning of children but also the psychological well-being of parents. This study also supported the evidences on the importance of social support for maternal psychological well-being, and the effect of maternal well-being on children's cognition. These results also should be adopted to augment the intervention programs such as maternal neighborhood support groups and enhance the maternal socialization.

4.3 Limitations and future directions

One limitation of this study is the limited sample size for refugee children.

Unfortunately, this is a common problem for studies about childhood trauma and cognitive functioning, due to special characteristics of the sample and time demanding research designs. In a recent meta-analysis about the neuropsychological functioning of children who experienced trauma (Malarbi et al., 2017), the average trauma group sample size was reported as approximately 29. Future studies should try to reach more participants to reveal more detailed statistical analyses and to reach more valid and reliable results.

Another limitation of the study was the failure of the assessment of trauma-related psychological symptoms due to procedural obstacles. Since PTSD and other trauma-related symptoms have an important impact on cognition, that should have been included in the study design. In the present study, a scale for trauma related reaction could not be used, mostly due to language barrier and also lack of adequate emotional assessment environment.

There are various studies targeting the psychological functioning and social adaptation of refugee children. However, most of the studies do not include the migration process but mainly focus on the war trauma. With the findings of this study, future studies may consider including the quantitative information about the migration process in their analyses.

This study also underlined the importance of host country language abilities. However this finding was not the main consideration of the present study, therefore the information related to language was rather limited. Future study may include receptive and expressive language abilities, first and second language abilities, and possible similarities between languages.

Lastly and most importantly, in the literature, there are not many studies about the cognitive functioning of traumatized children, and to our knowledge, there is no study directly targets the executive functioning of refugee children. An aforementioned meta-analysis (Malarbi et al., 2017) about trauma and children's cognitive functioning contained 27 studies and none of those studies were related to war trauma. But the refugee population is increasing worldwide and refugee children face more problems every day. In order to understand the problems with social, emotional and academic adaptation, scientific information should accumulate in the field. As the number of children exposed to war and migration increase so should the studies issue this phenomenon.

APPENDIX A

CHILD DEMOGRAPHIC FORM

Doğum tarihi:
(Birth Date)

___ / ___ / ____

Okul:
(School)

Sınıf:
(Grade)

Eğitim Dili:
(Language of education)

Okumuyor ise:
(in case of drop-out)

Okumama nedeni
(reason for drop-out)

Çalışıyor ise:
(if working)

Meslek:
(occupation)

Kaç yıldır çalışıyorsunuz?

(For how many years you've been working)

Haftada kaç gün çalışıyorsunuz?
(How many days a week do you work)

Günde kaç saat çalışıyorsunuz?
(How many hours do you work per day)

Sigara kullanıyor musun /ne sıklıkla?
(Do you smoke?/ How often?)

() Evet _____ () Hayır
Yes No

Alkol kullanıyor musun/ ne sıklıkta?
(Do you consume alcohol?/ How often?)

() Evet _____ () Hayır

Madde kullanıyor musun/ne sıklıkta/hangi maddeler?
(Do you use substances?/ How often?)

() Evet _____ () Hayır

APPENDIX B

PARENT DEMOGRAPHIC FORM (TURKISH)

Katılımcı No.:

Tarih:

Sayın veli,

Boğaziçi Üniversitesi Psikoloji Bölümü'nde yürütmekte olduğumuz çalışmaya çocuğunuzla beraber katılmayı kabul ettiğiniz için teşekkür ederiz.

Bu anket formunda aileniz ve araştırmaya katılan çocuğunuz hakkında bazı sorular yer almaktadır.

Cevaplarınızdan elde ettiğimiz veriler, kimlik bilgileriniz gizli tutularak kullanılacaktır.

Saygılarımızla,

Begüm Coşgun

Boğaziçi Üniversitesi

Formu dolduran: Anne Baba

Çocuğunuzun Doğum tarihi: ____ / ____ / ____

Çocuğunuzun Doğum yeri: _____

Kendinizi hangi etnik gruba ait tanımlıyorsunuz? Türk Türkmen Kürt
 Diğer _____

Evinizde hangi dil/diller konuşuluyor? _____

Medeni Hal: Bekar Evli Boşanmış
 Dul Yeniden evlenmiş

Anne Çalışıyor mu? Evet Hayır

Annenin Mesleği: _____

Baba Çalışıyor mu? Evet Hayır

Babanın Mesleği: _____

Annenin Eğitim Durumu: Okur-yazar değil
 Okula gitmemiş
 İlkokul
 Lise
 Üniversite

Babanın Eğitim Durumu: Okur-yazar değil
 Okula gitmemiş
 İlkokul
 Lise
 Üniversite

Hanenize giren geliri değerlendirdiğinizde aylık toplam geliriniz sizce ne düzeydedir? Çok düşük Düşük
 Orta Ortanın Üstü
 Yüksek

Çocuklarınız: (sattır ekleyebilirsiniz)

İsim:	Kız/Erkek:	Yaş:	Nerede Yaşıyor?

