Social Competence, Theory of Mind, and Executive Function

in Institution-reared Turkish Preschoolers

by

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A Thesis Submitted to the

Graduate School of Social Sciences

In Partial Fulfillment of the Requirements for

The Degree of

Master of Arts

In

Developmental Psychology

Koç University

May 2012

Koc University

Graduate School of Social Sciences and Humanities

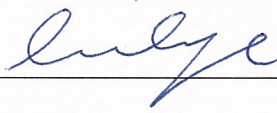This is to certify that I have examined this copy of a master's thesis by

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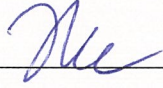and have found that it is complete and satisfactory in all respects,

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STATEMENT OF AUTHORSHIP

This thesis contains no material which has been accepted for any award or any other degree or diploma in any university or other institution. It is affirmed by the candidate that, to the best of her knowledge, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

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ABSTRACT

This study examined concurrent relations among social competence, theory of mind (ToM), and executive function (EF) in 107 three-to-five year-old institution-reared children in Turkey. We used the ToM scale of Wellman and Liu (2004) to measure mental state understanding, and examined the sequencing of ToM acquisition in Turkish children as a secondary aim. The results revealed that an understanding of diverse beliefs developed earlier than knowledge access, favoring the "individualistic pattern". The regression and SEM findings showed that EF was a significant predictor of ToM, but none of them were associated with social competence when age was controlled. Receptive language predicted social competence and EF directly, and ToM indirectly through EF, pointing to the importance of this ability for early development.

Keywords: Social competence, theory of mind, executive function, receptive language, institutionalization.

ÖZET

Bu çalışma, Türkiye'de yetiştirme kurumlarında yaşayan üç ve beş yaş aralığında bulunan 107 çocuğun, sosyal yetkinlik, zihin kuramı ve yönetici işlevleri arasındaki eş zamanlı ilişkileri incelemektedir. Zihin kuramı becerisi, Wellman ve Liu (2004) tarafından geliştirilen Zihin Kuramı ölçeği ile ölçülmüştür; böylece, ikincil amaç olarak zihin kuramı kazanımı sıralaması incelenmektedir. Sonuçlar farklı inanışı anlama becerisinin, bilgi erişimini anlama becerisinden önce geliştiğini göstererek, bireyci sıralamayı desteklemiştir. Regresyon ve Yapısal Eşitlik Modelleme analizleri yaş control edildiğinde, yönetici işlevlerin, zihin kuramı becerisini yordadığını, fakat ne yönetici işlevleri ne de zihin kuramının sosyal yetkinlik ile ilişkili olmadığını göstermiştir. Alıcı dil ise, sosyal yetkinlik ve yönetici işlevleri doğrudan yordarken, zihin kuramını yönetici işlevler aracılığı ile dolaylı olarak yordamaktadır. Bu çalışma, erken dönemdeki gelişim alanları için alıcı dil becerisinin önemine dikkat çekmektedir.

Anahtar Kelimeler: Sosyal yetkinlik, zihin kuramı, yönetici işlevler, alıcı dil, yetiştirme kurumları.

ACKNOWLEDGMENTS

I feel grateful to all those who share unforgettable memories with me throughout this thesis process.

First, I would like to express my gratitude to my advisor Bilge Yagmurlu for her valuable guidance and support for all the times. I would also like to thank to my committee members Prof. Aylin Küntay and Assc. Prof. Sibel Kazak Berument for accepting to be a part of the thesis committee and providing scientific assistance and valuable comments for this thesis.

I warmly thank to my cohort members and homemates Didem Işık, Banu Acarlar, Zeynep Civelek and Oya Kürüm. Their presence has been one of the things that make me happy every time, even in the most stressful times. Furthermore, I owe special thanks to Hatice Melis Yavuz for her sincere friendship in every situation beginning from the day I met her.

Last but not least, I am deeply thankful to my parents and my sister for supporting me in my all decisions.

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Chapter 1

INTRODUCTION

The recognition that social behavior in the preschool period continues to later years and predicts subsequent functioning in other domains like academic achievement (Masten et al.,1995; Oades-Sese, Esquivel, Kaliski, & Maniatis, 2011) and psychological well-being (Anselmi et al., 2008; Bornstein, Hahn, & Haynes, 2010) has led the researchers to examine predictors of early social competence and the nature of associations between social competence and other domains, particularly cognition (e.g., Razza & Blair, 2009; Suway, Degnan, Sussman, & Fox, 2011). Cognitive and sociocognitive abilities like executive function (EF) (e.g., Hughes & Ensor, 2008) and theory of mind (ToM) have been reported to be related with social behavior in children showing both typical (e.g., Jenkins & Astington, 2000) and atypical development (i.e., autism) (Peterson, Slaughter, & Paynter, 2007). However, most of this research was conducted with child samples with at least a middle socioeconomic background (e.g., Watson, Nixon, Wilson, & Capage, 1999). Smaller number of studies examining development in a wide range of socioeconomic backgrounds frequently indicated that children from disadvantaged circumstances displayed high levels of aggressive, withdrawn, and/or anxious behaviors (Berger, Paxon, & Waldfogel, 2009) and were significantly behind in cognitive and language abilities (Cutting & Dunn, 1999). Stating the significance of environment, researchers emphasized the need to work with diverse child samples to identify developmental pathways in each context (e.g., Hughes et al., 2005). A special underprivileged group is children who live in child-rearing institutions. Research has shown that institution-reared children experience major difficulties in almost all

areas of development (MacLean, 2003); interestingly yet, we have little knowledge on the pattern of the links among basic developmental domains for this group. In this study, we aimed to investigate concurrent relations between social competence, ToM, and EF in Turkish preschool children who live in rearing institutions. We used the Theory-of-Mind Scale of Wellman and Liu (2004) to measure ToM, that allowed us examine sequential progressions in mental state understanding in Turkish children; which was another aim of the study.

In this thesis, Chapter 1 gives a general introduction about the significance and the purpose of this study. Chapter 2 provides a review of the relevant literature on social competence, ToM, and EF, and presents a summary of the findings on development of institution-reared children. The aims and hypotheses of the current study are presented in Chapter 3. Detailed information about the participants, measures, and procedure of the study is presented in Chapter 4. Following that, Chapter 5 presents the results of the statistical analyses. Findings of the present research are discussed along with its strenghts and limitations, and directions for future research in Chapter 6.

Chapter 2

LITERATURE REVIEW

2.1 Social Competence

Social competence is defined as forming and maintaining positive social interactions with others while striving for personal goals (Rubin & Rose-Krasnor, 1992). Socially competent children engage in harmonious interactions, show less antisocial and more prosocial behavior, understand emotion expressions, and remain emotionally and behaviorally organized in challenging situations (Denham, 1986; Garner, 1996). After the second year of life, throughout preschool years, there is a general decrease in children's aggressive behaviors (Walker, 2005) and an increase in their prosocial acts (Eisenberg & Fabes, 1998). This is linked to improvement in various domains like social cognition, language, and self regulation (Denham, 1986).

2.2 Theory of Mind

Understanding others' minds is a sociocognitive ability that has been conceptualized to be necessary for engaging in socially competent behavior (Astington, 2003). ToM is characterized by the acquisition of understanding that people can have various mental states that may contradict reality and lead to different actions (Flavell, 1999; Wellman, Cross, & Watson, 2001). A significant improvement occurs in ToM between 3 and 5 years of age (Jenkins & Astington, 2000), which helps children to form more accurate associations between mental states and behavioral outcomes in social situations.

ToM has a multifaceted nature and includes an interconnectedcollection of basic mental states like desires, beliefs, knowledge, thoughts, and feelings (Flavell, 1999). Studies showed that English-speaking children in the US (Wellman & Liu,

2004) and Australia (Peterson, Wellman, & Liu, 2005), and children in Indonesia

(Kuntoro, Saraswati, Peterson, & Slaughter, 2011) gain insights about the mind in a

predictable sequence following a stepwise development: diverse desires (DD),

diverse beliefs (DB), knowledge access (KA), false belief (FB), and hidden emotion

(HE) understanding, respectively. This sequential progression in ToM means that an

understanding that people hold diverse desires is acquired earlier than an

understanding that people hold diverse beliefs; understanding diversity in beliefs is

easier than understanding incorrectness of beliefs; understanding ignorance (one can

be knowledgeable where the other is ignorant) is attained before understanding false

belief, and a correct judgment of people's hidden emotions develops relatively later

in the sequence. Research carried out with Chinese (Wellman, Fang, Liu, Zhu, &

Liu, 2006) and Iranian (Shahaeian, Peterson, Slaughter, & Wellman, 2011) children,

however, indicated a different sequence where knowledge access preceded diverse

belief: DD > KA > DB > FB > HE. These findings, overall, have led the researchers

to question the existence of a universal sequence in acquisition of different aspects of

ToM and to suggest that gaining understanding about a specific aspect of mind

understanding might be more functional, and hence, primary in a culture than

acquiring others. According to this argument (Shahaeian et al., 2011), it might be that

understanding the valued and accepted knowledge in the community is more

important in collectivistic cultures such as China and Iran, and understanding

different opinions and beliefs is more important in individualistic cultures such as

U.S. and Australia, and in cultures like Indonesia where western style may be

observed in parenting practices (see Kuntoro et al., 2011 for a discussion). The

aspect of mental state understanding that is more important would consequently be

emphasized more strongly in socialization practices of that culture, resulting in its faster attainment.

2.3 Social Competence and Theory of Mind

Despite inconsistencies in the literature, many findings indicated a significant association between social competence and ToM: preschool children with better mental state understanding were found to display higher levels of sharing (Moore, Barresi, & Thompson, 1998), intentional behavior that requires considering others' beliefs (Lalonde & Chandler, 1995), social skills, and peer popularity (Watson et al., 1999) even after controlling for language ability (Astington & Jenkins, 1995). Longitudinal studies revealed that this link is bi-directional: from early mental state understanding to social competence (Jenkins & Astington, 2000) and vice versa (Razza & Blair, 2009; Suway et al., 2011). There are, however, findings as well which suggest that ToM is not related with socially competent behavior (Newton & Jenvey, 2011) and peer status in a significant way (Badenes, Estevan, & Bacete; 2000; Slaughter, Dennis, & Pritchard, 2002). Although the literature provides mixed evidence on this association, there is consensus that children become more skilled in understanding minds throughout preschool years and these abilities are reflected in children's social interactions (Hughes & Leekam, 2004). Differentiating one's own and others' mental states make children more aware of possible interpretations of situations and help them shape their social behaviors accordingly. Thus, understanding others' mental states may not be sufficient by itself but appears to be necessary for engaging in adaptive and positive behavior (see Astington, 2003 for a discussion).

2.4 Executive Function, Theory of Mind, and Social Competence

A significant correlate of both social behavior and ToM is EF, a key cognitive ability that refers to the collection of processes like attention shifting, working memory, and inhibitory control, which guides behaviors towards a goal (Welsh, Pennington, & Groisser, 1991). EF is conceptualized to be the cognitive component of self regulation that leads to behavioral competence (Rueda, Posner, & Rothbart, 2005). Controlling attention, managing new information, and modulating oneself help children to function more adaptively in face of demands of the social world. This way, children can attend to exigencies during social interactions, and regulate their desires, thoughts and behaviors appropriately (Hughes & Ensor, 2008).

Studies investigating the relations between social behavior and EF have focused mostly on behavioral problems and little on social competence. The findings revealed that poor EF predicted externalizing behaviors (Hughes, White, Sharpen, & Dunn, 2000) and developmental disorders characterized by problems in the social domain such as autism (Ozonoff, Pennington, & Rogers, 1991). One of the few studies that focused on positive social outcomes (Razza & Blair, 2009) indicated that controlling for language, preschool EF was significantly associated with preschool social competence; however, it was not associated with kindergarten social competence.

ToM is also considered to be closely related with EF (Hughes, 2011; Moses & Tahiroglu, 2010): as the abilities to focus attention and handle more information improve, children become more likely to realize the presence of distinct mental states and to differentiate own minds from others' (Carlson, Moses, & Breton, 2002; Hala, Hug, & Henderson, 2003). Empirical studies revealed a significant link between EF and ToM both in children with typical development and in those with

autism (Ozonoff et al., 1991; Pellicano, 2010). EF predicted ToM both concurrently (Carlson & Moses, 2001; Perner, Lang, & Kloo, 2002) and longitudinally (Carlson, Mandell, & Williams, 2004; Flynn, 2007; Hughes, 1998) and some findings showed that the link between the two abilities is reciprocal (Kloo & Perner, 2003; Müller, Liebermann-Finestone, Carpendale, Hammond, & Bibok, 2012).

On the whole, the ability to regulate one's own thoughts, emotions, and behaviors requires multiple and complex attentional and cognitive skills like tuning out distractions to focus on something and actively processing multiple tasks. The processes of attention, working memory, and inhibitory control set the stage for identifying different mental states. These cognitive abilities decrease the likelihood of impulsive behavior and increase the chances that the child considers different behavior options and enacts regulated behavior. Considering these, Hughes, Dunn and White (1998) proposed that the association between EF and social competence could be an indirect one that is mediated by ToM. Although theoretically firm, this proposition has not been supported by empirical findings (Razza & Blair, 2009).

2.5 Institutional Rearing

While becoming rare in the West, institutionalization is still a very common way in many developing countries like Turkey to provide care for children who are in need of protection due to various reasons including parental death, abandonment, abuse, and severe poverty. Child-rearing institutions are typically deprived environments characterized by high child-staff ratio, limited stimulation, and unstable and restricted interaction with care providers (MacLean, 2003; Rutter, 1981; The St. Petersburg-USA Orphanage Research Team, 2005); and children in institutional care have been frequently found to have impaired development in all domains (Kaler & Freeman, 1994; Van IJzendoorn et al., 2011).

With respect to the social domain, they have been reported to display higher levels of withdrawn behavior, indiscriminately social/disinhibited behavior and/or externalizing problems compared to their counterparts in foster care (Roy, Rutter, & Pickles, 2004) and who were adopted (Lee, Seol, Sung, Miller, & Minnesota International Adoption Project Team, 2010). In a study conducted in Turkey (Simsek, Erol, Öztop, & Münir, 2007), elementary school children in institutions were found to show significantly more attention problems, rule-breaking, and aggressive behaviors than the family-reared children.

