RELATIONSHIPS BETWEEN EXECUTIVE FUNCTIONING, PRIVATE SPEECH, AND EMOTION REGULATION IN PRESCHOOLERS

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DECLARATION OF ORIGINALITY

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ABSTRACT

Relationships Between Executive Functioning, Private Speech,

and Emotion Regulation in Preschoolers

The present study investigated the associations among executive functioning (EF), private speech (PS), and emotion regulation (ER) in a sample 62 preschoolers from the age of 4- to 5-years, their mothers and teachers through a cross-sectional design. Inhibition (IC) and working memory (WM) difficulties of children were measured through mother reports on Childhood Executive Functioning Inventory (Thorell & Nyberg, 2008). Children's ER strategies were observed during the "Attractive Toy in a Transparent Box" task (Goldsmith, Reilly, Lemery, Longly, & Prescott, 1999). Effortful control and negative emotionality were assessed through mother and teacher reports on the Child Behavior Questionnaire Short Form (Putnam & Rothbart, 2006). Children's PS was observed during a categorization task and coded according to Berk's (1986) coding scheme. The PS positively predicted the IC difficulties beyond the child and family characteristics, implying that children who had difficulty in inhibition were more likely to rely on the PS. Bivariate correlations revealed that both the IC and WM difficulties were negatively related to effortful control and positively related to negative emotionality. The results seem to indicate that executive functions and temperamental emotion regulation are interrelated and the PS may have a supportive function for disinhibited children. The practical implications for school counselors and educators were discussed.

ÖZET

Okul Öncesi Yaştaki Çocuklarda Yönetici İşlevler, Kendine Yönelik Konuşma ve Duygu Düzenleme Arasındaki İlişkiler

Bu çalışma kesitsel bir tasarımla 4 ve 5 yaş grubundaki 62 anaokulu öğrencisi, anneleri ve öğretmenlerinin katıldığı bir örneklemde yönetici işlevler, kendine yönelik konuşma ve duygu düzenleme arasındaki ilişkileri incelemektedir. Çocukların dürtü kontrolü ve işler bellek zorlukları anneler tarafından doldurulan Çocukluk Dönemi Yönetici İşlevler Envanteri (Thorell & Nyberg, 2008) ile, duygu düzenleme stratejileri "Şeffaf Kutu İçinde Çekici Oyuncak" (Goldsmith, Reilly, Lemery, Longly, & Prescott, 1999) uygulamasının doğrudan gözlemi ile ölçülmüştür. Çocukların mizaca bağlı kendini denetleme ve olumsuz duygusallıkları anneler ve öğretmenler tarafından doldurulan Çocuk Davranış Listesi Kısa Formu (Putnam & Rothbart, 2006) ile ölçülmüştür. Çocukların kendine yönelik konuşmaları ise kartları grupladıkları bir uygulama ile ölçülmüş ve Berk'in (1986) şemasına göre kodlanmıştır. Sonuçlar kendine yönelik konuşmanın çocuk ve aile özelliklerinin ötesinde dürtü kontrolü sorunlarını yordayıcı olduğunu, dolayısıyla engellemede zorluk çeken çocukların kendine yönelik konuşmaya güvenme ihtimalinin daha yüksek olduğunu göstermektedir. Yönetici işlev zorluklarının (dürtü kontrolü ve işler bellek) mizaca bağlı kendini denetleme becerisi ile negatif, olumsuz duygusallık ile pozitif ilişkili olduğu bulunmuştur. Sonuçlar, yürütücü işlevler ve mizaca bağlı duygu düzenlemenin birbiriyle ilişkili olduğunu ve kendine yönelik konuşmanın dürtü kontrolü bakımından dezavantajlı çocuklar için destekleyici bir işlevi olabileceğini düşündürmektedir. Bulguların okul psikolojik danışmanlarının ve eğitimcilerin uygulamalarına yönelik implikasyonları hakkında tartışılmıştır.

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CHAPTER 1

INTRODUCTION

1.1 Background information

Regulation of both cognitive processes (e.g., Duncan et al., 2007) and emotions play a crucial role in adaptation and contribute to several outcomes of children including the academic ones such as readiness to learn and successful school adaptation (Blair, 2002; Blair & Diamond, 2008; Neuenschwander, Röthlisberger, Cimeli, & Roebers, 2012; Von Suchodoletz, Trommsdorff, Heikamp, Wieber, & Gollwitzer, 2009). Compared to the home environment, preschools are more structured in which children are expected to regulate themselves (Blair & Razza, 2007; McClelland & Cameron, 2012; McClelland et al., 2007; Ponitz, McClelland, Matthews, & Morrison, 2009). Consequently, it is critical to explore underlying mechanisms that promote or hinder children's self-regulation in preschool years that is a transition period to formal schooling.

Language acquisition is closely related to the regulation of cognitive aspects through supporting representational thinking, retrieval of information (Azmitia, 1992; Kopp, 1982; McCarthy, 1946) and the regulation of emotional processes that enable one to label the emotional states and control over behaviors (Campos, Frankel, & Camras, 2004; Cole, Armstrong, & Pemberton, 2010; Cole, Michel, & Teti, 1994; Eisenberg & Morris, 2003; Kopp, 1982; Thompson, 1994). Throughout the language development, children's speech in outer or observable forms that address the self is called as private speech. Private speech shows a marked improvement from the age of 3 to 5 years, and then it begins to be internalized and

turns to a silent thought (Berk, 1986; Winsler, 2009). The self-regulatory abilities of children show a similar acceleration during the preschool years, especially between the ages of 3 to 6 years (Carlson, 2005; Rothbart, 2007; Zelazo & Müller, 2002). Previous findings revealed that private speech is related to self-regulation (i.e., Barkley, 1997; Berk, 1986; Piaget, 1959, Vygotsky, 1934/1986).

1.2 Significance and the general aim of the study

Regulation of cognitive and emotional aspects is a critical developmental task for children and needless to say, an arrest or delay in this capacity could be a major concern for parents and teachers. Cognitive processes underlying self-regulation are called as the executive function which is an umbrella term for the capabilities including representation of the problem on the mind, planning, keeping the plan in mind, intending and carrying out the plan with using rules and evaluating the actions of the self.

The learning environments require conformity to the rules to some extent. Difficulties in self-regulation may lead to the violation of the rules in the form of inattentiveness, disruptive or interruptive behaviors (Willoughby, Kupersmidt, Voegler-Lee, & Bryant, 2011; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). In this case, the school personnel (i.e., teachers, school administrators) may tend to implement disciplinary acts for children, who show problems that result from self-regulation deficits, although these difficulties may indicate the children's special need for support in cognitive or emotional domains. One of the responsibilities of the school counselor is to assess and work through students' emotional and behavioral difficulties in collaboration with teachers, parents and other mental health professionals (Grothaus, 2013). For a valid and comprehensive

assessment, the counselor should be aware of the developmental capacities that are related to self-regulation and how these capacities could be integrated into the prevention models that aim to improve self-regulation. Early preventive actions are of great importance in terms of reducing possible future academic and social-emotional problems that might be experienced by children who are at-risk for self-regulatory difficulties at preschool age (Bidell & Deacon, 2010).

In this study, a number of developmental capacities that are related to self-regulation will be assessed. Specifically, this study aims to contribute to the literature by focusing on the interrelations among private speech, cognitive and emotional processes underlying self-regulation at the preschool period. Thus, its implications may help school counselors who work in early childhood education settings to recognize students with needs in regulatory abilities and generate plans to support their cognitive and emotional development.

CHAPTER 2

LITERATURE REVIEW

2.1 Executive function

Controlling the thought processes, behaviors, and emotions flexibly in case of conflict between one's desires and habits is the key developmental success that children acquire (Doebel & Zelazo, 2016). As stated above, the executive function (EF) skills enable one to represent the problem in mind with its possible solutions, and then plan their actions by selecting a proper strategy among the alternatives. The plan should be kept in mind long enough to guide the actions of the self for the execution of the solution, which also refers to the intending process, and then the plan should be carried out with utilizing rules. After these processes, one finally evaluates its actions and can decide whether the problem is solved or not. This integrated problem-solving framework which starts from the recognition of the problem to solution characterizes how each process fits into a single macrostructure (Zelazo, Carter, Reznick, & Frye, 1997).

Regulatory abilities of children are critical for their learning at school and also in other areas of life from childhood to adulthood (McClelland, Geldhof, Cameron, & Wanless, 2015). The EF has various effects on areas that contribute to children's future outcomes including academic (Blair & Razza, 2007; McClelland et al., 2007; Ponitz et al., 2009; Schmitt, McClelland, Tominey, & Acock, 2015), mental well-being (Balkis & Duru, 2016; Burton, Lydon, D'Alessandro, & Koestner, 2006; Gagnon, Durand-Bush, & Young, 2016; Hofer, Busch, & Kärtner, 2011; Simon & Durand-Bush, 2014; Wrosch, Scheier, Miller, Schulz, & Carver, 2003), and social competence (Diener & Kim, 2004; Eisenberg et al., 1996; Eisenberg, Pidada,

& Liew, 2001; Shields, Cicchetti, & Ryan, 1994). Likewise, deficiencies in regulatory abilities are closely related to behavioral disorders (Craig, et al., 2016; Douglass, 1999; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005). For instance, Barkley (1997) proposed a unified theory of the EF with crucial implications for behavioral problems such as attention deficit hyperactivity disorder (ADHD). The ADHD particularly results from the difficulties in behavioral inhibition that affects a number of EF abilities including working memory (i.e., the ability to keep information in mind, cognitively imitate the sequences of behaviors, sense of time, temporal organization of the behaviors), regulation of affective/motivational aspects and arousal (i.e., the ability to control emotions, resist urges, and regulate motivation), speech internalization (i.e., self-reflection, self-instruction, questioning of the self), and reconstitution (i.e., analyzing and synthesizing behaviors). Barkley (1997; 2014) thus concluded that individuals with the ADHD are expected to have impairments in their EF capacities.

Miyake and colleagues (2000) argued that the EF encompasses three main components namely shifting/flexibility, working memory (WM), and inhibitory control (IC). Flexibility/shifting component refers to the ability to switch mental sets in multi-task situations, or within task situations where it requires being persistent on a particular aspect of the task while disengaging from the other; the WM refers to keeping the incoming information in mind temporarily and the ability to manipulate it when necessary in order to execute/manage complex tasks (Baddeley, 1992); and the IC refers to the ability to suppress a dominant/autonomic response when needed or to stop the ongoing one (Barkley, 1997; Lehto, Juujärvi, Kooistra, & Pulkkinen, 2003; Miyake et al., 2000). These abilities were found as separate but related to each

other in adults (Miyake & Friedman, 2012; Miyake et al., 2000) as well as in children (Lehto et al., 2003).

Early childhood years constitute a crucial part in the development of the EF (e.g., Carlson, 2005; Garon, Bryson, & Smith, 2008) which contributes to higher-order cognitive functioning during adulthood (Huizinga, Dolan, & Van der Molen, 2006). The EF components show a protracted development. The WM begins to develop after 6 months of age as infants keep representations in their minds for gradually more prolonged periods of time, whereas more complex processes of the WM, such as updating or manipulating information, develops at around 15 months of age with the aid of emerging attentional systems (Diamond, 2002; Diamond, 2006; Garon et al., 2008). The IC begins to develop in the second half of the first year. For instance, babies direct their attention to the location, where an object is hidden by inhibiting their tendency to look at the object's previous location (Diamond, 2002; Garon et al., 2008). The WM and the IC become coordinated during the second year of life, so toddlers can keep a rule in their minds and use this piece of information in inhibiting distracting stimuli to be able to keep their attention on the task. Shifting/flexibility that is the third EF component is more complex than the others. This ability develops after the WM and the IC capacities. Basic response shift is seen at 1-year-old babies, whereas the complex shifting (both response and attention shifting) shows progress during the preschool ages (Garon et al., 2008). The main improvements in all these abilities appear during preschool years, especially from 3 to 6 years of age (Carlson, 2005; Diamond, 2002; Diamond, 2006; Garon et al., 2008; Zelazo & Müller, 2002) and they reach adult level around at the age of 11 to 15 years (Huizinga et al., 2006; Wu et al., 2011).

2.2 Emotion regulation

Regulation of emotions is crucial due to its supportive effect on adaptive behaviors, such as management of actions in emotionally intense environments (Thomson, 1994). Emotion and emotion regulation are complex terms and lack clear definitions. The term emotion is evaluated by Gross (1999) as a stimulus-response process. Experiential, behavioral and physiological mechanisms organize an adaptive response and these mechanisms play a role in shaping and manifestation of emotions. Thus, evaluation of the input (stimulus) and the response to it are unique to each (Gross, 1999). Accordingly, Campos and colleagues (2004) suggested that individual differences play a role in the significance of input that affects the quality of emotions, in the sense that the perceived significance of the event intensifies emotional response. Emotion regulation (ER) is, relatedly, defined as "the process of initiating, avoiding, inhibiting, maintaining, or modulating the occurrence, form, intensity, or duration of internal feeling states, emotion-related physiological, attentional processes, motivational states, and/or the behavioral concomitants of emotion in the service of accomplishing affect-related biological or social adaptation or achieving individual goals" (Eisenberg & Spinrad, 2004, p. 338).

The ER has various effects on areas that contribute to children's future outcomes, including academic achievement (Eckert, Ebert, Lehr, Sieland, & Berking, 2016; Graziano, Reavis, Keane, & Calkins, 2007; Ivcevic & Brackett, 2014), social competence (Eisenberg et al., 1993; Eisenberg et al., 1995; Fabes & Eisenberg, 1992; Garner & Estep, 2001; Hubbard & Coie, 1994; McDowel, Kim, O'Neil, & Parke, 2002; Spinrad et al., 2006), well-being (Gross & John, 2003; Hopp, Troy, & Mauss, 2011; Shimkowski, Schrodt, & Willer, 2016); and deficiencies in the ER are related

to externalizing and internalizing disorders (see Blair, Denham, Kochanoff, & Whipple, 2004; Rothbart, 2007).

2.2.1 Temperamental basis of emotion regulation

From the early months of life onwards, children show a great deal of variety in their emotionality, activity level (motor behavior) and attention span. For example, some children might be very fearful or cry in case of a low level of distress whereas others might join thrilling games. Similarly, some children may get overwhelmed by external stimuli easily while others enjoy the excitement of stimulation (Rothbart, 2007). These individual differences in emotionality and activity levels are due to differences in temperament (Rothbart, 2007), which is biologically-based and the origin of the personality (Bates, Goodnight, & Fite, 2008; Cumberland-Li, Eisenberg, Champion, Gershoff, & Fabes, 2003; Goldsmith et al., 1987; Rothbart, Ahadi, Hershey, & Fisher, 2001; Rothbart & Bates, 1998). Pertinent to the ER, two aspects of the temperament that are emotionality/affectivity and effortful control appear (Santucci et al., 2008).

Emotionality basically refers to the emotional reaction individuals give in response to a stimulus such as joy, anger, distress or fear (Santucci et al., 2008). Emotionality can also be described in terms of the intensity and duration of feeling states, such as anger or frustration (i.e., reaction to goal interruptions), fear (i.e., distress anticipation), sadness (i.e., reactions to disappointment), or soothability (i.e., recovery from a distressful event) (Rothbart, 2007). For instance, anger can be experienced from mild to intense levels and for a short or extended period (Gross, 2014).

On the other hand, effortful control (EC) consists of abilities such as attention, activity and inhibitory control (Eisenberg, Smith, & Spinrad, 2011; Rothbart, Sheese, & Posner, 2007) and this set of skills plays a critical role in the ER (Zhou, Chen, & Main, 2012). Given the biologically-based nature of the temperament, the EC shows consistency in time and contexts (i.e., Kochanska, Murray, Harlan, 2000). The abilities to control attention (i.e., executive attention), inhibit or activate behaviors, make decisions in case of conflicts, correct errors and execute planning are considered as the measurable components of the EC (Eisenberg et al., 2011; Rothbart & Bates, 2006; Zhou et al., 2012).

Better EC was found to be related to lower levels of negative emotionality (Blair et al., 2004; Eisenberg et al., 2011). In a longitudinal study, children's EC abilities were measured at 22 and 33 months with various performance tasks, during which they were asked to delay gratification (i.e., the ability to wait for eating a snack or to open a gift box), slow the motor activity down (i.e., the ability to walk to a desired object as slow as possible), suppress or initiate an activity (i.e., the ability to send a finish signal in a turn-taking situation), and control attention on Stroop-like tasks. Parental reports on the Inhibitory Control subscale of the Child Behavior Questionnaire (CBQ; Rothbart et al., 2001) were also obtained as an indicator of the EC, and both observations and parent-reported scores were combined to obtain a total score of the EC. Children's anger modulation was assessed both at 22 and 33 months of age through a task, which restricted the child to reach an attractive toy and joy modulation was assessed through a puppet task, which simply included tickling the child with a pair of puppets. The low intensity (i.e., lower levels of facial expression in anger- or joy-evoking situations) and latency in emotional responses were considered as better modulation of these emotions. The findings revealed that

toddlers who had better EC were also better at modulating their anger and joy (Kochanska et al., 2000). The researchers concluded that better EC is related to better modulation of the emotionality, and the link between these capacities was stable from the age of 22 months to 33 months. Hanish and colleagues (2004) conducted a similar study with preschoolers whose ages ranged from 3 to 5 years and found that higher levels of the EC which was measured through teacher reports on Attentional Shifting, Attentional Focusing and Inhibitory Control subscales of the CBQ were related to lower levels of negative emotionality as reported by teachers on Anger and Anxious/Fear subscales of the CBQ.

Similarly, in a recent study by Diaz and colleagues (2017), the EC of preschoolers were obtained through the parent, teacher, and trained observers' reports on CBQ, as well as, children's performances were observed on a computerized task, which requires children to push the button when a target stimulus (i.e., an apple) appears on the screen. Children's negative emotionality in terms of anger, sadness, and fear were observed during the class, lunch or recess hours and coded by trained observers based on facial (i.e., knitting eyebrows), behavioral (i.e., hitting), postural (i.e., dropped shoulders), and verbal (i.e., screaming) signs of negative affectivity. The results showed that lower levels of the EC were related to the expression of more negative affectivity in preschoolers.

As it is shown above, there are many ways of measuring the temperamental features that are related to self-regulation in children including self-, teacher- and parent-reports, direct observations and physiological measures. Self-reports of emotionality and the ER mainly assess the cognitive experience of the emotion. However, they are limited when children are young as they may not be aware of their ER processes (Eisenberg & Morris, 2003). Teacher-and parent-reports also give

valuable information as they observe the child over time and in multiple settings. However, these measures may not capture the child's ER accurately as parent-reports may suffer from the social desirability and teacher-ratings might be affected by their evaluations of the child's academic success or social competence (Eisenberg & Morris, 2003). Nevertheless, self, parent and teacher forms of temperament questionnaires (e.g., Infant Behavior Questionnaire, Rothbart, 1981; Child Behavior Questionnaire for 3-7 years, Rothbart et al., 2001; Early Adolescent Temperament Questionnaire for 9-15 years, Capaldi & Rothbart, 1992) are commonly used to assess children's emotionality and the EC both of which are central to the ER (e.g., Eisenberg et al., 1996; Eisenberg et al., 2005). Physiological measures examine the bodily indicators of emotional processes, such as heart rate or respiration and brain imagining (i.e., Electroencephalography [EEG]) are utilized to obtain activations in cortical systems that are responsible for the processing of emotions (Eisenberg & Morris, 2003).

Observational methods aim to assess children's emotional reactions and the EC in real life situations, and they are relatively objective ways of measuring it. There are many developmental tasks which require toleration of negative emotions (i.e., frustration), toleration of being alone for a while, delay of gratification, coping with fear or anxiety, and behaving acceptably (Cole et al., 1994). For example, Kochanska and colleagues (1997) developed an observational battery to assess how children are controlling their emotions and behaviors at toddlerhood, preschool and early school ages. Likewise, Laboratory Temperament Assessment Battery (LAB-TAB), developed by Goldsmith and colleagues (1999), is generally utilized in order to elicit emotion in laboratory conditions with an aim to assess emotional reactivity

and the EC in infants, toddlers, and preschool age children (e.g., Calkins, Gill, Johnson, & Smith, 1999; Dennis & Kelemen, 2009).

2.2.2 Emotion regulation strategies

In the case of an emotion-evoking situation, the behaviors of individuals are twofold: they either down-regulate or up-regulate intense emotions. Down-regulation is an attempt to decrease their negative emotional states or the duration of these emotional states, such as during anger, frustration or sadness. Likewise, up-regulation is an attempt to increase or extend the duration of their positive emotional states, such as joy or love. With these aims of down-regulating or up-regulating the emotional states and duration of them, different behaviors are utilized by individuals in the course of the development (Gross, 2014).

The first seven years of life is essential for the development of ER abilities of individuals (Rothbart, 2007). The control of the emotions first relies on external sources like caregivers. Around the second year of life, the ER shifts from external sources to internal sources of the child. When a caregiver soothes the baby in distressing situations, the child begins to interpret social signals and use these indicators to internal regulation. Gradually, children learn self-strategies like controlling their attention voluntarily in case of emotional arousal (Rothbart et al., 2001; Ursache, Blair, Stifter, & Voegtline, 2013). The shift of the ER from external sources to child's internal processes is linked with the development of language or other self-comforting abilities (Campos et al., 2004; Eisenberg & Morris, 2003; Thomson, 1994). Children begin to use their mental resources in the way that they distract themselves from an adverse event or pay attention to positive outcomes (e.g., delaying gratification by considering to achieve more rewards) during the age of 5

(Eisenberg & Morris, 2003). Over time they obtain a repertoire of strategies to be used for different stressors. For instance, they try to focus on the positive aspects of the experience if they cannot be able to change the situation or shift their attention from the distressing event or stimuli (Eisenberg & Morris, 2003; Thomson, 1994).

Some behavioral strategies such as distraction (i.e., focusing attention to another object than the frustrating one), self-soothing/comforting (i.e., thumb sucking, playing with hair/hair twisting, touching on clothes), approach/withdrawal (i.e., moving away from or getting close to the stimulus), social behaviors (asking for help to others), active engagement/persistence (i.e., sustaining engagement with task), instrumental behaviors (i.e., trying to leave the room), passive behaviors (i.e., blank expression), distortive behaviors (i.e., hitting, trying to damage the task at hand), cognitive reappraisal (i.e., verbalization to rethink and/or interpretation of negative situation differently), alternative problem solving (i.e., trying different strategies in solving problems) found to be serving regulatory functions. These categories have been studied in order to determine their effectiveness on emotional arousal in distressing situations (Buss & Goldsmith, 1998; Calkins et al., 1999; Cole, Dennis, Smith-Simon, & Kohen, 2009; Day & Smith, 2013; Diener & Mangelsdorf, 1999; Grolnick, Bridges, & Connell, 1996; Stansbury & Sigman, 2000; Stifter & Braungart, 1995; Supplee, Skuban, Trentacosta, Shaw, & Stoltz, 2011; Zimmerman & Stansbury, 2003).

The studies with preschool-age children generally yielded to use similar categories in coding emotion-laden behaviors. In studies with preschoolers where they were engaging in frustration/anger eliciting tasks, the ER strategies were coded under four discrete categories as self-comforting (e.g., rubbing clothes), instrumental regulation (e.g., escaping from the room), distraction (e.g., looking at different object

rather than emotionally distressing stimuli), and cognitive reappraisal (e.g., reframing the subjective experience of the event to change the one's emotional reactivity to it) (Stansbury & Sigman, 2000; Zimmerman & Stansbury, 2003). Such as in a delay of gratification task with preschoolers, Supplee and colleagues (2011) coded participants' ER strategies into four discrete categories. The task lasted 4- to 5-minutes, and the entire task was divided into 10-seconds epochs, and then each epoch was coded for either presence or absence of following ER strategies: active strategies (if the child showed behaviors categorized above as active engagement and self-soothing behaviors), passive strategies (if the child did not engage in any goal-directed behaviors), planful strategies (if the child showed behaviors categorized above as distraction and social behaviors) and focus on delay object (if the child's behaviors included attempting to touch forbidden toys).

The behaviors that are utilized by an individual in case of an emotion-evoking situation can be either adaptive/constructive or maladaptive/nonconstructive. In their study, Eisenberg and colleagues (1995) considered aggressive or instrumental ways of regulatory behaviors (i.e., aggression) as nonconstructive or maladaptive ways of coping, but distraction or help-seeking were considered as constructive or adaptive. Similarly, Jahromi and Stifter (2008) differentiated adaptive and maladaptive ways of coping. Adaptive ways included behaviors like goal-directed active engagement, trying alternative strategies in dealing with problems, or support seeking; and maladaptive ways included behaviors like aggression or disruptive acts.