Araştırmaya katılan çocuğunuzun boyu ve kilosu: _____

Çocuğunuz kaç haftalık doğdu? _____

Çocuğunuzun herhangi bir sağlık problemi var mı? Evet Hayır
Varsa nedir? _____

Çocuğunuz düzenli olarak ilaç kullanıyor mu? Evet Hayır
Hangi ilaçlar? _____
Ne zamandan beri? _____

Çocuğunuz ciddi bir kaza yaşadı mı? Evet _____
 Hayır

Çocuğunuza sizden başka kim bakım verdi?
(Bakıcı/babaanne/teyze gibi) _____

Evinizde kaç kişi yaşıyor? _____

Ailede psikiyatrik tanı almış olan var mı? Var _____ Yok

Ailede sağlık problemleri olan var mı? Var _____ Yok

Nasıl bir evde oturuyorsunuz? Apartman Dairesi
 Müstakil

Evin içinde tuvalet/banyo var mı? Var Yok

Evinizde televizyon var mı? Var Yok
Televizyon günde kaç saat açık? _____

Akıllı telefonunuz var mı? Var Yok
Ne sıklıkla telefonda vakit geçirirsiniz? Nadiren Bazen
 Sık sık Çoğu zaman

Evinizde kaç oda var? _____

Çocuğunuzun kendine ait odası var mı? Var Yok
Yoksa; odasını kimlerle paylaşıyor? _____

Ailede kimler çalışıyor? _____

Araştırmaya katılan çocuğunuz doğduğundan beri toplam kaç şehirde yaşadınız? _____

Araştırmaya katılan çocuğunuz doğduğundan beri toplamda kaç ev değiştirdiniz? _____

Şuanki adresinizde ne kadardır oturuyorsunuz? _____

Evet _____
 Hayır

Çocuğunuz okul değiştirdi mi/kaç kere?

İnsanlar hayatları boyunca birçok üzücü ve ağır olayla karşılaşabilir. Aşağıdaki sorular bu tür olumsuz yaşantılarla ilgilidir. Lütfen kendinizi ve araştırmaya katılan çocuğunuzu düşünerek sorulara cevap veriniz.

Ailenizden ve yakınlarınızdan hayatını kaybeden oldu mu? Evet Hayır

Size yakınlık dereceleri nedir? _____

Çocuğunuz silahlı veya bombalı saldırıya maruz kaldı mı? Evet Hayır

Çocuğunuz fiziksel saldırıya maruz kaldı mı? Evet Hayır

Çocuğunuz cinsel saldırıya maruz kaldı mı? Evet Hayır

Çocuğunuz çatışma silahlı ya da bombalı saldırıya tanıklık etti mi? Evet Hayır

Çocuğunuz çatışma fiziksel saldırıya tanıklık etti mi? Evet Hayır

Çocuğunuz çatışma cinsel saldırıya tanıklık etti mi? Evet Hayır

Çocuğunuz ve siz hiç şiddetli gıda yoksunluğu yaşadınız mı? (En az 2 gün gıdasız kalmak) Evet Hayır

Çocuğunuz burada sorulmayan başka stresli olaylar yaşadı mı?

Participant No.:

Date:

Dear Parent,

Thank you for agreeing to attend our study with your child. Our study is conducted in Boğaziçi University Psychology Department.

This questionnaire contains some questions about your family and your child participating in the survey.

The data we obtain from your replies will be kept confidential.

Sincerely,

Begüm Coşgun

Boğaziçi University

Who fills out the form?

Mother *Father*

Birth Date of Child:

___/___/___

Birth Place of Child:

Which ethnic group do you define yourself?

Arab *Turkmen* *Kurdish*
 Other _____

What languages are spoken in your home?

Your marital status:

Single *Married* *Divorced*
 Widow *Remarried*

Does mother works?

Yes *No*

Mother's profession:

Does father works?

Yes *No*

Father's profession:

Mother's education level

Illiterate *Didn't go to school* *Primary School* *High School* *University*
 Graduate School

Father's education level

Illiterate *Didn't go to school* *Primary School* *High School* *University*
 Graduate School

When you evaluate your monthly household income, at what level do you think it is?