Children in institutions have also been indicated to show persistent impairment in cognitive domains such as working memory (Bauer, Hanson, Pierson, Davidson, & Pollak, 2009; Bos, Fox, Zeanah, & Nelson, 2009), EF (Colvert et al., 2008), planning, attention shifting (Bauer et al., 2009), and face processing (Moulson, Westerlund, Fox, Zeanah, & Nelson, 2009). Regarding ToM development, Tarullo, Bruce and Gunnar (2007) found that 6-7-year-old children under institutional care showed significant delay in FB understanding compared to parent-reared children. Similarly, Yagmurlu, Berument, and Celimli (2005) showed that being reared in institution negatively predicted Turkish preschoolers' ToM over and above child's age, sex, verbal, and nonverbal abilities.

Studies have also revealed that the length of institutionalization is related with the extent of problems in mental state understanding (Colvert et al., 2008), attention, behavioral inhibition, and peer interactions (Gunnar, Van Dulmen, and the International Project Team, 2007), and early entry to the institution (i.e., in the first 12 or 18 months of life) predicts later behavior problems (Hawk & McCall,

2011) and deficits in executive skills (Merz & McCall, 2011) and sensory

processing (Wilbarger, Gunnar, Schneider, & Pollak, 2010).

Chapter 3

PRESENT STUDY

A review of the extant literature reveals that children in institutional care exhibit difficulties in many areas, including social competence, mental state understanding, and executive skills. Nevertheless, these studies have typically focused on the levels of developmental abilities but not on the predictive associations among them. A few exceptions (Colvert et al., 2008) investigated the role of ToM and EF in adverse outcomes, such as inattention/overactivity, quasi-autism, and disinhibited attachment, which are widely observed in institution-reared children. However, given that early adaptive behavior persists into later stages of life and predicts many important outcomes, including those in the academic domain (e.g., Masten et al.,1995) and psychological well-being (e.g., Anselmi et al., 2008), it is worthwhile to investigate social competence in institution-reared children and its relations with ToM and EF in the preschool period. Examining the role of executive skills in mental state understanding is another meaningful question to tackle, to identify the possible direct and indirect relationships among EF, ToM, and social competence. This was the first aim of the present study.

To achieve this goal, we worked with a large sample of preschool children with varying lengths of institutional experience and measured the research variables via well-established tools. To measure mental state understanding thoroughly, we used the ToM scale of Wellman and Liu (2004). This allowed us to explore the developmental sequence of ToM acquisition in Turkish preschoolers, which was the other aim of the study. In the thesis, we first present the analyses performed to investigate the sequence of steps in ToM development in Turkish preschoolers

(research question 1). This research question contributes to a discussion on the role of cultural context in acquisition of mental state understanding. Due to the paucity of accumulated evidence in the relevant literature, we had no specified predictions in favor of an "individualistic sequence" that was observed in U.S. (Wellman & Liu, 2004), Australia (Peterson et al., 2005), and Indonesia (Kuntoro et al., 2011) or a "collectivist sequence" observed in China (Wellman et al., 2006) and Iran (Shahaeian et al., 2011).

We then present the statistical analyses conducted to investigate the concurrent associations between social competence, ToM, and EF in our sample (research question 2). Although there is a possibility that the relations among developmental domains for institution-reared children might be dissimilar (or similar) with those reported for parent-reared children, we formed our predictions in light of the extant literature (major conceptualizations and empirical findings) which is mainly based on children reared in typical contexts (i.e., family). Therefore, we expected that with the development of EF, children would become more capable of representing other people's mental states. We also expected that better EF and ToM would be related to higher levels of social competence. Given the pairwise associations among EF, ToM, and social competence, and the conceptual background (Hughes et al., 1998) we also wanted to examine the possible indirect relation between EF and social competence through ToM. Due to the pronounced role of receptive language in mental state understanding (e.g., Milligan, Astington, & Dack, 2007) and social interactions (e.g., Longoria, Page, Hubbs-Tait, & Kennison, 2009), we controlled for receptive language in all regression analyses. In addition, we explored the possible indirect relations among these developmental domains via

Structural Equation Modeling (SEM). We also explored age- and sex-related

differences in EF, ToM, and social competence as part of the preliminary analyses.

Chapter 4

METHOD

4.1 Participants

The data were drawn from 107 preschool children residing in four child-rearing institutions located in three big cities in Turkey (see Table 1 for descriptive statistics). The sample consisted of twenty-one 3-year-olds, thirty-nine 4-year-olds, and forty-seven 5-year-olds. Eighty-one participants were boys (M_{age} = 57.95 months, SD = 9.14) and 26 were girls (M_{age} = 53 months, SD = 10.95); reflecting the state that girls are more likely to be adopted than boys in Turkey. Children in the sample had spent on average 37% of their lives in child-rearing institutions. Thirty five percent of the children were attending preschool. Primary child-care providers (N = 22) of the children also participated in the study by completing the demographic forms (see Appendix A), a screening inventory for child's general development, and the social competence scales (see Table 1 for care provider information). On average, one child-care provider gave information for 4.86 children (range = 1 to 10). None of the children had a known chronic physical health problem or developmental disorder. Children (N = 10) who were found to have developmental delay (indicated by a standard t-score lower than 35 from the screening inventory; see Section 4.2 for the developmental screening inventory) were not given the tasks measuring ToM and EF, and not described in this thesis.

All the four child-rearing institutions were established and operated by the Ministry of Family and Social Policies; therefore, they had very similar environmental characteristics (e.g., furnitures, toys etc.) and regulations. In each

Table 1

Demographic Profile of Institution-reared Children (N = 107) and their Primary Child-care Providers (N =22), and Descriptive Statistics for Study Variables.

Variable	M	SD	Min	Max	3 year-olds (n = 21)		4 year-olds (n = 39)		5 year-olds (n = 47)	
					M	SD	M	SD	M	SD
Age of child (in months)	56.75	9.79	36	71						
Age of entry in a child-rearing institution (in months)	35.47	16.99	0	65						
Duration of stay in the institution (in months)	21.28	17.27	2	70						
Duration of stay in the current institution (in months)	18.07	15.29	2	69						
Age of primary child-care provider (in years)	25.98	4.58	20	37						
Duration of care provided to the child's group (in months)	10.27	8.67	2	36						
Executive function [a,b] (0-1)	0.5	0.28	0	1	0.24	0.16	0.5	0.25	0.61	0.27
ToM [a,b] (0-4)	2.18	1.02	0	4	1.38	0.97	2.23	0.81	2.49	1.02
Social competence [b,c] (8-32)	21.58	4.65	11	32	18.93	4.49	21	4.73	23.26	4.04

[a] indicates significant difference between 3 and 4 year-olds. [b] indicates significant difference between 3 and 5 year-olds. [c] indicates a marginally significant difference ($p = .06$) between 4 and 5 year-olds.

institution, there were separate flats for each age group with a living room, kitchen unit, bathroom, and bedrooms. Each group had a female teacher who had received high school education with specialization on child development; she conducted the daily educational activities in weekdays. There were also three child-care providers for each age group, working on a shift system to provide coverage 24/7. They were responsible for physical care of the children and had attended training programs on child care provided by the Ministry. At the time the study was conducted, the number of children in each age group ranged between 8 and 13, and mean of child-staff ratio, which indicated the number of children per caregiver (both teachers and child-care providers) during a shift time, was 4.84 ($SD = 1.08$, $min = 3.00$, $max = 6.67$).

4.2 Materials

Developmental level. The Ankara Developmental Screening Inventory (ADSI; Savasir, Sezgin, & Erol, 1998) is a valid and reliable screening instrument for 0-6 year-old Turkish children. It includes 154 items that tap language-cognitive, fine motor, gross motor skills, and social and self-care development. The instrument provides a total raw score, which is converted to a standard *t-score*. A standard *t-score* of 50 represents the mean ($SD = 10$); 60 and 40 represent 1 SD above and below the mean, respectively (showing the typical development range), and 35 and lower represent developmental delay. The developmental level scores for our sample ($N = 107$) ranged between 36 and 61, with a mean of 48.49 ($SD = 5.93$); and were similar for girls ($M = 48.69$, $SD = 7.68$) and boys ($M = 48.42$, $SD = 5.31$); $F (1, 105) = .04$, *ns*.

Social competence. Two scales were utilized to assess social competence during peer play and during everyday interactions with peers and teachers (see Appendix B). Each scale included 8 items being rated on a 4-point Likert scale (1 =

"never" and 4 = "always"). To assess socially competent behavior during peer play, the Play Interaction subscale (e.g., 'Shares toys with others') of Penn Interactive Peer Play Scale (Fantuzzo, Mendez, & Tighe, 1998) was used. The Turkish adaptation of the scale was made by Öztürk (2011). Scores for each item were summed to obtain the play interaction subscale score ($M = 20.73$, $SD = 4.64$; $\alpha = .78$).

To assess socially competent behavior during general peer- and teacher-interactions, the Social Competence subscale of the Social Competence and Behavioral Evaluation Scale (LaFreniere & Dumas, 1996) was used. The Turkish adaptation of this scale was made by Corapci, Aksan, Arslan-Yalcin, and Yagmurlu (2010). Scores for each item (tapping tolerant, socially integrated, prosocial, cooperative behavior) were added to calculate the social competence subscale score ($M = 22.44$, $SD = 5.25$; $\alpha = .82$). The Play Interaction and Social Competence subscale scores were highly and positively correlated ($r(107) = .77$, $p < .001$); and were averaged to compose a total social competence score.

Theory of mind. The ToM scale (Wellman & Liu, 2004) included six tasks presented in the following order: *diverse desires (DD)*, *knowledge access (KA)*, *contents false belief (CFB)*, *diverse beliefs (DB)*, *explicit false belief (EFB)*, and *hidden emotion (HE)*, since Wellman and Liu (2004) found no effect of task order on ToM performance (see Appendix C for description of each task). The ToM scale was translated into Turkish by the authors and a graduate student (Kahraman, 2012). Similar to the original study (Wellman & Liu, 2004), all children who passed both the contrast and control questions and the target question were regarded as having passed the task. For each task, the child got a score of 0 for incorrect and 1 for correct responses; all scores were summed to get a total ToM score.

Executive function. EF was measured by two commonly used tasks (e.g., Razza & Blair, 2009; Carlson & Moses, 2001) that require children to hold a new rule in mind, detect the conflict between dominant and subdominant responses, and inhibit the natural dominant response: The day-night and the peg-tapping tasks (see Appendix D).

Day-night task. In the day-night task (Gerstadt, Hong, & Diamond, 1994), the child was instructed to show the picture of a nighttime sky with a moon and stars when the experimenter says the word 'day' and to show the picture of the daytime sky with suns when the experimenter says the word 'night'. After the child showed correct understanding of the rules during practice trials, he/she was administered a series of 10 test trials where each correct response was scored as 1 point. A proportion score -the number of correct responses divided by the total number of trials- was calculated as a measure of performance on the task.

Peg-tapping task. In the peg-tapping task (Diamond & Taylor, 1996), a wooden peg was presented and the child was instructed to tap twice right after the experimenter tapped once (Rule 1) and to tap once after the experimenter tapped twice (Rule 2). After the child showed correct understanding of the rules during practice trials, he/she was administered a series of 12 test trials with each correct tapping response scored as 1 point. Next, a new rule (Rule 3) was added to the task: not to tap after the experimenter tapped three times. After passing the practice trials, the child was administered a new series of 12 test trials and got 1 point for each correct tapping response. A proportion score -the number of correct responses divided by the total number of trials- was calculated as a measure of performance on the task (Blair & Razza, 2007). Day-night and peg-tapping tasks had a positive

correlation, $r(107) = .48$, $p < .001$; thus, the two task scores were averaged to compute a composite score of EF (see Hughes & Ensor, 2008; Pellicano, 2010).

Receptive language. The Turkish Expressive and Receptive Language Test (TIFALDI-AD; Berument & Güven, 2010) was used to measure receptive language. It is the Turkish equivalent of the Peabody PVT test, where the child is shown a series of four pictures and asked to choose the one that corresponds to the word which is read by the experimenter. Studies revealed high internal consistency, test-retest reliability, and split-half reliability for the test (Baydar, Küntay, Göksen, Yagmurlu, & Cemalcilar, 2008; Berument & Güven, 2010). The latent vocabulary scores were obtained by applying a three-parameter Item Response Theory model, which were then regressed on linear and quadratic indicators of age (in months) to obtain the residualized scores (Baydar et al., 2008). The obtained z-sores were used as the indicator of receptive language ability level.

4.3 Procedure

The data were collected after getting the approval of the University Ethics Committee and the Ministry of Family and Social Policies. Two visits were held within two days for behavioral assessments of all participants by the researcher. In the first visit, the child was first given the receptive language test and then the EF tasks (day-night and peg-tapping, successively) in a separate and quiet room with no one else present (lasted about 30-40 minutes). In the second visit, the ToM scale was given to the child in the same room (lasted about 20-30 minutes). No child displayed any discomfort and did not want to end the session before it was complete. The forms and scales were completed by the child's primary care provider in the institution in the first or the second day (took about 20 minutes).

Chapter 5

RESULTS

For preliminary analyses, a ToM score out of 6 tasks was calculated ($M =$ 2.56, $SD = 1.15$, $min = 0$, $max = 5$). Two percent of the children had a score of 0; 16% had a score of 1; 35% had a score of 2; 23% had a score of 3; 21% had a score of 4; 5% had a score of 5 (out of 6 tasks); and none of the children passed all the six ToM tasks. The 6-items ToM task score was positively correlated with child's age, $r(107) = .42$, $p < .001$ and did not differ significantly in girls and boys, $F(1, 105) = .22$, ns.

Two sets of statistical analyses were conducted to examine the developmental sequence of ToM acquisition. First, whether the six ToM tasks were similar or different in terms of difficulty level was explored. Next, scaling of the ToM tasks was analyzed.

