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SELF/OTHER DIFFERENTIATION BASED ON PRESENT VS PAST TENSE CUES IN TURKISH CULTURE

A Master's Thesis

by

SALİH BARTUĞ ÇELİK

Department of Psychology

İhsan Doğramacı Bilkent University

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To My Mother

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The Graduate School of Economics and Social Sciences
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by

SALİH BARTUĞ ÇELİK

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ABSTRACT

SELF/OTHER DIFFERENTIATION BASED ON PRESENT VS PAST TENSE CUES IN TURKISH CULTURE

Çelik, Salih Bartuğ
MA. Department of Psychology
Supervisor: Asst. Prof. Jedediah W. P. Allen

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The literature provides various studies that showed human beings' implicit awareness of their own and others' mental states (i.e., implicit Theory of Mind, ToM abilities). However, how much these implicit processes are qualitatively different from the explicit ToM abilities is an open question to investigate. To explore this issue, Bradford et al. (2015; 2018) conducted a study that showed it was easier for adults to adopt "self" perspectives than "other" perspectives. Importantly, participants found shifting from other- to self-oriented perspectives easier than shifting from self- to other. Bradford et al. concluded that self-oriented mental states might be *automatically processed* when thinking about others but that other-oriented mental state attribution requires consciously controlled processes. In the current study, we explored whether the task demands from Bradford et al.'s study affect participants' performances across shifting conditions. Self-oriented perspectives

might be always *processed* faster than other-oriented perspectives because they might include more concrete cues (e.g., past and personal experiences). To provide more concrete cues for the other-oriented perspective questions, participants were presented with Bradford et al.'s paradigm using the Turkish past-tense with the direct evidential marker, *-DI*. This manipulation allowed investigating whether other-oriented perspectives could be *processed* as fast as self-oriented perspectives. In order to also investigate the impact of cultural factors on the participants' performances, an Individuals-Collectivism survey was included. The results of the study showed similar findings with Bradford et al. (2015; 2018) in that participants more easily shifted from other- to self-oriented perspectives compared to self- to other-oriented perspectives. The results were discussed based on the current approaches (i.e., lean, middle-ground, and rich accounts) to social cognition.

Keywords: Theory of Mind, False Belief, Social Cognition, Turkish Evidential Markers, Action-based Approaches

ÖZET

TÜRK KÜLTÜRÜNDE KENDİMİZİN VE BAŞKALARININ DÜŞÜNCELERİNİ ŞİMDİKİ VE GEÇMİŞ ZAMAN KİPLERİ DAYANAĞINDA AYIRT ETME

Çelik, Salih Bartuğ
Yüksek Lisans, Psikoloji Bölümü
Tez Danışmanı: Dr. Öğr. Üyesi Jedediah W. P. Allen

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Araştırmalar kendimizin ve başkalarının düşüncelerini örtük bir şekilde fark edebildiğimizi ortaya koymuştur. Fakat örtük olarak gerçekleştirilen bu bilişsel süreçlerin bilinçli olarak gerçekleştirilen bilişsel süreçlerden ne kadar farklı olduğu henüz belirlenememiştir. Bu konuya açıklık getirmek amacıyla gerçekleştirilen bir çalışmada yetişkinlerin kendi düşüncelerini başkalarının düşüncelerinden daha çabuk anlamlandırdığı bulunmuştur (Bradford et al., 2015; 2018). Özellikle, yetişkinler, başkalarının düşüncelerinden kendi düşüncelerine geçmeyi gerektiren soruları kendi düşüncelerinden başkalarının düşüncelerine geçmeyi gerektiren sorulardan daha kolay bulduğu gösterilmiştir. Bu nedenle, insanların kendi düşüncelerini otomatik ve bilinç dışı olarak anlamlandırabildiği ileri sürülmüştür. Başkalarını düşünlerini anlamlandırmak için ise bilinçli düşünme gerektiren Açık Zihin Kuramı becerilerinin