Very Low *Low*
 Average *Above Average*
 High

Your children: (you may add lines)

Name:	Male/Female	Age	Where does he/she live?

The height and weight of your child participating in the survey:

How many months did your pregnancy last?

Does your child have any health problems?

Yes No

If yes, what is it?

Does your child regularly use medication?

Yes No

If yes, which medications?

Since when?

Did your child have a serious accident?

Yes No

If yes, what is it?

Who else became the caregiver of your child? (baby-sitter/ grandmother/ aunt etc.)

How many people live in your house?

Is there anyone got a psychiatric diagnosis in the family?

Yes _____ No

Is there anyone got a serious health problem in the family?

Yes _____ No

Do you have a toilet / bathroom in the house? Yes No

Do you have a TV in your house? Yes No

How many hours is the TV on per day? _____

Do you have a smart phone? Yes No

How often do you spend time on the phone? Rarely Sometimes
 Frequently Very often

How many rooms do you have? (except kitchen and bathroom) _____

Does your child have his/her own room? Yes No

If no, with whom he/she shares room? _____

Who works in the family? _____

Do you have plans of migrating to another country? Yes. No, we settle permanently in Turkey.

When did you come to Turkey? _____

When did you come to Istanbul? _____

Which cities do you live in before moving in Istanbul? _____

Since your child (who participates this study)
was born, how many houses did you change
in total? (In Syria and Turkey)

How long have you been living in your
current address?

Have you ever lived in a camp/for how long? () Yes _____ () No

In Syria;

In which city did you live?

Did you have a toilet / bathroom in the
house?

() Yes () No

How many people used to live in your house? _____

How many rooms did you have (except
kitchen and bathroom)?

Did your child have his/her own room?

() Yes () No

If no, with whom he/she used to
share room?

Who used to work in your family?

What was the mother's occupation?

What was the father's occupation?

When you evaluate your monthly household () Very Low () Low

income in Syria, at what level do you think it was? Average Above Average
 High

Did your child go to school in Syria? Yes No
For how many grades? _____

Did your child change school in Syria? Yes No
How many times? _____

Did your child change school in Turkey? Yes No
How many times? _____

Unfortunately, during many years of war most children have been exposed to violence and other unusually stressful experiences. The following questions inquire about such experiences of your child participates this study and you.

During the conflict or migration, did anyone from your family or relatives decease?
 Yes No

What was the degree of affinity?

Has your child been subjected to an armed or bombed attack in / after the conflict?
 Yes No

Has your child been subjected to a physical attack in / after the conflict?
 Yes No

Has your child been subjected to a sexual assault in / after the conflict? Yes No

Has your child been witnessed to an armed or bombed attack in / after the conflict? Yes No

Has your child been witnessed to a physical attack in / after the conflict? Yes No

Has your child been witnessed to a sexual assault in / after the conflict? Yes No

Do you have family members still live in Syria? Yes No

What is the degree of affinity? _____

During the conflict and migration, did you and your child have severe food deprivation? (Stay for at least 2 days without food) Yes No

Have you been separated from your child during conflict and migration? Yes No

When? (How old was your child?) _____

For how long? _____

In that period did someone accompanied your child? Yes No

Who did?

*During your child's conflict and migration,
did your child experience any other stressful
events not asked here?*



APPENDIX C

PARENT DEMOGRAPHIC FORM (ARABIC)

رقم المشارك :

التاريخ:

عزيزي ولي الأمر،

نشكرك على الموافقة لحضور دراستنا مع طفلك. هذه الدراسة يتم العمل بها في قسم علم النفس بجامعة بوغازيتشي.

هذا الاستبيان يحتوي على مجموعة من الأسئلة عن عائلتك وعن طفلك المشارك في الإحصائية.

البيانات المستخرجة من أجوبتكم سيتم الحفاظ على سريتها.

المخلصة،

بيجوم جوشجون

جامعة بوغازيتشي

من القائم على تعبئة الإستمارة؟

() الأم () الأب

تاريخ ميلاد الطفل:

____ / ____ / ____

مكان ولادة الطفل:

من أي ملة تعرف بها نفسك:

() عرب () تركمان () أكراد
() غير ذلك _____

ما هي اللغات المتحدث بها في منزلكم؟

حالتك الإجتماعية:

() عازب () متزوج
() مطلق () أرمل
() متزوج مرة أخرى

هل تعمل الأم؟

() نعم () لا

مهنة الأم؟

هل يعمل الأب؟

() نعم () لا

مهنة الأب؟

مستوى تعليم الأم؟

() أمية () لم تذهب إلى المدرسة
() تعليم ابتدائي () تعليم ثانوي
() جامعي () دراسات عليا