5.1 Pairwise Comparisons

Initially, the performance of the children on each task was examined: 91% of children passed diverse desires (DD), 71% passed diverse beliefs (DB), 44% of them passed knowledge access (KA), 20 and 12% of children passed explicit false belief (EFB) and contents false belief (CFB), respectively, and 19% of them passed hidden emotion (HE). To examine the difficulty level of the six tasks, McNemar's chi-square tests were conducted. The results of pairwise comparisons indicated that all tasks were significantly different from each other in terms of difficultness ($p = .0001$), except three: EFB, HE, and CFB. 1) The number of pairs where children passed EFB but not HE (51%) was not significantly different from the number of

pairs where children passed HE but not EFB (49%), McNemar's $\chi^2(1) = 0$, *ns*. 2) The

number of pairs where children passed HE but not CFB (61%) was not significantly

different from the number of pairs where children passed CFB but not HE (39%),

McNemar's $\chi^2(1) = 1.16$, *ns*. 3) The number of pairs where children passed EFB but

not CFB (63%) was not significantly different from the number of pairs where

children passed CFB but not EFB (37%), McNemar's $\chi^2(1) = 1.63$, *ns*. These

pairwise comparisons showed that EFB, HE, and CFB tasks did not differ from each

other in terms of difficulty level. Thus, EFB and HE were excluded from further

analysis. Wellman and Liu (2004) found that EFB and CFB were similar in difficulty

level, and did not use EFB in further analysis but kept only the CFB task as an

indicator of false belief. We preferred to keep false belief in the ToM score, rather

than HE, since false belief is conceptualized as one of the main aspects of ToM

(Wellman et al., 2001) and emphasized to be an important aspect of mind

understanding that is related with social competence (Astington, 2003). In the rest of

the thesis, FB (false belief) is used to refer to the CFB task.

5.2 Guttman Scale Sequences

For this set of analysis, Guttman scale sequences of four tasks (DD, DB, KA,

and FB) were examined. Guttman scaling, or scalogram analysis, is a method used to

establish a pattern in a scale in which items are ranked depending on their difficulty;

thus, if a respondent passes an item, he/she must pass all previous items (Guttman,

1950). By Guttman scaling, reproducibility of a set of items is estimated to make the

items fit the ideal patterns (Green, 1956). As shown in Table 2, responses of 89% of

the children (95 of 107) fit this four-item Guttman scale. Using Green's method of

estimation, the coefficient of reproducibility was calculated to identify the scalable

items (values > .90). The coefficient of reproducibility of the data was .97. In

addition, Green's index of consistency, which is regarded as a highly conservative measure, was calculated to test whether or not the observed coefficient of reproducibility was higher than what could be achieved by chance alone (values > .50). The index of consistency of the data was .57. Both coefficients indicated that the four-item ToM scale was highly scalable. In contrast, for the five-Item Guttman scale (DD > DB > KA > FB > HE), the coefficient of reproducibility of the data was .94; and the index of consistency was .33. It was not scalable for this data set.

Table 2

Guttman Scalogram Patterns for a Four-Item Scale

Pattern	1	2	3	4	5	Other patterns
Diverse Desire	-	+	+	+	+	
Diverse Belief	-	-	+	+	+	
Knowledge Access	-	-	-	+	+	
Contents False Belief	-	-	-	-	+	
Participants						
3-year-olds ($n = 21$)	4	8	5	3	0	1
4-year-olds ($n = 39$)	0	5	19	9	3	3
5-year-olds ($n = 47$)	1	4	11	15	8	8
Total ($N = 107$)	5	17	35	27	11	12

Note. A minus sign means the child failed the task; a plus sign means child passed the task. The 5 focal patterns represent 5 of the total possible 16 patterns of response encompassing the four items. Child showing any of the remaining 11 patterns was classified as other.

After it was confirmed that the four tasks formed a scalable set with a progressive sequence of DD > DB > KA > FB, the total ToM score was calculated

out of 4 tasks (see Table 2). Five percent of the children had a score of 0; 20% had a

score of 1; 39% had a score of 2; 26% had a score of 3; and 10% had a score of 4

(out of 4 tasks). The ToM total score was positively correlated with age, $r(107) = .45$,

$p < .001$, but did not differ in girls and boys, $F(1, 105) = .09$, ns.

5.3 Age-related Differences

ANOVAs were performed to examine age-related differences in EF, ToM,

and social competence of 3, 4, and 5 year-old children (see Table 1). Overall

differences between the three age groups were significant for EF ($F(2, 104) = 16.18$,

$p < .001$, $\eta^2 = .24$), ToM ($F(2, 104) = 10.22$, $p < .001$, $\eta^2 = .16$), and social

competence ($F(2, 104) = 7.60$, $p = .001$, $\eta^2 = .13$). (Table 1 presents the Bonferonni

post hoc comparisons for differences between age groups.)

5.4 Sex-related Differences

Because boys were significantly older than girls ($F(1, 105) = 5.23$, $p = .02$, η^2

$= .05$), sex-related differences were examined via ANCOVAs controlling for age.

The results showed that girls were more socially competent than boys ($F(1, 104) =$

13.53, $p < .001$, $\eta^2 = .12$); but boys and girls did not significantly differ on ToM ($F(1,$

$104) = 2.28$, ns), EF ($F(1, 104) = 2.35$, ns), and receptive language ($F(1, 104) = .01$,

ns).

5.5 Correlations among Variables

Zero-order correlations revealed that child's age was strongly and positively

correlated with EF, ToM, and social competence (see Table 3). Correlations of

receptive language with EF and social competence, and the one between EF and

ToM were significant both before and after the child's age was controlled. When age

controlled: the significant correlation between EF and social competence became

marginal, the one between ToM and social competence disappeared (Correlations of social competence with any of the six individual aspects of ToM were also non-significant when age was taken into account), and the correlation between receptive language and ToM became significant but still was low. The number of children per caregiver increased as child's age increased. After controlling for age, the significant correlation of child-staff ratio with EF and social competence disappeared. None of the child outcomes was associated with percentage of life in institution.

5.6 Predictive Associations among Variables

Two sets of hierarchical regression analyses were conducted to examine the predictive role of 1) EF in ToM, and 2) EF and ToM in social competence (see Table 4). Child's age and sex were introduced into the equation in the first step in all regression analyses. Because 'percentage of life spent in institution' and 'child-staff ratio' were not significantly associated with any of the study variables, they were not examined further in the regressions.

The first set of regression analysis revealed that the child's age significantly predicted ToM in the first step and receptive language further contributed to the prediction of ToM in the second step. In the third step, when EF was entered into the equation, the coefficient for receptive language became non-significant; and ToM was significantly and positively predicted by age and EF. Taken together with the result that receptive language and EF were significantly correlated (before and after age was controlled), these findings suggest that EF mediated the relationship between receptive language and ToM.

The second set of regressions showed that age and sex (being a girl) and receptive language significantly and positively predicted social competence. And

neither EF nor ToM was a significant predictor of social competence when introduced to the equation in the third step one at a time individually.

SEM was also conducted to test the model and to examine possible indirect relations among the study variables. Bootstrap analysis (Byrne, 2010) indicated that the model had a satisfactory fit with the data (see Figure 1). Standardized estimates for direct relations were consistent with those revealed by the regressions. The significant indirect path from receptive language to ToM via EF was also confirmed by SEM, $\beta = .04$, $p = .01$. In addition, SEM results revealed a significant indirect path from age to ToM through EF, $\beta = .06$, $p < .01$.

Table 3

Zero-order Correlations and Partial Correlations after Age is Controlled (N = 107)

Variables	1	2	3	4	5	6	7
1. Age	-						
2. Percentage of life institutionalized	.12	-	-.25**	-.05	-.04	.14	-.05
3. Child-staff ratio	.36***	-.19†	-	-.07	.03	-.09	.16
4. Receptive language	.00	-.05	-.06	-	.37***	.20*	.30**
5. Executive function	.54***	.04	.22*	.31***	-	.30**	.18†
6. ToM	.45***	.18†	.09	.18†	.47***	-	.07
7. Social competence	.38***	.00	.27**	.28**	.35***	.23*	-

Note. Zero-order correlations are presented below the diagonal, and partial correlations controlling for age are presented above the diagonal. The correlation between age and receptive language was 0, since receptive language score was age-standardized.
 †*p = .06. *p < .05. **p < .01. *** p ≤ .001.*

Table 4

Hierarchical Regression Analysis Predicting (1) ToM from Receptive Language and Executive Function (2) Social Competence from Receptive Language, Executive Function, and ToM

	Step 1			Step 2			Step 3 (regression 2)			Step 3 (regression 2)		
	B	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*
(1) DV: ToM												
Age	.05	.01	.48***	.05	.01	.48***	.04	.01	.34**			
Sex	-.32	.21	-.13	-.31	.21	-.13	-.24	.20	-.10			
Receptive language				.19	.09	.18*	.11	.09	.10			
Executive function							.92	.40	.25*			
R^2	.22			.25			.29					
F for change in R^2	14.62***			4.48*			5.39*					
(2) DV: Social Competence												
Age	.21	.04	.45***	.21	.04	.45***	.20	.05	.43***	.22	.05	.47***
Sex	-3.48	.95	-.32***	-3.46	.90	-.32***	-3.41	.92	-.32***	-3.52	.92	-.33***
Receptive language				1.28	.38	.27***	1.24	.41	.26**	1.32	.39	.28***
Executive function							.54	1.78	.03			
ToM										-.21	.43	-.05
R^2	.24			.32			.32			.32		
F for change in R^2	16.45***			11.17***			.09			.22		

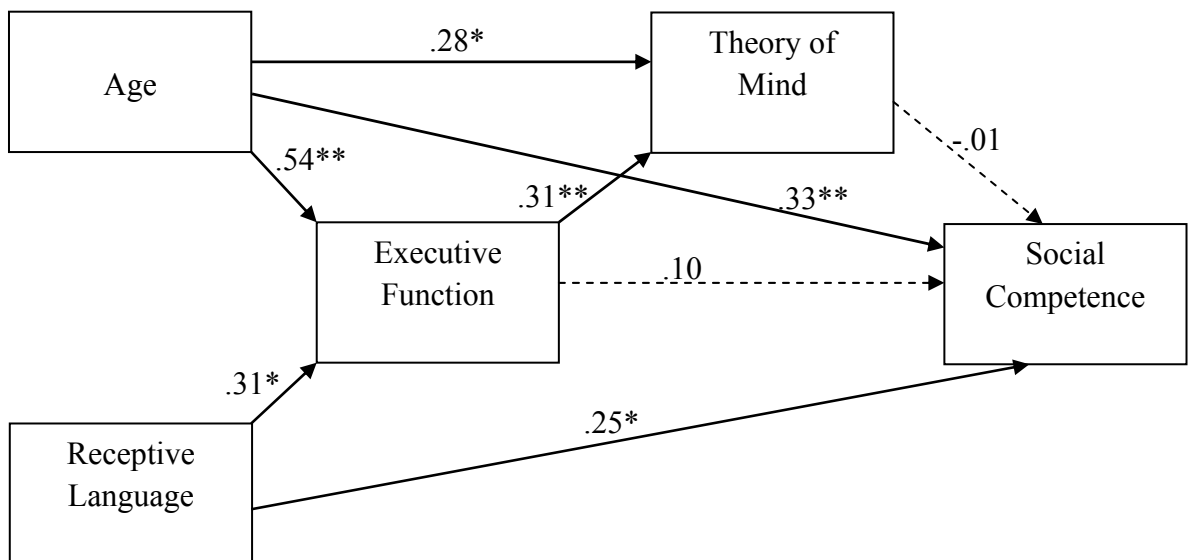*p < .05. **p < .01. ***p < .001.

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Figure 1. Standardized bootstrap estimates for the total sample

Note. Significant paths are depicted with solid lines, nonsignificant paths are with dashed lines. Model fit was satisfactory, $\chi^2 (2) = 1.23$, $p = .54$; CFI = 1.00, GFI = 1.00, AGFI = .97, and RMSEA = 0.00.
*p < .05. **p ≤ .01.

Chapter 6

DISCUSSION

6.1 Steps in Theory of Mind Development

Pairwise comparisons showed that the two FB tasks, the EFB and CFB tasks, were not significantly different in terms of difficulty level. This finding was similar to the earlier ones obtained by Wellman and Liu (2004) for US children and by Wellman et al. (2006) for Chinese children. Children's similar performance level on the FB tasks with different formats and materials suggested that these tasks successfully tap the degree of FB acquisition, and success or failure on them is not an artifact of task features (Wellman & Liu, 2004).

Similar to what Wellman and Liu (2004) did, we used CFB in further analysis as the indicator of FB. In the two studies conducted by Wellman and colleagues (Wellman & Liu, 2004; Wellman et al., 2006), FB understanding was significantly easier than HE understanding. In the present study, however, HE did not differ from FB in terms of difficulty level (the same result was obtained both with CBF and EFB). An explanation for this pattern is that both FB and HE tasks require an understanding of conflicting mental representations. The FB task requires recognizing another person's belief although this belief contradicts with reality; and the HE task requires recognizing another person's apparent emotion although this apparent emotion contradicts with his/her real emotion. Another explanation is about the facilitating role of distinct experiences in the understanding of hidden emotions. Peterson et al. (2005) found that children with autism acquired an understanding of hidden emotions earlier than false beliefs. They suggested that due to differences in

neurological functioning and environmental factors such as instructional strategies used in special education, children with autism may develop techniques to deal with real and apparent emotions without an understanding of mental states. It is possible that, in our sample, understanding hidden emotions was similarly facilitated by children's non-normative experiences that come with severe poverty, perhaps maltreatment, and for sure parental loss or separation. Exposure to a variety of emotional situations, many of which are probably negative, might have increased both the children's sensitivity to emotion-eliciting experiences (Trentacosta, Izard, Mostow, & Fine, 2006) and their knowledge of emotions and emotion regulation (Harris, 2000). In addition, Bugental, Shennum, Frank, and Ekman (2001) showed that children with a history of abuse detected deception more accurately compared to children without abuse history. Abusive parents commonly showed inconsistent behavior patterns which were conceptualized as an indicator of deception for their children. Thus, these children became more attentive to the cues for deception (Bugental et al., 2001). Similar processes may be observed among children residing in institutions considering their pre-institutional and institutional contexts. Such a personal history could have facilitated institution-reared children's awareness that emotions are sometimes masked for concord and one's real emotion can be different from how it looks.