kullanılması gerektiği düşünülmüştür. Bu çalışmada, verilen soruların içeriğinin katılımcıların kendi ve başkalarının düşünceleri arasında geçiş yapma performanslarına etkisi incelenmiştir. Katılımcıların kendi düşünceleri ile ilgi sorular başkalarının düşünceleri ile ilgili sorulardan daha somut ipuçları (örneğin, kişisel ve geçmiş deneyimler) içerdiği için daha kolay anlamlandırılmış olabileceği düşünülmüştür. Başkalarının düşünceleri ile ilgili soruları daha somut ipuçları ile sunmak amacıyla tüm sorular DI'lı geçmiş zaman ile sorulmuştur. Bu sayede başkalarının düşüncelerini anlamlandırmanın kendi düşüncelerimizi anlamlandırmamız kadar kolay olup olamayacağı araştırılmıştır. Kültürel faktörlerin katılımcıların performanslarına olan etkisini incelemek amacı ile bireycilik ve toplulukçuluk eğilimlerini ölçen bir anket de çalışmaya eklenmiştir. Bulgular önceki çalışmalarda olduğu gibi katılımcıların, başkalarının düşüncelerinden kendi düşüncelerine geçmeyi kendi düşüncelerinden başkalarının düşüncelerine geçmekten daha kolay bulduğunu göstermiştir. Sonuçlar sosyal bilişe "zengin", "orta-derece" ve "zayıf" bakış açılarından tartışılmıştır.

Anahtar kelimeler: Zihin Kuramı, Yanlış İnanç, Sosyal Biliş, Türkçe Geçmiş Zaman Kipleri, Hareket Odaklı Yaklaşımlar

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CHAPTER 1

INTRODUCTION

Theory of mind (ToM), which can be defined as an appreciation of our own and others' mental states, is a crucial cognitive ability for our social interactions. ToM abilities are fundamental to achieve successful social interactions because the appreciation of one's own and others' inner states is helpful to accurately predict others' behaviors and act accordingly. The literature provides various studies on how young children acquire different ToM abilities (including appreciation of beliefs; Wimmer & Perner, 1983, desires; Gopnik & Slaughter, 1991, ignorance; Hogrefe, Wimmer, & Perner, 1986, and emotions; Ruffman, Slade, & Crowe, 2002) during the preschool years (See also Wellman & Liu, 2004 for a meta-analytic review on the acquisition of ToM abilities). The classical (i.e., elicited-response) ToM tasks that were developed to measure children's ToM abilities have been criticized due to the task demands. It has been argued that the classical tasks require verbal report and executive resources that are still developing in young children. However, linguistic and executive resources may not be necessary for perceiving others' mental states (See Baillargeon, Scott, & He, 2010 for a review). Researchers tried to simplify the classical ToM tasks by creating spontaneous-response tasks that do not require executive and verbal resources. The result of these spontaneous-response measures

showed that even very young infants are sensitive to others' mental states (Onishi & Baillargeon, 2005; Surian, Caldi, & Sperber, 2007). Besides, similar spontaneous-response tasks were developed for adults to show the developmental unity in ToM abilities. The results showed that adults are also sensitive to other's mental states and automatically consider them in certain social situations (Kovacs, Teglas, & Endress, 2010) Based on the results of the spontaneous-response tasks, it has been argued that infants and adults are equipped with "a rudimentary form" of mental state attribution, known as implicit ToM abilities. Implicit ToM abilities are claimed to be sufficient to automatically *process* others' mental states and make sense of social situations when there is no need to use linguistic and executive resources.

One way to measure the nature of these implicit ToM abilities was developed by Bradford et al. (2015; 2018) in order to explore whether there are limits of these implicit ToM abilities. Bradford et al. (2015) designed the Self/Other Differentiation task for adults such that adults need to take either their own (i.e., self-oriented) or another person's (i.e., other-oriented) true or false belief about the content of a box. Based on participants' error rates and reaction times, the results indicated that shifting from the other-oriented questions to the self-oriented questions were harder than shifting from the self-oriented questions to the other-oriented questions. To be more concrete, if a person is first asked whether another person likes crackers or not, then, it might be easy for her to answer what she would answer to the same question. However, if she is first asked whether she likes crackers or not, then, it might be relatively hard for her to answer what another person would answer to the same question. Bradford et al. (2015) argued that while considering others' perspectives, self-oriented perspectives might be *automatically processed* which explains the

discrepancy in the findings that shifting from other-oriented questions to self-oriented questions are easier than shifting from self-oriented questions to other-oriented questions. Therefore, Bradford et al. (2015) specifically argue that self-oriented perspectives might be *automatically* taken into account and "self may act as a stem for reasoning about others' perspectives". Accordingly, other-oriented questions are only taken into account when it is explicitly required by the task. The follow-up study replicated these results in a Non-Western culture. The main purpose of conducting the study with a Non-Western sample is to support the idea that automatic *processing* of self-oriented mental states results from a universal ToM mechanism.