مستوى تعليم الأب؟

() أمي () لم يذهب إلى المدرسة
() تعليم ابتدائي () تعليم ثانوي
() جامعي () دراسات عليا

() منخفض جداً () منخفض
 () متوسط () اعلى من المتوسط
 () مرتفع

كيف تقيم مدخول البيت الشهري؟

أطفالك:

الإسم	ذكر/ أنثى	العمر	أين تعيش/ يعيش؟

طول ووزن طفلك المشارك في الإستييان:

ما هي المدة الشهرية التي استمر بها حملك؟

هل لدى طفلك أي مشاكل صحية؟

إن وُجد، ما هي؟

هل يستخدم طفلك العلاج بشكل منتظم؟

إذا نعم، أي أدوية؟

و منذ متى؟

هل تعرض طفلك لحادث خطير؟

إذا نعم، ما هو؟

من أيضاً أصبح موكلاً برعاية الطفل؟ (مربية/ جدة/ عمّة الخ)

كم من الأشخاص يعيشون في منزلك؟

هل يوجد أحد من العائلة مشخّص بمرض نفسي؟

هل يوجد أحد من العائلة بحالة صحية خطيرة؟

هل تملكون تواليت/ حَمّام في المنزل؟

هل تملكون جهاز تلفاز في المنزل؟

لكم ساعة في اليوم تستخدمون التلفاز؟

هل تملك هاتف ذكي؟

كم من الأحيان تستهلك الوقت على هاتفك؟

كم غرفة تملك في المنزل؟ (ما عدا المطبخ والحَمّام)

هل يملك طفلك غرفة خاصة به؟

إذا لا، مع من يشارك؟

- من يعمل في العائلة؟
- هل لديكم خطط للهجرة إلى بلد آخر؟
- منذ متى قدمت إلى تركيا؟
- منذ متى قدمت إلى إسطنبول؟
- ما هي المدن التي عشت فيها قبل قدومك إلى إسطنبول؟
- منذ ولادة طفلك (المشارك في الدراسة)، كم منزلاً غيرت كلياً؟ (في سوريا وتركيا)
- من منذ متى وأنت تعيش في مكان لإقامتك الحالي؟
- هل سبق وأن عشت في مخيم؟ كم المدة؟
- في سوريا؛
- في أي مدينة عشت؟
- هل كان لديك تواليت/حمام في المنزل؟
- كم من الأشخاص كانوا يعيشون في منزلك؟
- كم غرفة كان لديك (ما عدا الحمام والمطبخ)؟
- هل كان يملك طفلك غرفة خاصة به؟
- إذا لا، مع من كان يشارك؟
- من كان يعمل في عائلتك؟
- ماذا كان عمل والدتك؟
- ماذا كان عمل والدك؟
- عندما كنت في سوريا، كيف تقيم مدخول البيت الشهري؟
- هل كان يذهب طفلك إلى المدرسة؟
- كم مستوى دراسي أكملت؟
- هل اضطر طفلك إلى تغيير مدرسته في سوريا؟
- لكم مرة؟
- هل اضطر طفلك إلى تغيير مدرسته في سوريا؟
- كم مرة؟
- () نعم () لا، ننوي الإقامة الدائمة في تركيا
- () نعم () لا
- () نعم () لا
- () نعم () لا
- () نعم () لا
- () نعم () لا
- () منخفض جداً () متوسط () مرتفع () اعلى من المتوسط
- () نعم () لا
- () نعم () لا
- () نعم () لا
- () نعم () لا

مع الأسف، خلال سنوات الحرب الطويلة تعرض معظم الأطفال للعنف وغيره من التجارب المزعجة. الأسئلة الآتية تبحث في مثل تلك التجارب التي مر بها طفلك المشارك في التقييم والتي مررت بها أنت شخصياً.