Since understanding hidden emotions and false beliefs had similar difficultness, the 5-item sequence was not scalable. We preferred to keep the FB task in the scale (and the ToM composite score) because it is the central aspect of ToM that is commonly studied in the literature, especially in relation to social competence (see Astington, 2003). The analysis conducted with the four tasks revealed a progressive sequence of DD > DB > KA > FB. This order indicated that our sample

of Turkish preschoolers first understood diversity in non-cognitive mental states such as desires; then, they acquired an understanding of cognitive mental states like beliefs and knowledge; and later the conflicting mental representations like false beliefs. This sequence was in line with the "individualistic pattern" (DB > KA) observed in U.S. (Wellman & Liu, 2004), Australian (Peterson et al., 2005), and Indonesian (Kuntoro et al., 2011) children but not the "collectivistic pattern" (KA > DB) found in Chinese (Wellman et al., 2006) and Iranian (Shahaeian et al., 2011) samples (see Appendix E for a comprehensive summary of each task performance by study). This pattern that we found in Turkish institution-reared preschoolers might be due to the fact that many of the children had spent considerable amount of their lives in institutions and had lived together with a large number of children in similar ages. The relative ease of understanding diverse beliefs could be the outcome of their frequent exposure to various thoughts and opinions during their long-term and rich interaction with many peers in the institution. Or it might be reflecting just the relative ease of understanding diversity in beliefs than understanding knowledge, as true for many other child samples, such as in US, Australia, and Indonesia. The pattern revealed in this study has to be replicated with parent-reared samples for reaching a conclusion about the developmental sequence of ToM acquisition in Turkish preschoolers.

6.2 Age- and Sex-related Differences

We also examined the relations between demographic variables (i.e., age and sex) and EF, ToM, and social competence. We found that the child's age was positively associated with EF (e.g., Hughes, 1998), ToM (e.g., Wellman et al., 2001), and social competence (e.g., Walker, 2005). These results were consistent with the literature and revealed that executive skills, mental state understanding, and socially

competent behaviors of preschool-aged children living in child-rearing institutions improved significantly between the age of 3 and 6. With regard to sex-differences, the results revealed that girls were more socially competent than boys, but boys and girls did not differ on ToM and EF, controlling for age. The literature on sex differences in EF and ToM revealed mixed results. Some indicated a significant difference in favor of girls in social competence (Denham et al., 1991; Kochanska, 1997; Kochanska, Gross, Lin, & Nichols, 2002), ToM (Badenes et al., 2000; Walker, 2005), and EF (Hughes & Ensor, 2008), while some reported no significant difference in neither social competence (Hay, Caplan, & Nash, 2009), nor ToM and EF (e.g., Carlson et al., 2004; Hala et al., 2003; Razza & Blair, 2009). While girls' higher social competence scores may reflect their more harmonious and cooperative interactions, that may also indicate care providers' more favorable perceptions of girls compared to boys. The literature suggests that sex differences are more evident when rating scales are employed compared to observational measures (Grusec, Davidov, & Lundell, 2002; Iannotti, 1985). However, the finding that girls are more socially more competent and engage in more positive social behaviors has also been reported in earlier studies employing different measurement tools such as lab and naturalistic observations (e.g., Dunsmore, Noguchi, Garner, Casey, & Bhullar, 2008). This could be an outcome of children's temperamental characteristics (Sanson, Hemphill, Yagmurlu, & McClowry, 2011) and differential socialization (Whiting & Edwards, 1998; Yagmurlu & Sanson, 2009), that were beyond the scope of this research study.

The literature on institutionalized children does not focus much on sex differences in children's developmental outcomes. The ones that do, suggest that boys show more behavioral problems compared the girls (e.g., Gunnar et al., 2007).

The findings of Yagmurlu et al. (2005) study have also revealed that girls performed significantly better on ToM (FB and deception) tasks than boys. However, generally, no significant sex difference has been reported in children's ToM and EF performances (e.g., Colvert et al., 2008), similar to the findings of the present study.

6.3 Predictors of Theory of Mind and Social Competence

The results of this study revealed that, in line with the literature (e.g., Carlson et al., 2002; Hughes, 1998; Perner et al., 2002) and our expectations, EF significantly predicted ToM over and above child's age and receptive language. It also mediated the relations of ToM with age and with receptive language. Conflict inhibitory control requires the child to hold back a dominant response, to keep a conflicting new response in mind (necessitates working memory), and to activate it. Similarly, ToM requires inhibiting the actual or own mental representations, holding the other's mental representations in mind, and activating a response/behavior (which is appropriate to the situation) from the perspective of the other (Carlson & Moses, 2001). As Russell (1996) argued, this association implies two processes; EF may facilitate the *emergence* of ToM by assisting the comprehension of mental states, or it may facilitate the *expression* of ToM by enabling the child to reflect his/her mental state knowledge in behaviors. Accumulating evidence (Hughes, 2011; Moses & Tahiroglu, 2010) suggests that improvement in controlling attention and managing new information is necessary for processing different mental states. This was revealed also in our finding that age facilitated child's mind understanding through an increase in executive skills.

The finding that EF mediated the relations between receptive language and ToM is also supportive of the links suggested in earlier empirical and theoretical works. Associations between receptive language and understanding others' minds

(Carlson et al., 2004; Hughes, 2011), and between receptive language and EF (Hughes & Ensor, 2008; Müller et al., 2012) have been widely reported in earlier studies. In their meta-analysis, Milligan et al. (2007) revealed that early language ability, including receptive language, strongly predicted later ToM (FB) in preschool children. It is no wonder that communication introduces various minds to the child, makes him/her aware of the presence of different desires, beliefs or knowledge that he/she is unfamiliar with (Nelson, 2005). Receptive language, in particular, is a way to understand mental states; it helps the child capture various mental expressions and moves him/her towards the acquisition of ToM. According to the present findings, receptive language influenced the mind understanding through executive skills.

Studies also showed that vocabulary knowledge is a significant predictor of general cognitive ability (Marchman & Fernald, 2008) and executive skills (Müller et al., 2012). Verbalized instructions for the behavior help the child to think aloud about the appropriate behavior and how to activate that behavior. This way, the child develops self-speech for self-regulation. Thus, increased use of self-speech contributes to improvement in the cognitive component of self-regulation which is EF (Carlson et al., 2004; Vygotsky, 1962). Receptive language works as a tool for the child to regulate his/her cognitive abilities; it leads to an enhancement in executive functions, which in turn facilitates the ability to understand others' mental representations.

The analyses also highlighted the importance of early receptive language for social competence. This result is consistent with earlier findings (e.g., Gertner, Rice, & Hadley, 1994; Longoria et al., 2009; Öztürk, 2011) and conceptualizations that emphasize communicative ability as crucial for understanding social demands and

responding to them effectively (see Gallagher, 1993; Hart, Newell, & Olsen, 2003). Kaler and Kopp (1990) found that comprehension of requests was associated with compliance to the requests even as early as 12 months of age. Our finding correspondingly suggests that understanding what others express in words enhances communication and increases the chance that the child will engage in appropriate behavior that matches the social situation.

Receptive language was a critical ability for cognitive and social abilities of the institution-reared children. Although the present study did not aim to compare the levels of developmental areas between institution- and parent-reared preschoolers, to discuss about the differences on levels of the receptive language ability between institution-reared and parent-reared preschoolers, the means of age standardized receptive language scores of this sample and the nationally representative sample of 3 and 4 year-old Turkish children who participated in the study of Early Childhood Developmental Ecologies in Turkey (ECDET; Baydar et al., 2008) were compared. The comparison showed that while receptive language of the 3-year-old institution-reared children ($n = 21$) had a mean of -.03 ($SD = 1.02$), receptive language of the 3-year-old parent-reared children ($n = 1051$) had a mean of -.05 ($SD = 1.01$). For the 4-year-old children, both institution-reared preschoolers ($n = 39$) and parent-reared preschoolers ($n = 916$) had a mean of .05 ($SD = 1.08$, $SD = .94$, respectively). This examination shows that vocabulary knowledge of institution-reared preschool children (with age-appropriate developmental levels) is comparable to that of parent-reared preschool children

Our prediction that EF and ToM would be associated with social competence was partly confirmed. The moderate and significant correlations of social

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competence with EF and ToM both became non-significant when child's age and/or language were accounted for. These results suggest that the shared variance of both EF and ToM with social competence is partially due to age-related synchronical changes occurring in the cognitive and social abilities. The few studies (e.g., Hughes et al., 2000; Razza & Blair, 2009) that investigated the relation of EF with social competence, but not behavior problems, have likewise revealed that the strength of this association diminished considerably when age or language was controlled.

The literature on social competence and ToM reveals both a positive significant relation (e.g., Moore et al., 1998; Watson et al., 1999) and a non-significant relation (e.g., Badenes et al., 2000; Newton & Jenvey, 2011) between the two abilities. It is, however, acknowledged that understanding other's mental state (e.g., in the context of need) does not ensure prosocial acts (e.g., helping, sharing) (Astington, 2003). Because other factors like motivation and characteristics of the recipient play a significant part in social behavior, the link between mental state understanding and socially competent behavior is not a strong one (Carlo, Knight, Eisenberg, & Rotenberg, 1991). It is also asserted that the links between the two domains can appear to be more significant when social competence is measured to tap the behaviors that require understanding others' minds (Astington, 2003). For instance, while both comforting and helping daily activities are positive behaviors, comforting behavior requires understanding the thoughts or emotions of the other but helping daily activities is displayed more as part of the learned behavior patterns, hence is more conventional, requiring less perspective taking. In the present study, we wanted to investigate a large range of children's socially competent behaviors, and accordingly our social competence score reflected various modalities of positive and adaptive behavior, including the ones that probably did not necessitate an

advanced mind understanding (e.g., works easily in groups). However, even when we picked the social competence items that visibly demanded an understanding of others' mental states (eight items; e.g., comforts others when hurt; $\alpha = .85$), the association between ToM and social competence was still non-significant ($r = .16$, $p = .09$), suggesting that the weak link we found between ToM and social competence was not an artifact of our measurement methods.

6.4 Conclusion

Highlighting the strengths and weaknesses of the study is necessary for an accurate interpretation of the findings. A strength was the use of a comprehensive ToM measure that assesses child's understanding of different mental states, like diverse desires and beliefs, knowledge access, and false beliefs. So far, studies (e.g., Razza & Blair, 2009) on the associations between social competence, ToM, and EF have mainly focused on false belief as the key indicator of mental state understanding. A limitation of the study was, however, related to the measurement of social competence. It depended solely on child-care provider reports since observation methods could not be employed due to the restrictions of the Turkish Ministry of Family and Social Policies on videotaping children. It must also be acknowledged that the cross-sectional nature of the data does not allow causal inferences to be drawn. We used the term 'predictor' in the statistical sense and following from this, discussed some of the findings in terms of one factor having a 'role' in another as we referred to the paths in the tested model. However, it is recognized that there can be complex feedback loops among developmental domains and it would be more possible to delineate these intricate relationships with longitudinal studies.

The relations among social competence, ToM, EF, and language presented here pertain to institution-reared children who were born into the most disadvantaged families in Turkey. Our data do not allow arriving at a conclusion on these developmental abilities (e.g., their levels, associations) in average Turkish preschool children who typically live with their families. Future studies that include both parent-reared and institution-reared samples will be informative in this respect, and will let us identify any lag in development of disadvantaged child groups and spot differences in their developmental pathways, if any. While we presently cannot make comparative statements in this regard, our findings are enlightening, especially for pointing at the importance of early receptive language ability in social competence and EF, and for its indirect role in ToM through enhancing executive skills. An applied implication of this finding is that early linguistic stimulation is critical for development of children coming from deprived environments. Intervention programs that target early receptive vocabulary would benefit various other areas of development as well, both sociocognitive, cognitive, and social.

The results of this study are also informative about the nature of ToM acquisition in children residing in rearing institutions in Turkey. The investigation of sequential progression in mental state understanding contributes to the accumulating literature on the role of sociocultural context in ToM development. Future research with parent-reared normative Turkish child samples is again necessary for generalizability of the patterns of ToM acquisition revealed in this study. An argument with regard to a collectivistic vs. individualistic pattern and the role of socialization contexts in the development of such patterns can then be made more confidently.

References

Anselmi, L., Barros, F. C., Teodoro, M. L., Piccinini, C. A., Menezes, A. M. B., Araujo, C. L., & Rohde, L. A. (2008). Continuity of behavioral and emotional problems from pre-school years to pre-adolescence in a developing country. *Journal of Child Psychology and Psychiatry, 49*, 499-507. doi: 10.1111/j.1469-7610.2007.01865.x

Astington, J. W. (2003). Sometimes necessary, never sufficient: False-belief understanding and social competence. In B. Repacholi & V. Slaughter (Eds.), *Individual differences in theory of mind: Implications for typical and atypical development* (pp. 13-38). New York: Psychology Press.

Astington, J. W., & Jenkins, J. M. (1995). Theory of mind development and social understanding. *Cognition and Emotion, 9*, 151-165. doi: 10.1080/02699939508409006

Badenes, L., Estevan, R., & Bacete, F. J. G. (2000). Theory of mind and peer rejection at school. *Social Development, 9*, 271-283. doi: 10.1111/1467-9507.00125

Bauer, P. M., Hanson, J. L., Pierson, R. K., Davidson, R. J., & Pollak, S. D. (2009). Cerebellar volume and cognitive functioning in children who experienced early deprivation. *Biological Psychiatry, 66*, 1100-1106. doi:10.1016/j.biopsych.2009.06.014

References

Baydar, N., Küntay, A., Göksen, F., Yagmurlu, B., & Cemalcilar, Z. (2008). *Study of early childhood developmental ecologies in Turkey (ECDET)* [1st wave Data file]. Retrieved from http://portal.ku.edu.tr/~tecge/index.htm

Berger, L. M., Paxson, C., & Waldfogel, J. (2009). Income and child development. *Children and Youth Services Review, 31*, 978-989. doi:10.1016/j.childyouth.2009.04.013

Berument, S. K., & Güven, A. G. (2010). Turkish Expressive and Receptive Language Test: Receptive Vocabulary Subscale (TIFALDI-RT). Turkish Psychological Society.