Adaptive or maladaptive ways of coping in case of distress may be related to temperamental characteristics of individuals (emotionality and the EC) (i.e., Eisenberg et al., 1996; Fabes et al., 2003; Rubin, Coplan, Fox, &, Calkins, 1995). For

instance, in a longitudinal study with children from the age of 5 to 8 years, Rydell, Berlin, and Bohlin (2003) reported that higher levels of anger predicted more externalizing problems in children and similarly higher levels of fear and poor fear regulation were significant predictors of internalizing problems. Another study with young adults reported that lower levels of the EC were related to more aggressive and impulsive behaviors (De Panfilis, Meehan, Cain, & Clarkin, 2013). A similar association was shown with 3-years-old children. Children's EC abilities were measured through different tasks (i.e., delay of gratification, waiting for to unwrap a gift box) and also parents were asked to fill out the Inhibitory Control and Attention Focusing subscales of the CBQ. Children's both internalizing and externalizing problem behaviors were assessed through parent- and teacher-reports on the Child Behavior Checklist (CBCL; Achenbach, 1991). The researchers found that lower levels of both observed and reported EC of children were related to more externalizing problem behaviors (Olson, Sameroff, Kerr, Lopez, & Wellmann, 2005).

Some studies particularly focused on the ER strategies' relation to temperamental emotionality and the EC. Calkins and Johnson (1998) showed that 18- months-old toddlers who displayed more distress (i.e., crying, fussing) in a frustrating situation (i.e., waiting for a snack) were more prone to use maladaptive ways of coping such as aggression and less adaptive ways like distraction or help-seeking. Santucci and colleagues (2008) investigated the role of the temperamental factors of children aged from of 4 to 7 years on their ER strategies. Children's negative emotionality was assessed through the Anger, Sadness, and Fear subscales of the CBQ, and Attentional Focusing and Inhibitory Control subscales of the CBQ were utilized to assess the EC. Children's ER strategies were observed during a delay task, which required them to wait for eating a cookie or unwrapping a gift box, and

coded into three discrete categories as negative focus on delay (i.e., negative affective expressions of the children while engaging with the delayed object), behavioral distraction (i.e., actively engaging with something else than delay object), and positive reward anticipation (i.e., joyful behaviors or asking questions regarding the delay object). The researchers found that negative affectivity predicted a more negative focus on delay behaviors which were considered by researchers as a maladaptive way of coping. In their study, Blair and colleagues (2003) collected data from parents regarding preschoolers' negative emotionality and the EC through the CBQ, and parents also reported their children's coping strategies in problem situations. The results showed that children with negative emotionality used adaptive strategies (i.e., getting support, thinking about positive aspects of the problem) less but maladaptive ways of coping (i.e., aggression) more, and better EC was related to more constructive and less maladaptive ways in preschoolers.

Cole and colleagues (2009) investigated the preschoolers' understanding of the ER strategies (adaptive or maladaptive ways) and assessed how they used ER strategies in case of an actual frustrating situation. They used a puppet procedure and basically asked children to generate strategies for angry or sad puppets (i.e., "Could you tell this puppet how to stop feeling sad/angry?"). In addition to strategy generation, children's strategy recognition was also assessed in the same puppet procedure and children were basically asked to choose the most effective strategy for the angry or sad puppets among the effective (i.e., "Should this puppet focus on something nice to stop feeling angry?) and ineffective ones (i.e., "Should this puppet hit someone to stop being angry?"). The researchers also observed the ER strategies preschoolers showed during a transparent box task (Goldsmith et al., 1999), and they categorized strategies under five categories as persistence, alternative problem

solving, social behaviors, distraction, and distortive behaviors. The researchers also assessed the negative emotionality levels and the EC of children through mother-reports on the CBQ (Rothbart et al., 2001). Contrary to the studies which showed that negative emotionality and poor EC were related to more maladaptive ways of coping, the researchers found that children's temperamental characteristics were not related to the ER strategies they showed during the frustrating situation and their ER strategy generations for angry or sad puppets. The researchers stated that the child's temperament might influence children's coping strategies in the sense that more reactive children might have more opportunity to learn how to regulate it. On the contrary, the increased reactivity of children such as higher levels of frustration might also lead those children to miss the chance to understand their emotional experiences which in turn cause difficulty in regulating their emotion-related behaviors. Therefore, the temperamental characteristics of children could be related to the ER strategies in different ways. The ER strategies of children during the frustrating situation predicted by the strategy understanding variables (strategy recognition and generation in puppet procedures), which might imply that children's access in the ER strategies plays a major role in the ER rather than innate temperamental variables.

2.3 Private speech

Private speech (PS) is basically defined as the external speech of children addressing to the self, not to any particular person (Berk, 1986; Bivens & Berk, 1990; Diaz & Berk, 1992). In the book 'The Language and Thought of the Child', Piaget (1959) viewed the PS as an indicator of cognitive immaturity, and the earliest, undeveloped form of the thought and egocentrism in young children. In a similar vein, he argued

that their egocentric speech stems from the lack of ability to take the perspective of others; and it does not include communicatory purposes since there is no aim of this speech to be understood by a listener. As cognitive capacities improve and social influences from others (like peers) rise, egocentric speech begins to decline, and it is finally replaced by effective social speech. In contrast to Piaget (1959) Vygotsky (1934/1986) suggested that this earliest form of speech is already social. Children's speech includes two aspects: speech for oneself (the PS) and speech for others (social speech). While social speech is utilized in order to communicate with others, the PS helps children to guide and direct their actions by speaking or talking to themselves in the absence of the others such as caregivers. Vygotsky (1934/1986) asserted that development first occurs in the interpersonal level and then in the intrapersonal level. Children's regulatory abilities develop within early experiences in which caregivers' talk to or instruct them, and then children begin to talk to themselves loudly during the toddlerhood and preschool years to lead their thoughts, behaviors and solve problems until the speech becomes internal. Thus, children's cognitive development is shaped by social interactions with others and cultural experiences on a large scale. Adults or other members of the society help children to learn culture-bound activities, tools of thought like semantics, and cultural ways in solving problems; and on the intrapersonal level, they appear in children's PS and therefore shape their thought processes. From this viewpoint, the PS has a role in transferring culture or culture-related mental skills to next generations in Vygotskian theory (Berk, 1992; Vygotsky, 1934/1986).

The PS has an inverted U-shaped development and generally begins at early preschool years, shows an increase in external (out-loud) forms and becomes more internal at early elementary years and takes the form of partial or external

manifestations of internal speech (i.e., inaudible lip movements or mutterings), then goes underground and becomes silent thought (Bivens & Berk, 1990; Diaz & Berk, 1992; Kohlberg, Yaeger, & Hjertholm, 1968; Montero & de Dios, 2006; Winsler & Naglieri, 2003).

The PS changes its function in development, such as younger preschoolers use it randomly and their PS is generally predicted by the social context (Berk, 1992). Older preschoolers' PS, on the other hand, is predicted by their activities and goals, and they utilize it more systematically while solving problems (Luria, 1961; Winsler, Carlton, & Barry, 2000). In other words, the PS first occurs in younger children as an afterthought, and then it gradually accompanies their behaviors on challenging tasks (Berk, 1992). Additionally, its use increases on difficult and challenging tasks where the tasks demand more than child's normal/automatized abilities. It is less likely to occur during easy and routine tasks where the child has already mastered (Diaz, 1992; Kohlberg et al., 1968).

Measurement, coding, and analysis of the PS are generally based on videotaping; but similar procedures can also be utilized for live coding (Winsler, Fernyhough, McClaren, & Way, 2005). Many studies yielded to use "utterance" as a unit of analysis (see Winsler et al., 2005). The utterance is basically defined as a completed sentence or a fragment, a clause having a marker of termination, and any idiomatic expression (i.e., conversational turn) temporally separated from the other by minimum of 2 seconds (Diaz, Winsler, Attencio, & Harbers, 1992; Feigenbaum, 1992; Winsler et al., 2005). The private and social speech differentiation is another step in the coding procedure. Social speech includes explicit reference to others, asking or replying questions of others, making eye contact with other people either following or during the speech, using behavioral markers like modifying body

position in the direction of the other during the speech, and/or continuing speech after any social utterance by less than 2 seconds (Diaz, 1992; Fernyhough & Russell, 1997; Furrow, 1992; Goudena, 1992). The PS includes none of these indicators and used by children to address self, but not to any particular listener (Berk, 1986; Diaz, 1992).

Previous studies have shown that several categories were used in the coding of the PS (see Winsler et al., 2005). Since the development of the PS follows a pattern starting from irrelevant forms to more goal-directed forms and becomes internal gradually at older ages (e.g., Kohlberg et al., 1968), coding procedures generally include a category for internal forms/signs of the PS, such as inaudible mutterings or lip movements, and categorization systems usually make distinctions between the relevance or irrelevance of the PS to the task (Diaz, 1992). For example, one of the most widely used categorization systems is Berk's (1986) three-level categorization (e.g., Alarcón-Rubio et al., 2014; Bono & Bizri, 2014; Fernyhough & Fradley, 2005; Winsler et al., 2005). In her study, Berk (1986) separated the PS utterances into three categories. Level I category includes task-irrelevant PS like word plays, repetitions, irrelevant affect expressions, commenting to imaginary others. Level II category includes audible task-relevant forms of the PS like describing one's activity, commenting to self, asking or replying questions to self, reading the task aloud, affect expressions addressing to task (i.e., "I did it"). Level III category includes partial PS or indicators of inner speech such as mutterings, lip movements or whispers (Berk, 1986).

It has been suggested that the use of the PS increases along with the increasing task difficulty, which requires children to use more cognitive resources, implying that the PS is utilized more to overcome task difficulties (Berk & Garvin,

1984; Diaz, 1992; Fernyhough & Fradley, 2005; Kohlberg et al., 1968). In addition, a number of studies showed that children tend to use more task-relevant types of the PS while solving a challenging problem, as those types of the PS help children to sustain their engagement on the task (Berk, 1986; Montero & de Dios, 2006; Roberts & Tharp, 1980; Winsler, De Leon, Wallace, Carlton, & Wilson-Quayle, 2003).

The PS has been studied in relation to cognitive abilities (Alarcon-Rubio et al., 2014; Bono & Bizri, 2014; Winsler, Fernyhough, & Montero, 2009), memory (Al-Namlah, Meins, & Fernyhough, 2012), the ER (Day & Smith, 2013; Ntourou, Conture, & Walden, 2013), the EF (Fernyhough & Fradley, 2005; Müller, Jacques, Brocki, & Zelazo, 2009), planning (Lidstone, Meins, & Fernyhough, 2010), motivation (Atencio & Montero, 2009), creativity (White & Daugherty, 2009), attention (Berk, 1986); and with various populations such as with bilinguals (Nelson, 2015).

2.4 Executive function and private speech

There is a temporal similarity between the acceleration of development of the EF abilities and the appearance of the PS during the preschool years (Zelazo & Frye, 1997), and this situation brings importance to the relationship between these two concepts. Insofar, Vygotskian position regarding the role of the PS is its supportive importance on children's self-regulation (Vygotsky, 1934/1986). Contrary to Vygotsky, Piaget's position regarding the PS is its manifestation of child's immaturity in cognitive aspects (Piaget, 1959).

Barkley (1997, 2014) also included the role of the PS in his theory of the Attention Deficient Hyperactivity Disorder (ADHD) which is closely related to the deficiencies in the EF abilities. Barkley (1997, 2014) especially emphasized the

relationship between the IC (or response inhibition) and the PS, and considered the internalization of the self-directed speech or the PS as an indicator of better regulation over the actions of the self. He argued that during the early years, there are observable (or outer) forms of self-directed actions (like PS), but with maturation, these outer (self-directed) actions are replaced by the internal forms; thus, this internalization plays a role in self-regulation. Therefore, it seems that Barkley's approach is similar to Piaget's in the sense that the overt or less internalized PS may indicate underdeveloped self-regulatory systems in children.

In line with the Barkley's theory, Berk and Potts (1991) compared the PS in typically developing school-age children, whose ages ranged from 6 to 12 years to the one in their peers who were diagnosed with ADHD. Children's PS was observed during after-school individual math activities. They found that the PS of children with ADHD was internalized later than the control group when examined in terms of the age group effects. The researchers indicated that children with ADHD, due to deficiencies in regulatory and on attention systems, could have delays in internalization of the PS. Similar results were also reported by Corkum and colleagues (2008). They also compared the PS of children aged from 6- to 11- years to the one in their peers who were diagnosed with ADHD during the inhibition task. They found that children with ADHD utilized more external PS, especially in task-irrelevant and task-relevant forms, and they concluded that children with ADHD tend to use more external, out-loud forms of the PS (or less internalized or less mature PS forms) compared to the control group.

The relationship between the EF and the PS has been widely investigated. Some studies showed a positive relationship (e.g., Lee & McDonough, 2015), while others found negative or no relationship between the PS and the EF (e.g., Aro,

Poikkeus, Laakso, Tolvanen, & Ahonen, 2015). Also, some researchers found a relationship among the PS types (i.e., task-relevant form or task-relevant partial form) and the EF (e.g., Alarcón-Rubio et al., 2013). Accordingly, some findings suggested that more internal and partial forms of the PS are positively related to the EF in children.

In a three-year longitudinal study with the elementary school children showed that overt manifestations (inaudible mutterings, whispers, etc.) and task-relevant forms of the PS, observed during math classes, were related to greater self-control over behaviors such as inhibiting distractive behaviors and sustaining attention (Bivens & Berk, 1990). In another study with children from the age of 8- to 9-years, the PS was measured by self-reports on the Self-Talk Questionnaire which is developed by the researchers due to fully-internalized nature of the PS during those ages. Children's scores on the Self-Talk Questionnaire were positively associated with teacher-reported regulation of the self (Lee & McDonough, 2015). Thus, children who reported themselves as utilizing self-speech more often obtained higher scores regarding their classroom behaviors, such as the ability to notice own error on a task and correct them, from their teachers. In their study, Lidstone and colleagues (2010) asked children, aged from 7- to 10-years-old, to plan their movements beforehand on the Tower of London task (ToL; Shallice, 1982), which is a common measure of the EF. In this study, one group took the ToL task under articulatory suppression (by repeating a word for every second) condition while the other group was in the control condition; thus, they were able to use the PS if they needed. The results showed that the articulatory suppression condition had an adverse effect on children's ToL performance. The results also emphasized the role of the PS on planning. Hence, when it interfered during the ongoing performance (i.e., interfering

child from talking to themselves by putting them in articulatory suppression condition), the participants scored lower than the participants in the control condition on the EF (ToL) task.

In particular, Bono and Bizri (2014) observed the PS of children whose ages ranged from 3 to 5 years during a challenging Lego task. Teachers reported children's self-regulation abilities (i.e., following classroom rules or instructions, disrupting other kids' games) on the Self-Control Rating Scale (SCRS; Kendall & Wilcox, 1979). The researchers reported negative relations of both the task-relevant forms and the total amount of the PS that children utilized during the Lego task to children's self-regulatory abilities (Bono & Bizri, 2014). In a relatively recent study by Alarcon-Rubio and colleagues (2014) with 4- to 7-years-old, the PS was observed during an activity where children were required to sort cards according to a rule. Their EF performance was measured by the Dimensional Change Card Sorting (DCCS) which requires children to keep a rule in mind, shift among the rules and pay attention (Zelazo, 2006). The study showed that internal and task-relevant forms of the PS were related to better performance on the DCCS task.

2.5 Private speech and emotion regulation

Language helps children to recognize and label their emotional states (Campos et al., 2004; Cole et al., 2010; Eisenberg & Morris, 2003). The contribution of language to the ER was emphasized by many researchers (e.g., Cole et al., 2010; Eisenberg & Morris, 2003). Nevertheless, the number of studies focusing on the link between the PS and the ER seems few.

In a study, children aged from 4 years and 9 months to 5 years and 6 months were observed in terms of the PS use during various tasks (i.e., free play, an art

activity, and a puzzle activity) and their ER was assessed through teacher reports on the Emotion-Regulation Checklist (ER Checklist, Shields & Cicchetti, 1997). The study showed that children who were reported to have good ER skills by their teachers used more PS than their peers who were reported to have poor ER skills (Broderick, 2001). Winsler and colleagues (2003) assessed preschoolers' PS during selective attention (i.e., placing cards into a category according to shared commonalities of two pictures on the card, such as color or shape) and Lego construction tasks; and their negative (i.e., screaming, crying), positive (i.e., laughing) and neutral (neither positive or negative) affect expressions were observed during classroom hours. Parents and teachers also reported children's externalizing problems on the Preschool and Kindergarten Behavior Questionnaire (Merrell, 1994). It was found that children who utilized more considerable amount of PS overall during observations expressed more positive and less neutral affect and their teachers also reported those children as more likely to have externalizing problems. In addition, if children utilized more internal forms of the PS as proportioned to their total amount of the PS, they were rated as having fewer externalizing problems by their teachers.

Much recent work with children between the ages of 4.5- to 6-years, the ER and the PS were assessed through a locked-box frustration task. The task was designed to evoke sadness and anger in children. The participants' performances on locked box frustration task were recorded and coded for the ER strategies and the PS. Distraction (i.e., distracting him/herself from the locked box by focusing on another object to overcome frustration) and self-comforting (i.e., manipulating body, clothes, etc. for soothing purposes to overcome frustration) strategies of the participants were rated as indicators of the ER. The study has indicated that the facilitative forms (self-

supporting speech such as setting goals or describing the activity) of the PS used by children, were related to the utilization of less distraction strategy. In other words, children who talked to themselves in a supportive way were the ones that distracted less by the other factors. In addition, children who used partial forms of the PS like inaudible mutterings were also the ones who had higher levels of self-comforting. This result indicated that the more advanced forms of the PS (i.e., the partial forms) support the regulation of emotions which also leads to lower levels of anger in children (Day & Smith, 2013).

In their study, Day, Smith, Neal, and Dunsmore (2018) measured the children's emotionality (sadness and anger) on a locked box frustration task and also got reports from parents on the Sadness and Anger/Frustration subscales of the Child Behavior Questionnaire Short Form (CBQ-SF; Putnam & Rothbart, 2006). Children's EC was measured through a dinky toys protocol, during which they were asked to select a toy from a basket filled with small toys without moving their hands from their knees (Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996). Besides, parents reported their children's EC through the Attention Focusing, Attention Shifting, and Inhibitory Control subscales of the CBQ-SF. Children's PS was recorded while they performed on a selective attention task (i.e., matching cards according to either their color or shape). The EC was not related either to task-relevant or partial forms of the PS. The results indicated that children's greater use of internal forms of the PS was related to higher levels of sadness even after controlling for their age, gender, social speech, and the EC. The researchers concluded that the PS might be a way of perseverating; thus those very sad children might sustain their engagement with the task with the help of the PS.

2.6 Executive function and emotion regulation

The EF and ER both influence and are influenced by each other in the course of development (Blair & Diamond, 2008). Besides, they contribute to many developmental outcomes such as psychosocial adaptation (Calkins & Howse, 2004; Ursache, Blair, & Raver, 2012).

2.6.1 Executive function and effortful control

The concepts EF and EC have been usually used interchangeably, especially in the self-regulation studies (Zhou et al., 2012). The EF has been studied within the context of cognitive neuroscience and clinical psychology with its attribution to the regulation of cognitive aspects. The EC, which is defined as the regulation of the temperament, has been studied within the psychobiological model and it carries substantial overlaps with the EF in the framework of the self-regulation (Bridget, Oddi, Laake, Murdock, & Bachmann, 2013; Zhou et al., 2012). The commonalities shared by these two constructs seem to be the IC and attentional processes (Bridget et al., 2013; Zhou et al., 2012). The IC tasks were generally utilized as measurement tools in both the EF and the EC studies (Blair & Razza, 2007). For instance, some IC tasks (e.g., Snack delay; Kochanska et al., 2000) were used in order to assess the EF in some studies (i.e., Carlson, 2007) and the EC in others (i.e., Kochanska & Knaack, 2003). Whereas the IC was conceptualized as a cognitive skill in the EF literature, it was described as the regulation tool for emotion or emotion-related behaviors in the studies focusing on the EC (Zhou et al., 2012). In addition, regulation of attentional processes is also included in both theories. One of the components of the EC is the executive attention (i.e., the ability to shift attention or voluntarily control of

attention) and it resembles the updating function of the WM in the EF model (Bridget et al., 2013; Zhou et al., 2012).

One difference between the EF and the EC is their consideration of the self-regulation in different contexts. The EC studies focused on the regulation of the self during emotion-evoking situations (i.e., Diaz et al., 2017), while most of the EF studies focused on the emotion-neutral tasks or situations (see Zelazo, 2006) (Zhou et al., 2012). Relatedly, the EF abilities are classified as "hot" functions and "cool" functions (Zelazo & Müller, 2002). Hot functions include affective aspects of regulation, whereas cool aspects are relatively related to the regulation of cognitive aspects. These hot and cool aspects are also separated in prefrontal cortex where accounts as the center of all EF abilities. Equally, Zelazo and Müller (2002) indicated that hot aspects are associated with ventral and medial parts of the prefrontal cortex (VM - PFC) whereas cool aspects are more associated with lateral prefrontal cortex (L - PFC). Abstract (i.e., application of a rule during a task) or decontextualized tasks (e.g., sorting cards during the Wisconsin Card Sorting Task; Grant & Berg, 1948) and the tasks which require the child to inhibit a motor response or suppress a dominant response and to control his/her attention (i.e., Stroop-like tasks) are more likely to evoke "cool" EF (Kim, Nordling, Yoon, Boldt, & Kochanska, 2013). People use "hot" functions where the task has affective significance to them. Hot functions are also utilized during impulse control tasks that require suppression of an emotionally-charged reaction to the desired object (Hongwanishkul, Happaney, Lee, & Zelazo, 2005; Kim et al., 2012; Zelazo & Cunningham, 2007; Zelazo & Müller, 2002).

Previous studies which assess the relationship between the EF and EC showed a low to moderate association (Zhou et al., 2012). For example, Blair and

Razza (2007) studied both constructs with their relations to preschoolers' math and literacy performances. Their results demonstrated that moderate correlations of the IC component (i.e., the child taps twice with a wooden peg when the experimenter taps once, and vice versa.) of the EF to the teacher-reported EC, which was obtained from the composite score of Inhibitory Control, Attention, Approach and Anger subscales of the Child Behavior Questionnaire (CBQ; Putnam & Rothbart, 2006). Similarly, another study with preschoolers reported small to moderate associations between the parent-reported EC on the CBQ (Putnam & Rothbart, 2006) and the EF variables which were assessed through the Self-Ordered Pointing Task (Petrides & Milner, 1982) and the Dimensional Change Card Sorting Task (DCCS; Zelazo et al., 2003) (Hongwanishkul et al., 2005).

In addition, the link between the EF and negative emotionality has been examined by many researchers. Young adults who expressed higher levels of negative affect had poorer IC, indicating the role of the IC of the EF in the regulation of the expression of negativity outward (Bridgett et al., 2013). Similar to the study in young adults, a study with children suggested that children who had better ability to inhibit their behavioral tendencies on the EF tasks (i.e., Simon Says; Strommen, 1973) were better in regulating their negative expressions compared to their counterparts with poor IC (Carlson & Wang, 2007). This result demonstrated that children who were good at the IC function of the EF were also successful at suppressing their negative emotional expressions (i.e., nose wrinkling, lowered eyebrows). Similarly, Ferrier, Bassett, and Denham (2014) studied the relationship between the EF (inhibition and attention) and emotionality in preschoolers, and they reported that children's better EF performance (both observed and reported by

teachers on a scale) was related to more positive emotionality as reported by independent observers.

2.6.2 Executive function and emotion regulation strategies

The EF starts to develop from earlier months of life, but the major developments occur from the age of 3 to 6 years (Diamond, 2002; Diamond, 2006; Garon et al., 2008; Zelazo & Müller, 2002). Similarly, Rothbart (2007) emphasized the role of the first seven years of life on the ER development, since children begin to internalize the social rules during this period, which helps them to become more advanced in the regulation of their own emotions and gain a repertoire of the ER strategies to be used in various contexts.

In general, the links between the ER strategies and the EF has been investigated empirically. In a longitudinal study with a large sample of participants (1,292 children) it was found that infants who showed higher negative reactivity (i.e., screaming, fussing, closing eyes completely or partially, and opening one's mouth widely) to emotionally distressing events (i.e., mask task to elicit fear) and spent a more extended amount of time in self-regulatory behaviors (i.e., looking at caregiver, gestures, seeking comfort) at 15 months of age were better in the EF at 48 months of age, compared to infants who showed higher negative reactivity but spent a shorter amount of time in the ER behaviors (Ursache et al., 2013). The results indicated that children who had high emotional reactivity and better regulation of their high emotionality in early ages performed better on the EF tasks in older ages. Similarly, the EF plays an important role in ER-relevant problems and disorders. College students with poorer EF abilities reported higher levels of perceived stress which in

turn predicted more aggressive behavior (Sprague, Verona, Kalkhoff, & Kilmer, 2011).

Jahromi and Stifter (2008) coded preschoolers' ER strategies during a frustration task (i.e., children struggled to get the desired toy from a locked box) and a disappointment task (i.e., children were given an undesired toy rather than a desired one) either as constructive (i.e., persistence on task, support-seeking, trying alternative strategies) or nonconstructive (i.e., aggressive behaviors, disruptive acts). Their EF skills were assessed through different Stroop-like tasks (i.e., Go/No-Go, Cohen, MacWhinney, Flatt & Provost, 1993; Day/Night, Gerstadt, Hong, & Diamond, 1994). The findings indicated that children with better EF performance showed better control over their behaviors and displayed less nonconstructive ways of coping.