In the current study, we tried to investigate whether the performance difference across shifting conditions (i.e., shifting from self- to other-oriented vs. other- to self-oriented perspectives) results from the characteristics of the task. Specifically, task characteristics might cause self-oriented questions to be processed faster than other-oriented questions regardless of shifting across self- and other-perspectives. Therefore, self-oriented questions may not be *automatically processed* and the reason that they are easier to answer is because they include "concrete cues" (e.g., past and personal experiences on the belief scenario). We believe the existence of the concrete cues in the self-oriented questions might allow the participants to strengthen their representations. Based on Özoran's (2009) study in Turkish preschoolers, one way to test such a hypothesis is to use Turkish direct evidential marker, *–DI*, which may "strengthen" adults' representations about others' beliefs in other-oriented questions. For this reason, in the present study, we provided participants with Bradford et al.'s (2015) task in both Turkish present-tense (i.e., control condition)

and Turkish past-tense with direct evidential marker, *–DI* (i.e., test condition) to see whether shifting from self-oriented questions to other-oriented questions could be as easy as shifting from other-oriented questions to self-oriented questions. As Bradford et al. (2018), we also included a collectivism-individualism scale (the Auckland Individualism and Collectivism Scale, AICS) in order to test whether this aspect of culture has an impact on adults' ToM abilities.

In the following sections, we will first give a historical background on the debate of of ToM development (Section 1.1). Then, in Section 1.2, we will explain the rationale behind conducting studies that use spontaneous-response measures to assess infants and adults' ToM abilities. Specifically, throughout the Section 1.2.1 to 1.2.3, three main spontaneous-response ToM measures (Violation of Expectation, VoE, anticipatory-looking, AL, and active-helping) will be discussed. In Section 1.2.4, we will present one of the well-known approaches to explain ToM mechanisms, two-systems account, that argues the possible limits on implicit ToM abilities. In Section 1.2.5, we will present a third possibility on what infants and adults' successes on these spontaneous-response ToM tasks may mean from "lean approaches". In Section 1.3, we will explain the rationale behind the Self/Other Differentiation task and provide a critique of Bradford et al.'s (2015; 2018) interpretations of the findings. After explaining the rationale behind the task (Section 1.3.1), we will provide non-mentalistic explanations to the Bradford et al.,'s findings (2015; 2018) (Section 1.3.2). Specifically, we will propose that the disparity across conditions of Self/Other Differentiation task could be also explained based on the characteristics of the task instead of assuming *automatic processing* of self-perspectives and "self as a stem" for reasoning about other-perspectives. Lastly, in

Section 1.4, we will propose the hypotheses to empirically test the alternative possibility that the differences on adults' performances across shifting from self- to other-perspectives and from other- to self-perspectives might be due to the task demands instead of "automatic processing" in implicit ToM abilities.

1.1 The historical background on the debate of ToM development

An early discussion concerning ToM abilities was through non-human primates by questioning whether they can understand the mental states of others (Premack & Woodruf, 1978). It was found that non-human primates could successfully predict others' behaviors and act accordingly which suggested that they could appreciate other's mental states in ways that are related to human ToM abilities. However, based on the Dennett's (1978) critics on Premack and Woodruff's (1978) experiment, it was argued that false belief tests are needed to understanding whether an agent has genuine ToM abilities or not. The rationale behind Dennett's (1978) critique is that one's own mental states (e.g., true beliefs) should contradict with others' mental states (e.g., false beliefs) to be sure that the agent does not predict others' behaviors based on their own beliefs. Consequently, the agent needs to appreciate *others' mental states* to accurately predict their behaviors when they involve false-beliefs (See Dennett, 1979 for a theoretical discussion on the necessity of false belief test for an empirical investigation of ToM abilities).