- خلال فترة النزاع في سوريا أو النزوح، هل فقدت أحداً من أفراد عائلتك؟
- () نعم () لا

ما هي صلة القرابة؟

- هل سبق وأن تعرض طفلك لإعتداء مسلح أو تفجير خلال/ بعد النزاع؟
() نعم () لا
- هل سبق وأن تعرض طفلك لإعتداء جسدي خلال/ بعد النزاع؟
() نعم () لا
- هل سبق وأن تعرض طفلك لإعتداء جنسي خلال/ بعد النزاع؟
() نعم () لا
- هل سبق وأن شهد طفلك إعتداء مسلح أو تفجير خلال/ بعد النزاع؟
() نعم () لا
- هل سبق وأن شهد طفلك إعتداء جسدي خلال/ بعد النزاع؟
() نعم () لا
- هل سبق وأن شهد طفلك إعتداء جنسي خلال/ بعد النزاع؟
() نعم () لا
- هل ما يزال لديك أفراد من العائلة يعيشون في سوريا؟
() نعم () لا

ما هي صلة القرابة؟

- خلال معاشنتك للنزاع والنزوح، هل تعرضت أنت أو طفلك للحرمان من الطعام؟ (البقاء لمدة يومين على الأقل بدون أكل)
() نعم () لا
- هل تفرقت عن طفلك خلال النزاع أو النزوح؟
() نعم () لا

متى؟ (كم كان عمر طفلك؟)

وكم طالبت الفترة؟

- في تلك الفترة هل كان طفلك بصحبة أحد؟
() نعم () لا

من قام بذلك؟

خلال فترة الحرب والنزوح التي عايشها طفلك، هل
تعرض لأحداث مؤثرة نفسياً لم تذكر هنا؟



APPENDIX D

OSLO 3-ITEM SOCIAL SUPPORT SCALE (TURKISH/ARABIC)

İhtiyacınız olduğunda komşularınızdan yardım almanız ne kadar kolaydır? Çok kolay yardım alırım Kolay yardım alırım Zor yardım alırım Çok zor yardım alırım

Ciddi problemleriniz olduğunda güvenebileceğiniz kadar yakın kaç insane var? 6+ 3-5 1-2 Hiç

İnsanlar nasıl olduğunuzu ne kadar önemser? Çok önemser Biraz önemser Pek önemsemez Hiç önemsemez

سهل جداً
 سهل
 صعب
 صعب جداً

كم هي سهولة الحصول على مساعدة من الجيران في حالة حاجتك لها؟

5-3 +6 كم عدد الأشخاص القريبين منك بحيث يمكنك الاعتماد عليهم إذا واجهتك مشاكل خطيرة؟
 لا يوجد 2- 1

بعض الكثير ما مدى الاهتمام الذي يظهره الأشخاص في ما تقوم/ين به؟
 لا يوجد القليل

How easy can you get help from your neighbors if you should need it?

- Very easy*
- Easy*
- Difficult*
- Very difficult*

How many people are so close to you that you can count on them if you have serious problems?

- 6+*
- 3-5*
- 1-2*
- none*

How much concern do people show in what you are doing?

- A lot*
- Some*
- Little*
- No*



APPENDIX E

CES-D FORM (TURKISH)

Center for Epidemiological Studies Depression Scale (Turkish Form)

Aşağıda duygu ve davranışlarımızla ilgili ifadeler yer almaktadır.
Lütfen geçen hafta boyunca aşağıdakileri ne sıklıkla hissettiğinizi
veya yaşadığınızı belirtin.

	Hiçbir Zaman - Nadiren (1 günden daha az)	Birazcık - Birkaç Kez (1-2 gün)	Arada Sırada - Bazen (3-4 gün)	Çokça - Çoğu Zaman (5-7 gün)
1. Genellikle canımı sıkmayan şeyler canımı sıktı.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Açlık hissetmedim, iştahım yerinde değildi.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Arkadaşlarım veya ailemin yardımına rağmen kötü ruh halinden kurtulamadım.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Ruh halimin diğer insanlar kadar iyi olduğunu hissettim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Yaptığım işe odaklanmakta zorlandım.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Kendimi depresyonda hissettim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Her şeye çaba harcamam gerektiğini hissettim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Gelecek için umutlu hissettim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Hayatımın bir başarısızlık olduğunu düşündüm.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Korktuğumu hissettim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Huzursuz uyudum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Mutluydum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Her zamankinden az konuştum.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Kendimi yalnız hissettim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. İnsanlar arkadaş canlısı değildi.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Yaşamdan zevk aldım.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Ağlama nöbetleri geçirdim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Kendimi üzgün hissettim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. İnsanların benden hoşlanmadığını hissettim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. İşler yolunda gitmedi.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX F

CES-D FORM (ARABIC)

المقياس CES - D

فيما يلي وصف لحالتك أو سلوكك خلال الأسبوع الماضي. أجب، من فضلك، على الأسئلة التالية:

خلال الأسبوع الماضي:	دراً ما كنت، أو ما كنت أبداً، (0)	أحياناً ما كنت (ليوم أو يومين)	غالباً ما كنت (3 إلى 4 أيام)	كنت على الأغلب أو دائماً (5 إلى 7 أيام)
أترجع من أشياء ما كان من شأنها أن تزعجني في الأحوال العادية.	0	1	2	3
لا أريد أن أكل، لم يكن لدي شهية للطعام.	0	1	2	3
أحس أنني لا أستطيع أن أبعد عن نفسي المشاعر و الأفكار الحزينة، رغم المساعدة من قبل أفراد العائلة و الأصدقاء	0	1	2	3
أشعر أنني جيد، كما الناس الآخرين	0	1	2	3
أجد صعوبة في التركيز	0	1	2	3
أشعر أنني مكتئب	0	1	2	3
أشعر أن كل ما أفعله متعب	0	1	2	3
أشعر أنني متفائل بالمستقبل	0	1	2	3
أحس أن حياتي فاشلة	0	1	2	3
أشعر أنني خائف	0	1	2	3
أنام وأنا قلق	0	1	2	3
أشعر نفسي سعيداً	0	1	2	3
أتكلم أقل مما هو معتاد	0	1	2	3
أحس نفسي وحيداً	0	1	2	3
أحس أن الناس ليسوا ودودين	0	1	2	3
أستمع بالحياة	0	1	2	3
أحس بنوبات بكاء	0	1	2	3
أحس نفسي حزيناً	0	1	2	3
أشعر أن الناس يسيئون الظن بي	0	1	2	3
أجد صعوبة في أن أبدأ أشغالي المختلفة	0	1	2	3

APPENDIX G

CRIES-13

Zor Olayların Etkileri Ölçeği

Herhangi bir stresli olaya maruz kalan pek çok insan, olay sırasında ve sonrasında, aşağıda listelendiği gibi çeşitli belirtiler yaşayabilirler. Söz konusu bu ifadeleri okurken başınızdan geçen o olayı düşünün ve belirtilen durumların *son bir haftadır* sizin için ne kadar geçerli olduğunu, altındaki ölçek üzerinde işaretleyin.

1. İstemediğim halde kendimi o olayları düşünürken buluyorum.

Hayır hiç bulmuyorum	Bazen	Sıklıkla	Hemen her zaman
()	()	()	()

2. O olayları aklımdan çıkarmak için çaba harcıyorum.

Hayır hiç harcamıyorum	Bazen	Sıklıkla	Hemen her zaman
()	()	()	()

3. Dikkatimi yaptığım işlere vermekte güçlük çekiyorum.

Hayır hiç çekmiyorum	Bazen	Sıklıkla	Hemen her zaman
()	()	()	()

4. Arada sırada o olayla ilgili yoğun duyguların dalgalar halinde gelip gittiğini hissediyorum.

Hayır hiç hissetmiyorum	Bazen	Sıklıkla	Hemen her zaman
()	()	()	()

5. Olaydan önceki halime kıyasla daha kolayca etkilenip, yerimden sıçıyorum.

Hayır hiç sıçramıyorum	Bazen	Sıklıkla	Hemen her zaman
()	()	()	()

6. O olayları hatırlatacak yerlerden ve durumlardan uzak durmaya çalışıyorum.

Hayır hiç çalışmıyorum	Bazen	Sıklıkla	Hemen her zaman
()	()	()	()

7. O olaylar hakkında konuşmamaya çalışıyorum.

Hayır hiç çalışmıyorum	Bazen	Sıklıkla	Hemen her zaman
()	()	()	()

8. O olaylarla ilgili görüntüler birden bire gözümün önüne geliyor.

Hayır hiç gelmiyor	Bazen	Sıklıkla	Hemen her zaman
()	()	()	()

9. Etrafımdaki her şey bu olayları düşünmeme yol açıyor.

Hayır hiç açmıyor	Bazen	Sıklıkla	Hemen her zaman
()	()	()	()

10. O olayları düşünmemeye çalışıyorum.

Hayır hiç çalışmıyorum Bazen Sıklıkla Hemen her zaman
() () () ()

11. Kolayca sinirleniyorum.

Hayır hiç sinirlenmiyorum Bazen Sıklıkla Hemen her zaman
() () () ()

12. Ashnda görünürde bir tehlike olmadığı halde kendimi tetikte hissediyorum.

Hayır hiç hissetmiyorum Bazen Sıklıkla Hemen her zaman
() () () ()

13. Uyku problemlerim var.

Hayır hiç yok Bazen Sıklıkla Hemen her zaman
() () () ()