2.7 Overview and the hypotheses of the study

As it is stated above, the EF, the ER, and the PS are crucial contributors to the human adaptation. Accumulating studies have demonstrated the relationship between the EF and the ER. Nevertheless, present findings regarding the association of the PS to these capacities seem mixed. Thus, the associations among the EF, the ER and the PS will be examined in this study.

The present findings regarding the link between the EF and the PS seem to be inconsistent in two ways. Whereas some studies showed that the PS is related to better EF (e.g., Lee & McDonough, 2015; Lidstone et al., 2010) others demonstrated that the PS use negatively related to the EF (e.g., Bono & Bizri, 2014). The first line of findings seems to support Vygotskian position (Vygotsky, 1934/1986) which suggests the supporting role of the PS for the EF in children while the second line of

findings appears to be in line with the arguments by Piaget (1959) and Barkley (1997, 2014) who argued that the limited internalization of the PS is related to poorer regulation of the self in children. Therefore, the first goal of this study is to examine the association between the EF components (WM and IC) and the PS that was shown by children during the Card Sorting Task. The hypotheses regarding this goal are non-directional due to the contradictory results of earlier studies. Accordingly, it is hypothesized that the PS is related to mother-reported difficulties in children's WM (Hypothesis 1) and IC (Hypothesis 2) controlling for the child's age, gender, expressive language ability, and parents' education level.

As the link between the PS and the ER-related capacities (the ER strategies, the EC, and negative emotionality) was less studied, the direction of the relationship among these two variables seems unclear. In this study, the ER strategies will be coded as avoidance and constructive. It seems that there is no study focusing on the link between the PS and the use of these specific ER strategies in preschoolers. Some findings are suggesting that the PS helps children to comfort themselves and maintain their persistence in case they get frustrated (e.g., Day & Smith, 2013). Based on this result, two hypotheses are formed. It is expected that the PS is related to the use of a greater number of constructive strategies in case of frustration (Hypothesis 3) and the PS is related to the use of fewer number of avoidance strategies (Hypothesis 4) controlling for the child's age, gender, expressive language ability and temperamental characteristics that are related to the ER (i.e., negative emotionality and the EC).

In addition, in their study, Berk and Potts (1991) found that children with ADHD were delayed in their internalization of the PS compared to their typically developing peers. They argued that the relationship between the PS and the self-

regulation is bidirectional. That is to say, the PS might be related to the regulation of the self. On the other hand, its internalization might also be related to well-functioning self-regulatory abilities. Therefore, in the current study, the factors which predict the use of the PS during the Card Sorting Task will be examined. The hypothesis regarding this goal is non-directional due to lack of empirical findings with the PS as an outcome variable. Accordingly, it is hypothesized that the PS is predicted by temperamental variables (negative emotionality and the EC) and the EF (WM and IC), to control for child's age and gender (Hypothesis 5). There is some evidence showing that the greater use of the internal forms (Level III) of the PS is related to higher levels of sadness (negative affectivity) in preschoolers (Day et al., 2018). In line with these findings, it is hypothesized that mother- and teacher-reported negative emotionality will be related to greater utilization of the PS in preschoolers (Hypothesis 6). Day and colleagues (2018) also found that the EC was not related to the PS types (both task-relevant and partial forms), based on this finding a null hypothesis was formed that the mother- and teacher-reported EC scores will not be related to the PS (Hypothesis 7).

Previous research suggested that the EF and the ER are related constructs in the sense that both contributed to one's self-regulation (e.g., Calkins & Howse, 2004; Ursache et al., 2012). Whereas the EF refers to cognitive skills promoting regulation, the EC constitutes its temperamental basis (Zhou et al., 2012). Many studies (e.g., Blair & Razza, 2007; Hongwanishkul et al., 2005) showed a positive association between the two. Thus, it is hypothesized that the mother- and teacher-reported EC scores will be negatively related to mother-reported WM (Hypothesis 8) and IC (Hypothesis 9) difficulties. In line with the previous findings, which linked negative emotionality to the EF difficulties (e.g., Bridgett et al., 2013; Carlson & Wang,

2007), it is also hypothesized that the mother- and teacher-reported negative emotionality scores will be positively related to mother-reported WM (Hypothesis 10), and IC (Hypothesis 11) difficulties. In addition, previous literature pointed out that the EF difficulties might be related to maladaptive ways of coping in case of distress (e.g., Jahromi & Stifter, 2008; Sprague et al., 2011). Therefore, a greater number of constructive strategies that children use when they are frustrated is expected to be related to fewer WM (Hypothesis 12) and IC (Hypothesis 13) difficulties. Similarly, a greater number of avoidance strategies is expected to be related to more WM (Hypothesis 14) and IC (Hypothesis 15) difficulties.

CHAPTER 3

METHOD

3.1 Sample of the study

A total of sixty-two (35 girls, 27 boys) preschoolers, their parents, and teachers participated in the study. All of the participants were enrolled in four preschools governed by municipalities in İstanbul, Turkey. The children's ages ranged from 49 to 74 months (M = 62.16, SD = 6.07). Forty-five percent of the children were the single child of the family, 45.2% had one sibling, and 9.7% had two siblings. Majority of the children were first born of the family (69.4%), 24.2% of the children were the second child, and 6.5% were the third (last) child of the family.

The mean age for mothers and fathers were 36.54 (SD = 6.05) and 38.41 (SD = 4.98) years respectively. Ninety-eight percent of the families were intact. A summary of descriptive statistics for the child and family demographic variables of the study are presented in Table 1.

3.2 Instruments

3.2.1 Family demographic characteristics

Mothers were asked to complete a demographic form to provide information about the child's birth date, gender, birth order, school type (private or public), primary caretaker, and the number of children they have and their sexes. Moreover, parental information regarding their age, marital status, level of education, occupational information and monthly house income were obtained. The family demographic form was presented at Appendix A (English version) and Appendix B (Turkish version).

Table 1. Descriptive Statistics for Child and Family Demographic Characteristics

Demographic Variable (N = 62)	*M*	*SD*
Child age (months)	62.16	6.07
Mother age (years)	36.53	6.05
Father age (years)	38.41	4.98
Demographic Variable	***N***	**%**
Child sex (female)	62	56.5
Child's birth order	62	
First child		69.4
Second child		24.2
Third child		6.5
Number of children in the family	62	
One child		45.2
Two children		45.2
Three children		9.7
Maternal Education	62	
Primary school		8.1
Middle school		9.7
High school		21.0
2-year college		8.1
Undergraduate		43.5
Master degree		9.7
Paternal Education	60	
Primary school		6.7
Middle school		8.3
High school		35.0
2-year collage		8.3
Undergraduate		30.0
Master's degree		10.0
Other		1.7
Employment of mother	62	
Unemployed		24.4
Employed		72.6
Monthly House Income	55	
< 1500		9.1
1500-2999		25.5
3000-4499		12.7
4500-5999		10.9
6000-7499		23.6
7500-9000		5.5
>9000		12.7

3.2.2 Private speech

A categorization task was used in the study in order to capture children's PS, and the entire task performance was observed and recorded by a video camera. In this semantic task, children are given 25 cards to be sorted into five categories; namely musical instruments, animals, transport vehicles, food, and school supplies. Each card is rectangularly shaped in 10 x 10 cm. The pictures in each category were prepared based on the information that was obtained by the study of Alarcon-Rubio and colleagues (2014). Each category includes pictures of typical and less typical items. In the pilot study, it was observed that 4- and 5-years-old preschoolers were able to do the task. The task was not too difficult for the participating children to handle or too easy.

During the card sorting task (CST), the researcher stays in the same room with the child in order to create a familiar environment and to avoid child to feel him/herself inhibited in this experimental situation. The researcher first introduces the categories that are named and illustrated with some small example pictures of the category. Then, the first two cards of each category are distributed in order to show the child how to sort cards. After the introduction process, the child is given 25 cards and researcher instructs the child by saying "Now, you know how to play this game. I will give you these cards and you will place them to categories which they belong". Right after the instruction, the following instruction is given "Some children like to talk aloud while engaging this task, if you want to talk, you can talk. I will sit here, and when you finished, you can tell me" to prompt children to talk aloud and obtain more private speech (i.e., Alarcon-Rubio et al., 2014). After cards are given to the participant child, the researcher sits in a long distance to the child and seems to engage in something else. The task did not have a time limit. The completion of the

task by preschoolers ranged from 1.02 minutes to 5.09 minutes (M = 2.02, SD = .88). Also, 71.2% of the children completed the task without any mistakes.

The researcher and an undergraduate (sophomore) student who was trained on the PS based on Private Speech Coding Manual (Winsler et al., 2005) coded the PS data according to Berk's (1968) coding procedure. After transcription of the entire speech in the task, they were separated into "utterances" which was defined as a completed sentence or a fragment, a clause having a marker of termination, and any idiomatic expression (i.e., conversation turn) temporally separated from the other by minimum of 2 seconds (see Diaz et al., 1992; Fernyhough & Fradley, 2005; Winsler et al., 2005). Further, the utterances were classified as either social speech (SS) or private speech (PS). If the utterance included eye contact with the researcher, physical signs such as gaze at researcher or touching her, content markers such as talking following-up of the researcher's speech, and if the child started speaking after any social speech without two seconds intervals (temporal continuity), this speech was coded as social. When the utterance was not aimed to communicate with the researcher, in other words, if it was self-directed, this speech was coded as private. The PS was further coded into three discrete categories as "level I PS" if the PS is external and irrelevant to the current task (i.e., "I like pizza"), "level II PS" if the PS is external and relevant to the current task such as guiding and self-regulatory comments (i.e., "This picture goes to that category"), and "level III PS" if the PS is not entirely external but task-related and partial like whispers or inaudible mutterings (Berk, 1986). Since the task did not have a time limit for completion, the total amount of utterance in each type of PS was divided by the completion time of the task (minutes) (e.g., Alarcon-Rubio et al., 2014; Lidstone et al., 2011).

In the Card Sorting Task, level I PS (task-irrelevant, out loud) was used by 22.8% of the participants, level II PS (task-relevant, out loud) was used by 35.08% of the participants and lastly level III PS (task-relevant, partially internalized) was used by 77.19% of the participants. In total, 89.47% of the sample was used at least one kind of the PS during the task.

The category agreement between the coders was 96%. The PS coding sheet was presented at Appendix C (English version) and Appendix D (Turkish version).

3.2.3 Teacher and mother reports of talkativeness

In addition to the objective measurement of child's PS; teachers and mothers were asked to rate each children's talkativeness by simply asking "On a scale from 0 to 10, how talkative would you say [name] is?" (Fernyhough & Fradley, 2005, p.110). The question was presented at Appendix E (English version) and Appendix F (Turkish version).

3.2.4 Temperamental characteristics related to emotion regulation

The Child Behavior Questionnaire (CBQ) was developed by Rothbart and colleagues (2001) for the purpose to assess temperament in children from 3 to 8 years of age. The short form (CBQ-SF, Putnam & Rothbart, 2006) includes 94 items and 15 subscales including activity level, anger/frustration, approach, attentional focusing, discomfort, falling reactivity and soothability, fear, high intensity pleasure, impulsivity, inhibitory control, low intensity pleasure, perceptual sensitivity, sadness, shyness, and smiling/laughter.

In the present study, six subscales of the CBQ-SF were used in accordance with the aims of the study. The anger/frustration (i.e., the negative emotional

response of the child in case of interruption of an ongoing task or goal-related behaviors) subscale consists of 6-items (Cronbach's α = .76). Attentional focusing (i.e., ability to maintain focus on task-related situations) subscale consists of 6-items (Cronbach's α = .75). Falling reactivity and soothability (i.e., the recovery from excitement-giving situations) subscale consists of 6-items (Cronbach's α = .73). Impulsivity (i.e., the response-related speed of the child) subscale consists of 6-items (Cronbach's α = .72). Inhibitory control (i.e., the capacity to suppress dominant response when asked or if changes occur in a situation) subscale consists of 6-items (Cronbach's α = .72). Lastly, sadness (i.e., the negative affect or decrease in the mood of the child to the disappointment-giving situations or loss) subscale consists of 7-items (Cronbach's α = .61). In this study, children's mothers and teachers were asked to rate the items over the 7-point Likert-type scale (1- *extremely untrue for your child* to 7- *extremely true for your child*). The total score is obtained by averaging the responses to the items in each subscale after appropriate reverse codings were done.

Mothers and teachers were asked to fill out the CBQ-SF. Parent and teacher report forms were presented at Appendix G (parent-report form, English version), Appendix H (parent-report form, Turkish version), Appendix I (teacher-report form, English version), and Appendix J (teacher-report form, Turkish version). The reliability and validity study for the Turkish form of the parent-report version was conducted by Sari, İşeri, Yalçın, Arslan, and Şener (2012). The Cronbach's alphas of the subscales were ranged from .47 to .86, with a mean of .78 (N = 87), for anger/frustration subscale α = .75, attentional focusing α = .63, falling reactivity and soothability subscale α = .76, impulsivity subscale α = .47, inhibitory control subscale α = .67, and sadness subscale α = .58. Also, test-retest reliability was found

as ranged from $r = .68$ to $r = .86$ for all subscales. The Cronbach's alphas of the subscales of the teacher report form were ranged from .68 to .88 (Teglasi et al., 2015).

In the current study, the Cronbach's alphas of mother-reported subscales were ranged from .40 to .75; for anger/frustration subscale $\alpha = .75$, attentional focusing $\alpha = .55$, soothability subscale $\alpha = .55$, impulsivity subscale $\alpha = .40$, inhibitory control subscale $\alpha = .74$, and sadness subscale $\alpha = .50$. For the teacher-report form, the Cronbach's alphas of the subscales were ranged from .40 to .82; for anger/frustration subscale $\alpha = .69$, attentional focusing $\alpha = .82$, soothability subscale $\alpha = .63$, impulsivity subscale $\alpha = .50$, inhibitory control subscale $\alpha = .81$, and sadness subscale $\alpha = .40$.

As mentioned above, six subscales of CBQ-SF were chosen, namely anger/frustration, sadness, soothability and falling reactivity, inhibitory control, attentional focusing, and impulsivity for this study. The questions in anger/frustration (e.g., "Has temper tantrums when s/he does not get what s/he wants"), sadness (e.g., "Cries sadly when a favorite toy gets lost or broken") and soothability and falling reactivity (e.g., "Is easy to soothe when s/he is upset") scales assess affective/emotional part of regulation of children towards the emotionally stressful situations. In the factor analysis study of CBQ-SF, Putnam and Rothbart (2006) categorized sadness, anger, and soothability/falling reactivity subscales under "negative affectivity". Similarly, Eisenberg and colleagues (1995) categorized anger/frustration, sadness, and soothability/falling reactivity subscales as "unregulated negative emotion". Based on theoretically-driven categories, those three subscales were grouped as the "negative emotionality" and the internal consistency for the mother-reported composite score of sadness, anger, and

soothability/falling reactivity was found as α = .68 and the teacher-reported composite score of sadness, anger, and soothability/falling reactivity were found as α = .73. Higher scores in negative emotionality indicate that the child has greater difficulty in regulating their negative emotions.

The questions in attentional focusing (e.g., "When practicing an activity, has a hard time keeping her/his mind on it"), impulsivity (e.g., "Usually rushes into an activity without thinking about it"), and inhibitory control (e.g., "Can wait before entering into new activities if s/he is asked to") scales assess effortful control (EC) which is closely related to emotional regulation towards emotionally stressful situations (Eisenberg et al., 2011; Kochanska et al., 2000). As mentioned on the ER part, Rothbart and Bates (2006) defined the EC as "the efficiency of executive attention—including the ability to inhibit a dominant response and/or to activate a subdominant response, to plan, and to detect errors" (p. 129). The EC is related to voluntarily control of attention, the ability to inhibit the dominant response and the ability to activate a behavior when necessary (Eisenberg et al., 2011). Based on the EC theory, those three subscales were grouped as the "effortful control", and Cronbach's alpha of the mother-reported composite score of attentional focusing, impulsivity and inhibitory control was found as α = .62 and Cronbach's alpha of the teacher-reported composite score of attentional focusing, impulsivity and inhibitory control as α = .82. Higher scores in the EC imply that the child is better in the EC (regulating his/her attention, impulses, and inhibition).

Teacher and mother reports on negative emotionality were not correlated (r = -.02, *n.s.*), and mother and teacher reports on the EC were significantly and positively correlated (r = .36, p < .01). Eisenberg and colleagues (1995) also reported zero correlation between parent and teacher reports on children's negative

emotionality. Similarly, Day and colleagues (2018) found that children's reported negative emotionality and observed negative emotionality showed a zero correlation. Thus, they considered that difference in contexts might influence the ratings. For example, mothers may report children's emotionality in a more global perspective, while teachers may observe children's emotionality in a more specific classroom environment with other students. Since children show differences in negative emotionality depending on the context; they calculated a composite score to maximize validity and reduce measurement error. Similar consideration with the study by Day and colleagues (2018), scores of mother and teacher-reports for negative emotionality and the EC variables were averaged, and these aggregated scores were used in the analyses.

3.2.5 Emotion regulation strategies in the face of frustration

In order to assess the ER strategies of children in the face of frustration, the Attractive Toy in a Transparent Box (ATTB) task of the Pre-School version of Laboratory Temperament Assessment Battery (Goldsmith et al., 1999) was utilized. This task requires children to unlock a transparent box for 4 minutes to play with a chosen/desirable toy. The child can see his/her selected/desirable toy in a transparent box but cannot be able to play with it since it is locked and the given keys are not opening it.

During this task, the researcher stays in the room with the child. First, the child is asked to order five toys (two cars, one pony, one cartoon star baby, and one Barbie doll) in terms of their attractiveness to them (which one he or she wants to play with the most). After the child orders the toys from his or her wish to play most to least, the experimenter keeps the most attractive toy chosen by the child and hides

the other toys from the child's view and says "OK, here's how you play the game. I'm going to put this toy (desired toy) in this box (while in the act of doing so), and then I'm going to put this lock on it. You can use these keys to open the lock and one of these keys will unlock it, so if you can find it, you can play with the toy you choose, OK?" (Goldsmith et al., 1999, p.23). If the child does not know how to use the key and lock, the researcher shows him/her how to use it. In case the child tells that the keys are not working, the researcher instructs him or her as "I have a little thing to do in here, as soon as it is over I will come there. You can keep going." to keep the child on the task.

Coding of the ER strategies on the ATTB was prepared based on the existing literature as briefly stated in the literature review, and especially studies with the preschoolers were taken into consideration (e.g., Cole et al., 2009; Day & Smith, 2013; Stansbury & Sigman, 2000; Zimmerman & Stansbury, 2003). If the child distracts his/her attention from the focus object for more than two seconds or participates to other activities than the ATTB task, this period was coded as "distraction". When the child moves his/her body, plays with his/her clothes, sucks his/her thumb, clasps or grasps his/her hands, plays with his/her hair, touching his/her face or shows any object-oriented repetitive behaviors to self-soothe; this period was coded as "self-comforting". When the child tries to leave the room, or in general any escape behaviors were coded as "instrumental strategies/withdrawal". When the child insists on opening the box but not in a forceful manner, these behaviors were coded as "persistence/focusing on task". If the child engages in any disruptive behavior like throwing the box, hitting or any movements to damage the box, these behaviors were coded as "disruptive behavior". If the child asks help from others to open the closed box, these behaviors were coded as "social behaviors", and

lastly if the child gets close to the stimulus without a purpose to unlock it (focusing on box, toys inside without aiming to open it) these behaviors were coded as "approach".

The videotaped performances were divided into 10-seconds intervals. Each interval was coded as presence (the interval will be coded as "1") or absence (the interval will be coded as "0") of the ER strategy given above in any of the categories. Each interval was not exclusive to just one strategy. The ER strategies were coded by two senior undergraduate students who were trained about the ER strategies and blind to the study aims. The category agreement between raters was 81%. The sample of the coding sheet for the ER strategies was given at Appendix K (English version) and Appendix L (Turkish version).

Eisenberg and colleagues (1993) classified coping/emotional regulation strategies into four distinct categories as distraction/avoidance strategies (behaviors including avoidance, doing nothing, denying to open the box), aggression, venting (i.e., crying to release emotional distress) and seeking support. Blair and colleagues (2004) categorized the ER strategies into three categories as constructive coping, emotional venting, and passive coping. Jahromi, Meek, and Ober-Reynolds (2012) categorized coping strategies as constructive strategies (like goal-directed behaviors, getting social help), venting strategies and avoidance strategies (like avoidance, distraction and alternative ways to open box). Based on existing literature, the ER strategies were grouped into two variables as "constructive strategies" (including goal-directed persistence on task, behaviors serve to self-soothe, getting help from the experimenter, and approach behaviors) and "avoidance strategies" (withdrawal or deny to open the box, aggressive behaviors, and distraction). The total number of the ER strategies in each category was summed and used in statistical analyses.

3.2.6 Executive functioning difficulties

In order to assess children's EF difficulties, mothers were asked to fill out the Childhood Executive Function Inventory (CHEXI). The CHEXI was developed by Thorell and Nyberg (2008) in order to capture the EF in children from the ages of 4 to 7 years, and the scale is based on ratings of parents and teachers according to their observation of the child's behavioral indications of the EF. The scale consists of 26 items on a 5-point Likert scale format (from 1 = *definitely not true* to 5 = *definitely true*).

The scale consists of four subscales including working memory, planning, regulation, and inhibition. In a factor analysis, the CHEXI found to have two factors which tap into working memory (WM) and inhibition control (IC) (Kayhan, 2010; Thorell & Nyberg, 2008) in preschoolers. The total score was obtained by averaging the scores of the items in each subscale. The higher scores on the subscales refer to higher levels of deficiency. The form was presented at Appendix M (English version) and Appendix N (Turkish version). The reliability and validity of the scale were examined in a Turkish study (Kayhan, 2010). The internal consistency was reported as $\alpha = .97$ for parent forms. In the current study, the internal consistency of mother-reported WM subscale was found as $\alpha = .83$, and the IC subscale was found as $\alpha = .76$.

3.2.7 Expressive language ability

The Turkish Expressive and Receptive Language Test (TİFALDİ) was developed by Berument and Güven (2013) for the assessment of receptive and expressive language ability of children between the ages from 2 to 12 years old. In this study, only the expressive language subtest of the TİFALDİ was used. The expressive vocabulary

subtest includes 80 pictures with one picture in each page. The pictures are ordered according to their level of difficulty. The test-retest reliability of the expressive language subtest was found as .97, the split-half reliability was reported as .99 and Cronbach's alpha was reported as .97.

The child starts the test based on his/her age. Each page includes one picture and the child is asked to name the given picture. If s/he makes a mistake after the age-adjusted start item, the researcher goes back to an easier item until the child gives eight consecutive responses and the task ends when the child makes six mistakes out of eight responses in a row.

3.3 Procedure

In order to conduct this study, ethical permission was obtained from Boğaziçi University Ethical Commission (INAREK) (Appendix O). Data collection occurred between May 2017 and December 2017, which corresponded to spring and fall terms of the preschools. After the approval of ethical permission, the researcher contacted several preschools located in İstanbul, Turkey. All the mother, teacher and school administration permissions were obtained separately through informed consent forms. The samples of informed consent forms were given at Appendix P (parental consent form, English version), Appendix Q (parental consent form, Turkish version), Appendix R (teacher consent form, English version), Appendix S (teacher consent form, Turkish version), Appendix T (school principle consent form, English version), and Appendix U (school principle consent form, Turkish version). Teacher and school administration forms were distributed and collected during school visits.

Maternal forms were sent to the child's home in cooperation with the school administrators and teachers. Mothers were asked to fill out the demographic form,

the CBQ-SF, the CHEXI and talkativeness question. Teachers were asked to fill out the CBQ-SF and the talkativeness question. The detailed list of measures was given at Appendix V. Child assessments were done on school grounds, and the tasks were given in the following order: the CST, the TİFALDİ, and the ATTB. Each child was tested individually in a quiet room. The application of all tasks lasted about 30 minutes for each participant. Children's performances during these tasks were video-recorded for coding purposes.

3.4 Data analysis plan

For data inspection, two sets of analyses will be conducted. First, gender and age differences will be examined through Independent Samples *t*-test, and a non-parametric Mann-Whitney test in case normality of the distribution is not obtained for the variables of interest.

To test the research hypotheses, a series of Multiple Hierarchical Regression analyses will be conducted. Prior to running regressions, the assumptions will be tested in terms of normality, univariate outliers, multicollinearity, singularity, collinearity (i.e., Tolerance and variance inflation factor [VIF]), linearity (through normal P-Plots), and the Cook's distance (Tabachnick & Fidell, 2013). Harrell (2001) suggested that ten participants per variable are the minimum required sample size to ensure accurate prediction. The sample size of this study allowed analyses up to six independent variables.

Specifically, two sets of regression models with the WM and IC difficulties as the outcome variables will be run to test first and second research hypotheses that are about the relation between the PS and the EF difficulties. In these models, the child's age, gender, and the parents' education level (the average of maternal and

paternal education levels) will be entered in the first block as control variables. The child's expressive language ability and the EF difficulty (for WM deficiency, IC deficiency will be entered and for the IC deficiency, the WM deficiency will be entered) will be entered in the second block. The amount of PS shown by the child during the categorization task will be entered in the third block.