Blair, C., & Razza, R.P. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development, 78*, 647–663. doi:10.1111/j.1467-8624.2007.01019.x

Bornstein, M.H., Hahn, C.S., & Haynes, O.M. (2010). Social competence, externalizing, and internalizing behavioral adjustment from early childhood through early adolescence: Developmental cascades. *Development and Psychopathology, 22*, 717-735. doi: 10.1017/S0954579410000416

Bos, K.J., Fox, N., Zeanah, C.H., & Nelson, C.A. (2009). Effects of early psychosocial deprivation on the development of memory and executive function. *Frontiers in Behavioral Neuroscience, 3*, 1-7. doi: 10.3389/neuro.08.016.2009

Bugental, D., Shennum, W., Frank, M., & Ekman, P. (2001). 'True Lies': Children's abuse history and power attributions as influences on deception detection. In

V. Manusov, J. H. Harvey, V. Manusov, J. H. Harvey (Eds.), *Attribution, communication behavior, and close relationships* (pp. 248-265). New York, NY US: Cambridge University Press.

Byrne, B. M. (2010). *Structural equation modeling with AMOS*. New York: Taylor & Francis Group.

Carlo, G., Knight, G. P., Eisenberg, N., & Rotenberg, K. J. (1991). Cognitive processes and prosocial behaviors among children: The role of affective attributions and reconciliations. *Developmental Psychology*, *27*, 456-461. doi: 10.1037/0012-1649.27.3.456

Carlson, S. M., Mandell, D. J., & Williams, L. (2004). Executive function and theory of mind: stability and prediction from ages 2 to 3. *Developmental Psychology, 40*, 1105-1122. doi: 10.1037/0012-1649.40.6.1105

Carlson, S. M., & Moses, L.J. (2001). Individual differences in inhibitory control and children's theory of mind. *Child Development, 72,* 1032–1053. doi: 10.1111/1467-8624.00333

Carlson, S. M., Moses, L.J., & Breton, C. (2002). How specific is the relation between executive function and theory of mind? Contributions of inhibitory control and working memory. *Infant & Child Development, 11*, 73-92. doi: 10.1002/icd.298

Colvert, E., Rutter, M., Kreppner, J., Beckett, C., Castle, J., Groothues, C., Hawkins, A., Stevens, S., & Sonuga-Barke, E. (2008). Do theory of mind and executive function deficits underlie the adverse outcomes associated with profound early deprivation?: Findings from the English and Romanian adoptees

study. *Journal of Abnormal Child Psychology, 36*, 1057-1068. doi: 10.1007/s10802-008-9232-x

Corapci, F., Aksan, N., Arslan-Yalcin, D., & Yagmurlu, B. (2010). The psychometric evaluation of the social competence and behavior evaluation scale with Turkish preschoolers. *Turkish Journal of Child and Adolescent Mental Health, 17*, 3-14.

Cutting, A. L., & Dunn, J. (1999). Theory of mind, emotion understanding, language, and family background: Individual differences. *Child Development, 70*, 853-865. doi: 10.1111/1467-8624.00061

Denham, S. (1986). Social cognition, prosocial behavior, and emotion in preschoolers: Contextual validation. *Child Development, 57*, 194-201. doi: 10.2307/1130651

Denham, S. A., Zahn-Waxler, C., Cummings, E. M., & Iannotti, R. J. (1991). Social competence in young children's peer relations: Patterns of development and change. *Child Psychiatry and Human Development, 22*, 29-44. doi: 10.1007/BF00706057

Diamond, A., & Taylor, C. (1996). Development of an aspect of executive control: Development of the abilities to remember what I said and to "do as I say, not as I do". *Developmental Psychobiology, 29*, 315-334. doi: 10.1002/(SICI)1098-2302(199605)29:4<315::AID-DEV2>3.0.CO;2-T

Dunn, J. (1995). Children as psychologists: The later correlates of individual differences in understanding of emotions and other minds. *Cognition and Emotion, 9*, 187–201. doi: 10.1080/02699939508409008

References

Dunsmore, J. C., Noguchi, R. P., Garner, P. W., Casey, E. C., & Bhullar, N. (2008). Gender-specific linkages of affective social competence with peer relations in preschool children. *Early Education And Development*, *19*(2), 211-237. doi: 10.1080/10409280801963897

Eisenberg, N., & Fabes, R. A. (1998). Prosocial development. In N. Eisenberg & W. Damon (Eds.), *Handbook of Child Psychology*, Vol. 4: Social, emotional and personality development (5th ed., pp. 701-778). New York: Wiley.

Fantuzzo, J., Mendez, J., & Tighe, E. (1998). Parental assessment of peer play: Development and validation of the parent version of the Penn Interactive Peer Play Scale. *Early Childhood Research Quarterly, 13*, 659-676. doi: 10.1016/S0885-2006(99)80066-0

Flavell, J.H. (1999). Cognitive Development: Children's knowledge about the mind. *Annual Review of Psychology, 50*, 21-45. doi: 10.1146/annurev.psych.50.1.21

Flynn, E. (2007). The role of inhibitory control in false belief understanding. *Infant and Child Development, 16*, 53-69. doi: 10.1002/icd.500

Gallagher, T.M. (1993). Language skill and the development of social competence in school-age children. *Language, Speech, and Hearing Services in Schools, 24,* 199–205.

Garner, P.W. (1996). The relations of emotional role taking, affective/moral attributions and emotional display rule knowledge to low-income school-age children's social competence. *Journal of Applied Developmental Psychology, 17*, 19-36. doi: 10.1016/S0193-3973(96)90003-9

References

Gerstadt, C. L., Hong, Y. J., & Diamond, A. (1994). The relationship between cognition and action: performance of children -7 years old on a stroop- like day-night test. *Cognition, 53*, 129-153. doi: 10.1016/0010-0277(94)90068-X

Gertner, B. L., Rice, M. L., & Hadley, P. A. (1994). Influence of communicative competence on peer preferences in a preschool classroom. *Journal of Speech and Hearing Research, 37,* 913–923.

Green, B. F. (1956). A method of scalogram analysis using summary statistics. *Psychometrica, 21,* 79-88. doi: 10.1007/BF02289088

Grusec, J. E., Davidov, M., & Lundell, L. (2002). Prosocial and Helping Behavior. In P. K. Smith & C. H. Hart (Eds.), *Blackwell Handbook of Childhood Social Development* (pp. 457-474). Oxford: Blackwell.

Gunnar, M., Van Dulmen, M.H.M., & The Minnesota International Adoption Project Team (2007). Behavioral problems of post-institutionalized internationally adopted children. *Development and Psychopathology, 19*, 129-148. doi: 10.1017/S0954579407070071

Guttman, L. (1950). The basis of scalogram analysis. In S.A. Stouffer, L. Guttman, E.A. Suchman, P.A. Lazarsfeld, S.A. Star, & J.A. Clausen (Eds.), *Measurement and prediction* (pp. 60 - 90). Princeton, NJ: Princeton University Press.

Hala, S., Hug, S., & Henderson, A. (2003). Executive function and false-belief understanding in preschool children: Two tasks are harder than one. *Journal of Cognition and Development, 4*, 275-298. doi: 10.1207/S15327647JCD0403_03

References

Harris, P.L. (2000). Understanding emotion. In M. Lewis & J. Haviland-Jones (Eds.), *Handbook of emotions* (2nd edition) (pp. 281 - 292). New York: Guildford Press.

Hart, C.H., Newell, L.D., & Olsen, S. (2003). Parenting skills and social-communicative competence in childhood. In J. O. Greene, B. R. Burleson, J. O. Greene, B. R. Burleson (Eds.) , *Handbook of communication and social interaction skills* (pp. 753-797). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Hawk, B., & McCall, R. B. (2011). Specific extreme behaviors of post-institutionalized Russian adoptees. *Developmental Psychology, 47*, 732-738. doi: 10.1037/a0021108

Hay, D. F., Caplan, M., & Nash, A. (2009). The beginnings of peer relations. In K. H. Rubin, W. M. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 121-142). The Guilford Press.

Hughes, C. (1998). Finding your marbles: Does preschoolers' strategic behavior predict later understanding of mind? *Developmental Psychology, 34*, 1326-1339. doi: 10.1037/0012-1649.34.6.1326

Hughes, C. (2011). *Social understanding and social lives: From toddlerhood through to the transition to school*. Hove, East Sussex: Psychology Press.

Hughes, C., Dunn, J., & White, A. (1998). Trick or Treat?: Uneven understanding of mind and emotion and executive dysfunction in "Hard-to-manage" preschoolers. *Journal of Child Psychology & Psychiatry & Allied Disciplines, 39*, 981-994. doi: 10.1111/1469-7610.00401

References

Hughes, C., & Ensor, R. (2008). Does executive function matter for preschoolers' problem behaviors. *Journal of Abnormal Child Psychology, 36*, 1-14. doi: 10.1007/s10802-007-9107-6

Hughes, C., & Leekam, S. (2004). What are the links between theory of mind and social relations? Review, reflections and new directions for studies of typical and atypical development. *Social Development, 13*, 590–619. doi: 10.1111/j.1467-9507.2004.00285.x

Hughes, C., Jaffee, S. R., Happé, F., Taylor, A., Caspi, A., & Moffitt, T. E. (2005). Origins of individual differences in theory of mind: From nature to nurture? *Child Development, 76*, 356–370. doi: 10.1111/j.1467-8624.2005.00850_a.x

Hughes, C., White, A., Sharpen, J., & Dunn, J. (2000). Antisocial, angry, and unsympathetic: 'Hard-to-manage' preschoolers' peer problems and possible cognitive influences. *Journal of Child Psychology and Psychiatry, 41*, 169-179. doi: 10.1111/1469-7610.00558

Iannotti, R. J. (1985). Naturalistic and structured assessments of prosocial behavior in preschool children: The influence of empathy and perspective taking. *Developmental Psychology, 21*(1), 46-55. doi: 10.1037/0012-1649.21.1.46

Jenkins, J. M., & Astington, J. W. (2000). Theory of mind and social behavior: Causal models tested in a longitudinal study. *Merrill-Palmer Quarterly, 46*, 203-220.

Kahraman, O. G. (2012). An investigation of the effects of a theory-of-mind based intervention program on 48-60months-old children's cognitive perspective

taking and prosocial behaviors. Unpublished doctoral dissertation. Gazi University, Ankara.

Kaler, S. R., & Freeman, B. J. (1994). Analysis of environmental deprivation: Cognitive and social development in Romanian orphans. *Journal of Child Psychology and Psychiatry, 35*, 769-781. doi: 10.1111/j.1469-7610.1994.tb01220.x

Kaler, S.R., & Kopp, C. B. (1990). Compliance and comprehension in very young toddlers. *Child Development, 61,* 1997–2003. doi: 10.2307/1130853

Kloo, D., & Perner, J. (2003). Training transfer between card sorting and false belief understanding: Helping children apply conflicting descriptions. *Child Development, 74*, 1823-1839. doi: 10.1046/j.1467-8624.2003.00640.x

Kochanska, G. (1997). Multiple pathways to conscience for children with different temperaments: From toddlerhood to age 5. *Developmental Psychology, 33*, 228-240. doi: 10.1037/0012-1649.33.2.228

Kochanska, G., Gross, J. N., Lin, M.-H., & Nichols, K. E. (2002). Guilt in young children: Development, determinants, and relations with a broader system of standards. *Child Development, 73*(2), 461-482. doi: 10.1111/1467-8624.00418

Kuntoro, I. A., Saraswati, L., Peterson, C., & Slaughter, V. (2011). *A tale of two cities: Micro-cultural influences on theory of mind development in Jakarta, Indonesia*. Manuscript submitted for publication.

References

LaFreniere, P. J., & Dumas, J. E. (1996). Social competence and behavior evaluation

in children ages 3 to 6 years: The short form (SCBE-30). *Psychological*

Assessment, 8, 369-377. doi: 10.1037/1040-3590.8.4.369

Lalonde, C. E., & Chandler, M. J. (1995). False belief understanding goes to school:

On the social-emotional consequences of coming early or late to a first theory

of mind. *Cognition and Emotion, 9*, 167-185. doi:

10.1080/02699939508409007

Lee, R. M., Seol, K. O., Sung, M., Miller, M. J., & Minnesota International Adoption

Project Team (2010). The behavioral development of Korean children in

institutional care and international adoptive families. *Developmental*

Psychology, 46, 468-478. doi: 10.1037/a0017358

Longoria, A. Q., Page, M. C., Hubbs-Tait, L., & Kennison, S. M. (2009).

Relationship between kindergarten children's language ability and social

competence. *Early Child Development & Care, 179*, 919-929. doi:

10.1080/03004430701590241

MacLean, K. (2003). The impact of institutionalization on child development.

Development and Psychopathology, 15, 853-884. doi:

10.1017/S0954579403000415

Marchman, V. A., & Fernald, A. (2008). Speed of word recognition and vocabulary

knowledge in infancy predict cognitive and language outcomes in later

childhood. *Developmental Science, 11*, 339-432. doi:10.1111/j.1467-

7687.2008.00671.x

References

Masten, A.S., Coatsworth, J.D., Neemann, J., Gest, S.D., Tellegen, A., & Garmezy, N. (1995). The structure and coherence of competence from childhood through adolescence. *Child Development, 66,* 1635-1659. doi: 10.2307/1131901

Merz, E. C., & McCall, R. B. (2011), Parent ratings of executive functioning in children adopted from psychosocially depriving institutions. *Journal of Child Psychology and Psychiatry, 52*, 537–546. doi: 10.1111/j.1469-7610.2010.02335.x

Milligan, K., Astington, J., & Dack, L. (2007). Language and theory of mind: Meta-analysis of the relation between language ability and false-belief understanding. *Child Development*, *78*, 622-646. doi: 10.1111/j.1467-8624.2007.01018.x

Moore, C., Barresi, J., & Thompson, C. (1998). The cognitive basis of prosocial behavior. *Social Development, 7*, 198-218. doi: 10.1111/1467-9507.00062

Moses, L. J., & Tahiroglu, D. (2010). Clarifying the relation between executive function and children's theories of mind. In J. Carpendale, G. Iarocci, U. Müller, B. Sokol, & A. Young (Eds), *Self- and Social-Regulation: Exploring the Relations between Social Interaction, Social Cognition, and the Development of Executive Functions* (pp. 218-233). New York: Oxford University Press.