		<i>Not at all</i>	<i>Rarely</i>	<i>Some- times</i>	<i>Often</i>
1.	<i>Do you think about it even when you don't mean to?</i>	[]	[]	[]	[]
2.	<i>Do you try to remove it from your memory</i>	[]	[]	[]	[]
3.	<i>Do you have difficulties paying attention or concentrating</i>	[]	[]	[]	[]
4.	<i>Do you have waves of strong feelings about it</i>	[]	[]	[]	[]
5.	<i>Do you startle more easily or feel more nervous than you did before it happened?</i>	[]	[]	[]	[]
6.	<i>Do you stay away from reminders of it (e.g. places or situations)</i>	[]	[]	[]	[]
7.	<i>Do you try not talk about it</i>	[]	[]	[]	[]
8.	<i>Do pictures about it pop into your mind?</i>	[]	[]	[]	[]
9.	<i>Do other things keep making you think about it?</i>	[]	[]	[]	[]
10.	<i>Do you try not to think about it?</i>	[]	[]	[]	[]

- | | | | | | |
|-----|---|-----|-----|-----|-----|
| 11. | <i>Do you get easily irritable</i> | [] | [] | [] | [] |
| 12. | <i>Are you alert and watchful even when there is no obvious need to be?</i> | [] | [] | [] | [] |
| 13. | <i>Do you have sleep problems?</i> | [] | [] | [] | [] |

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APPENDIX H

ETHICS COMMITTEE APPROVAL

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
İnsan Araştırmaları Kurumsal Değerlendirme Alt Kurulu

Sayı: 2017-26

5 Mayıs 2017

Begüm Coşgun
Psikoloji

Sayın Araştırmacı,

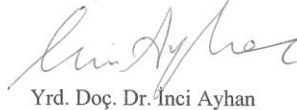
"Sığınmacı ve Mülteci Çocuklarda Bilişsel Fonksiyonları Etkileyen Faktörler" başlıklı projeniz ile ilgili olarak yaptığımız SBB-EAK 2017/28 sayılı başvuru İNAREK/SBB Etik Alt Kurulu tarafından 5 Mayıs 2017 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Saygılarımızla,

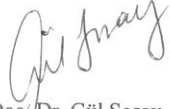
İnsan Araştırmaları Kurumsal Değerlendirme Alt Kurulu



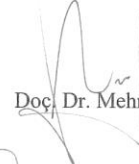
Doç. Dr. Ebru Kaya



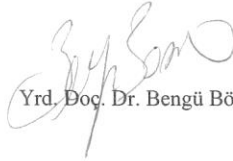
Yrd. Doç. Dr. İnci Ayhan



Doç. Dr. Gül Sosay



Doç. Dr. Mehmet Yiğit Gürdal



Yrd. Doç. Dr. Bengü Börkan

APPENDIX I

INFORMED CONSENT FORM (ARABIC)

استمارة الموافقة المسبقة

المؤسسة الداعمة للبحث: جامعة بوغازيتشي

إسم البحث: استكشاف العوامل التي تؤثر على الوظائف الإدراكية عند الأطفال
اللاجئين

قائد المشروع: البروفسور علي تكجان

البريد الإلكتروني:

هاتف:

إسم الباحثة: بيجوم جوشكن

البريد الإلكتروني:

عزيزي ولي الأمر،

يشارك كل من أستاذ علم النفس، جامعة بوغازيتشي، علي تكجان ونور بينيتشيري (دكتوراه) وطالبة الدراسات العليا بيجوم جوشكنفي مشروع بحث علمي. تهدف هذه الدراسة إلى البحثفي العوامل التي تؤثر على الوظائف الإدراكية لطالبي اللجوء الذين شهدوا الحرب وعاشوا الهجرة والنزوح. ندعوك أنت وأطفالك لمساعدتنا في هذا البحث.

في بحثنا، سيكون لدينا مقابلة تدوم لمدة نصف ساعة تقريبًا. في هذه المقابلة، سيطلب منك ملء استمارة حول ظروف معيشة طفلك وتجاربه السابقة. ثم سيكون لدينا جلسة مع طفلك حيث نلعب بعض ألعاب الإنتباه والذاكرة.

الغرض من بحثنا هو تحديد العوامل التي تؤثر على الوظائف الإدراكية (الانتباه والذاكرة وغير ذلك) للأطفال الذين اضطروا للهجرة بسبب الظروف الصعبة في وطنهم. يتم هذا البحث لغرض علمي. تعتمد خصوصية الوالدين ومعلومات الأطفال على المعلومات التي يتم الحصول عليها ضمن نطاق البحث ولن يتم

استخدامها لأغراض أخرى. تمت الموافقة على بحثنا من قبل لجنة أخلاقيات جامعة بوغازيتشي.