In order to assess the research hypotheses 3 and 4 that aim to examine the relation of the PS to avoidance and constructive ER strategies, two sets of Multiple Hierarchical Regression analyses will be run with the constructive and avoidance ER strategies as the outcome variables. In these models, the child's age and gender will be entered as the control variables in the first block. The child's expressive language ability, temperamental negative emotionality and EC variables will be entered in the second block. The amount of PS shown by the child during the categorization task will be entered in the last block.

In order to test the Hypothesis 5, which aims to predict the PS by the temperamental characteristics of children related to ER (negative emotionality and the EC) and the EF (WM and IC difficulties), a Multiple Hierarchical Regression analysis will be conducted. In this model, the child's age and gender will be entered as the control variables in the first block. Temperamental variables, which are negative emotionality and the EC will be entered in the second block. The EF difficulties (the WM and IC difficulties) will be entered at the last block. This model will also assess the 6th research hypothesis, which is about the relation between the PS and negative emotionality and 7th research hypothesis, which is about the relation between the PS and the EC.

Research hypotheses 8, 9, 10, 11, 12, 13, 14, 15 will be examined through Pearson Product-Moment Correlations as they aim to assess the bivariate relations

among the EF (WM and IC) and the ER variables (negative emotionality, the EC, avoidance strategies, constructive strategies) will be examined through. Due to low sample size, $p < .10$ value will be accepted as marginally significant, in line with some studies in the literature (e.g., Schumm, Pratt, Hartenstein, Jenkins, & Johnson, 2013).

CHAPTER 4

RESULTS

4.1 Descriptive statistics of the study variables

Assumptions for normality were checked before the analyses. The level I PS (i.e., out-loud, task-irrelevant) and the level II PS (i.e., out-loud, task-relevant) variables were eliminated from the analyses because of the lack of variance. Scores on all other variables were found to be normally distributed except for the ones on the PS types (social speech, the total PS, and the level III PS) and the ER strategies which are avoidance and constructive (see Table 2). In order to normalize positive skewness on the level III PS, the total PS, social speech and avoidance strategies subtype of the ER strategies, square root transformations were performed; and in order to normalize negative skewness on constructive strategies subtype of the ER strategies, reflected square root transformation was conducted (Field, 2005; Tabachnick & Fidell, 2013).

Seven children completed the task in silence without showing any type of the PS. In line with previous studies, the data based on these children were included in the analyses with a consideration that those children's capacity for the PS might be advanced in some ways and excluding them might limit individual differences within the sample (Bono & Bizri, 2014). A further analysis was run with and without those children and the correlational changes were shown as scatterplots in Appendix W.

All variables were inspected for possible outliers that were defined as values larger than 3.29 standard deviations above or below the standardized mean (Tabachnick & Fidel, 2013). There was one outlier value on talkativeness of children reported by mothers. This outlier was deleted. There were no outliers on any of the variables of interest.

Means, standard deviations, ranges, standardized skewness and kurtosis values (by dividing skewness and kurtosis values into standard errors), and reliability analyses of variables on demographic information from mothers, aggregated (teacher and mother reports) scores on the CBQ-SF (negative emotionality and the EC); mother reports on the CHEXI (the WM and the IC deficiency); teacher and mother reports of talkativeness; level I PS (task-irrelevant, external), level II (task-relevant, external PS), the level III PS (task-relevant, partially internalized PS), the total amount of the PS (composite of the level I, the level II and the level III PS) and social speech (i.e., the speech which is directed to a particular listener, not to the self); expressive language ability scores on the TİFALDİ; the number of avoidance and constructive ER strategies on the ATTB task were presented in Table 2.

Table 2. Descriptive Statistics of the Variables

Variable	*N*	*M*	*SD*	Min.	Max.	*S*	*K*	α
Children's age in months	62	62.16	6.07	49	74	-0.45	-1.38	
Negative emotionality	61	3.08	0.07	1.63	4.68	-0.12	+0.71	
Effortful control	61	4.43	0.08	2.92	5.39	-1.84	-0.98	
WM deficiency	57	25.80	6.77	13	42	+0.37	-0.83	0.83
IC deficiency	58	32.45	6.76	16	49	+1.32	+1.06	0.76
Mother-reported talkativeness	62	7.82	1.78	1	10	-3.65	+3.70	
Teacher-reported talkativeness	61	7.03	2.04	2	10	-0.86	-0.79	
Expressive vocabulary	60	57.55	9.13	34	76	-1.04	+0.18	
Private Speech	57							
Level I PS/min		0.35	0.95	0	5.37	11.52	23.58	
Level II PS/min		2.25	5.80	0	27.45	9.89	15.41	
Level III PS/min		2.54	3.45	0	19.44	8.43	15.51	
Total PS/min		5.15	6.74	0	31.37	6.39	6.69	
Social Speech/min	57	0.80	1.31	0	4.58	5.25	2.87	
Avoidance Strategies	57	6.12	0.73	0	23	3.12	0.98	
Constructive Strategies	57	22.40	0.67	3	33	-5.05	6.66	

Note: *S* = skewness/standard error, *K* = kurtosis/standard error, α = Cronbach's alpha, WM deficiency = Working Memory deficiency, IC deficiency = Inhibition deficiency, Level I PS/min = task-irrelevant, out loud form of private speech utterances per minute, Level II PS/min = task-relevant, out loud form of private speech utterances per minute, Level III PS/min = task-relevant, partially internalized private speech utterances per minute, Total PS/min = composite utterances of Level I, Level II and Level III PS per min, Social Speech/min = Social Speech utterances per minute

4.1.1 Gender differences

There was a significant gender difference in the EC, females (M = 4.60, SD = 0.63, n = 34) were rated as having higher levels of the EC than males (M = 4.23, SD = 0.65, n = 27), t (59) = 2.21, $p < .05$). Also, a Mann-Whitney test indicated that boys (Mdn = 24) used more constructive strategies (i.e., persistence to open the box, asking for help), compared to female preschoolers (Mdn = 23), U = 524.5, $p < .05$. There was no significant difference as a function of gender on any other variables of the study.

4.1.2 Age differences

There was an age difference in the talkativeness variable; mothers reported 5-year-olds (M = 8.25, SD = 1.20, n = 40) as more talkative than 4-year-olds (M = 7.36, SD = 1.96, n = 21), t (30.14) =1.93, $p < .10$. Levene's test indicated unequal variances (F = 10.54, p = 0.002), so degrees of freedom were adjusted from 59 to 30.14. There was no significant difference as a function of age on any other variables of the study.

4.2 Associations among the variables of interest

Bivariate correlations among the study variables are demonstrated in Table 3. First, the associations were examined in terms of child and family characteristics. As the children's age increased, they showed better expressive language ability (r = .24, $p <$ .10) and also rated by their mothers as more talkative (r = .26, $p < .05$). Age was also found marginally and negatively correlated with the use of avoidance strategies (r = -.25, $p < .10$), and (reflected scores of) constructive strategies (r = -.23, $p <$. 10), indicating that older children were less likely to use avoidance (i.e., distracting their attention from the frustrating stimuli, or using disruptive behaviors) when they got frustrated and they were more likely to use constructive ways such as persistence or

asking for help in this frustrating situation. Higher amounts of family income were found to be related to fewer WM problems (r = -.40, p < .01) and better expressive language ability (r = .40, p < .01) in children. In addition, those children were also reported as more talkative both by their mothers (r = .31, p < .05) and teachers (r = .24, p < .10). Children, whose mothers' educational level was higher also found to be better in expressive language ability (r = .30, p < .05), rated as marginally more talkative by their teachers (r = .21, p < .10) and less deficient in the WM (r = -.24, p < .10) and the IC (r = -.24, p < .10). Similar to mothers' education level, children whose fathers' education level was higher were also found as better in expressive language ability (r = .34, p < .05), and having less deficiency in the WM (r = -.28, p < .05) and the IC (r = -.37, p < .01). Briefly, as the education level of parents increases, the child is more likely to regulate himself or herself cognitively (i.e., keeping instructions in mind, inhibiting his or her dominant responses when asked) and become better in expressing himself/herself verbally.

In addition, children with better expressive language abilities had fewer WM problems (r = -.24, p < .10) and they were less likely to use avoidance (i.e., distraction, disruptive behaviors) strategies (r = -.26, p < .10). In other words, expressive language ability may help children to regulate themselves behaviorally in emotionally intense situations, update coming information from the environment and maintain their attention on tasks.

Lastly, mother and teacher-reported talkativeness of children showed a significant positive relationship (r = .40, p < .01), indicating that mothers and teachers generally agreed upon the amount of talkativeness that children showed. In addition, children who were better in expressive language were also found to be more talkative by their mothers (r = .28, p < .05) and teachers (r = .26, p < .05).

Table 3. Bivariate Correlations Among the Variables of Interest

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Age	1	.18	-.03	-.10	.24†	.26*	.10	-.04	.14	-.19	.03	-.14	-.05	-.00	-.25†	-.23†
2. Monthly house income		1	.67**	.54**	.40**	.31*	.24†	-.01	.08	-.41**	-.20	.00	.05	.06	-.16	-.05
3. Maternal education			1	.69**	.30*	.11	.21†	.03	-.05	-.24†	-.24†	-.02	.04	.15	-.06	.09
4. Paternal education				1	.34*	-.02	.09	-.07	.15	-.28*	-.37**	-.00	.04	.14	-.10	.11
5. Expressive language					1	.28*	.26*	.05	.21	-.24†	-.02	.01	.16	.04	-.26†	-.00
6. Talkativeness (mother)						1	.40**	.10	-.18	-.21	.15	.14	.25†	.07	-.18	-.17
7. Talkativeness (teacher)							1	.32*	-.33**	-.16	.16	.05	.25†	.41**	.04	.00
8. Negative emotionality								1	-.53**	.32*	.43**	.32*	.27*	.36**	.04	-.00
9. Effortful control									1	-.39**	-.49**	-.26†	-.23†	-.28*	-.05	.11
10. WM deficiency										1	.50**	.16	.02	.01	.32*	.16
11. IC deficiency											1	.28*	.32*	.00	-.15	-.22
12. LIII PS/min												1	.56**	.06	-.03	.05
13. Total PS/min													1	.08	-.05	-.01
14. Social Speech/min														1	.19	.17
15. Avoidance Strategies															1	.70**
16. (reversed) Constructive Strategies																1

Note: Age = age in months, WM deficiency = Working Memory deficiency, IC deficiency = Inhibition deficiency, LIII PS/min = Level III Private Speech, partially internalized self-speech per minute during Card Sorting Task, Total PS = total amount of private speech per minute during Card Sorting Task, Social Speech/min = Social Speech utterances per minute during Card Sorting Task

† $p < .10$, * $p < .05$, ** $p < .01$

4.2.1 The associations among the EF, the PS and language skills

A glance on the relationships among the EF variables and the total PS showed that the relationship of the total PS to the WM deficiency was not significant. However, there was a positive correlation between the amount of total PS and the IC deficiency ($r = .32$, $p < .05$), indicating that children, who used a greater amount of the PS were rated by their mothers as having more difficulties in the IC. In addition, level III PS (partially internalized, task-relevant) was also positively related to the IC difficulties ($r = .28$, $p < .05$) of children.

In order to examine the predictive role of the PS to the EF, two sets of multiple hierarchical regressions (MHRs) were conducted with the WM deficiency and the IC deficiency as the outcome variables. All assumptions were checked prior to conducting MHRs as briefly stated in the data analysis plan. Mother's and father's education level were highly correlated ($r = .68$, $p < .01$), therefore these two variables were averaged as a single composite as parents' education level; and kept in the first step in all multiple hierarchical regression analyses.

The predictor variables which were entered at the first block to the model were the child's age, gender and parents' education level, the ones which were entered in the second block were the child's expressive language ability, the IC deficiency (in the model that the WM deficiency was the outcome variable) and the WM deficiency (in the model that the IC deficiency was the outcome variable); and the one that was entered in the third block was the total PS that the child showed during the CTS task. Level III PS (task-relevant, partially internalized PS) was not included in MHRs since the total amount of the PS was largely correlated with this type of PS (level III) ($r = .56$, $p < .01$). Therefore, only the total amount of PS was kept in the analyses. The model where the WM deficiency was the outcome variable

was presented in Table 4, the model where the IC deficiency was the outcome variable was presented in Table 5.

Table 4. Predicting the WM Deficiency

	WM deficiency				
Variable	*B*	SE *B*	β	R^2	ΔR^2
Step 1				.14	.14†
Age	-3.11	1.92	-.22		
Gender	-.30	1.85	-.00		
Parents' edu	-1.63	.67	-.32*		
Step 2				.37	.23**
Age	-3.58	1.71	-.26*		
Gender	-1.89	1.76	-.14		
Parents' edu	-.39	.68	-.09		
Expressive language	-.12	.09	-.16		
IC deficiency	.52	.13	.53**		
Step 3				.38	.01
Age	-3.71	1.71	-.26*		
Gender	-1.68	1.77	-.12		
Parent edu	-.31	.68	-.06		
Expressive language	-.11	.10	-.14		
IC deficiency	.57	.14	.57**		
Total PS/min	-.66	.63	-.13		

Note: Age: 0 = 4-years old, ,1 = 5-years old, Gender: 0 = females, 1 = males, Parents' edu = composite score of father and mother level of education, WM deficiency = Working Memory deficiency, IC deficiency = Inhibition deficiency, Total PS/min = total private speech utterances per minute during Card Sorting Task
† $p < .10$, * $p < .05$, ** $p < .01$

Age, gender and parents' education level which were entered to the regression equation in the first block accounted for a marginally significant 14% of the variance in the WM deficiency, $R^2 = .142$, F (3, 49) = 2.70, $p < .10$. After the proportion of variance in the WM deficiency scores explained by the child's age, gender and parents' education level was controlled for, expressive language ability and the IC deficiency score still remained as significant contributors to the variance in the WM deficiency, explaining an additional 23% of the variance, $\Delta R^2 = .228$, ΔF (2, 47) = 8.51, $p < .01$. Controlling for the impact of the child's age, gender, expressive language ability, the IC deficiency, and parents' education level, the PS did not

remain as a significant contributor to the variance in the WM deficiency, $\Delta R^2 = .014$, ΔF (1, 46) = 1.08, $p = n.s.$ In total, the model explained the 38.4% of the variance on the WM deficiency F (6, 46) = 4.79, $p < .01$.

Table 5. Predicting the IC Deficiency

	IC deficiency				
Variable	*B*	SE *B*	β	R^2	ΔR^2
Step 1				.23	.23**
Age	1.53	1.82	.11		
Gender	4.48	1.76	.32*		
Parents' edu	-1.87	.64	-.37**		
Step 2				.43	.19**
Age	2.82	1.66	.20†		
Gender	4.19	1.60	.31*		
Parents' edu	-1.25	.63	-.24†		
Expressive language	.07	.09	.10		
WM deficiency	.48	.12	.48**		
Step 3				.49	.07*
Age	2.94	1.59	.21†		
Gender	3.37	1.56	.25*		
Parent edu	-1.25	.60	-.24*		
Expressive language	.05	.09	.06		
WM deficiency	.47	.12	.47**		
Total PS/min	1.33	.55	.27*		

Note: Age: 0 = 4-years old,1 = 5-years old, Gender: 0 = females, 1 = males, Parents' edu = composite score of father and mother level of education, WM deficiency = Working Memory deficiency, IC Deficiency = Inhibition deficiency, Total PS/min = total private speech utterances per minute during Card Sorting Task

† $p < .10$, * $p < .05$, ** $p < .01$

In the second model where the IC deficiency was the outcome variable; child's age, gender and parents' education level which were entered to the regression equation in the first block accounted for 23% of the variance in the IC deficiency, $R^2 = .233$, F (3, 49) = 4.95, $p < .01$. After the proportion of variance in the IC deficiency scores explained by child's age, gender and parents' education level was controlled for, expressive language ability and the WM deficiency variables remained significant in predicting the variance in the IC deficiency, explaining an additional 19% of the variance, $\Delta R^2 = .194$, ΔF (2, 47) = 7.94, $p < .01$. Controlling for the impact of child's

age, gender, expressive language ability, the WM deficiency and parents' education level, the total amount of the PS still remained as a significant contributor to the variance in the IC deficiency, explaining an additional 7% variance, $\Delta R^2 = .065$, ΔF (1, 46) = 5.84, $p < .05$. In total, this model explained the 49.1% of the variance on the IC deficiency F (6, 46) = 7.40, $p < .01$.

4.2.2 The associations among the ER, the PS and language skills

When examining the link between the PS and the ER, it was found that negative emotionality was positively correlated both with the level III PS ($r = .32$, $p < .05$) and the total amount of the PS ($r = .27$, $p < .05$). That is to say, children who used more internal forms of the PS and, in general, more PS were less able to regulate their negative emotions (i.e., anger, sadness). Also, the EC was found as negatively correlated both with the level III PS ($r = -.26$, $p < .10$) and the total amount of PS ($r = -.23$, $p < .10$), indicating that children who used more partial forms of the PS and in total greater amounts of the PS were rated as less able to regulate their emotion-related behaviors. In correlational analyses, the ER strategies (avoidance and constructive) were not related to mother- and teacher-reported negative emotionality and the EC, and the PS.

In order to examine the role of the PS to the ER strategies which are avoidance and constructive, two sets of MHRs were conducted. Prior to conducting hierarchical regressions, all assumptions were tested as briefly stated in the data analysis plan. The predictor variables which were entered to the first block were child's age and gender; expressive language ability, negative emotionality and the EC were entered to the second block, and the total amount of the PS was entered to the third block. The model where the avoidance strategies variable was the outcome

variable was presented in Table 6, the model where the constructive strategies variable was the outcome variable was presented in Table 7.

Table 6. Predicting Avoidance Strategies

	Avoidance strategies				
Variable	*B*	SE *B*	β	R^2	ΔR^2
Step 1				.08	.08
Age	-.37	.37	-.14		
Gender	-.72	.36	-.28†		
Step 2				.12	.04
Age	-.30	.39	-.11		
Gender	-.66	.40	-.26†		
Expressive language	-.03	.02	-.19		
Negative emotionality	.09	.39	.04		
Effortful control	-.12	.35	-.06		
Step 3				.12	.00
Age	-.30	.39	-.11		
Gender	-.67	.41	-.26		
Expressive language	-.03	.02	-.19		
Negative emotionality	.08	.40	.04		
Effortful control	-.11	.36	-.06		
Total PS/min	.01	.14	.01		

Note: Age: 0 = 4-years old, 1 = 5-years old, Gender: 0 = females, 1 = males, Total PS/min = total private speech utterances per minute during Card Sorting Task
† $p < .10$, * $p < .05$, ** $p < .01$

In the MHR equation where the avoidance strategies as the outcome variable, none of the predictor variables explained the significant variance on the outcome variable F (6, 47) = 1.09, $p = n.s.$, suggesting that those variables could not adequately predict the using avoidance strategies.

In the MHR equation where the constructive strategies as the outcome variable, none of the predictor variables explained the significant variance on the outcome variable F (6, 47) = 0.88, $p = n.s.$, suggesting that those variables could not adequately predict the using constructive strategies.

Table 7. Predicting Constructive Strategies

	(reflected scores of) Constructive strategies				
Variable	*B*	SE *B*	β	R^2	ΔR^2
Step 1				.09	.09†
Age	-.30	.21	-.20		
Gender	-.41	.20	-.28*		
Step 2				.09	.01
Age	-.31	.22	-.20		
Gender	-.42	.23	-.29†		
Expressive language	.01	.01	.07		
Negative emotionality	.03	.22	.02		
Effortful control	.03	.20	.03		
Step 3				.10	.00
Age	-.31	.22	-.20		
Gender	-.43	.23	-.30†		
Expressive language	.01	.01	.06		
Negative emotionality	.02	.22	.01		
Effortful control	.04	.20	.04		
Total PS/min	.03	.08	.05		

Note: Age: 0 = 4-years old,1 = 5-years old, Gender: 0 = females, 1 = males, Total PS/min = total private speech utterances per minute during Card Sorting Task
† $p < .10$, * $p < .05$, ** $p < .01$

4.2.3 The associations among the child's temperamental characteristics, the EF and the PS

The results documented above showed that the total amount of the PS was negatively related to the EC, whereas it was positively related to negative emotionality and IC difficulties in children. In addition, the amount of the PS positively predicted the IC difficulties beyond the child's age, gender, expressive language ability, the WM difficulties, and parents' education level. In a regression model, the total amount of the PS was used as an outcome variable rather than a predictor. Thus, it was predicted by the child's age and gender (the first block); negative emotionality, the EC and the IC difficulties (the second block). The WM difficulties of children were not entered to the model due to the lack of a relationship between the total PS children showed and their WM difficulties. All assumptions were checked before the

analysis as briefly stated in the data analysis plan. None of the predictor variables explained any significant variance in the outcome variable F (5, 47) = 1.68, p = *n.s.*, suggesting that those variables could not adequately predict the total amount of the PS utilized by children during the Card Sorting Task. The model where the total amount of the PS was the outcome variable presented in Table 8.

Table 8. Predicting the Total Amount of the PS

	Total PS/min				
Variable	*B*	SE *B*	β	R^2	ΔR^2
Step 1				.06	.06
Age	-.06	.39	-.02		
Gender	.69	.38	.25†		
Step 2				.15	.09
Age	-.09	.40	-.03		
Gender	.45	.40	.17		
Negative emotionality	.35	.40	.14		
Effortful control	-.01	.35	-.00		
IC deficiency	.04	.03	.21		

Note: Age: 0 = 4-years old,1 = 5-years old, Gender: 0 = females, 1 = males, IC deficiency = Inhibition deficiency, Total PS/min = total private speech utterances per minute during Card Sorting Task
† $p < .10$, * $p < .05$, ** $p < .01$

CHAPTER 5

DISCUSSION

5.1 General discussion

The main aim of this study was to investigate the relationships among executive functioning (EF), private speech (PS) and emotion regulation (ER) in preschoolers aged from 4 to 5 years in a cross-sectional design. Self-regulatory capacities of children in terms of the cognitive and affective aspects were found to be strong predictors of school readiness and future academic success in preschoolers (Blair & Diamond, 2008; Blankson, Weaver, Leerkes, O'Brian, Calkins, & Marcovitch, 2017; Cohen & Mendez, 2009; Eisenberg, Valiente, & Eggum, 2010; Prior, Bavin, & Ong, 2011; Ursache et al., 2012; Vitiello & Greenfield, 2017). The onset of the PS during the preschool ages are related to cognitive as well as affective sides of regulation (e.g., Alarcon-Rubio et al., 2014; Day & Smith, 2013), therefore the interrelationships among the PS, the EF difficulties (WM & IC difficulties) as well as the temperamental negative emotionality, effortful control (EC) and the ER strategies (constructive and avoidance) were investigated. In this chapter, the findings related to the hypotheses of the study were discussed in light of the previous studies. Besides, the limitations, implications, and recommendations for future studies were presented.

5.2 Child and family characteristics

In this study, there was a gender difference in the EC where girls were rated higher on the EC (which is the composite of attentional focusing, inhibitory control and [non] impulsivity) compared to boys. This result seems parallel with the existing

literature stating that the girls performed better in the EC tasks (Diaz, et al., 2017; Hongwanishkul et al., 2005; Kochanska et al., 2000; Matthew, Ponitz, & Morrison, 2009, McClelland et al., 2007; Wanless et al., 2013). Similarly, the child's gender was also a significant predictor of the IC difficulties in which girls were found to be less deficient in the IC. The existing literature showed that girls generally outperformed boys in inhibition tasks (Carlson & Moses, 2001; Eisenberg et al., 1995; Raaijmakers, Sergeant, Maassen, Van Engeland, & Matthys, 2008) and they were also found to be better in regulating their emotion-related behaviors. Girls' rapid development of maturation compared to boys during the preschool years and socialization practices encouraging girls to exert more control over their behaviors might lead them to have better IC and regulate their emotion-related behaviors (Raaijmakers et al., 2008). In addition, boys utilized more constructive strategies compared to girls.

There were no differences as a factor of gender on the WM deficiency, negative emotionality, and avoidance strategies. Previous studies also showed no significant gender difference in the WM (Brocki & Bohlin, 2004; Raaijmakers et al., 2008; Yamamoto & Imai-Matsumura, 2017). The gender difference in the IC was expected compared to the WM difficulties since parents might tend to expect more socially-regulated behaviors and compliance from girls. In terms of negative emotionality, previous findings are inconsistent concerning gender difference in the negative emotionality of preschoolers. For instance, some studies showed that boys are more likely to show negative emotions such as anger and sadness than girls (e.g., Eisenberg et al., 1995; Herndorn, Bailey, Shewark, Denham, & Bassett, 2013) suggesting that girls might be better at meeting the demands of caregivers whereas boys' emotionality might be more salient as perceived by parents and teachers. Other

studies revealed higher negative emotionality for girls which might result from gender-based stereotypes (i.e., females feel and express more sadness compared to boys) (Fabes & Martin, 1991). Also, in line with the current study's results, some findings reported no gender difference on negative emotionality (Blair et al., 2004; Day et al., 2018; Dollar & Stifter, 2012; Murphy, Eisenberg, Fabes, Shepard, & Guthrie, 1999). Regarding avoidance strategies, similar studies also showed no gender difference (Day & Smith, 2013). This study did not attempt to measure the frustration or the emotionality levels of preschoolers during the frustration task (the ATTB), but there was no gender difference in children's negative emotionality (reported by teacher and mothers on Sadness, Anger and Soothability subscales of the CBQ-SF) in the sample as mentioned above. Therefore, it might be possible that boys and girls got frustrated in similar levels during the task and used a similar number of avoidance strategies to handle the frustration.