Moulson, M. C., Westerlund, A., Fox, N. A., Zeanah, C. H., & Nelson, C. A. (2009). The effects of early experience on face recognition: An event-related

potential study of institutionalized children in Romania. *Child Development, 80*, 1039-1056. doi:10.1111/j.1467-8624.2009.01315.x

Müller, U., Liebermann-Finestone, D. P., Carpendale, J. M., Hammond, S. I., & Bibok, M. B. (2012). Knowing minds, controlling actions: The developmental relations between theory of mind and executive function from 2 to 4 years of age. *Journal of Experimental Child Psychology, 111*, 331-348. doi: 10.1016/j.jecp.2011.08.014

Nelson, K. (2005). Language pathways into the community of minds. In J. W. Astington & J. A. Baird (Eds.), *Why language matters for theory of mind* (pp. 26 – 49). New York: Oxford University Press.

Newton, E., & Jenvey, V. (2011). Play and theory of mind: associations with social competence in young children. *Early Child Development & Care, 181*, 761-773. doi: 10.1080/03004430.2010.486898

Oades-Sese, G. V., Esquivel, G. B., Kaliski, P. K., & Maniatis, L. (2011). A longitudinal study of the social and academic competence of economically disadvantaged bilingual preschool children. *Developmental Psychology, 47*, 747-764. doi: 10.1037/a0021380

Oyserman, D., Coon, H.M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin, 128*, 3-72. doi: 10.1037/0033-2909.128.1.3

Ozonoff, S., Pennington, B.F., & Rogers, S.J. (1991). Executive function deficits in high-functioning autistic children: Relationship to theory of mind. *Journal of*

References

Child Psychology and Psychiatry, 32, 1081-1106. doi: 10.1111/j.1469-7610.1991.tb00351.x

Öztürk, A. (2011). Social competence and parent child system in preschool. Unpublished doctoral dissertation. Hacettepe University, Ankara.

Pellicano, E. (2010). The development of core cognitive skills in autism: A 3-year prospective study. *Child Development, 81*, 1400-1416. doi: 10.1111/j.1467-8624.2010.01481.x

Perner, J., Lang, B., & Kloo, D. (2002). Theory of mind and self control: More than a common problem of inhibition. *Child Development, 73*, 752-767. doi: 10.1111/1467-8624.00436

Peterson, C. C., Slaughter, V. P., & Paynter, J. (2007). Social maturity and theory of mind in typically developing children and those on the autism spectrum. *Journal of Child Psychology & Psychiatry, 48*, 1243-1250. doi: 10.1111/j.1469-7610.2007.01810.x

Peterson, C. C., Wellman, H. M., & Liu, D. (2005). Steps in theory-of-mind development for children with deafness or autism. *Child Development, 76*, 502-517. doi: 10.1111/j.1467-8624.2005.00859.x

Razza, R. A., & Blair, C. (2009). Associations among false-belief understanding, executive function, and social competence: A longitudinal analysis. *Journal of Applied Developmental Psychology, 30*, 332-343. doi: 10.1016/j.appdev.2008.12.020

References

Roy, P., Rutter, M., & Pickles, A. (2004). Institutional care: associations between
overactivity and lack of selectivity in social relationships. *Journal of Child
Psychology & Psychiatry, 45*, 866-873. doi:10.1111/j.1469-
7610.2004.00278.x

Rubin, K. H., & Rose-Krasnor, L. (1992). Interpersonal problem solving and social
competence in children. In V. B. Van Hasselt & M. Hersen (Eds.), *Handbook
of social development: A lifespan perspective* (pp. 283-323). New York:
Plenum Press.

Rueda, M. R., Posner, M. I., & Rothbart, M. K. (2005). The development of
executive attention: Contributions to the emergence of self-regulation.
Developmental Neuropsychology, 28, 573-594. doi:
10.1207/s15326942dn2802_2

Russell, J. (1996). *Agency: Its role in mental development.* Hove: Erlbaum, Taylor &
Francis.

Rutter, M. (1981). *Maternal deprivation reassessed*. New York: Penguin.

Sanson, A., Hemphill, S., Yagmurlu, B., & McClowry, S. G. (2011). Temperament
and social development. In P. K. Smith & C. H. Hart (Eds.), *Wiley-Blackwell
handbook of childhood social development, 2nd ed* (pp. 227-245). West
Sussex, UK: Wiley-Blackwell.

Savasir, I., Sezgin, N., & Erol, N. (1998). Handbook of Ankara developmental
screening inventory (2nd ed.). Ankara, Turkey: Rekmay.

References

Shahaeian, A., Peterson, C. C., Slaughter, V., & Wellman, H. M. (2011). Culture and the sequence of steps in theory of mind development. *Developmental Psychology, 47*, 1239-1247. doi: 10.1037/a0023899

Simsek, Z., Erol, N., Öztop, D., & Münir, K. (2007). Prevalence and predictors of emotional and behavioral problems reported by teachers among institutionally reared children and adolescents in Turkish orphanages compared with community controls. *Children and Youth Services Review, 29*, 883-899. doi: 10.1016/j.childyouth.2007.01.004

Slaughter, V., Dennis, M.J., & Pritchard, M. (2002). Theory of mind and peer acceptance in preschool children. *British Journal of Developmental Psychology, 20*, 545-564. doi: 10.1348/026151002760390945

Suway, J.G., Degnan, K.A., Sussman, A. L., & Fox, N.A. (2011). The relations among theory of mind, behavioral inhibition, and peer interactions in early childhood. *Social Development, 21,* 331-342. doi: 10.1111/j.1467-9507.2011.00634.x

Tarullo, A.R., Bruce, J., & Gunnar, M.R. (2007). False belief and emotion understanding in post-institutionalized children. *Social Development, 16*, 57-78. doi: 10.1111/j.1467-9507.2007.00372.x

The St. Petersburg-USA Orphanage Research Team (2005). Characteristics of children, caregivers, and orphanages for young children in St. Petersburg, Russian Federation. *Journal of Applied Developmental Psychology, 26*, 477-506. doi: 10.1016/j.appdev.2005.06.002

References

Trentacosta, C. J., Izard, C. E., Mostow, A. J., & Fine, S. E. (2006). Children's emotional competence and attentional competence in early elementary school. *School Psychology Quarterly, 21*, 148-170. doi: 10.1521/scpq.2006.21.2.148

Van IJzendoorn, M. H., Palacios, J., Sonuga-Barke, E.J.S., Gunnar, M. R., Vorria, P., McCall, R.B., Le Mare, L., Bakermans-Kranenburg, M.J., Dobrova-Krol, N.A., & Juffer, F. (2011). I. Children in institutional care: Delayed development and resilience. *Monographs of the Society for Research in Child Development, 76*, 8–30. doi: 10.1111/j.1540-5834.2011.00626.x

Vygotsky, L. (1962). *Thought and language*. Cambridge, MA: MIT Press.

Walker, S. (2005). Gender differences in the relationship between young children's peer-related social competence and individual differences in theory of mind. *Journal of Genetic Psychology, 166*, 297-312. doi: 10.3200/GNTP.166.3.297-312

Watson, A.C., Nixon, C.L., Wilson, A., & Capage, L. (1999). Social interaction skills and theory of mind in young children. *Developmental Psychology, 35*, 386-391. doi: 10.1037/0012-1649.35.2.386

Wellman, H.M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development, 72*, 655-684. doi: 10.1111/1467-8624.00304

Wellman, H.M., Fang, F., Liu, D., Zhu, L., & Liu, G. (2006). Scaling of theory of mind understanding in Chinese children. *Psychological Science, 17*, 1075-1081. doi: 10.1111/j.1467-9280.2006.01830.x

References

Wellman, H.M., & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child Development, 75*, 523-541. doi: 10.1111/j.1467-8624.2004.00691.x

Welsh, M.C., Pennington, B.F., & Groisser, D. B. (1991). A normative-developmental study of executive function: A window on prefrontal function in children. *Developmental Neuropsychology, 7*, 131-149. doi: 10.1080/87565649109540483

Whiting, B. B., & Edwards, C. P. (1988). *Children of different worlds. The formation of social behavior*. Cambridge: Harvard University Press.

Wilbarger, J.L., Gunnar, M., Schneider, M., & Pollak, S. (2010). Sensory processing in internationally-adopted, post-institutionalized children. *Journal of Child Psychology and Psychiatry, 51*, 1105-1114. doi: 10.1111/j.1469-7610.2010.02255.x

Yagmurlu, B., Berument, S.K., & Celimli, S. (2005). The role of institution and home contexts in theory of mind development. *Journal of Applied Developmental Psychology, 26*, 521-537. doi: 10.1016/j.appdev.2005.06.004

Yagmurlu, B., & Sanson, A. (2009). Parenting and temperament as predictors of prosoocial behavior in Australian and Turkish-Australian children. *Australian Journal of Psychology, 61(2),* 77-88. doi: 10.1080/00049530802001338.

Appendix A

Genel Bilgi Formu

Dolduran kişinin adı-soyadı: _____

Anketi doldurduğunuz tarih: Gün_____   Ay_____   Yıl_____

Yuvanın adı: _____

Çalışmaya Katılan Çocuk ile İlgili Sorular:

1. Çocuğun adı ve soyadı: _____
2. Çocuğun doğum tarihi: Gün_____   Ay_____   Yıl_____
3. Çocuğun cinsiyeti (lütfen işaretleyiniz): Erkek_____   Kız_____
4. Çocuğun ilk kez SHÇEK bünyesindeki herhangi bir kuruma geldiği tarih:
 Gün_____   Ay_____   Yıl_____
5. Çocuğun ilk kez şu anda kalmakta olduğu kuruma geldiği tarih:
Gün_____   Ay_____   Yıl_____
6. Çocukta herhangi bir gelişimsel sorun var mı? (örnek: otizm, Down sendromu-mongolizm)

_____

_____

7. Çocuğun varsa kardeş sayısı: _____
    Kardeşlerinin cinsiyeti ve doğum yılı:
    1. Erkek_____   Kız_____   Yıl_____
    2. Erkek_____   Kız_____   Yıl_____
    3. Erkek_____   Kız_____   Yıl_____
    4. Erkek_____   Kız_____   Yıl_____

8. Çocuk yuvada kaç kişilik bir grupla beraber yaşıyor?

_____

9. Çocuğun bulunduğu yaş grubundaki bakıcı sayısı nedir?
Tam zamanlı: _____   Yarı zamanlı: _____

10. Çocuk dışarıda anaokuluna/okul öncesi kuruma devam ediyor mu?
Evet / Hayır
Evet ise; çocuk anaokuluna/ kreşe ne zaman başladı? Ay_____   Yıl_____

Çocuğun Sağlığı ve Gelişimi ile İlgili Sorular:

11.   Çocuğun geçirdiği önemli bir kaza, ameliyat veya hastalık var mı? (örnek: yüksek bir yerden düşme, yanma, trafik kazası, menenjit vb.)

_____

_____

_____

_____

12.   Çocuğun bilinen önemli bir sağlık sorunu ve/veya sürekli kullanması gereken ilaçlar var mı? (örnek: kalça çıkığı, astım, epilepsi, kalp, şeker, romatoid artrit, depresyon, hiperaktivite)

_____

_____

_____

Aşağıdaki yer alan durumlar bu çocukta görülüyorsa lütfen yanında işaret koyunuz:

Kekeleme		Nörolojik hastalık (epilepsi vb.)	
Konuşma gecikmesi		Bağışıklık sistemi hastalığı (vb.)	
Altını ıslatma (çiş-kaka tutamama)		Engel (görme, işitme, ortopedik vb.)	

13.   Çocuğun son 6 aydır kullandığı bir cihaz veya alet var mı? (örnek: gözlük, atel, koltuk değneği vb.)

_____

Appendix B

Çocuğun Adı: _____

Bakıcının kuruluşta çalıştığı süre: _____

Bakıcının yaşı: _____

Sosyal Beceri Ölçeği

Bölüm A

Aşağıda, çocukların **serbest oyun zamanında yaşıtlarına** gösterdikleri bazı davranışlar yer almaktadır. Lütfen her bir ifadeyi dikkatlice okuyunuz ve söz konusu davranışı çocuğun son **6 ay içerisinde** ne sıklıkla yaptığını işaretleyiniz. Soruları cevaplarken çocuğun söz konusu davranışı **"oyun zamanında"** ne kadar yaptığını düşününüz. Eğer çocuk anlatılan davranışı **hiçbir zaman** yapmıyorsa 1'i; **bazen** yapıyorsa 2'yi; **sık sık** yapıyorsa 3'ü; **her zaman** yapıyorsa 4'ü işaretleyiniz.

	Hiçbir zaman	Bazen	Sık sık	Her zaman
1. Diğer çocuklara oyun sırasında yardımcı olur.	1	2	3	4
2. Oyun zamanında kavga veya tartışma başlatır.	1	2	3	4
3. Oyun zamanında diğerleri tarafından dışlanır.	1	2	3	4
4. Oyunda sırasını beklemeyi reddeder.	1	2	3	4
5. Oyun oynayan çocukların çevresinde dolanır, aralarına girmeye tereddüt eder.	1	2	3	4
6. Oyuncaklarını paylaşır.	1	2	3	4
7. Oyun zamanında içe kapanır.	1	2	3	4
8. Oyun zamanında amaçsızca çevrede dolanır.	1	2	3	4
9. Diğer çocukların oyunla ilgili fikirlerini reddeder.	1	2	3	4
10. Oyun zamanında diğer çocuklar tarafından görmezden gelinir/ yok sayılır.	1	2	3	4
11. Oyun sırasında gereksiz yere gevezelik eder, konuşur.	1	2	3	4

	Hiçbir zaman	Bazen	Sık sık	Her zaman
12. Oyun sırasında arkadaşları arasında çıkan anlaşmazlıkları yatıştırmaya çalışır.	1	2	3	4
13. Oyun zamanında başkalarının eşyalarına zarar verir.	1	2	3	4
14. Oyun sırasında başkalarıyla farklı görüşte olduğunu kavga etmeden ifade eder.	1	2	3	4
15. Oyuna çağrıldığında katılmayı reddeder.	1	2	3	4
16. Oyuna girebilmek için başkasının yardımına ihtiyaç duyar.	1	2	3	4
17. Oyun sırasında başkalarına sözlü olarak sataşır.	1	2	3	4
18. Oyun sırasında ağlar, mızmızlanır, huysuzluk eder.	1	2	3	4
19. Diğerlerini oyuna katılmaları için çağırır, onları teşvik eder.	1	2	3	4
20. Oyun sırasında başkalarının elindekileri (eşya ya da oyuncak) zorla alır.	1	2	3	4
21. Oyun sırasında birilerinin canı yandığında veya üzüldüklerinde onları teselli eder.	1	2	3	4
22. Oyun kurallarını anlayıp takip etmede zorlanır.	1	2	3	4
23. Herhangi bir oyuna başlayabilmek için bakıcı annenin yönlendirmesine ihtiyaç duyar.	1	2	3	4
24. Başkalarının oyununu bozar.	1	2	3	4
25. Oyun zamanında mutsuz görünür.	1	2	3	4
26. Oyun zamanında saldırgandır.	1	2	3	4
27. Oyun sırasında olumlu duygular gösterir (örn.: güler, kahkaha atar).	1	2	3	4
28. Oyun kurma konusunda yaratıcıdır.	1	2	3	4
29. Oyunu ve arkadaşlarını yönetmek ister.	1	2	3	4
30. Grup bir etkinlikten başka bir etkinliğe geçerken uyumsuz davranıp düzeni bozar.	1	2	3	4

Bölüm B

Aşağıda, çocukların **genel olarak** gösterdikleri bazı **duygu ve davranışlar** yer almaktadır. Lütfen her bir ifadeyi dikkatlice okuyunuz ve söz konusu duyguyu veya davranışı çocuğun **son 6 ay içerisinde "genel olarak"** ne sıklıkla yaptığını işaretleyiniz. Eğer çocuk anlatılan davranışı **hiçbir zaman** yapmıyorsa 1'i; **bazen** yapıyorsa 2'yi; **sık sık** yapıyorsa 3'ü; **her zaman** yapıyorsa 4'ü işaretleyiniz.