المشاركة في هذا البحث عمل تطوعي بالكامل. إذا شاركت، يمكنك سحب موافقتك في أي مرحلة من العمل دون سبب، وإنهاء المقابلة. في حالة طلب طفلك ذلك خلال التطبيق، سيتم إنهاء الجلسة.

إذا كنت ترغب في الحصول على مزيد من المعلومات حول المشروع البحثي، يرجى التواصل مع:

.....

إذا وافقت أنت وطفلك على المشاركة في هذا المشروع البحثي، يرجى التوقيع على هذه الاستمارة

اسم وكنية ولي الأمر:

التوقيع:

اسم الطفل المشارك في البحث:

التاريخ (يوم/شهر/سنة): / /

APPENDIX J

INFORMED CONSENT FORM (TURKISH)

VELİ BİLGİ ve ONAM FORMU

Araştırmayı destekleyen kurum: Boğaziçi Üniversitesi

Araştırmanın adı: Çocuklarda Bilişsel Fonksiyonları Etkileyen Faktörler

Proje Yürütücüsü: Prof. Ali Tekcan

E-mail adresi:

Telefonu:

Araştırmacının adı: Begüm Coşgun

Adresi: Boğaziçi Üniversitesi, Psikoloji Bölümü

E-mail adresi:

Telefonu:

Sayın Veli,

Boğaziçi Üniversitesi Psikoloji Bölümü öğretim üyeleri Prof. Ali Tekcan, Nur Yeniçeri (Ph.D.) ve yüksek lisans öğrencisi Begüm Coşgun'un katılımıyla bir bilimsel araştırma projesi yürütülmektedir. Bu çalışmanın amacı çocuklardaki bilişsel fonksiyonları etkileyen gündelik yaşam faktörlerini araştırmaktır. Bu araştırmada bize yardımcı olmanız için çocuklarınızı ve sizi projemize davet ediyoruz.

Araştırmamızda, size yaklaşık 15 dakika sürecek bir anket formu verilecektir. Bu formda sizlere yaşam şartlarınız ve araştırmaya katılacak çocuğunuz hakkında bazı sorular sorulacaktır. Ardından çocuğunuzla yaklaşık yarım saat sürecek bir görüşme yapılacaktır. Bu görüşmede çocuğunuz ile bilgisayar üzerinden bazı dikkat ve hafıza oyunları oynanacaktır.

Araştırmamızın amacı çocukların evlerindeki ortamın ve yaşadıkları olayların çocukların dikkat, hafıza gibi bilişsel fonksiyonlarına etkilerini görmektir. Bu araştırma bilimsel bir amaçla yapılmaktadır. Veli ve çocuk bilgilerinin gizliliği esas tutulmaktadır, araştırma kapsamında edinilen bilgiler başka amaçlarla kullanılmayacaktır. Araştırmamız, Boğaziçi Üniversitesi Etik Kurulu tarafından onaylanmıştır.

Bu araştırmaya katılmak tamamen isteğe bağlıdır. Katıldığınız takdirde çalışmanın herhangi bir aşamasında bir sebep göstermeden onayınızı çekebilir, görüşmeyi sonlandırabilirsiniz. Uygulama sırasında çocuğunuzun istemesi halinde de uygulama sonlandırılacaktır.

Araştırma projesi hakkında ek bilgi almak istediğiniz takdirde lütfen iletişime geçiniz:

Boğaziçi Üniversitesi Psikoloji Bölümü öğretim üyesi Nur Yeniçeri, Ph.D

Boğaziçi Üniversitesi Psikoloji Bölümü öğretim üyesi Prof. Ali Tekcan

Yüksek lisans öğrencisi Begüm Coşgun

Boğaziçi Üniversitesi Sosyal Bilimler Enstitüsü Etik Kurulu (Telefon: 0212-359 6810, E-mail: sbe@boun.edu.tr)

Eğer sizin ve çocuğunuzun bu araştırma projesine katılmanızı kabul ediyorsanız, bu formu imzalamanızı rica ediyoruz

Ben, (velinin adı), yukarıdaki metni okudum ve çocuğumla birlikte katılmamız istenen çalışmanın kapsamını ve amacını anladım. Söz konusu araştırmaya katılmayı kabul ediyorum.

Formun bir örneğini aldım / almak istemiyorum (bu durumda araştırmacı bu kopyayı saklar).

Velinin Adı-Soyadı:.....

İmzası:.....

Araştırmaya Katılacak Çocuğun Adı-Soyadı:

.....

Telefon:

Tarih (gün/ay/yıl):...../...../.....

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