An examination of age differences on the variables revealed that as children get older (in months), expressive language abilities and talkativeness scores increased too, which seems to be in line with the findings in the literature (Bono & Bizri, 2014; Chow & Wehby, 2018).

The age of children (in months) was related to the use of fewer number of avoidance strategies and higher number of constructive strategies at the preliminary analyses, indicating that in case of frustration, as children got older they used more constructive strategies like distracting their attention or asking for help than avoidance strategies like behaving aggressively or denying to open the box. This result is similar to the findings of Cole and colleagues (2009) in which children's understanding of the ER strategies in case of anger and sadness examined through the use of puppets. In their study, preschoolers aged from 3 to 4 years were asked to

generate the ER strategies for angry and sad puppets, and then children's ER strategy generations were coded and analyzed. Besides, children's ER strategies in case of frustration were examined through the ATTB task (Goldsmith et al., 1999). Their study found that as children's age increased, they became able to generate more strategies for angry puppets, and those children were also found to be utilizing more constructive strategies (like distracting their attention or asking for help rather than being disruptive) in case of an actual frustrating situation. The study concluded that older children could distinguish among the ER strategies, thus became more competent in choosing and applying them. In this study, although older children (in months) used both avoidance and constructive strategies, they are more likely to use the latter one. Thus, it can be claimed that children's strategies to deal with frustrating situations get various and more adaptive with increasing age.

Child's age (in months) was not related to the EF variables (the IC and the WM difficulties), which might be due to the restricted age range; thus, the changes in the EF capacities may not be apparent in this group. Similarly, the child's age was not related to temperamental negative emotionality and the EC. The lack of age difference in the negative emotionality and the EC variables might stem from the biologically-based nature of the temperament, so these capacities are less likely to change with age (i.e., Rothbart et al., 2001). In line with the current study's results, some studies also reported that there were no significant differences in negative emotionality and emotional control or the EC as a factor of age during the preschool years (Fabes et al., 1999; Liebermann, Giesbrecht, & Müller, 2007).

Parents' education level was positively related to children's expressive language ability, and it was negatively related to children's EF (WM & IC) deficiencies. Parents' education level was also a significant predictor of the IC

deficiency suggesting that higher parental education predicts less deficiency in the IC. This result is consistent with the literature showing that parents' education level supports the EF abilities (Ardila, Rosselli, Matute, & Guajardo, 2005; Finch & Obrodovic, 2017). Monthly house income was positively related to parents' education level, children's expressive language ability, and talkativeness; and it was negatively related to the WM deficiency. Thus, children from higher income families seem better in expressive language and cognitive self-regulation probably because they are exposed to more stimulating home environments. This result is consistent with existing literature where the family income, as well as parents' education level, was reported as supporting the self-regulatory abilities in preschoolers (Ardila et al., 2005; Finch & Obrodovic, 2017).

Children's expressive language ability was positively related to mother- and teacher-reported talkativeness, whereas it was marginally and negatively related to the WM difficulties and the use of avoidance strategies in the face of frustration. The function of the WM is to keep the incoming information in mind temporarily, thus language ability might help children to remember instructions, label them, and give way to representational thinking (Baddeley, 1992; Kopp, 1982; Müller et al., 2009), which in turn lead to less use of avoidance strategies and engage more in tasks. The expressive language ability was not related to ER variables (negative emotionality, the EC, avoidance and constructive strategies) and IC difficulties of children. The lack of a significant relationship of expressive language ability to these variables might be due to the similar levels of expressive language ability between the age groups of this study. Carlson, Mandell, and Williams (2004) reported age group differences in 2- to 3- year-olds as a function of language ability. However, as Müller

and colleagues (2009) indicated that language ability might have a significant effect on self-regulation during the younger ages compared to older ages.

In this study, children's PS was found to be unrelated to expressive language ability in line with previous studies (Corkum et al., 2008; Fernyhough & Fradley, 2005). The PS showed significant associations with negative emotionality, the EC, and the IC difficulties which supports the role of the language on self-regulatory abilities (Azmitia, 1992; Cole et al., 2010). Mutual influences among those variables, thus, make them worth to study together considering their effects on children's future outcomes (i.e., academic, well-being) (Cole et al., 2010).

In this study, 89.47% of the children utilized at least one kind of the PS, which shows that the PS is a tool that is commonly used at the preschool age (Berk, 1986; Piaget, 1959; Vygotsky, 1934/1986). The level I (task-irrelevant, external) and level II (task-relevant, external) PS were eliminated from the analyses due to the restricted range of scores, in line with some studies with similar age groups (e.g., Day & Smith, 2019). In the sample, only 22.4% of the children used the level I PS, 35.1% of the children used the level II PS, and 77.6% of the children used the level III PS at least once during the categorization task. This result was expected as Vygotskian (Vygotsky, 1934/1986) perspective centers on the idea that the PS becomes inner thought (silent thought or thinking inside the head). The occurrence of the level I PS (task-irrelevant, external speech) was at the lowest level compared to other two PS types, and the most of the children yielded to use level III PS (task-relevant, partially internalized). This result was also consistent with the study by Berk and Potts (1991), in which normally-developing children from the age of 6 to 12 years were observed during the math seatwork and were found to be utilizing less

level I PS (3.2% of their sample) and level II PS (20% of their sample), whereas generally yielded to use the level III PS (54.5% of the sample).

5.3 Discussion based on the hypotheses of the study

5.3.1 The associations among the PS, the EF and language abilities

In this study, children's PS was observed through a categorization task, and the EF problems were measured by mother reports. Two non-directional hypotheses were stated regarding the relationship between the PS and EF difficulties (WM & IC difficulties). The first hypothesis stated that there is a relation between the PS during the categorization task and children's WM difficulties based on mother reports, controlling for the child's age, gender, expressive language ability, and parents' education level. The second hypothesis stated that there is a relation between the amount of PS children showed and their IC difficulties, controlling for child's age, gender, expressive language ability, and parents' education level. The results showed that there was a positive association between the total amount of the PS children used during the categorization task and their IC difficulties, indicating that mothers reported their children who used a greater amount of the PS as having more problems in inhibiting their impulsivity. The results also demonstrated that controlling for the impact of child's age, gender, expressive language ability, the WM difficulties, and parents' education level, the total amount of the PS children made significantly predicted some variance in children's IC difficulties.

The result seems consistent with the findings of Diaz and colleagues (1992) who showed that preschoolers aged from 3 to 5 years who had been reported by their teachers as more impulsive had used more PS as they spent more cognitive effort

(i.e., inhibit the response to distractors) compared to that of less impulsive ones. Furthermore, Bono and Bizri (2014) found out that the PS increased as the self-regulation (reported by teachers) decreased in 3-to-5-years-old children. The researchers stated that their teachers might perceive the children's PS as a tool to make plans and to solve problems, in general, to overcome the difficulties of the tasks, which links the increased use of the PS to children's struggle to overcome tasks from the perspective of the teachers. Their teachers probably perceived these children who utilize more PS as having difficulties in regulating themselves in other contexts too. In their study, Corkum and colleagues (2008) compared the PS use of typically developing children (not diagnosed with ADHD) and children with the ADHD on an inhibition task. They found that children with the ADHD used more PS, including partially internalized PS compared to the control group (not diagnosed with ADHD). Therefore, it can be stated that children who have difficulty in the IC rely more on the PS compared to children in the control group (children without ADHD). Aro and colleagues (2015) also investigated the effectiveness of the PS (task success while using the PS or not) to the cognitive abilities of 5-years-old children. They reported a negative relationship between the effectiveness of the PS and the IC. They concluded that children who had poor cognitive abilities (e.g., inhibition, planning) might benefit more from using the PS compared to children with good cognitive abilities since children with higher cognitive abilities were successful by using less PS (or without the help of the PS).

Other findings in the literature also showed that children who were found to have a greater number of behavioral problems tended to use more PS compared to children with a fewer number of behavioral problems (Copeland, 1979; Winsler, Manfra, & Diaz, 2007; Winsler, Diaz, Atencio, McCarthy, & Chabay, 2000). In a

longitudinal study with children from the age of 3.5 to 5.5 years, data were obtained from different schools through teacher reports based on the ADHD diagnostic criteria as stated in Diagnostic and Statistical Manual of Mental Disorders (DSM-III-TR; American Psychiatric Association, 1987), and the top 10% of children were asked to participate in the study and those children were grouped as behaviorally at-risk. The control sample was randomly chosen from the rest of the large sample. In total 29 behaviorally at-risk children and 43 typically-developing children as a control sample participated in the study. The PS was observed at four different occasions in every six months through different tasks (i.e., completing a puzzle, selective attention tasks). The researchers found that at the first occasion of the data collection, children who were behaviorally at-risk group utilized significantly higher amounts of PS than the control group. In following sessions, the researchers reported that behaviorally at-risk group continued to utilize greater amounts of the PS compared to the control group. Furthermore, the researchers reported that while children in the control group were more likely to complete the tasks in silence, behaviorally at-risk group typically completed tasks with the aid of the PS. It was argued that children with more attention, impulsivity and hyperactivity problems might have different trajectories in internalization of the PS compared to their typically developing peers (Winsler et al., 2000).

Contrary to the significant contribution of the PS to the IC difficulties, it was not found to be a predictor of the WM problems. The total amount of the PS did not explain any additional variance on the WM difficulties. The possible reason for the lack of an association between the PS and the WM deficiency could be related to the format of the Card Sorting Task which the PS was assessed. In this task, children were given 25 cards and five categories which were already labeled with the name of

the category and with example pictures on it. The WM refers to keep the incoming information in mind temporarily and ability to manipulate it when necessary in order to execute/manage complex tasks (Baddeley, 1992). Considering the definition of the WM, the task might not require children to keep any information in mind or manipulate it or did not require children to use the functions of the WM since all information was already given to the child by labeling the categories with names and sample pictures. A similar explanation was also provided by Jacques and Zelazo (2005) who stated that when children were provided all information (i.e., explicit instructions) to solve the problem, they may not need functions of the WM; thus, the lack of a relationship between the PS and the WM might be due to the methodology that was used in this study.

The current findings regarding the link between the PS and the EF (WM & IC difficulties) were contrary to Vygotskian ideas, which considered the PS as a tool of self-regulation (Vygotsky, 1934/1986). However, our results were in line with the Piagetian position (Piaget, 1959) that the outer form of the speech or the PS was an indicator of limited cognitive ability in children. Similarly, Barkley (1997, 2014) considered the internalization of the PS or decrease in outer forms of the speech as an indicator of better regulation of the self. Barkley's ideas can be interpreted in a way that the better IC should be related to less outer speech or the PS. Therefore, the current study's results regarding the predictive role of the PS on the IC difficulties also seemed to be in line with the Barkley's ideas.

The findings showed that the more significant amount of the PS is related to a larger number of IC problems and the amount of the PS is not associated with the WM problems at all. These findings seem contradictory with previous research which linked the PS, especially partially internalized PS, to better performance on

the EF tasks (e.g., Alarcón-Rubio et al., 2013, Fernyhough & Fradley, 2005; Lidstone et al., 2010). The positive association between the PS and the IC difficulties can be explained through different routes. The first reason could be the task's difficulty. In the current study, 71.2% of the participants were successful in sorting cards (during the CST) without any mistakes. Many studies in literature reported that children's PS use increased with task difficulty, especially tasks with medium difficulty yielded more PS in children (Aro et al., 2015; Behrend, Rosengren, & Perlmutter, 1989; Fernyhough & Fradley, 2005; Lidstone et al., 2010; Patrick & Abravanel, 2000). Tasks which were of an age-appropriate level of difficulty and close to the zone of proximal development were the ones that elicited or required more PS as a regulatory tool. Besides, Frauenglass and Diaz (1985) reported that tasks which were considered as easy to be completed by children could be completed without using the PS as a mediator tool. Therefore, it can be considered that children might not need to use the PS because the task was not challenging enough to require regulation. Vygotsky's ideas also support this notion that task mastery requires the child not to use the overt PS as a regulatory tool (Vygotsky, 1934/1986). In other words, as the child feels mastery over the task and the success increases, the overt PS is replaced by internal verbal thought (Berk & Sphul, 1995). The task (the CST) of the current study in the assessment of the PS, based on the success rate, could be below the zone of proximal development for the sample group; therefore, the PS could have been fully internalized and could not have been observed.

In this study, children's PS and EF problems were measured by adopting different methodologies, rather than relying on one task. In previous studies, children's EF performance was measured by tasks such as Tower of London Task (ToL) and their PS was observed during the implementation of those tasks (Benigro,

Bryd, McNamara, Berg, & Farrar, 2011; Lidstone et al., 2010). In this study, information regarding the EF difficulties was obtained from the mothers, and the PS was observed during a categorization task. Thus, the methodology of this study is not comparable to the one that was used in earlier ones. Nevertheless, the current study's findings which show the link of the PS to the IC deficiency were supported by many other studies as mentioned before, so using the same methodology or the different methodologies might not change the direction of this relationship.

In conclusion, the first hypothesis which was regarding the possible relationship between the PS that was utilized during the categorization task and the WM difficulties of children as reported by their mothers, controlling for child's age, gender, expressive language ability, the IC difficulties and parents' education level was not supported by the study's findings. The second hypothesis which was regarding the possible relationship between the PS and the IC difficulties of children, controlling for child's age, gender, expressive language ability, the WM difficulties, and parents' education level was supported. This study found that the total amount of the PS positively predicted the IC difficulties of children, even after controlling for child and family characteristics. Thus, the second hypothesis of this study was supported in a way that the findings showed a relationship between the IC difficulties and the total amount of the PS, and further, it was shown that the direction of this relationship was positive, controlling for child and family factors.

5.3.2 The associations among private speech and emotion regulation strategies

In this study, the PS of children was assessed through a categorization task, and the ER strategies of children were observed during a frustration task (the ATTB) and coded as either constructive (i.e., asking help, persistence on task) or avoidance (i.e.,

distraction, aggressive behaviors or withdrawal). Regarding the relation between the amount of the PS and the ER strategies, which are avoidance and constructive, this study hypothesized that the amount of the PS was positively related to constructive ways of coping (Hypothesis 3) and negatively related to avoidance strategies (Hypothesis 4), after controlling for child's age, gender, expressive language ability and temperamental factors that are related to the ER (negative emotionality and the EC).

Bivariate correlations revealed that there was no association between the amount of the PS and the ER strategies (constructive and avoidance) and similarly the amount of the PS was not related to the ER strategies after controlling for child's age, gender and temperamental characteristics (negative emotionality and the EC). This result was contradictory to the study hypotheses and the findings of Day and Smith (2013) which linked the PS to more constructive ways of coping like self-comforting.

A possible explanation for the lack of a relationship between the PS and the ER strategies (constructive and avoidance) unlike the previous finding might be due to the methodological issues. In their study, Day and Smith (2013) measured both the PS and the ER strategies during the ATTB that is the task that required children to unlock a box. However, in the current study, the information regarding children's PS and ER strategies was obtained on different tasks. The Card Sorting Task (during which the PS was assessed) requires previous crystallized knowledge (i.e., familiarity with objects in the pictures such as animals, food). Thus, this task was not likely to require "hot" aspects of regulation; rather it requires one to use the "cold" EF (i.e., Zelazo & Müller, 2002). The transparent box, on the other hand, was less contextualized and it required children to regulate themselves in terms of affective

aspects or to use the hot functions of the EF. Thus, the task utilized in this study to assess the PS of children might not be comparable to the task utilized to assess the ER strategies concerning their correspondence to different sides of regulation. Therefore, the non-significant relationship between the amount of the PS and the ER strategies may be partially explained by the difference in methodology.

5.3.3 The associations among the temperament-based regulation, executive function, and private speech

In the present study, it was hypothesized that the PS is predicted by temperamental variables (negative emotionality and the EC) and the EF (IC difficulties) to control for child's age and gender (Hypothesis 5). It was also hypothesized that the greater amount of the PS utilized by preschoolers during the categorization task is related to higher levels of negative emotionality (Hypothesis 6) and not related to the EC (Hypothesis 7) as reported by mothers and teachers. In the model where the total amount of the PS was the outcome variable, neither temperamental variables (negative emotionality and the EC) nor the IC difficulties of children explained variance on the use of the PS. As far as is known, the PS was not used as the outcome variable in previous studies. In their study, Berk and Potts (1991) discussed that the direction of the relationship between self-regulation and the PS should be considered bidirectional, instead of unidirectional. That is to say, the self-regulatory effect of the PS depends on maturely functioning self-regulatory systems. However, this study did not find a significant predictive effect of temperamental variables (negative emotionality and the EC) and the IC difficulties on the total amount of the PS utilized by children during the categorization task. It seems that the PS is not

predicted by the IC differences, rather it predicts them when the impact of other child characteristics such as age, gender, and expressive language ability is eliminated.

The results also showed that the total amount of the PS was not predicted by negative emotionality, which was based on teacher and mother reports regarding children's anger, sadness and (non)soothability and the EC, which was based on mother and teacher reports regarding children's inhibition, attentional focusing and (non)impulsivity. The study of Day and colleagues (2018) found that partial forms of the PS were related to higher levels of sadness in preschoolers, which is the finding that the Hypothesis 6 of this study is based on. The results of this study might not be comparable to the study of Day and colleagues (2018) in the sense that their study considered the PS as the predictor of the sadness levels of preschoolers. However, in the current study, the total amount of the PS was considered as the outcome and the negative emotionality levels of the preschooler as the predictor variable. Nevertheless, on the correlational level, it was found that the relationship of negative emotionality to the partially internalized PS (level III) and the total amount of the PS was in a positive direction and thus it might be stated that both level III PS and the total amount of PS were more likely to be utilized by children, who were reported by their mothers and teachers as having greater levels of negative emotionality. Nonetheless, the total amount of the PS was not related to negative emotionality when entered into the model with child's age, gender, and the IC difficulties.

Similar to negative emotionality, children's EC was not associated with the total amount of the PS they showed as expected based on the findings in the study by Day and Smith (2018). The possible reason for the lack of a predictor role of the EC on the PS might be due to the accumulation of scores on inhibition, attentional focusing and (non)impulsivity to get the EC variable. For instance, in her study, Day

(2014) found that the PS types (i.e., partially internalized, external task-relevant) were related to some components of the EC (i.e., inhibition) but not others (i.e., attentional focusing). For that reason, subcomponents of the EC might have dissimilar routes regarding their association to the PS since each of them might serve diverse functions under the umbrella of the EC. The subcomponents of the EC could not be entered to the model as separate variables due to the small sample size of the current study. Therefore, the nuanced relationships might not be achieved.

In conclusion, Hypothesis 5, which asserted that the total amount of the PS children showed might be related to their temperamental characteristics and the EF skills after controlling for age and gender was not supported. Hypothesis 6, which stated that the greater amount of the PS utilized by preschoolers during the categorization task is related to higher levels of negative emotionality was only supported on the correlational level. Hypothesis 7, which was the mother- and teacher-reported EC scores are not related to the PS was supported.

5.3.4 The associations among executive function and the temperamental bases of the emotion regulation

In this study, the EF capacities (the WM & the IC difficulties) of children were obtained through mother reports and the temperamental bases of the ER (negative emotionality and the EC) were reported by mothers and teachers. In the present study, it was hypothesized that better EC is related to fewer WM (Hypothesis 8) and the IC (Hypothesis 9) difficulties and higher levels of negative emotionality are related to greater WM (Hypothesis 10) and IC (Hypothesis 11) difficulties. The results showed that children with poorer EC were rated as having more WM and IC deficiencies. In line with the existing findings in literature, a moderate negative

relation between children's EC and their EF difficulties (WM & IC deficiency) found, which indicates that these two constructs overlap to some extent and tap into the similar set of skills underlying self-regulation (e.g., Blair & Razza, 2007; Hongwanishkul et al., 2005; Zhou et al., 2012).

The current study also showed that higher levels of negative emotionality were related to greater EF difficulties in line with the previous findings (Bridgett et al., 2013; Carlson & Wang, 2007; Sprague et al., 2011; Ursache et al., 2013). Thus, it seems that better EF is related to better regulation of temperamental negative emotionality (i.e., sadness, anger). These results appear to support that the cognitive aspects of the regulation were closely related to emotional aspects; thus, the difficulty in one area may influence the other (Calkins & Howse, 2004).

In conclusion, hypotheses 8 and 9, which stated that better EC is related to fewer WM and IC difficulties were supported. Similarly, hypotheses 10 and 11 which asserted that the negative emotionality of preschoolers might be related to more significant difficulties in both the WM and IC were also supported.

5.3.5 The associations among executive function and the emotion regulation strategies

In this study, information regarding children's EF difficulties was obtained through mother reports. The ER strategies were observed on a frustration task and coded as either constructive (i.e., persistence, self-soothing, asking help, approach) or avoidance strategies (i.e., withdrawal, denying to open the box, aggressive behaviors, distraction). It was hypothesized that constructive strategies are related to fewer WM (Hypothesis 12) and IC (Hypothesis 13) difficulties. Similarly, it was hypothesized that avoidance strategies are related to greater WM (Hypothesis 14) and IC

(Hypothesis 15) difficulties. The results revealed that there was no relation between the ER strategies (either constructive or avoidance) children used when they got frustrated and their IC or WM difficulties. These results seem contrary to the previous findings, which showed that better EF capacity is related to less maladaptive (like avoidance) and more adaptive (constructive) ways of coping (e.g., Jahromi & Stifter, 2008).

The possible explanation for the lack of a relationship between the EF difficulties and ER strategies might be due to the contextual factors of assessment. The mothers reported about problems of their children experienced in daily life due to their poor WM or IC from a more global perspective, whereas the ways how children deal with frustration (ER strategies) were observed during a laboratory-like situation (the ATTB task). McClelland, Ponitz, Messersmith, and Tominey (2010) argued that observational data of self-regulation might have some shortcomings, mainly because it might not manifest itself in immediate behaviors of children. Therefore, the mother reports, which were based on naturalistic observation of children during development might not be related to the immediate actions of children in the case of four minutes-long frustration during the ATTB task.

However, it was found that the WM difficulties were positively correlated with avoidance strategies, meaning that children with more WM problems showed more avoidance strategies. The WM enables children to sustain and update their attention on tasks (Baddeley, 1992; Barkley, 1997), thus help children to engage in tasks. Therefore, it is possible that children who have difficulty in sustaining their attention on tasks turn to avoiding the target (i.e., opening the box and getting the toy) and pay attention to a distractor. From this viewpoint, children who used more avoidance strategies may have failed to be goal-oriented. In other words, those who

predominantly distracted themselves from opening the box did so because they could not keep the task in mind for long enough. In any case, this result points to the fact that cognitive capacities are very much involved in individuals' coping in emotionally intense situations. In a recent study, participants' ER abilities improved significantly through WM training, compared to the abilities of participants who did not attend the WM training (Xiu, Zhou, & Jiang, 2016). Thus, improving cognitive skills like the WM may foster children's social-emotional competence.

In conclusion, the hypotheses stating the greater use of constructive ways of coping in case of frustration is related to fewer WM (Hypothesis 12) and IC (Hypothesis 13) difficulties, and the greater use of avoidance strategies might be related to greater IC difficulties (Hypothesis 15) were not supported. However, Hypothesis 14 which states a positive association between children's WM difficulties and their utilization of more avoidance strategies was supported.

5.4 Limitations and recommendations for future studies

The current study has some limitations. First of all, the sample size was small. In total, sixty-two preschoolers, their mothers, and teachers participated in the study. The study with larger sample sizes could provide more generalizable results.

Secondly, due to statistical issues, some scores in the variables were aggregated in order to ease the interpretation of the results. Six subscales of the CBQ-SF were reduced into two categories as negative emotionality and the EC. Furthermore, six subcategories of observed ER strategies were reduced into two categories as avoidance and constructive strategies. While the data reduction was helping us to interpret the results in a more straightforward way, it may also lead us to miss some nuances.

Thirdly, level I (external, task-irrelevant) and level II (external, task-relevant) PS types were eliminated from the analyses due to lack of variance on these variables; and thus, the analyses were run over the total amount of the PS. In future studies, various tasks or settings should be used to increase the variance on these variables, and therefore they can provide further information regarding the relationship of different PS types to the EF and ER.

Fourth limitation of the study is about ecological validity. Children's PS and ER strategies were assessed in a laboratory-like environment during individual sessions. However, the amount of PS may depend on the tasks and contexts, and similarly, children may use different ER strategies during different emotion-evoking situations. Therefore, the laboratory setting may not show the full spectrum of the children's PS use and ER strategies in their daily lives. Future studies may utilize different observational methods (i.e., observing children in their natural environments) to capture a more comprehensive picture of the use of the PS and the utilization of the ER strategies. Concerning this, the categorizations for both the PS and the ER strategies might not capture actual PS or regulatory strategies in the ER adequately. There are various coding schemes both for the PS and the ER strategies in the current literature. The coding scheme that was chosen for the assessment of the PS in this study was the most commonly used categorization system in existing literature, and similarly, the coding scheme for the ER strategies was formed compatible with the existing literature with preschool-age groups. Nevertheless, in this study children's performance during the frustration task was coded only for the ER strategies, but affect intensity (i.e., how frustrated did they get when they could not get the attractive toy out of the box) during the task was not measured. Thus,

future studies may develop more extensive coding schemes which assess both emotionality and ER strategies in case of frustration.