	Hiçbir zaman	Bazen	Sık sık	Her zaman
31. Yüz ifadesinden duygularını anlamak zordur.	1	2	3	4
32. Zorda olan bir çocuğu teselli eder ya da ona yardımcı olur.	1	2	3	4
33. Kolaylıkla hayal kırıklığına uğrayıp sinirlenir.	1	2	3	4
34. Faaliyeti kesintiye uğradığında kızar. (örnek: yemek zamanı elindeki oyunu vb. bırakması gerektiğinde kızgınlık gösterir.)	1	2	3	4
35. Huysuzdur, çabuk kızıp öfkelenir.	1	2	3	4
36. Gündelik işlerde yardım eder (örneğin, sınıf toplanırken ya da beslenme dağıtılırken yardımcı olur).	1	2	3	4
37. Çekingen ve ürkektir; yeni ortamlardan ve durumlardan kaçınır (örneğin yeni biriyle tanıştığında, yeni bir oyun öğrenilirken vb.).	1	2	3	4
38. Genel olarak üzgün, mutsuz ya da depresiftir.	1	2	3	4
39. Grup içinde çekingendir ya da grupta olmaktan huzursuz görünür.	1	2	3	4
40. En ufak bir şeyde bağırır ya da çığlık atar.	1	2	3	4
41. Hareketsizdir, oynayan çocukları uzaktan seyreder.	1	2	3	4
42. Anlaşmazlıklara çözüm yolları arar.	1	2	3	4
43. Gruptan ayrı, kendi başına kalır.	1	2	3	4
44. Diğer çocukların görüşlerine önem verir.	1	2	3	4
45. Diğer çocuklara vurur, onları ısırır ya da tekmeler.	1	2	3	4

	Hiçbir zaman	Bazen	Sık sık	Her zaman
46. Grup faaliyetlerinde diğer çocuklarla birlikte çalışır, onlarla iş birliği yapar.	1	2	3	4
47. Diğer çocuklarla anlaşmazlık yaşar.	1	2	3	4
48. Genel olarak halsiz ve yorgun görünür.	1	2	3	4
49. Oyuncaklara iyi bakar, oyuncakların kıymetini bilir.	1	2	3	4
50. Grup faaliyetleri sırasında konuşmayı ya da faaliyetlere katılmayı reddeder.	1	2	3	4
51. Kendinden küçük çocuklara karşı dikkatlidir.	1	2	3	4
52. Grup içinde fark edilmez, siliktir.	1	2	3	4
53. Diğer çocukları istemedikleri şeyleri yapmaya zorlar.	1	2	3	4
54. Bakıcı annelere kızdığı zaman onlara vurur ya da çevresindeki eşyalara zarar verir.	1	2	3	4
55. Genel olarak endişeli görünür.	1	2	3	4
56. Makul açıklamalar yapıldığında, söyleneni kabul eder.	1	2	3	4
57. Bakıcı annelerinin söylediklerine karşı çıkar.	1	2	3	4
58. Cezalandırıldığında (örneğin herhangi bir şeyden yoksun bırakıldığında) başkaldırır, karşı koyar.	1	2	3	4

Appendix C

Table C1

Numbers and Percentages of the Children who passed each ToM task and Brief Description for the tasks (N = 107)

Task	*n* (%)	Description
Diverse Desire (DD)	97 (91)	Child judges that different people have different desires about the same object: After choosing his/her own preferred snack (cookie or carrot), child predicts the choice of other person (who has the opposite preference).
Diverse Belief (DB)	76 (71)	Child judges that different people have different beliefs about the same object, when the true or false belief is not known: After stating his/her belief about the place where a pet is hiding (garage or bushes), child predicts the search behavior of a person who has the opposite belief.
Knowledge Access (KA)	47 (44)	Child sees what is in a box and judges the knowledge of a person who does not see the inside of the box: After seeing a toy in a nondescript box, child judges (yes/no) if a person who has never seen the inside of the box knows what is in the box.
Explicit False Belief (EFB)	21 (20)	Child judges how a person will search when s/he is given that person's mistaken belief: After being told a story about a boy searching for his mittens, s/he is told that his mittens are in the backpack, but the boy thinks they are in the closet. Child judges where the boy looks for his mittens (in the backpack or closet).
Hidden Emotion (HE)[a]	20 (19)	Child judges that a person can feel one emotion but display a different emotion: Child is told a story about a boy whose aunt brings him a book although he wants his aunt to bring him a toy car. Child judges how the boy will feel inside and show on his face.
Contents False Belief (CFB)[b]	13 (12)	Child judges a person's false belief about what is in a distinctive container when the child knows what is inside of the container: Child sees a pencil case and discovers it has a band-aid inside. Child judges the belief of a person who has never seen inside the closed case.

[a] To ensure familiarity, the scenario used in the Chinese version of HE task was utilized (Wellman et al., 2006), but the character in the story was changed as "aunt" instead of "uncle", since the participant children were more familiar to females (i.e., care-providers and teachers in institutions were all females). For the Hidden Emotion task, although we did not include the reality and appearance justification control questions which were added to the task in study of Peterson, Wellman, and Liu (2005), the control questions prior to the target questions confirmed whether or not the child understood the cause-effect relations in the story. [b] To ensure familiarity, a pencil case was used instead of a band-aid box.

Note. In the Turkish version of the scale, the story characters were given common Turkish names and everything else in the tasks (e.g., stories, materials, questions) was kept the same. Each task included a contrast or control question and a target question.

Zihin Kuramı Becerisi Gelişimsel Ölçeği

Veriliş sırası: Farklı istek, bilgi erişimi, içerik yanlış inanış, farklı inanış, belirgin, yanlış inanış, saklı duygu

1. Farklı istek

Materyaller: Küçük bir erkek oyuncak bebek. Yarısında bir havuç, diğer yarısında bir kurabiye resmi bulunan 22x28 cm boyutlarında kâğıt.

Önce araştırmacı oyuncağı ve resimleri gösterir ve çocuğa tanıtır: "Bu Ali (oyuncak bebeği kâğıdın üzerine, iki resmin ortasına yerleştirin). Ali'nin karnı acıkmış ve canı bir şeyler yemek istiyor. Burada iki farklı yiyecek var: bir havuç (işaret et) ve bir kurabiye (işaret et)."

Sonra çocuğa *kendi isteği* sorulur: "Sen en çok hangi yiyeceği **seversin**? En çok havucu mu, yoksa kurabiyeyi mi seversin?"

Eğer çocuk "Havuç" derse, "Peki, bu iyi bir seçim. **Ama**… Ali aslında kurabiyeleri **sever** (işaret etme). Havucu sevmez. **O**nun **en çok sevdiği** yiyecek kurabiyedir." denir.

Eğer çocuk "Kurabiye" derse, "Peki, bu iyi bir seçim. **Ama**… Ali aslında havucu **sever** (işaret etme). Kurabiyeyi sevmez. Onun **en çok sevdiği** şey havuçtur." denir.

Sonra *hedef soru*ya geçilir: "Evet şimdi yemek yeme zamanı. Ali **yalnızca bir** yiyeceği seçebilir, **sadece birini**. Ali (Ali'yi işaret et) hangi yiyeceği **seçer**? Havucu mu, kurabiyeyi mi?"

Puanlama: Çocuk *hedef soru*ya, *kendi isteği sorusu*na verdiği cevabın tersi biçimde cevap verirse doğru cevap vermiş olur.

2. Farklı İnanış

Materyaller: Küçük bir kız oyuncak bebek. Yarısında çalılık ve diğer yarısında bir garaj resmi bulunan 22x28 cm boyutlarında kâğıt.

Önce araştırmacı oyuncağı ve resimleri gösterir ve çocuğa tanıtır: "Şimdi başka bir oyuna geçiyoruz. Bu Ayşe (oyuncak bebeği kâğıdın üzerine, iki resmin ortasına yerleştirin). Ayşe kedisini bulmak istiyor. Kedisi çalılıkların içinde (işaret et) saklanıyor olabilir ya da garajın içinde (işaret et) saklanıyor olabilir."

Sonra çocuğa *kendi inanış*ı sorulur: "Sence kedi nerede? Çalılıkların içinde mi (işaret et) yoksa… garajın içinde mi (işaret et)?"

Eğer çocuk "Çalılıklar" derse, "Evet bu iyi bir fikir. **Ama**… Ayşe kedisinin garajın içinde (işaret etme) olduğunu **düşünüyor**. Kedinin garajın içinde olduğunu düşünüyor." denir.

Eğer çocuk "Garaj" derse, "Evet bu iyi bir fikir. **Ama**… Ayşe kedisinin çalılıkların içinde (işaret etme) olduğunu **düşünüyor**. Kedinin çalılıkların içinde olduğunu **düşünüyor**." diye cevap verilir.

Sonra *hedef soru*ya geçilir: "Peki… Ayşe (Ayşe'yi işaret et) kedisini nerede **arar**? Çalılıkların içinde mi yoksa garajın içinde mi?"

Puanlama: Bu bölümdeki sorunun cevabının doğru olarak puanlanması için çocuğun *hedef soru*yu *kendi inanış sorusu*na verdiği yanıtın tersi biçimde cevaplaması gerekmektedir.

3. Bilgi Erişimi

Materyaller: Kolayca tanımlanamayan (yani dış görünüşünden ne kutusu olduğu anlaşılmayan, örnek: çikolata, bardak) kare şeklinde küçük bir kutu. Kutuya sığacak büyüklükte oyuncak bir köpek. Küçük bir kız oyuncak bebek.

Araştırmacı önceki oyunun materyallerini kaldırır ve yeni materyalleri çıkartır:

"Burada bir kutu var (kutunun üzerine parmağını koy)."

Araştırmacı çocuğa sorar: "Sence kutunun içinde ne var (kutuyu işaret et)?"

Çocuk cevap verse de vermese de araştırmacı meraklı ve heyecanlı bir şekilde:

"Haydi bir bakalım… Aaa içinde **bir köpek** varmış!" der.

Araştırmacı köpeği göstermek için kutunun kapağını açar ve çocuğun köpeği

gördüğünden emin olduktan sonra kutuyu kapatır.

Çocuğun kutunun içinde ne olduğunu öğrenip öğrenmediği anlamak için *kontrol*

sorusu sorulur: "Peki…Söyle bakalım, ne vardı kutunun içinde?"

Eğer çocuk burada hata yaparsa, soruyu doğru yanıtlayana kadar içerisinde

bulunanlar tekrar gösterilir.

Araştırmacı eline bebeği alır: "Ve işte Zeynep. Zeynep bu kutunun içindekini **daha**

önce hiç görmedi."

Sonra *hedef soru*ya geçilir. Araştırmacı "Peki… Zeynep kutuda ne olduğunu **biliyor**

mu?" diye sorar. Çocuğun cevabından sonra *hafıza sorusu* sorulur. Araştırmacı

"Zeynep bu kutunun içini **gördü mü**?" diye sorar.

Puanlama: Bu bölümdeki sorunun cevabının doğru olarak puanlanması için çocuğun

*hedef soru*yu ve *hafıza sorusu*nu "hayır" olarak yanıtlaması gerekmektedir.

4. Belirgin Yanlış İnanış

Materyaller: Erkek oyuncak bebek. Bir yarısında dolap diğer yarısında sırt çantası

resmi bulunan 22x28cm boyutlarında kâğıt.

Araştırmacı önceki oyunun materyallerini kaldırır ve yeni materyalleri çıkartır: "Bak

bu Murat. Murat eldivenlerini arıyor. Murat'ın eldivenleri ya sırt çantasında (işaret

et) ya da dolapta (işaret et) olabilir. **Aslında** Murat'ın eldivenleri sırt çantasında.

Ama Murat eldivenlerin **dolapta** (işaret et) olduğunu **düşünüyor**."

Araştırmacı çocuğa hedef soruyu sorar: "Peki… Murat eldivenlerini nerede **arar**?

Sırt çantasında mı yoksa dolapta mı?"

Sonra gerçeklik sorusu sorulur: "Murat'ın eldivenleri **gerçekte** nerede? Sırt

çantasında mı dolapta mı?"

Puanlama: Çocuk *hedef soru*yu, "dolap" ve *gerçeklik sorusu*nu "sırt çantası" olarak

yanıtlarsa doğru cevap vermiş olur.

5. <u>İçerik Yanlış İnanış</u>

Materyaller: Ön yüzünde görünür biçimde boya kalemleri resimleri olan standart bir

boya kalemi kutusu. Kutunun içinden çıkacak bir yara bandı. Küçük bir erkek

oyuncak bebek.