Another limitation of this study is that mother reports can be affected by social desirability, and teacher reports can be affected by the children's school success. Nevertheless, it is valuable that information about the preschoolers' behaviors is based on different sources who observe them in different environments. Future studies may like to utilize performance-based assessment tools/tasks (instead of reported EF or ER) which may tap different faculties than mother or teacher ratings.

Despite the limitations, this study provides crucial implications regarding developmental processes underlying self-regulation in a group of Turkish preschoolers. The use of various methodologies and tasks could give direction to future researchers who aim to expand the knowledge of the relationships among the PS, the EF and the ER.

5.5 Practical implications and conclusion

The results of this study showed that the PS is a significant predictor of children's IC difficulties, beyond child and family characteristics. As it was discussed above, formal schooling practices require children to regulate themselves and stay in silence. However, children with greater difficulty in self-regulation might rely more on the PS; therefore, an understanding of this need is essential for parents, teachers and especially for school counselors. Children, who talk to themselves during the classroom might seem disruptive especially when school administrators or teachers expect children to comply with the classroom rules and not to disrupt others by any means of making noise. Children, who utilize the PS more because of their self-

regulation difficulties can be penalized due to being disruptive or not following the classroom rules (being silent). Punitive or disapproving attitudes against those children may make them fail in getting the necessary support for their needs. School counselors may consult with teachers regarding the self-regulation difficulties of students and related behavioral acts (talking privately) to raise awareness regarding the link between the PS and impulsivity. Such an increase in teachers' awareness can help these children in receiving the necessary support regarding their cognitive or emotional difficulties. School counselors' suggestion of appropriate changes in classroom environment or tasks (i.e., after-school arrangements, appropriately chosen classroom tasks that allow children talk to themselves) for children with self-regulatory difficulties can help these students to catch up with their peers especially in academic domains.

This study also revealed that the regulation of emotions is closely related to the regulation of cognitive aspects. Having difficulty in the cognitive area can also be related to the difficulties in emotional domains of children, or vice versa. School counselors, therefore, come up with various preventive actions or supportive activities in order to increase the general self-regulation skills of students. Activities which aim to increase emotion regulation can also support children's cognitive skills.

APPENDIX A

DEMOGRAPHIC INFORMATION FORM (ENGLISH)

Your child's (participating to this study)
Birth date: _____
Gender: _____

Name of his/her school:
Public School: ____
Private School: ____

Grade: ____

How many children do you have? ____
Birthdates of your children:
1. _____
2. _____
3._____
4._____
5. _____

Your children's sexes;
1. Girl ____ Boy ____
2. Girl ____ Boy ____
3. Girl ____ Boy ____
4. Girl ____ Boy ____
5. Girl ____ Boy ____

Birth order of your participating child:____

Marital Status: Married ____ Not Married ____

Your year of birth: _____
Your level of education:
1 ____ Primary school degree
2 ____ Middle school degree
3 ____ High school degree
4 ____ College degree (2 years)
5 ____ Undergraduate degree (4 year)
6 ____ Master's Degree
7 ____ Others (please indicate_____)

Your partner's year of birth: _____
Your partner's level of education
1 ____ Primary school degree
2 ____ Middle school degree
3 ____ High school degree
4 ____ College degree (2 years)
5 ____ Undergraduate degree (4 year)
6 ____ Master's Degree
7 ____ Others (please indicate_____)

Status of employment
1____ Yes
2 ____ No

Job: _____

How many years have you been working?
____

If you ever employed before, what was the duration of your employment?
_____

Your weekly working hours ____

Your monthly family income

1____ less than 1500 TL
2 ____ 1.500 - 2.999 TL
3 ____ 3.000 - 4.499 TL
4 ____ 4.500 - 5.999 TL
5 ____ 6.000 - 7.499 TL
6 ____ 7.500 - 8.999 TL
7 ____ more than 9.000 TL

Who is the primary care-taker of your child at home (you can choose more than one)

____ Mother
____ Father
____ Other relative (e.g., aunt etc.)
____ Babysitter
____ Other (please indicate _____)

APPENDIX B

DEMOGRAPHIC INFORMATION FORM (TURKISH)

DEMOGRAFİK BİLGİ FORMU

Sizinle beraber bu araştırmaya katılan çocuğunuzun;
Doğum tarihi: _____
Cinsiyeti: _____

Okulunun İsmi:
Devlet okulu ____
Özel okul ____

Sınıfı: ____

Toplam kaç çocuğunuz var? ____

Çocuklarınızın doğum tarihi:
1. _____
2. _____
3._____
4._____
5. _____

Çocuklarınızın cinsiyeti;
1. Kız ____ Erkek ____
2. Kız ____ Erkek ____
3. Kız ____ Erkek ____
4. Kız ____ Erkek ____
5. Kız ____ Erkek ____

Çalışmaya katılan çocuğunuzun doğum sırası: ____

Şu anki medeni durumunuz: Evli ____ Evli değil ____

Sizin doğum yılınız: _____
En son mezun olduğunuz okul:
1 ____ İlkokul
2 ____ Ortaokul
3 ____ Lise
4 ____ Meslek Yüksek Okulu (2 yıllık)
5 ____ Üniversite (4 yıllık)
6 ____ Lisans Üstü
7 ____ Başka (belirtiniz_____)

Eşinizin doğum yılı: _____
Eşinizin Eğitimi (en son mezun olduğu okul)
1____ İlkokul
2 ____ Ortaokul
3 ____ Lise
4 ____ Meslek Yüksek Okulu (2 yıllık)
5 ____ Üniversite (4 yıllık)
6 ____ Lisans Üstü
7 ____ Başka (belirtiniz_____)

Şu an çalışıyor musunuz?
1____ Evet ise
2 ____ Hayır ise

İşiniz: _____

Hangi yıldan beri çalışıyorsunuz? ____

Eğer daha önce çalıştıysanız, hangi yıllar arasında çalıştınız? _____

Haftada kaç saat çalışıyorsunuz? ____

Ailenin toplam aylık geliri ne kadardır?

1____ 1.500 ve altı
2 ____ 1.500- 2.999
3 ____ 3.000- 4.499
4 ____ 4.500- 5.999
5 ____ 6.000- 7.499
6 ____ 7.500- 8.999
7 ____ 9.000 ve üzeri

Evinizde çocuğunuzun bakımıyla en çok kim ilgilenir? (Birden fazla seçenek işaretleyebilirsiniz.)

____ Anne
____ Baba
____ Diğer akrabalar (Örn. teyze, hala vb.)
____ Bakıcı
____ Diğer (belirtiniz _____)

APPENDIX C

PRIVATE SPEECH CODING SHEET (ENGLISH)

ID: _____ Date: _____

Record Number:
Coder ID:

The coding of the private speech consists of three parts. First of all, transcription of the entire speech in Card Sorting Task should be done. After the transcriptions are done, the speeches should be divided into utterances. The utterances will further be coded as either social or private speech. At the third step, all private speech utterances will be categorized as Level I, Level II and Level III private speech.

1. Transcription of utterances

Utterance: The utterance is basically defined as a completed sentence or a fragment, a clause having a marker of termination, and any idiomatic expression (i.e. conversation turn) temporally separated from the other by minimum of 2 seconds (Feigenbaum, 1992; Diaz, Winsler, Attencio & Harbers, 1992; Winsler et al. 2005). There should be no temporal and semantic discontinuity in one utterance.

Temporal discontinuity: If there are two seconds of pause between the utterances, these utterances should be counted as two different utterances rather than one.

Semantic discontinuity: If the utterances are separated from each other in terms of the content of the speech, these utterances should be counted as two different utterances rather than one without considering temporal continuity.

Example: Where is the blue one? Here it is. (when an utterance starts one way and they the child quickly and smoothly changes his mind and says another/different thing, like these two sentences, they should be coded as two utterances, rather than one)

2. Social Speech and Private Speech

Social Speech:

- Includes open references to others
- Asking questions to others or replying the questions of others
- Making eye contact with the others during the speech
- Moving the body to the direction of the other when speaking
- Continuing the speak after any social speech without 2 seconds interval

Private Speech:

Includes none of the indicators of the social speech and used by children to address to the self, not others

3. Further coding of the private speech utterances (Berk, 1986)

The private speech utterances will further be coded as Level I, Level II and Level II private speech categories based on following descriptions of the categories.

Level I PS (task irrelevant, out loud): includes task-irrelevant speech like word plays, repetitions, irrelevant affect expressions, commenting to imaginary others (i.e., I like ice-cream)

Level II PS (task relevant, out loud): includes audible task relevant forms of speech like describing one's activity, commenting to self, asking-replying questions to self, reading the task aloud, affect expressions addressing to task (i.e., "I did it").

Level III PS (task-relevant, partially internalized): includes partial private speech or indications of inner speech, such as mutterings, lip movements or whispers (Berk, 1986).

Total Time on the Task: _____

Total Utterance: _____

Total Level I PS: _____ (number of utterances)

Total Level II PS: _____ (number of utterances)

Total Level III PS :_____ (number of utterances)

Total Social Speech: _____ (number of utterances)

APPENDIX D

PRIVATE SPEECH CODING SHEET (TURKISH)

KENDİNE YÖNELİK KONUŞMA KODLAMA KAĞIDI

ID: _____ Date: _____

Kayıt Numarası:
Kodlayıcı ID:

Kendine yönelik konuşmanın kodlanması üç aşamadan oluşmaktadır. Öncelikle katılımcı tarafından kullanılan tüm konuşmaların transkripti yapılmalıdır. Ardından tüm transkripti yapılan sözceler sosyal ve kendine yönelik konuşma olarak ayrılmalıdır. Üçüncü aşamada tüm kendine yönelik konuşmalar Berk'ün (1986) kategorizasyonuna göre Seviye 1, Seviye 2 ve Seviye 3 olarak, ve sosyal konuşmalar olarak kodlanmalıdır.

1. Sözcelerin tamamının transkripsiyonu

Sözce: Tamamlanmış ya da yarıda bırakılmış cümle, sonlandırma işaretine sahip bir cümle, ve en az 2 saniye ile birbirinden ayrılan herhangi bir ifade (örn. konuşma sırası) olarak tanımlanmaktadır (Feigenbaum, 1992; Diaz, Winsler, Attencio & Harbers, 1992; Winsler vd., 2005).

Sözceler birbirinden zamansal ve anlamsal ayrım yoluyla ayrılır:

Zamansal ayrım (temporal discontinuity): iki cümle arasında 2 saniyeden uzun boşluk var ise, bu iki cümle iki ayrı sözcedir.

Anlamsal ayrım (semantic discontinuity): bir cümle kendinden önce gelen cümleden anlamsal açıdan ayrılıyorsa (zaman farkı gözetmeksizin) bu iki cümle iki ayrı sözce olarak değerlendirilir. Çocuk kendi kendine konuşurken bir cümle başlatıp anlamı ufak ve yavaş bir şekilde değiştiriyor, yeni bir cümle başlatıyorsa bu cümle iki ayrı sözce olarak kodlanmalıdır.

Örn: Bu mavi nereye gidecek? İşte buraya! (iki ayrı sözce)

2. Sosyal ve Kendine Yönelik Konuşmanın Ayırt Edilmesi

Sosyal Konuşma:

- Başkalarına açık referans verme/birine yönelik konuşma
- Başkalarına soru sorma ya da başkalarının sorularını yanıtlama
- Konuşma sırasında ya da konuşmaya devam eden süreçte bir kişi ile göz teması kurma
- Konuşma sırasında vücudun yönünü başkasına yönelik olarak değiştirme gibi davranışsal belirteçler

- Herhangi bir sosyal sözceden 2 saniye geçmeden konuşmaya devam etme

Kendine Yönelik Konuşma:

- Sosyal konuşma belirtilerinden hiçbirini içermez ve çocuk tarafından belli bir dinleyiciye yönelik olarak değil kendine yönelik olarak kullanılır

3. Aşağıdaki her 10 saniyelik dilimi aşağıdaki kategorilerine göre kodlayınız

Sosyal Konuşma için "SK"

Seviye 1 Kendine Yönelik Konuşma için S1: Eğer kendine yönelik konuşma şunları içeriyorsa S1 olarak kodlanmalıdır: söz oyunları, şarkı söyleme, tekrarlar, alakasız duygu ifadeleri (örn. "Kedileri çok severim") orada olmayan/hayali başkalarına yorum yapma (araştırmacıya yönelik olmayan) gibi alakasız konuşmalar

Seviye 2 Kendine Yönelik Konuşma için S2: Eğer kendine yönelik konuşma şunları içeriyorsa S2 olarak kodlanmalıdır: etkinliğini/davranışı tanımlama/adlandırma, planları/yapacağı davranışı tarif etme (örn. "Şimdi bu anahtarı kullanacağım." kendine yorum yapma, kendine soru sorma (örn. "Şimdi hangi anahtarı kullanmalıyım?"), görevi yüksek sesle okuma, görevle ilgili dışsal konuşmalar (örn. "Yaptım!", "Bunu biliyorum"), aşamaları açıklama, kendi performansını değerlendirme

Seviye 3 Kendine Yönelik Konuşma için S3: Eğer kendine yönelik konuşma şunları içeriyorsa S3 olarak kodlanmalıdır: kendine yönelik bir kısmı duyulan, tam net olmayan (tam cümle şeklinde) veya kendine yönelik konuşmanın daha dışsal belirtilerini içeren dudak hareketleri veya fısıltılar

Toplam Harcanan Süre:_____

Toplam Kendine Yönelik Konuşma:_____ (sözce)

Toplam S1:_____ (sözce)

Toplam S2:_____ (sözce)

Toplam S3:_____ (sözce)

Toplam Sosyal Konuşma:_____ (sözce)

APPENDIX E

TALKATIVENESS QUESTION (PARENT AND TEACHER FORM, ENGLISH)

ID: _____ Date: _____

Talkativeness Question

Dear Parent/Teacher,

On a scale from 0 to 10, how talkative ……. (the name of the participant child) is? Please be sure you marked a number below.

1--------2--------3--------4--------5--------6--------7--------8--------9--------10

(Less talkative) (Very talkative)

Thank you for your response!

APPENDIX F

TALKATIVENESS QUESTION (PARENT AND TEACHER FORM, TURKISH)

KONUŞKANLIK ANKETİ (EBEVEYN VE ÖĞRETMEN FORMU)

ID: _____ Tarih: _____

Sevgili Velimiz/Öğretmenimiz,

0'dan 10'a kadar olan bir ölçekte, çocuğunuz/öğrenciniz ……...……..…nın konuşkanlığını değerlendiriniz. Lütfen bir rakamı yuvarlak içine aldığınızdan emin olunuz.

1--------2--------3--------4--------5--------6--------7--------8--------9--------10

(Az konuşkan) (Çok konuşkan)

Yanıtınız için teşekkür ederiz.

APPENDIX G

CHILD BEHAVIOR QUESTIONNAIRE-SHORT FORM

(PARENT-REPORT, ENGLISH)

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Name of the child:

Date of Chidl's birth (month/day/year):

Date:

Age of Child (years and months):

Sex of Child:

Instructions: Please read carefully before starting:

On the next pages you will see a set of statements that describe your children's reactions to a number of situations. We would like you to tell us what your child's reaction is likely to be in those situations. There are of course no "correct" ways of reacting; children differ widely in their reactions, and it is these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of your child's reaction within the past six months. Use the following scale to indicate how well a statement describes your child:

If the statement is;
extremely untrue of your child**,** please circle **"1"**
quite untrue of your child, please circle **"2"**
slightly untrue of your child, please circle **"3"**
neither true of false of your child, please circle **"4"**
slightly true of your child, please circle **"5"**
quite true of your child, please circle **"6"**
extremely true of your child, please circle **"7"**

If you cannot answer one of the items because you have never seen the child in that situation, for example, if the statement is about the child's reaction to your singing and you have never sung to the child, then circle **NA** (not applicable).

Please be sure to circle a number or NA for every item.

1	Gets angry when told s/he has to go to bed.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
2	Usually rushes into an activity without thinking about it.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
3	Cries sadly when a favorite toy gets lost or broken.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
4	Has temper tantrums when s/he doesn't get what s/he wants.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**

5	When practicing an activity, has a hard time keeping her/his mind on it.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
6	Tends to become sad if the family's plans don't work out.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
7	Will move from one task to another without completing any of them.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
8	Has a hard time settling down after an exciting activity.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
9	Seems to feel depressed when unable to accomplish some task.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
10	Often rushes into new situations.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
11	Gets quite frustrated when prevented from doing something s/he wants to do.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
12	Becomes upset when loved relatives or friends are getting ready to leave following a visit.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
13	When angry about something, s/he tends to stay upset for ten minutes or longer.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
14	Takes a long time in approaching new situations.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
15	Can wait before entering into new activities if s/he is asked to.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
16	Gets angry when s/he can't find something s/he wants to play with.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
17	Is slow and unhurried in deciding what to do next.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
18	Changes from being upset to feeling much better within a few minutes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
19	Prepares for trips and outings by planning things s/he will need.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
20	Tends to say the first thing that comes to mind, without stopping to think about it.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
21	Has trouble sitting still when s/he is told to (at movies, church, etc.).	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
22	Rarely cries when s/he hears a sad story.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
23	Rarely becomes upset when watching a sad event in a TV show.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
24	If upset, cheers up quickly when s/he thinks about something else.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
25	Rarely gets upset when told s/he has to go to bed.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
26	When drawing or coloring in a book, shows strong concentration.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
27	Is easy to soothe when s/he is upset.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
28	Is good at following instructions.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
29	When building or putting something together, becomes very involved in what s/he is doing, and works for long periods.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
30	Approaches places s/he has been told are dangerous slowly and cautiously.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
31	Rarely becomes discouraged when s/he has trouble making something work.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**

32	Is very difficult to soothe when s/he has become upset.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
33	Can easily stop an activity when s/he is told "no."	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
34	Is among the last children to try out a new activity.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
35	Is easily distracted when listening to a story.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
36	Gets angry when called in from play before s/he is ready to quit.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
37	Sometimes becomes absorbed in a picture book and looks at it for a long time.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**

Please check back to make sure you have completed all the pages of the questionnaire. Thank you very much for your help!

APPENDIX H

CHILD BEHAVIOR QUESTIONNAIRE-SHORT FORM

(PARENT-REPORT, TURKISH)

ÇOCUK DAVRANIŞ LİSTESİ KISA FORMU (EBEVEYN)

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İsim: Doğum tarihi (gün/ay/yıl):
Tarih Tam Yaşı (ay/yıl):
Cinsiyeti:

Talimat: Lütfen başlamadan önce dikkatlice okuyunuz.
Sonraki sayfalarda çocuğunuzun çeşitli durumlardaki tepkilerini tanımlayan çeşitli ifadelerle karşılaşacaksınız. Bu durumlar karşısında sizin çocuğunuzun tepkisinin nasıl olacağını belirtmenizi istiyoruz. Elbette, "doğru" tepki diye bir şey yoktur, çocuklar çok farklı şekilde tepki gösterebilirler ve biz de bu farklılıkların neler olduğunu öğrenmeye çalışıyoruz. Lütfen her ifadeyi okuyup onun, çocuğunuzun "geçtiğimiz altı ay içinde" benzer durumlardaki tepkisini "doğru" mu "yanlış" mı ifade ettiğine karar veriniz.
Eğer bu ifade;
çocuğunuz için **tamamıyla yanlışsa "1"i**
çocuğunuz için **çoğunlukla yanlışsa "2"yi**
çocuğunuz için **kısmen yanlışsa "3"ü**
çocuğunuz için **ne doğru ne yanlışsa "4"ü**
çocuğunuz için **kısmen doğruysa "5"i**
çocuğunuz için **çoğunlukla doğruysa "6"yı**
çocuğunuz için **tamamıyla doğruysa "7"yi**
çocuğunuzda böyle bir durumla karşılaşmamışsanız ve bu nedenle o maddeyi yanıtlayamıyorsanız **uygun değil (UD)**'yi daire içine alınız.
Lütfen **her durum** için bir rakamı ya da uygun değil şıkkını daire içine aldığınızdan emin olunuz

1	Yatağa gitmesi gerektiği söylendiğinde sinirlenir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
2	Genellikle düşünmeden hemen harekete geçer.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
3	En sevdiği oyuncak kaybolduğunda veya kırıldığında içli içli ağlar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
4	İstediği bir şey olmadığında öfke nöbeti geçirir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
5	Bir işle uğraşırken zihnini o iş üzerinde tutmakta zorlanır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
6	Ailesinin planları yolunda gitmezse üzülür.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**

7	Bir işi bitirmeden diğer işe geçer.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
8	Heyecan verici bir etkinlikten sonra sakinleşmekte güçlük çeker.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
9	Bazı görevleri başaramadığında üzülür.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
10	Sıklıkla yeni ortamlara atılır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
11	Yapmak istediği bir şeyden alıkonulduğunda hayal kırıklığı yaşar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
12	Ziyarete gelen sevdiği akrabalarının veya arkadaşlarının gitmeye hazırlanmaları, onu mutsuz eder.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
13	Bir şeye sinirlendiğinde en az 10 dakika kızgın olur.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
14	Yeni durumlara alışması uzun zaman alır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
15	İstenirse, yeni etkinliklere geçmeden önce bekleyebilir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
16	Oynamak istediği şeyi bulamazsa kızar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
17	Ne yapacağına karar verirken yavaştır ve acele etmez.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
18	Üzgünken, birkaç dakika içinde daha iyi hissetmeye başlayabilir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
19	Gezmeye gitmeden önce ihtiyaçlarını hazırlar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
20	Aklına gelen ilk şeyi durup düşünmeden hemen söyler.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
21	İstendiğinde, sakince oturmakta zorlanır (Sinemada, otobüste vs.).	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
22	Üzücü bir öykü duyduğunda pek ağlamaz.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
23	Televizyondaki üzücü bir olaydan pek etkilenmez.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
24	Üzgün olduğunda, başka bir şey düşünerek çabucak neşelenir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
25	Yatağa gitmesi gerektiği söylendiğinde pek olumsuz tepki vermez.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
26	Resim yaparken ya da kitap boyarken çok iyi yoğunlaşır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
27	Üzüldüğünde, kolaylıkla yatıştırılır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
28	Yönergeleri* takip etmede iyidir. *Yönerge: Dur!, Geri gön!, Sağa dön! vs. gibi…	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
29	Bir şey oluştururken veya bir şeyleri bir araya getirirken yaptığı işe odaklanır ve uzun süre ilgilenir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
30	Tehlikeli olduğu söylenen yerlere yavaş ve dikkatlice yaklaşır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
31	Bir şeyi çalıştırmakta zorlansa da cesareti pek kırılmaz.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
32	Kızdığında sakinleştirilmesi çok zordur.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
33	Hayır dendiğinde yaptığı şeyi kolayca bırakabilir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
34	Yeni bir etkinliği neredeyse en son deneyen çocuktur.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**

35 Bir öykü dinlerken dikkati kolayca dağılır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
36 Oyun oynamayı bırakması istendiğinde sinirlenir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
37 Bazen resimli kitaplara dalıp gider ve uzun süre onlara bakar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**

Lütfen tüm soruları cevapladığınıza emin olunuz. Yardımlarınız için çok teşekkür ederiz!

APPENDIX I

CHILD BEHAVIOR QUESTIONNAIRE- SHORT FORM

(TEACHER-REPORT, ENGLISH)

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Name of the child:

Date of Child's birth (month/day/year):

Date:

Age of Child (years and months):

Sex of Child:

Instructions: Please read carefully before starting:

On the next pages you will see a set of statements that describe children's reactions to a number of situations. We would like you to tell us what the above-named child's reaction is likely to be in those situations. There are of course no "correct" ways of reacting; children differ widely in their reactions, and it is these differences we are trying to learn about. Please read each statement and decide whether it is a "true" or "untrue" description of the child's reaction within the past six months. Use the following scale to indicate how well a statement describes the child:

If the statement is;
extremely untrue of this child**,** please circle **"1"**
quite untrue of this child, please circle **"2"**
slightly untrue of this child, please circle **"3"**
neither true of false of this child, please circle **"4"**
slightly true of this child, please circle **"5"**
quite true of this child, please circle **"6"**
extremely true of this child, please circle **"7"**

If you cannot answer one of the items because you have never seen the child in that situation, for example, if the statement is about the child's reaction to your singing and you have never sung to the child, then circle **NA** (not applicable).

Please be sure to circle a number or NA for every item.

1	Gets angry when told s/he has to remain still during rest time.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
2	Usually rushes into an activity without thinking about it.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
3	Cries sadly when a favorite toy gets lost or broken.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
4	Has temper tantrums when s/he doesn't get what s/he wants.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
5	When practicing an activity, has a hard time keeping her/his mind on it.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**

6	Tends to become sad if plans (for a special event or activity) don't work out.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
7	Will move from one task to another without completing any of them	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
8	Has a hard time settling down after an exciting activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
9	Seems to feel depressed when unable to accomplish some task	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
10	Often rushes into new situations	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
11	Gets quite frustrated when prevented from doing something s/he wants to do.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
12	Becomes upset when friends are getting ready to leave the classroom.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
13	When angry about something, s/he tends to stay upset for ten minutes or longer.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
14	Takes a long time in approaching new situations.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
15	Can wait before entering into new activities if s/he is asked to.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
16	Gets angry when s/he can't find something s/he wants to play with.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
17	Is slow and unhurried in deciding what to do next	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
18	Changes from being upset to feeling much better within a few minutes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
19	Plans for new activities or changes in routine to make sure s/he has what will be needed	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
20	Tends to say the first thing that comes to mind, without stopping to think about it.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
21	Has trouble sitting still when s/he is told to (story time, etc.)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
22	Rarely cries when s/he hears a sad story.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
23	Rarely becomes upset when listening to a sad story	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
24	If upset, cheers up quickly when s/he thinks about something else.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
25	Rarely gets upset when told s/he has to remain quiet during rest times	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
26	When drawing or coloring in a book, shows strong concentration.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
27	Is easy to shoot when s/he is upset.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
28	Is good at following instructions.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
29	When building or putting something together, becomes very involved in what s/he is doing, and works for long periods.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
30	Approaches places that s/he thinks might be “risky” slowly and cautiously	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
31	Rarely becomes discouraged when s/he has trouble making something work.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
32	Is very difficult to soothe when s/he has become upset	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
33	Can easily stop an activity when s/he is told "no."	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**

34	Is among the last children to try out a new activity.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
35	Is easily distracted when listening to a story.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
36	Gets angry when called away from an activity or game before s/he is ready to quit	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**
37	Sometimes becomes absorbed in a picture book and looks at it for a long time.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**NA**

Please check back to make sure you have completed all the pages of the questionnaire. Thank you very much for your help!

APPENDIX J

CHILD BEHAVIOR QUESTIONNAIRE- SHORT FORM

(TEACHER-REPORT, TURKISH)

ÇOCUK DAVRANIŞ LİSTESİ KISA FORM (ÖĞRETMEN FORMU)

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Çocuk Davranış Listesi

İsim: Doğum tarihi (gün/ay/yıl):
Tarih Tam Yaşı (ay/yıl):
Cinsiyeti:

Talimat: Lütfen başlamadan önce dikkatlice okuyunuz.
Sonraki sayfalarda öğrencinizin çeşitli durumlardaki tepkilerini tanımlayan çeşitli ifadelerle karşılaşacaksınız. Bu durumlar karşısında öğrencinizin tepkisinin nasıl olacağını belirtmenizi istiyoruz. Elbette, "doğru" tepki diye bir şey yoktur, çocuklar çok farklı şekilde tepki gösterebilirler ve biz de bu farklılıkların neler olduğunu öğrenmeye çalışıyoruz. Lütfen her ifadeyi okuyup onun, öğrencinizin "geçtiğimiz altı ay içinde" benzer durumlardaki tepkisini "doğru" mu "yanlış" mı ifade ettiğine karar veriniz.
Eğer bu ifade;
öğrenciniz için **tamamıyla yanlışsa "1"i**
öğrenciniz için **çoğunlukla yanlışsa "2"yi**
öğrenciniz için **kısmen yanlışsa "3"ü**
öğrenciniz için **ne doğru ne yanlışsa "4"ü**
öğrenciniz için **kısmen doğruysa "5"i**
öğrenciniz için **çoğunlukla doğruysa "6"yı**
öğrenciniz için **tamamıyla doğruysa "7"yi**
öğrencinizde böyle bir durumla karşılaşmamışsanız ve bu nedenle o maddeyi yanıtlayamıyorsanız **uygun değil (UD)**'yi daire içine alınız.
Lütfen **her durum** için bir rakamı ya da uygun değil şıkkını daire içine aldığınızdan emin olunuz

1	Dinlenme zamanında sessiz durması gerektiği söylendiğinde kızar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
2	Genellikle düşünmeden hemen harekete geçer.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
3	En sevdiği oyuncak kaybolduğunda veya kırıldığında içli içli ağlar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
4	İstediği bir şey olmadığında öfke nöbeti geçirir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
5	Bir işle uğraşırken zihnini o iş üzerinde tutmakta zorlanır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
6	Öğretmeninin yaptığı planlar (örneğin, bir gezi planı) tasarlandığı gibi gerçekleşmezse üzülür.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**

7	Bir işi bitirmeden diğer işe geçer.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
8	Heyecan verici bir etkinlikten sonra sakinleşmekte güçlük çeker.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
9	Bazı görevleri başaramadığında üzülür.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
10	Sıklıkla yeni ortamlara atılır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
11	Yapmak istediği bir şeyden alıkonulduğunda hayal kırıklığı yaşar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
12	Arkadaşlarının sınıftan ayrılmak için hazırlanmaları onu mutsuz eder.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
13	Bir şeye sinirlendiğinde en az 10 dakika kızgın olur.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
14	Yeni durumlara alışması uzun zaman alır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
15	İstenirse, yeni etkinliklere geçmeden önce bekleyebilir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
16	Oynamak istediği şeyi bulamazsa kızar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
17	Ne yapacağına karar verirken yavaştır ve acele etmez.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
18	Üzgünken, birkaç dakika içinde daha iyi hissetmeye başlayabilir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
19	Yeni aktivitelerden ya da rutinindeki değişikliklerden önce ihtiyaç duyacağı şeyleri hazırlar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
20	Aklına gelen ilk şeyi durup düşünmeden hemen söyler.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
21	İstendiğinde, sakince oturmakta zorlanır (hikaye okuma zamanlarında vs.).	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
22	Üzücü bir öykü duyduğunda pek ağlamaz.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
23	Üzücü bir hikaye dinlerken pek etkilenmez.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
24	Üzgün olduğunda, başka bir şey düşünerek çabucak neşelenir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
25	Dinlenme zamanında sessiz kalması gerektiği söylendiğinde pek olumsuz tepki vermez	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
26	Resim yaparken ya da kitap boyarken çok iyi yoğunlaşır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
27	Üzüldüğünde, kolaylıkla yatıştırılır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
28	Yönergeleri* takip etmede iyidir. *Yönerge: Dur!, Geri gön!, Sağa dön! vs. gibi…	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
29	Bir şey oluştururken veya bir şeyleri bir araya getirirken yaptığı işe odaklanır ve uzun süre ilgilenir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
30	Tehlikeli olduğu söylenen yerlere yavaş ve temkinli yaklaşır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
31	Bir şeyi çalıştırmakta zorlansa da cesareti pek kırılmaz.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
32	Kızdığında sakinleştirilmesi çok zordur.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
33	Hayır dendiğinde yaptığı şeyi kolayca bırakabilir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
34	Yeni bir etkinliği neredeyse en son deneyen çocuktur.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
35	Bir öykü dinlerken dikkati kolayca dağılır.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**

36	Etkinliği veya oyun oynamayı bırakması istendiğinde sinirlenir.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**
37	Bazen resimli kitaplara dalıp gider ve uzun süre onlara bakar.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**UD**

Lütfen tüm soruları cevapladığınıza emin olunuz. Yardımlarınız için çok teşekkür ederiz!

APPENDIX K

EMOTION REGULATION STRATEGIES CODING SHEET (ENGLISH)

ID: _____ Date: _____

Emotion-Regulation Strategies Coding Sheet

Tape number:
Coder's ID:

Timings

All behaviors will be coded in 10-second intervals as stated on the table below. The indicated ER strategies will be coded as present/absent unless otherwise noted. Start after the experimenter gives the child the instructions and keys.

Behavioral Codes – unless indicated otherwise the following will be coded as present/absent ("1" for the present, "0" for the absent). The time slots are not exclusive to one category, so if the child shows more than one strategy during the interval, please code all of them.

Distraction (DS)

Child focuses on anything other than the box, such as on his/her body, light, poster in the room, camera, experimenter, or anything at the room at least for 2 seconds (or more). If child has a brief glance on anything other than the box, this is not considered as distraction.

Self-comforting (SC)

Child engages in manipulating his/her body (such as his/her hair, fingers), clothing, or any material (such as keys) and if child shows any auto-manipulative acts such as shaking/rocking his/her body (seems to soothe him/herself), this will be coded as self-comforting. These behaviors could be as follows: hand/hair/face clasping, sucking finger/thumb, picking nose, rubbing clothes or face. Those behaviors appear to acts to comfort him/herself (unconscious acts serving self-soothing purposes). These behaviors should be coded if last 2 seconds or more.

Instrumental strategies/withdrawal (IS)

Child tries to leave the room, escape or defeat against open the box.

Persistence/focusing on task (PR)

Child concentrates on the box, the toy inside and keys (playing with the keys will be coded as persistence if the child is focusing on them to open the box, not playing purposes, such as using them to open the box or seems searching the right key. If the child is playing with the keys, not for the purpose of open the box including sorting keys without the purpose of finding the right key but just for fiddling purposes, this will be coded as distraction). The concentration to the task materials should be last for at least 2 seconds or more. Just a brief look will not be coded as persistence. In this duration, child is not speaking, stay focused to task to open the box for 2 seconds or more, purposefully sorting the keys at hand to find the right one even she/he actively not trying one of them on box.

Disruptive behavior (DB)

Child engages in socially unacceptable/aggressive behavior such as hitting the box, other objects, trying to break or damage the box.

Social behaviors (SB)

Child asks help from others to open the closed box.

Approach (AP)

Child gets close to the stimulus (box) without an intention to open it.

10s.	10s.	10s.	10s.	10s.	10s.
10s.	10s.	10s.	10s.	10s.	10s.
10s.	10s.	10s.	10s.	10s.	10s.
10s.	10s.	10s.	10s.	10s.	10s.

Total time: 4 minutes/240 seconds

Total DS: _____
Total SC: _____
Total IS: _____
Total PR: _____
Total DB: _____
Total SB: _____
Total AP: _____

APPENDIX L

EMOTION REGULATION STRATEGIES CODING SHEET (TURKISH)

DUYGU DÜZENLEME STRATEJİLERİ KODLAMA KAĞIDI

ID: _____ Tarih: _____

Kaset Numarası:
Kodlayıcı ID:

Zamanlama

Tüm davranışlar 10 saniyelik aralıklarla, aşağıda verilen tabloya kodlanmalıdır. Aşağıda verilen duygu düzenleme stratejileri aksi belirtilmediği takdirde var/yok olarak tabloya kodlanacaktır. Araştırmacı çocuğa bilgilendirme vermeyi tamamladığında ve anahtarları verdiğinde kodlamaya başlayınız.

Davranışsal Kodlar: Aksi belirtilmedikçe aşağıdaki davranışlar var (1) ya da yok (0) şeklinde 10 saniyelik dilimlere kodlanacaktır. 10 saniyelik aralıklar sadece bir duygu düzenleme stratejisine mahsus değildir, eğer çocuk mevcut kategoride birden fazla strateji gösteriyorsa, lütfen hepsini kodlayınız.

Dikkat Dağıtma (DD)

Çocuk kutudan başka herhangi bir nesneye 2 saniyeden daha uzun süre odaklanır (örneğin kendi vücudu, lamba, duvardaki poster, kamera, araştırmacı vb.). Eğer çocuk kutu dışındaki nesnelere sadece kısa bir bakış fırlatıyorsa, bu dikkat dağıtma olarak düşünülmemelidir.

Kendini Rahatlatma (KR)

Çocuk vücudu (saçları, parmakları gibi), kıyafetleri veya herhangi bir materyal (anahtarlar gibi) ile meşgul olur ve eğer çocuk vücudunu sallama/titretme gibi (kendini rahatlatmaya yönelik) oto-manipülatif eylemler gösterir. Bu davranışlar şu şekilde olabilir: eli/saçı/yüzü sıkmak/tutmak, parmak/başparmak emmek, buruna dokunmak/sıkmak, kıyafetini veya yüzünü ovalamak. Bu davranışlar, kendisini rahatlatmak amaçlı görünmektedir (bilinçsiz hareketlerdir, kendini rahatlatmayı amaçlar). Bu davranışlar, 2 saniye veya daha uzun sürerse kodlanmalıdır.

Araçsal Stratejiler, Geri Çekilme (AS)

Çocuk odayı terk etmeye çalışır, kaçar ya da kutuyu açmayı reddeder.

Görevde Kalma/ Odaklanma (GK)

Çocuk kutuyu açmaya, içindeki oyuncağa ve anahtarlara (eğer çocuk kutuyu açmak için onlara odaklanır, kutuyu açma amaçlı kullanır veya doğru anahtarı bulmaya çalışır gibi görünür) yoğunlaşır. Çocuk anahtarlar ile sadece oynuyor, doğru anahtarı bulma amacı gütmüyorsa (sadece anahtarları elinde sıralıyor ama kutuyu açmaya çalışmıyorsa) bu dikkat dağıtma olarak kodlanmalıdır, görevde kalma/odaklanma olarak kodlanmamalıdır. Görevde kalma/odaklanma en az 2 saniye veya daha uzun sürmelidir. Sadece kısa bir bakış atma görevde kalma/odaklanma olarak kodlanmayacaktır.

Yıkıcı Davranışlar (YD)

Çocuk sosyal olarak kabul edilebilir olmayan kutuya vurma, kutuyu kırma ya da kutuya zarar verme gibi agresif davranışlar sergiler.

Sosyal Davranışlar (SD)

Çocuk kutuyu açma amaçlı başkalarından yardım talep eder.

Yakınlaşma (YA)

Kutuyu açma amacı olmadan kutuya yakınlaşır.

10s.	10s.	10s.	10s.	10s.	10s.
10s.	10s.	10s.	10s.	10s.	10s.
10s.	10s.	10s.	10s.	10s.	10s.
10s.	10s.	10s.	10s.	10s.	10s.

Total time: 4 dakika/240 saniye

Toplam DD: _____
Toplam KR: _____
Toplam AS: _____
Toplam GK: _____
Toplam YD: _____
Toplam SD: _____
Toplam YA: _____

APPENDIX M

CHILDHOOD EXECUTIVE FUNCTIONING INVENTORY (CHEXI, ENGLISH)

CHILDHOOD EXECUTIVE FUNCTIONING INVENTORY (CHEXI) FOR PARENTS AND TEACHERS

Below, you will find a number of statements. Please read each statement carefully and thereafter indicate how well that statement is true for the child. You indicate your response by circling one of the numbers (from 1 to 5) after each statement.

Definitely not true	Not true	Partially true	True	Definitely true
1	2	3	4	5

1. Has difficulty remembering lengthy instructions	1	2	3	4	5
2. Seldom seems to be able to motivate him-/herself to do something that he/she doesn't want to do	1	2	3	4	5
3. Has difficulty remembering what he/she is doing, in the middle of an activity	1	2	3	4	5
4. Has difficulty following through on less appealing tasks unless he/she is promised some type of reward for doing so	1	2	3	4	5
5. Has a tendency to do things without first thinking about what could happen	1	2	3	4	5
6. When asked to do several things, he/she only remembers the first or last	1	2	3	4	5
7. Has difficulty coming up with a different way of solving a problem when he/she gets stuck	1	2	3	4	5
8. When something needs to be done, he/she is often distracted by something more appealing	1	2	3	4	5
9. Easily forgets what he/she is asked to fetch	1	2	3	4	5
10. Gets overly excited when something special is going to happen (e.g., going on a field trip, going to a party)	1	2	3	4	5
11. Has clear difficulties doing things he/she finds boring	1	2	3	4	5
12. Has difficulty planning for an activity (e.g., remembering to bring everything necessary for a field trip or things needed for school)	1	2	3	4	5
13. Has difficulty holding back his/her activity despite being told to do so	1	2	3	4	5
14. Has difficulty carrying out activities that require several steps (e.g., for younger children, getting completely dressed without reminders; for older children, doing all homework independently)	1	2	3	4	5

www.chexi.se

Definitely not true	Not true	Partially true	True	Definitely true
1	2	3	4	5

15. In order to be able to concentrate, he/she must find the task appealing	1	2	3	4	5
16. Has difficulty refraining from smiling or laughing in situations where it is inappropriate	1	2	3	4	5
17. Has difficulty telling a story about something that has happened so that others may easily understand	1	2	3	4	5
18. Has difficulty stopping an activity immediately upon being told to do so. For example, he/she needs to jump a couple of extra times or play on the computer a little bit longer after being asked to stop	1	2	3	4	5
19. Has difficulty understanding verbal instructions unless he/she is also shown *how* to do something	1	2	3	4	5
20. Has difficulty with tasks or activities that involve several steps	1	2	3	4	5
21. Has difficulty thinking ahead or learning from experience	1	2	3	4	5
22. Acts in a wilder way compared to other children in a group (e.g., at a birthday party or during a group activity)	1	2	3	4	5
23. Has difficulty doing things that require mental effort, such as counting backwards	1	2	3	4	5
24. Has difficulty keeping things in mind while he/she is doing something else	1	2	3	4	5

APPENDIX N

CHILDHOOD EXECUTIVE FUNCTIONING INVENTORY (CHEXI, TURKISH)

ÇOCUKLUK DÖNEMİ YÖNETİCİ İŞLEV ENVANTERİ
EBEVEYN/ÖĞRETMEN FORMU*

Aşağıda, bir dizi ifadeler bulacaksınız. Lütfen, her ifadeyi dikkatlice okuyunuz ve sonra o ifadenin çocuğunuz/öğrenciniz için **ne kadar doğru** olduğunu belirtiniz. Cevabınızı, her ifadeden sonra yer alan sayılardan (1'den 5'e kadar) **birini** daire içine alarak gösteriniz. Lütfen **her soruya** yanıt verdiğinizden emin olunuz. Katılımınız için teşekkür ederiz.

Kesinlikle doğru değil	**Doğru değil**	**Kısmen doğru**	**Doğru**	**Kesinlikle doğru**
1	**2**	**3**	**4**	**5**

1.Uzun talimatları hatırlamakta zorluk yaşar.	1	2	3	4	5
2. Yapmak istemediği bir şeyi yapmak konusunda kendini **nadiren** motive edebilir.	1	2	3	4	5
3. Bir etkinliğin ortasındayken, ne yapıyor olduğunu hatırlamada zorluk yaşar.	1	2	3	4	5
4. Yapması için bir ödül vaat edilmezse, daha az ilgisini çeken görevleri tamamlamakta zorluk yaşar.	1	2	3	4	5
5.İlk olarak ne olabileceği hakkında düşünmeden bir şeyleri yapma eğilimi vardır.	1	2	3	4	5
6. Birkaç işi yapması istenildiğinde sadece ilk veya sonuncu olarak yapılması isteneni hatırlar.	1	2	3	4	5
7. Takıldığı zamanlarda, bir sorunu farklı yollarla çözmekte zorluk yaşar.	1	2	3	4	5
8. Bir işin yapılması gerektiğinde, sıklıkla, daha ilgi çekici bir şeyden dolayı dikkati dağılır.	1	2	3	4	5
9. Gidip alması istenen şeyi kolayca unutur.	1	2	3	4	5
10. Özel bir durum (örn; okul gezisine gitmek, bir eğlenceye gitmek vb.) olacağı zaman aşırı derecede heyecanlanır.	1	2	3	4	5
11.Sıkıcı bulduğu işleri yapmada belirgin zorluk yaşar.	1	2	3	4	5
12. Bir etkinliği planlamada zorluk yaşar (Örn; okul gezisi veya okul için gerekli olan malzemeleri getirmeyi hatırlamak gibi).	1	2	3	4	5
13. Söylenilmesine rağmen, kendini tutmakta veya zapt etmekte zorluk yaşar.	1	2	3	4	5

*Copyright ® 2008, L. B.Thorell ve L. Nyberg

Türkçe çeviri ve uyarlama Ezgi Kayhan tarafından L. B.Thorell'in izniyle yapılmıştır (2009).

Kesinlikle doğru <u>değil</u>	Doğru <u>değil</u>	Kısmen doğru	Doğru	Kesinlikle doğru
1	2	3	4	5

14. Birçok adımdan oluşan etkinlikleri devam ettirmekte zorluk yaşar (Örn; küçük çocuklar için, hatırlatılmadan tüm kıyafetlerini giyebilmek; büyük çocuklar için, tüm ev ödevlerini kendi başına yapabilmek).	1	2	3	4	5
15. Konsantre olabilmesi (dikkatini verebilmesi) için verilen görevi ilgi çekici bulması gerekir.	1	2	3	4	5
16. Uygun olmayan durumlarda, gülümsememek veya gülmemek için kendini tutmakta zorlanır.	1	2	3	4	5
17.Başkalarının kolayca anlayacağı şekilde, olmuş bir olay hakkında hikâye anlatmakta zorlanır.	1	2	3	4	5
18. Durdurulması söylendikten **hemen sonra** bir etkinliği durdurmakta zorlanır. Örneğin, durdurması istendikten sonra birkaç kez daha zıplar veya bilgisayarda bir süre daha oynar.	1	2	3	4	5
19. *Nasıl* yapıldığı ayrıca **gösterilmediği** sürece sözlü talimatları anlamakta zorlanır.	1	2	3	4	5
20. Birkaç adımı içeren işlerde ya da etkinliklerde zorluk yaşar.	1	2	3	4	5
21. İleriyi düşünme veya deneyimlerinden ders çıkarmada zorluk yaşar.	1	2	3	4	5
22. Bir grup içinde, diğer çocuklar ile karşılaştırıldığında daha haşarı şekilde davranır (Örn; Bir doğum günü partisinde veya grup etkinliği sırasında).	1	2	3	4	5
23. Geriye doğru sayma gibi zihinsel çaba gerektiren görevleri yapmakta zorlanır.	1	2	3	4	5
24. Bir işle uğraşırken başka şeyleri aklında tutmakta zorlanır.	1	2	3	4	5
25. Nispeten basit görevleri yerine getirirken dahi sesli düşünür.	1	2	3	4	5
26. Aynı yaştaki akranları ile karşılaştırıldığında, zaman kavramını anlamakta zorlanır.	1	2	3	4	5

Her soruyu cevapladığınızdan emin olunuz. Katılımınız için teşekkür ederiz.

*Copyright ® 2008, L. B.Thorell ve L. Nyberg

Türkçe çeviri ve uyarlama Ezgi Kayhan tarafından L. B.Thorell'in izniyle yapılmıştır (2009).

APPENDIX O

PERMISSION FROM THE BOĞAZİÇİ UNIVERSITY ETHICS COMMISSION

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

Sayı : 2017/11

3 Mart 2017

Gizem Öztemur

Eğitim Bilimleri Bölümü

Sayın Araştırmacı,

"Okul Öncesi Yaştaki Çocuklarda Kendine Yönelik Konuşma, Yönetici İşlevler ve Duygu Düzenleme Arasındaki İlişkilerin Araştırılması" başlıklı projeniz ile ilgili olarak yaptığınız SBB-EAK 2017/7 sayılı başvuru İNAREK/SBB Etik Alt Kurulu tarafından 3 Mart 2017 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Saygılarımızla,

İnsan Araştırmaları Kurumsal Değerlendirme Alt Kurulu

Doç. Dr. Ebru Kaya

Yrd. Doç. Dr. İnci Ayhan

Yrd. Doç. Dr. Gül Sosay

Yrd. Doç. Dr. Mehmet Nafi Artemel

Yrd. Doç. Dr. Bengü Börkan

APPENDIX P

INFORMED CONSENT FORM (PARENT, ENGLISH)

Supporting Institution: Boğaziçi University

Name of the research: Relationships between executive functioning, private speech, and emotion regulation in preschoolers

Project Manager: Assistant Professor Nihal Yeniad

E-mail address: nihal.yeniad@boun.edu.tr

Phone: 0212 359 65 74

Name of the researcher: Gizem Öztemür

E-mail address: gizem.oztemur1@gmail.com

Phone: 05388615645

Subject of the Project: The aim of this research is to assess the relationships among cognitive, emotional and the language abilities of the preschoolers, aged from 4 to 5 years. In order to hold this project, nearly 60 preschoolers are needed. For this project, ethical permissions were obtained from the Boğaziçi University Ethical Commission and the results of this study will be examined by the Master of Arts in Educational Sciences, Guidance and Psychological Counseling program.

Consent:

Dear Parent,

We are kindly inviting you to participate in the thesis study named as “Relationships between executive functioning, private speech and emotion regulation in preschoolers”.

If you agree to participate in the study, we will ask you to fill out our Demographic Information Form that we have sent to you and fill out our questionnaires regarding your child's emotional, cognitive and language skills, which will take up to 15 minutes.

If you give your consent, we will do game-like tasks that will last about 25-30 minutes on the school ground with your child. Applications include:

• "Find the Right Key to Play!" game: In this game-like task, your child will be given a bunch of keys and a locked box with a toy in it, and s/he will be asked to open a locked-box with the help of keys. This game will take about 4 minutes.

• "Card Sorting Task" game: In this task, your child will be given a bunch of pictures and s/he will be asked to place these pictures according to their categories. This game will about 5 minutes.