Araştırmacı diğer materyalleri kaldırırken yeni materyalleri çıkarır: " Şimdi ben sana

başka bir şey göstereceğim. Burada bir kalem kutusu var."

Araştırmacı boya kalemi kutusunu çocuğun önüne koyar: " Sence bu kalem

kutusunun içinde ne var?"

Bu soruya çocuğun "kalem" demesi için gerekirse yönlendirmede bulunulur. Örneğin

birinci yönlendirmede araştırmacı "İçinde kalem olabilecek gibi mi görünüyor?" der.

Çocuk yine de "kalem" demezse, ikinci yönlendirme yapılır, "Bu ne çeşit bir kutu?

İçinde ne olmalı?" denir. Üçüncü yönlendirmede ise araştırmacı "Burada kalemler mi

olmalı yoksa kitaplar mı?" diye sorar.

Çocuktan "kalem" cevabını aldıktan sonra araştırmacı heyecanla: "Hadi bakalım…

Aaa içinde **bir yara bandı** varmış!"

Araştırmacı boya kalemi kutusunun içindeki yara bandını dışarı çıkarır ve çocuğun yara bandını gördüğünden emin olduktan sonra yara bandını tekrar boya kalemi kutusunun içine koyar ve kapağını kapatır.

Çocuğun boya kalemi kutusunun içinde yara bandı olduğunu öğrenip öğrenmediği kontrol edilir: "Peki… Ne vardı kutunun içinde?" (*kontrol sorusu*)

Eğer çocuk burada hata yaparsa, soruyu doğru yanıtlayana kadar kutunun içindeki yara bandı tekrar gösterilir.

Araştırmacı eline bebeği alır: "İşte Ahmet geldi (Ahmet'i gösterir). Ahmet bu boya kalemi kutusunun içini **daha önce hiç görmedi.**"

Sonra *hedef soru*ya geçilir. Araştırmacı "Peki… Ahmet kutunun içinde ne olduğunu **düşünür**? Boya kalemi mi yoksa bir yara bandı mı?" diye sorar. Çocuk yanıtlamazsa soru tekrarlanır. Çocuğun cevabından sonra *hafıza sorusu*na geçilir. Araştırmacı "Ahmet bu kutunun içini **gördü mü**?" diye sorar.

Puanlama: Bu bölümdeki sorunun cevabının doğru olarak puanlanması için çocuğun *hedef soruyu* "boya kalemi" olarak ve *hafıza sorusu*nu (görme hakkında olan son soru) "hayır" olarak yanıtlaması gerekmektedir.

6. Saklı Duygu

Materyaller: Arkası dönük olduğu için yüzü görünmeyen bir erkek çocuğun başının resmi (8x8 cm ebatlarına yakın). Duygu Ölçeği: Sırasıyla mutlu, normal (ne mutlu ne üzgün) ve üzgün ifadeleri olan üç basit yüz çizimi içeren 8x25 cm ebatlarında bir kâğıt (yalnızca siyah-beyaz dairesel çizgilerden oluşan basit gözler, çizgi şeklinde ağızlar vb. içeren basit yüz çizimleri).

Oyuna hazırlık amacıyla araştırmacı duygu ölçeğini çıkarır ve çocuğun önüne koyar: "Şimdi sana bir çocuk hakkında hikâye anlatacağım. Bu hikâyede, çocuk mutlu

hissediyor olabilir (duygu ölçeği üzerinde işaret eder). Üzgün hissediyor olabilir (duygu ölçeği üzerinde işaret eder). Ya da ne mutlu ne üzgün sadece normal hissediyor olabilir (duygu ölçeği üzerinde işaret eder)."

Araştırmacı çocuğun yüzlerin hangi duyguları anlattığını öğrenip öğrenmediğini kontrol eder. Araştırmacı her ifadeyi teker teker sorar: "Şimdi bana gösterebilir misin? Bu yüzlerden hangisi üzgün? Hangisi mutlu? Hangisi ne mutlu ne üzgün, yani normal?"

Eğer çocuk hata yaparsa ön hazırlık baştan yapılır.

Araştırmacı: "Aferin sana… Tamam şimdi hikayeye geçelim. Hikâyeyi anlattıktan sonra, sana çocuğun **içinde gerçekten nasıl hissettiğini** (kendi kalbine dokunarak) **ve** yüz olarak **nasıl göründüğünü** (kendi yanağına dokunarak) soracağım. İnsanın içinde nasıl hissettiği (kendi kalbine dokunarak) ile yüzünün dışarıdan nasıl göründüğü (kendi yanağına dokunarak) aynı olabilir, ya da farklı olabilir."

Bu noktada duygu ölçeği kenarda bir yere konur. Çocuk hedef soruları ölçeğe işaret ederek cevaplamak zorunda değildir. Ölçek tam önlerinde olmayacak ama göz önünde bulunacak şekilde kenarda durur. Böylelikle, çocuk istisnai biçimde sözlü iletişimden kaçınmadığı sürece, duygu ölçeği ısınma sürecinde sadece ipucu veren bir hatırlatıcı olarak kullanılır.

Araştırmacı hikâyeyi anlatmaya başlar: "Bu hikâye Mehmet hakkında (resmi göster). Mehmet'in teyzesi bir seyahatten yeni döndü. Seyahate gitmeden önce Mehmet'e oyuncak bir araba getireceğine söz vermişti. **Fakat** oyuncak araba yerine Mehmet'e bir kitap aldı. Mehmet **kitapları sevmez** (yavaş hızda). Mehmet'in asıl istediği oyuncak bir araba. **Ama**… Mehmet'in **ne hissettiğini saklaması gerekiyor**. Çünkü eğer teyzesi Mehmet'in gerçek duygularını öğrenirse ona bir daha hiçbir şey almaz."

Çocuğun hikâyeyi anlayıp anlamadığını kontrol etmek için sorular sorulur:

"Mehmet'in teyzesi ona ne aldı?" (*Hafıza Sorusu*)

Eğer çocuk "Kitap" cevabını verirse oyuna devam edilir. Eğer yanlış cevap verirse hikâye tekrar anlatılır.

Çocuk ilk soruya doğru cevap verdikten sonra ikinci soruya geçilir: "Mehmet'in teyzesi Mehmet'in gerçekte nasıl hissettiğini bilirse ne yapacak?" (*Hafıza sorusu*)

Eğer çocuk "Mehmet'e bir daha hiçbir şey almayacak" cevabını verirse oyuna devam edilir. Eğer çocuk yanlış cevap verirse, hikâye tekrar anlatılır.

Sorulara doğru cevap verilip hikâyenin anlaşıldığı görülünce oyuna devam edilir ve *hedef soru*lar sorulur: "Peki… Teyzesi ona kitabı verdiğinde, Mehmet gerçekte **nasıl hissetti** (kendi kalbine dokunarak)? Mutlu mu, üzgün mü, yoksa ne mutlu ne üzgün, yani normal mi?" Araştırmacı bu soruyu sorarken herhangi bir duygu göstermez. Çocuk soruyu cevaplamazsa soru tekrarlanır. Çocuk soruyu cevapladıktan sonra: "Peki… Teyzesi ona kitabı verdiğinde, Mehmet yüz ifadesi olarak **nasıl görünmeye çalıştı** (kendi yüzüne dokunarak)? Mutlu mu, üzgün mü, yoksa ne mutlu ne üzgün, yani normal mi?" Araştırmacı bu soruyu da sorarken herhangi bir duygu göstermez. Çocuk soruyu cevaplamazsa soru tekrar sorulur.

Puanlama: Puanlama son iki *hedef soru*ya verilen yanıtlara dayanmaktadır. Bu bölümdeki sorunun cevabının doğru olarak puanlanabilmesi için çocuğun "*gerçekten hissedilen*" sorusuna olan yanıtının "*görünüş*" sorusuna verdiği yanıttan daha olumsuz olması gerekmektedir (örn. Gerçek his için üzgün ve görünüm için mutlu veya ne mutlu ne de üzgün; veya gerçek his için ne mutlu ne de üzgün ve görünüş için mutlu).

Appendix D

Yönetici İşlevler Değerlendirmeleri

1. **Gündüz-Gece**

Araştırmacı:: 'Şimdi çok acayip bir oyun oynayacağız seninle. Eğer ben sana "Gündüzün resmini göster" deseydim sen bana bu kartı gösterirdin, değil mi? Çünkü gündüz olduğunda güneş açar. Peki... ben sana "Bana gecenin resmini göster" deseydim, sen bu bana kartı gösterirdin, değil mi? Evet, çünkü gece gökyüzünde ay ve yıldızlar olur. Ama biz şimdi bunların tam tersini yapacağız. Ben 'gece' dediğimde, senin bana üzerinde güneş resmi olan bu kartı göstermeni istiyorum (araştırmacı elini gündüz resminin üstüne koyar ve bekletmeden geri çeker). Ben 'gündüz' dediğimde senin bana üzerinde ay resmi olan bu kartı göstermeni istiyorum (araştırmacı elini gece resminin üstüne koyar ve bekletmeden geri çeker). Haydi biraz alıştırma yapalım (gerçek denemelere geçmeden önce çocuğa iki tur yardımcı olunur).

Gerçek denemelere geçmeden önce yapılan alıştırma denemelerinde çocuğa yanlış yaptıysa düzeltici yönerge verilmelidir: Örneğin, acayip bir oyun bu; gece deyince bunu göstereceksin, haydi bir deneme daha yapalım, 'gece'.... Çocuk doğru yaptıysa övücü sözler söylenir: Örneğin 'Aferin, gece dedim, sen gündüzü gösterdin' gibi.

Araştırmacı: "Unutma, eğer ben gece dersem güneş kartını göstereceksin, gündüz dersem ay kartını göstereceksin. Kelimenin tam tersini gösteren karta işaret edeceksin. Bakalım sen bu acayip/tuhaf oyunu oynayabilecek misin? "

Gece - gece - gündüz - gece - gündüz

ARA

Gece - gündüz - gündüz - gece - gündüz

NOT: Çocuğun her denemeden sonra elini kartlardan geri çekmesi, elini herhangi bir kartın üzerinde bırakmaması çok önemlidir. Bu konuda her deneme öncesi, gerektiğinde hatırlatma yapılır: Örneğin, "Göster, sonra çek elini, tamam mı?" "Çek elini şimdi" gibi.

2. Ritim Tutma

Araştırmacı: "Şimdi başka bir oyuna geçelim. Bu kalemleri tıklatarak bir ritim oyunu oynayacağız. Öncelikle bu kalemlerden hangisini istersin?"

"Şimdi eğer masaya böyle bir kere tıklatırsam (tıklatır ve bitirince kalemi havada tutar), senin iki kere tıklatmanı istiyorum (Çocuğun doğru yapmasını sağlar). Aferin, aynen böyle" (Tebessüm).

"Eğer böyle iki kere tıklatırsam (iki defa tıklatır), senin sadece bir kere tıklatmanı istiyorum (Çocuğun doğru yapmasını sağlar). Aferin, aynen böyle" (Tebessüm).

İki kez tek ve çift tıklatma alıştırması yaparlar. Araştırmacı, çocuğun doğru yapmasına yardımcı olur, ona ne kadar iyi olduğu konusunda olumlu geribildirim verir, heyecan gösterir: "Harika! Sen bu oyunu nasıl oynayacağını biliyorsun. Haydi, şimdi gerçekten oynayalım."

Bir İki İki Bir İki Bir

Araştırmacı: "Benimle çok güzel oynuyorsun hadi biraz daha oynayalım. Unutma ben bir kere tıklatınca sen iki kere, ben iki kere tıklatınca sen bir kere tıklatıyorsun."

İki Bir Bir İki Bir İki

Araştırmacı: "Aferin… Hadi biraz daha zorlaştıralım bu oyunu. Bakalım daha zor bir ritmi oynayabilecek misin? Şimdi, eğer böyle bir kere tıklatırsam (tıklatır), senin sadece iki kere tıklatmanı istiyorum (Çocuğun doğru yapmasını

sağlar), iki kere tıklatırsam (tıklatır) senin bir defa tıklatmanı istiyorum (Çocuğun doğru yapmasını sağlar), ama 3 kere tıklatırsam senin hiiiiiiç tıklatmanı istemiyorum. Hadi bir deneme yapalım. (Bir İki Üç deneme yaparlar). "Aferin, sen bu oyunu öğrenmişsin".

Bir İki Üç İki Bir Üç

Araştırmacı: "Benimle çok güzel oynuyorsun hadi biraz daha oynayalım. Unutma ben bir kere tıklatınca sen iki kere, ben iki kere tıklatınca sen bir kere tıklatıyorsun, ben üç kere tıklatınca, sen hiç tıklatmıyorsun."

Üç İki Bir İki Bir Üç

Araştırmacı: "Aferin çok güzel oynadın benimle."

NOT: Çocuk eğer "Kaç tane vurdun hatırlamadım/anlamadım" derse "Olabilir, devam edelim" diyoruz; eğer "Kuralı hiç hatırlamıyorum" derse kuralı hatırlatıyoruz.

Appendix E

Table E1

Summary of percentages of children who passed each ToM scale tasks, by study

	Present Study	Wellman & Liu (2004)	Peterson, Wellman, & Liu (2005)				Wellman et al. (2006)	Shahaeian et al. (2011)		Kuntoro et al. (2010)		
Country	Turkey	America	Australia				China	Australia	Iran	Jakarta, Indonesia	Jakarta, Indonesia	Australian
	Institution-reared TDP	TDP	Deaf native signers	Deaf late signers	Children with autism	TDP	TDP	TDP		Trash pickers	TDP	TDP
Sample size	107	75	11	36	36	62	92	77	58	60	41	28
ToM tasks												
Diverse desire	91%	95%	100%	92%	86%	95%	89%	95%	86%	85%	88%	100%
Diverse belief	71%	84%	91%	92%	86%	85%	71%	77%	47%	85%	85%	82%
Knowledge access	44%	73%	82%	53%	75%	82%	79%	68%	88%	33%	58%	79%
Contents false belief	12%	59%	82%	33%	47%	32%	54%	36%	16%	40%	54%	36%
Explicit false belief	20%	57%					49%					
Hidden emotion	19%	32%	54%	28%	64%	19%	37%	16%	17%	12%	37%	39%

Note. TDP = Typically developing preschoolers