• Turkish Expressive Language Test: In this test, your child will be asked to name the objects in a picture book. This test is planned to last about 10-15 minutes.

Your child's performance in these individual tasks will be recorded by a video camera so that the researcher can encode them, and a video number will be used instead of the children's name or identity. Video records will be kept in the thesis student's encrypted computer, filled parents and teacher questionnaires will be kept in a locked cabinet in the room of the project manager, and they will be destroyed after the research ends. The questionnaires requested from your child's teacher also consist of similar questions that will help us to measure your child's cognitive, emotional and language skills. This research is carried out for scientific purposes and it is based on the confidentiality.

The participation to the study is voluntary. If you agreed to participate, you have a right to withdraw at any point of the study without asserting any explanation.

If you want more information regarding this study, please contact with Assist. Prof. Nihal Yeniad, faculty member of Boğaziçi University at Social Sciences department (Phone: 0212 359 65 74, Address: Boğaziçi University Faculty of Education, Educational Sciences Department, 34342 Bebek, İstanbul)

If you agreed to participate to this study and if you give permission for your child to participate to this study, please sign this form and send us back in an enclosed envelope.

I (name of the participant) ....., read the study above and I permitted my child..... (name of your child) to participate to this study. I understood the extent and the aims of the study and I am volunteer to participate. I had an opportunity to ask questions regarding the study. I understood that I have a right to withdraw at any time of the study without asserting any explanation and I understood that I will not face any negativity in case of withdrawal.

Under these circumstances I agree to participate in this research with my own request, without any pressure and coercion, and I permit my child to participate.

I took the copy of this form / I do not want to take the copy of this form (in this case the researcher keeps the copy).

Name and surname of the participant:……..
Phone Number:……..

E-mail address:……..

Signature:……
Date (day/month/year):...../...../.....

APPENDIX Q

INFORMED CONSENT FORM (PARENT, TURKISH)

KATILIMCI BİLGİ VE ONAM FORMU (EBEVEYN)

KATILIMCI BİLGİ ve ONAM FORMU

Araştırmayı destekleyen kurum: Boğaziçi Üniversitesi

Araştırmanın adı: Okul Öncesi Yaştaki Çocuklarda Yönetici İşlevler, Kendine Yönelik Konuşma ve Duygu Düzenleme Arasındaki İlişkilerin Araştırılması

Proje Yürütücüsü: Yrd. Doç. Dr. Nihal Yeniad

E-mail adresi: nihal.yeniad@boun.edu.tr

Telefonu: 0212 359 65 74

Araştırmacının adı: Gizem Öztemür

E-mail adresi: gizem.oztemur1@gmail.com

Telefonu: 05388615645

Proje konusu: Çalışmanın amacı, 4 ile 5 yaşlarında anaokuluna devam eden çocuklarda bilişsel, duygusal ve sözel beceriler arasındaki ilişkinin araştırılmasıdır. Çalışmanın gerçekleşmesi için yaklaşık 60 katılımcı aileye ihtiyaç duyulmaktadır. Çalışma için Boğaziçi Üniversitesi Etik Kurulu'ndan gerekli izinler alınmıştır ve sonuçların değerlendirilmesi Boğaziçi Üniversitesi Sosyal Bilimler Enstitüsü Rehberlik ve Psikolojik Danışmanlık Yüksek Lisans programı tarafından yapılacaktır.

Onam:

Sayın Veli,

Sizi "Okul Öncesi Yaştaki Çocuklarda Yönetici İşlevler, Kendine Yönelik Konuşma ve Duygu Düzenleme Arasındaki İlişkilerin Araştırılması" isimli tez çalışmasına katılmaya davet ediyoruz.

Araştırmaya katılmayı kabul ettiğiniz takdirde size göndermiş olduğumuz Demografik Bilgi Formu ve çocuğunuzun duygusal, bilişsel ve dil becerileri hakkındaki sorulardan oluşan ve en fazla 15 dakikanızı alacağını tahmin ettiğimiz anketimizi doldurmanızı rica edeceğiz.

Siz onay verdiğiniz takdirde çocuğunuz ile okul zemininde yaklaşık 25-30 dakika sürecek oyun benzeri uygulamalar yapacağız. Uygulamalar şunlardır:

- "Doğru Anahtarı Bul Oyuncakla Oyna!" Oyunu: Bu oyun benzeri uygulamada çocuğunuza anahtarlar verilecek ve bu anahtarları kullanarak şeffaf kapalı bir kutu

içine koyulan oyuncağı verilen anahtarlar yardımı ile çıkarması istenecektir. Bu oyun yaklaşık 4 dakika sürmektedir.

- "Kart Eşleme" Oyunu: Bu uygulamada çocuğunuza beş ayrı kategoriden oluşan resimler verilecek ve çocuğunuzdan bu resimleri kategorilerine göre ayırması istenecektir. Bu oyun yaklaşık 5 dakika sürmektedir.
- Türkçe İfade Edici Dil Testi: Bu testte çocuğunuzdan resimli bir kitaptaki nesnelerin isimlerini söylemesi istenecektir. Bu testin yaklaşık 10-15 dakika sürmesi planlanmaktadır.

Çocuğunuzun bu bireysel uygulamalardaki performansı daha sonra araştırmacının kodlayabilmesi için kamerayla kayıt altına alınacak, video kayıtlarında çocukların ismi yerine bir numara kullanılacaktır. Video görüntüleri araştırma projemiz süresince tez öğrencisinin şifreli bilgisayarında, doldurulan veli ve öğretmen anketleri ise proje yürütücüsünün odasında kilitli bir dolapta muhafaza edilip araştırma sona erdiğinde imha edileceklerdir. Çocuğunuzun öğretmeninden istenen anketler de size verilen, çocuğunuzun duygusal ve dil becerilerini ölçmemize yardımcı olacak benzer sorulardan oluşmaktadır. Bu araştırma bilimsel bir amaçla yapılmaktadır ve katılımcı bilgilerinin gizliliği esas tutulmaktadır.

Araştırmaya katılmak tamamen isteğe bağlıdır. Katıldığınız takdirde çalışmanın herhangi bir aşamasında herhangi bir sebep göstermeden onayınızı çekme hakkına da sahipsiniz.

Araştırma projesi hakkında ek bilgi almak istediğiniz takdirde lütfen Boğaziçi Üniversitesi Eğitim Bilimleri Bölümü Öğretim Üyesi Yrd. Doç. Dr. Nihal Yeniad ile temasa geçiniz (Telefon: 0212 359 65 74, Adres: Boğaziçi Üniversitesi, Eğitim Fakültesi Eğitim Bilimleri Bölümü, 34342 Bebek, İstanbul).

Eğer bu araştırma projesine katılmayı ve çocuğunuzun katılmasını kabul ediyorsanız, lütfen bu formu imzalayıp kapalı bir zarf içerisinde bize geri yollayın.

Ben (katılımcının adı) ....., yukarıdaki metni okudum ve çocuğum ..... (çocuğunuzun ismi) ile birlikte katılmam istenen çalışmanın kapsamını ve amacını, gönüllü olarak üzerime düşen sorumlulukları tamamen anladım. Çalışma hakkında soru sorma imkânı buldum. Bu çalışmayı istediğim zaman ve herhangi bir neden belirtmek zorunda kalmadan bırakabileceğimi ve bıraktığım takdirde herhangi bir olumsuzluk ile karşılaşmayacağımı anladım.

Bu koşullarda söz konusu araştırmaya kendi isteğimle, hiçbir baskı ve zorlama olmaksızın katılmayı ve çocuğumun katılmasını kabul ediyorum.
Bu formun bir örneğini aldım / almak istemiyorum (bu durumda araştırmacı bu kopyayı saklar).

Bu çalışmaya katılmayı kabul ediyorum ve çocuğumun bu çalışmaya katılmasını kabul ediyorum.

Katılımcı Adı-Soyadı:……..
Telefon numarası:……..

E-posta adresi:……..

İmzası:……
Tarih (gün/ay/yıl):...../...../.....

APPENDIX R

INFORMED CONSENT FORM (TEACHER, ENGLISH)

Supporting institution of the research: Boğaziçi University

Name of the research: Relationships between executive functioning, private speech, and emotion regulation in preschoolers

Project Manager: Assistant Professor Nihal Yeniad

E-mail address: nihal.yeniad@boun.edu.tr

Phone: 0212 359 65 74

Name of the researcher: Gizem Öztemür

E-mail address: gizem.oztemur1@gmail.com

Phone: 05388615645

Subject of the Project: The aim of this research is to assess the associations among cognitive, emotional and the language abilities of the preschoolers, aged from 4 to 5 years. In order to held this project, nearly 60 preschoolers are needed. For this project, ethical permissions were obtained from the Boğaziçi University Ethical Commission and the results of this study will be examined by the Master of Arts in Educational Sciences, Guidance and Psychological Counseling program.

Consent:

Dear Teacher,

We are kindly inviting you to participate in the thesis study named as “Relationships between executive functioning, private speech and emotion regulation in preschoolers”.

If you agree to participate in the study, we will ask you to fill out our questionnaires regarding your student’s emotional, cognitive and language skills, which will take up to 15 minutes.

If you give your consent, we will do game-like tasks that will last about 25-30 minutes on the school ground with your student, after the parental permissions are taken. Applications include:

• "Find the Right Key to Play!" game

• "Card Sorting Task" game

• Turkish Expressive Language Test

Participation to this research is entirely voluntary. Our questionnaires that we ask you to fill out do not contain any inconveniences. However, if you feel uncomfortable for any reason during your participation, you are free to withdraw from the study. The questionnaires filled by you will be kept in a locked cabinet in the room of the project manager, and they will be destroyed after the research ends. This research is carried out for scientific purposes and it is based on the confidentiality.

The participation to the study is voluntary. If you agreed to participate, you have a right to withdraw at any point of the study without asserting any explanation.

If you want more information regarding this study, please contact with Assist. Prof. Nihal Yeniad, faculty member of Boğaziçi University at Social Sciences department (Phone: 0212 359 65 74, Address: Boğaziçi University Faculty of Education, Educational Sciences Department, 34342 Bebek, İstanbul)

If you agreed to participate to this study, please sign this form and send us back in an enclosed envelope.

I (name of the participant) ....., read the study above and I agreed to participate to this study. I understood the extent and the aims of the study and I am volunteer to participate. I had an opportunity to ask questions regarding the study. I understood that I have a right to withdraw at any time of the study without asserting any explanation and I understood that I will not face any negativity in case of withdrawal.

Under these circumstances I agree to participate in this research with my own request, without any pressure and coercion.

I took the copy of this form / I do not want to take the copy of this form (in this case the researcher keeps the copy).

I agreed to participate to this study.

Name and surname of the participant:……..
Phone Number:……..

E-mail address:……..

Signature: ……
Date (day/month/year):...../...../.....

APPENDIX S

INFORMED CONSENT FORM (TEACHER, TURKISH)

KATILIMCI BİLGİ VE ONAM FORMU (ÖĞRETMEN)

KATILIMCI BİLGİ ve ONAM FORMU

Araştırmayı destekleyen kurum: Boğaziçi Üniversitesi

Araştırmanın adı: Okul Öncesi Yaştaki Çocuklarda Yönetici İşlevler, Kendine Yönelik Konuşma ve Duygu Düzenleme Arasındaki İlişkilerin Araştırılması

Proje Yürütücüsü: Yrd. Doç. Dr. Nihal Yeniad

E-mail adresi: nihal.yeniad@boun.edu.tr

Telefonu: 0212 359 6574

Araştırmacının adı: Gizem Öztemür

E-mail adresi: gizem.oztemur1@gmail.com

Telefonu: 05388615645

Proje konusu: Projenin konusu 4 ile 5 yaşlarında anaokuluna devam eden çocuklarda bilişsel, duygusal ve sözel beceriler arasındaki ilişkinin araştırılmasıdır. Çalışmanın gerçekleşmesi için yaklaşık 60 katılımcıya ihtiyaç duyulmaktadır. Çalışma için Boğaziçi Üniversitesi Etik Kurulu'ndan gerekli izinler alınmıştır. Sonuçların değerlendirilmesi Boğaziçi Üniversitesi Sosyal Bilimler Enstitüsü Rehberlik ve Psikolojik Danışmanlık Yüksek Lisans programı tarafından yapılacaktır.

Onam:

Sevgili Öğretmen,

Sizi "Okul Öncesi Yaştaki Çocuklarda Yönetici İşlevler, Kendine Yönelik Konuşma ve Duygu Düzenleme Arasındaki İlişkilerin Araştırılması" isimli tez çalışmasına katılmaya davet ediyoruz.

Araştırmaya katılmayı kabul ettiğiniz takdirde size vermiş olduğumuz, öğrencinizin duygusal ve dil becerileri hakkındaki sorulardan oluşan en fazla 15 dakikanızı alacağını düşündüğümüz anketimizi doldurmanızı rica edeceğiz. Bu anketteki sorular, öğrenciniz duygu uyandıran durumlardan ne tür davranışlar gösterdiğine ve dil becerilerine dair sorulardan oluşmaktadır.

Bu çalışma çerçevesinde, veli ve okul izniyle öğrenciniz ile okul zemininde yaklaşık 25-30 dakika sürecek çalışmalar yapılacaktır. Bu çalışmalar öğrencinizin dil becerileri, duygusal ve bilişsel becerilerini ölçmeye yönelik aşağıda belirtilen oyun benzeri etkinliklerden oluşmaktadır. Uygulamalar şunlardır:

- "Doğru Anahtarı Bul Oyuncakla Oyna!" Oyunu

- Kart Eşleme Oyunu
- Türkçe İfade Edici Dil Testi

Araştırmaya katılmak tamamen isteğe bağlıdır. Sizden doldurmanızı rica ettiğimiz anketimiz rahatsızlık verecek soruları içermemektedir. Ancak, katılım sırasında herhangi bir nedenden ötürü kendinizi rahatsız hissederseniz cevaplama işini yarıda bırakıp çıkmakta serbestsiniz. Doldurulan öğretmen anketleri proje yürütücüsünün odasında kilitli bir dolapta muhafaza edilip araştırma sona erdiğinde imha edileceklerdir. Bu araştırma bilimsel bir amaçla yapılmaktadır ve katılımcı bilgilerinin gizliliği esas tutulmaktadır.

Araştırma projesi hakkında ek bilgi almak istediğiniz takdirde lütfen Boğaziçi Üniversitesi Eğitim Bilimleri Bölümü Öğretim Üyesi Yrd. Doç. Dr. Nihal Yeniad ile temasa geçiniz (Telefon: 0212 359 65 74, Adres: Boğaziçi Üniversitesi, Eğitim Fakültesi Eğitim Bilimleri Bölümü, 34342 Bebek, İstanbul).

Eğer bu araştırma projesine katılmayı kabul ediyorsanız, lütfen bu formu imzalayıp kapalı bir zarf içerisinde bize geri yollayın.

Ben (katılımcının adı) ....., yukarıdaki metni okudum ve katılmam istenen çalışmanın kapsamını ve amacını, gönüllü olarak üzerime düşen sorumlulukları tamamen anladım. Çalışma hakkında soru sorma imkânı buldum. Bu çalışmayı istediğim zaman ve herhangi bir neden belirtmek zorunda kalmadan bırakabileceğimi ve bıraktığım takdirde herhangi bir olumsuzluk ile karşılaşmayacağımı anladım.

Bu koşullarda söz konusu araştırmaya kendi isteğimle, hiçbir baskı ve zorlama olmaksızın katılmayı kabul ediyorum.

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

Çalışmaya katılmayı kabul ediyorum.

Katılımcı Adı-Soyadı:……..
Telefon numarası:……..

E-posta adresi:……..

İmzası:……
Tarih (gün/ay/yıl):...../...../.....

APPENDIX T

INFORMED CONSENT FORM (SCHOOL PRINCIPAL, ENGLISH)

Supporting institution: Boğaziçi University

Name of the research: Relationships between executive functioning, private speech, and emotion regulation in preschoolers

Project Manager: Assistant Professor Nihal Yeniad

E-mail address: nihal.yeniad@boun.edu.tr

Phone: 0212 359 65 74

Name of the researcher: Gizem Öztemür

E-mail address: gizem.oztemur1@gmail.com

Phone: 05388615645

Subject of the Project: The aim of this research is to assess the associations among cognitive, emotional and the language abilities of the preschoolers, aged from 4 to 5 years. In order to hold this project, nearly 60 preschoolers are needed. For this project, ethical permissions were obtained from the Boğaziçi University Ethical Commission and the results of this study will be examined by the Master of Arts in Educational Sciences, Guidance and Psychological Counseling program.

Consent:

Dear School Principal,

We are kindly inviting you to participate in the thesis study named as “Relationships between executive functioning, private speech and emotion regulation in preschoolers”.

If you give your consent, we will do game-like tasks that will last about 25-30 minutes on the school ground with your students, after the parental permissions are taken. Also, we will get reports from your teachers regarding their students’ cognitive, emotional ad language abilities. Tasks with students include:

• "Find the Right Key to Play!" game

• "Card Sorting Task" game

• Turkish Expressive Language Test

Our study includes no risks for its participants. If you want more information regarding this study, please contact with Assist. Prof. Nihal Yeniad, faculty member of Boğaziçi University at Social Sciences department (Phone: 0212 359 65 74,

Address: Boğaziçi University Faculty of Education, Educational Sciences Department, 34342 Bebek, İstanbul)

If you agreed to participate to this study, please sign this form and send us back in an enclosed envelope.

I (name of the participant) ....., read the study above and I agreed to participate to this study. I understood the extent and the aims of the study and I am volunteer to participate. I had an opportunity to ask questions regarding the study. I understood that I have a right to withdraw at any time of the study without asserting any explanation and I understood that I will not face any negativity in case of withdrawal.

Under these circumstances I permit to this study to held with our teachers and students.

I took the copy of this form / I do not want to take the copy of this form (in this case the researcher keeps the copy).

I agreed to participate to this study.

Name and surname of the participant:……..
Phone Number:……..

E-mail address:……..

Signature: ……
Date (day/month/year):...../...../.....

APPENDIX U

INFORMED CONSENT FORM (SCHOOL PRINCIPAL, TURKISH)

KATILIMCI BİLGİ VE ONAM FORMU (OKUL MÜDÜRÜ)

BİLGİ ve ONAM FORMU

Araştırmayı destekleyen kurum: Boğaziçi Üniversitesi

Araştırmanın adı: Okul Öncesi Yaştaki Çocuklarda Yönetici İşlevler, Kendine Yönelik Konuşma ve Duygu Düzenleme Arasındaki İlişkilerin Araştırılması

Proje Yürütücüsü: Yrd. Doç. Dr. Nihal Yeniad

E-mail adresi: nihal.yeniad@boun.edu.tr

Telefonu: 0212 359 6574

Araştırmacının adı: Gizem Öztemür

E-mail adresi: gizem.oztemur1@gmail.com

Telefonu: 05388615645

Proje konusu: Projenin konusu 4 ile 5 yaşlarında anaokuluna devam eden çocuklarda bilişsel, duygusal ve sözel beceriler arasındaki ilişkinin araştırılmasıdır. Çalışmanın gerçekleşmesi için yaklaşık 60 katılımcıya ihtiyaç duyulmaktadır. Çalışma için Boğaziçi Üniversitesi Etik Kurulu'ndan gerekli izinler alınmıştır ve sonuçların değerlendirilmesi Boğaziçi Üniversitesi Sosyal Bilimler Enstitüsü Rehberlik ve Psikolojik Danışmanlık Yüksek Lisans programı tarafından yapılacaktır.

Onam:

Sevgili Okul Yöneticisi,

Sizi "Okul Öncesi Yaştaki Çocuklarda Yönetici İşlevler, Kendine Yönelik Konuşma ve Duygu Düzenleme Arasındaki İlişkilerin Araştırılması" isimli tez çalışmasına katılmaya davet ediyoruz.

Siz onay verdiğiniz takdirde okulunuz anaokulu öğrencileri ile veli izni alınarak yaklaşık 25-30 dakika sürecek oyun benzeri çalışmalar yapılacaktır. Aynı zamanda okul öğretmenlerinizden öğrencinin duygusal ve dil becerileri hakkında sorulardan oluşan anketi doldurmaları istenecektir. Bu çalışmalar çocuğun yaş grubuna uygun görevlerle öğrencinizin dil becerileri, duygusal ve bilişsel becerilerini ölçmeye yönelik oyun benzeri etkinliklerdir. Yapılacak etkinlikler şu şekildedir:

- "Doğru Anahtarı Bul Oyuncakla Oyna!" Oyunu
- Kart Eşleme Oyunu
- Türkçe İfade Edici Dil Testi

Yapmak istediğimiz araştırmanın öğrencinize risk getirmesi beklenmemektedir. Araştırma projesi hakkında ek bilgi almak istediğiniz takdirde lütfen Boğaziçi Üniversitesi Eğitim Bilimleri Bölümü Öğretim Üyesi Yrd. Doç. Dr. Nihal Yeniad ile temasa geçiniz (Telefon: 0212 359 65 74, Adres: Boğaziçi Üniversitesi, Eğitim Fakültesi Eğitim Bilimleri Bölümü, 34342 Bebek, İstanbul).

Eğer bu araştırma projesine katılmayı kabul ediyorsanız, lütfen bu formu imzalayıp kapalı bir zarf içerisinde bize geri yollayın.

Ben (katılımcının adı) ....., yukarıdaki metni okudum ve izin vermem istenen çalışmanın kapsamını ve amacını, gönüllü olarak üzerime düşen sorumlulukları tamamen anladım. Çalışma hakkında soru sorma imkânı buldum. Bu çalışmayı istediğim zaman ve herhangi bir neden belirtmek zorunda kalmadan bırakabileceğimi ve bıraktığım takdirde herhangi bir olumsuzluk ile karşılaşmayacağımı anladım.

Bu koşullarda söz konusu araştırmaya kendi isteğimle, hiçbir baskı ve zorlama olmaksızın okulumuz öğrencileri ve öğretmenleri ile yapılmasına izin veriyorum.

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

Çalışmaya katılmayı kabul ediyorum.

Katılımcı Adı-Soyadı:……..
Telefon numarası:……..

E-posta adresi:……..

İmzası:……
Tarih (gün/ay/yıl):...../...../.....

APPENDIX V

A SUMMARY OF THE MEASUREMENT TOOLS

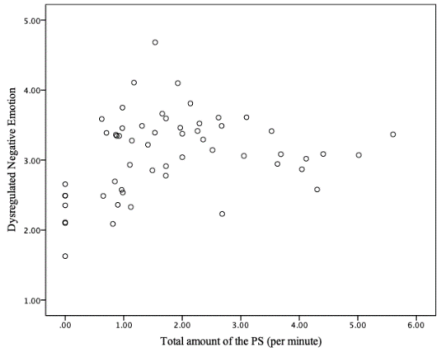
Assessment Tool/ Technique	Informant	Method	Construct
Family Demographic Form	Mothers	Questionnaire	Demographic Characteristics
Childhood Executive Functioning Inventory (CHEXI)	Mothers	Questionnaire	Working Memory and Inhibitory Control Difficulties
Child Behavior Questionnaire Short Form (CBQ-SF)	Mothers and Teachers	Questionnaire	Temperamental Emotionality and Effortful Control
Talkativeness Question	Mothers and Teachers	Question	Talkativeness
Card Sorting Task (CST)	Preschoolers	Observation	Private Speech
Attractive Toy in a Transparent Box Task (ATTB)	Preschoolers	Observation	Emotion-Regulation Strategies
Turkish Expressive and Receptive Language Test (TIFALDI)	Preschoolers	Performance Task	Expressive Vocabulary

APPENDIX W

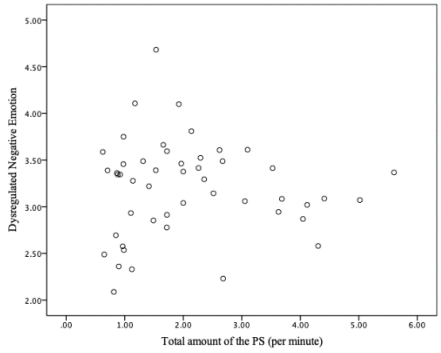
FURTHER ANALYSES

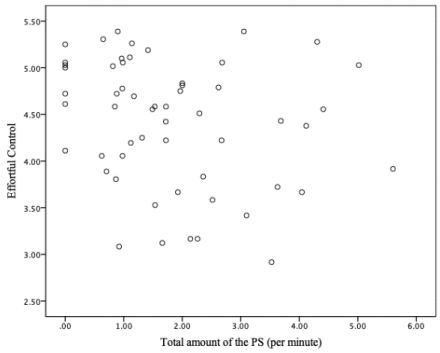
Scatter Plots with PS and negative emotionality and effortful control variables

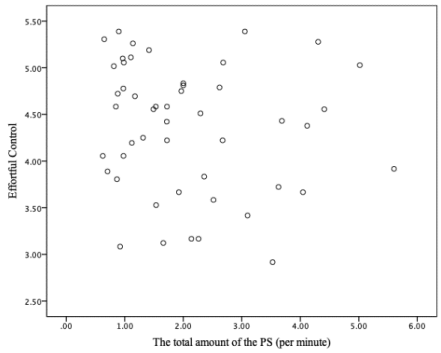
7 silent children included



7 silent children excluded







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