Wimmer and Perner (1983) developed a false-belief task to measure children's ability to reason about other's mental states. The findings showed that around 4 years of age, children start to appreciate false beliefs of others on a situation about an object's location while having a true belief about the same situation. After Wimmer

and Perner (1983), the literature created different versions of false belief task (e.g., the unexpected content task, Perner & Leekam & Wimmer, 1987; the active-deception task, Chandler, Fritz, & Hala, 1989) that had similar age findings of an age-4 transition. The well-known unexpected contents task, for example, measures young children's comprehension of false beliefs based on a box that reveals an "unexpected" content (e.g., revelation of crayon from a candy box). In the task, children were first shown a candy box and asked what they think is inside the box. After the revelation stage where the candy box revealed an unexpected content (i.e., the crayon), children were asked what another person would think is inside. As in the case of other false belief tasks, before age 4, children have difficulty appreciating another person's false belief about the content of the box while having a true belief about the content of the box. Other meta-representational tasks that require appreciation of various sorts of mental states were also developed. The other meta-representational tasks also seemed to undergo an age 4 transition and were correlated with FB tasks.

Despite the existence of some cross-cultural differences (Liu, Wellman, Tardif, & Sabbagh, 2008; Shahaeian, Peterson, Slaughter, & Wellman, 2011; Shahaeian, Nielsen, Peterson, & Slaughter, 2014), a universal unity was observed on the development of ToM abilities such that at around age 5, children can appreciate other's mental states, including beliefs, desires, ignorance and emotions that develop in similar ages across cultures (See Wellman & Liu, 2004 for a comprehensive ToM battery, developed for preschoolers). It has been argued that linguistic and domain-general developments that happen at around age 4 (i.e., executive function and

inhibitory abilities) lead to the universal pattern in the development of young children's ToM abilities.

Children younger than age 4 may not be successful on the ToM tasks due to the additional task demands, which the nature of the tasks requires (i.e., linguistic, inhibitory and executive demands). That is, before age 4, even though children can reason about rudimentary forms of others' mental states starting from very beginning of their first year of life (Onishi & Baillargeon, 2005; Surian et al., 2007), the linguistic and executive demands that has been used to measure preschoolers' ToM abilities prevent them to show early metarepresentational competence for mental state attribution to agents. The classical ToM tasks require children to *explicitly* reason about a given situation and verbally report their answer. However, another possible way to look at young children and infants' ToM abilities comes through *spontaneous-response* ToM measures (e.g., violation of expectation (VoE, Onishi & Baillargeon, 2005), anticipatory looking (Clements & Perner, 1994) and active-helping paradigms (Buttlemann, Carpenter, & Tomasello, 2009). The results indicated that from the first year of their life, infants' behaviors were influenced by agents' beliefs, which may suggest mental state attribution (Baillargeon, Scott, & He, 2010). A related question to better understand the nature of implicit ToM cognition is about whether early metarepresentational competence disappears after the development of *full-blown* ToM cognition. To see whether there is a developmental unity in human beings' implicit ToM abilities across ages, spontaneous-response tasks for adults were also developed. The spontaneous-response ToM tasks for adults indicated very similar results to infants' performances (Kovacs et al., 2010, Samson et al., 2010).

The results of these spontaneous-response ToM tasks, designed for both infants and adults, have been interpreted differently based on different approaches to early social cognition. Although some researchers argue that results of spontaneous-response ToM tasks can be interpreted through low-level processes (i.e., behavioral-rule strategies, Perner, 2010; Povinelli & Vonk, 2003 or action-based approaches, Allen & Bickhard, 2013a, b, 2018; Allen, 2015; Carpandale & Lewis, 2006; 2015) other researchers provided rich (automatic encoding of beliefs, Kovacs et al., 2010) or middle ground (two-systems account, Apperly & Butterfill, 2009; Butterfill & Apperly, 2013) explanations on the results of these spontaneous-response ToM measures.

1.2 The rationale behind the spontaneous-response ToM tasks and criticisms

The rationale behind conducting spontaneous-response ToM tasks emerged due to the relatively high demands of elicited-response ToM tasks, used to measure preschoolers' false belief understanding. Elicited-response ToM tasks require children to verbally report their prediction about the protagonist's behavior for a given scenario. It has been argued that children might have the ability to attribute false beliefs to the protagonist before passing the elicited-response ToM tasks. Due to the developing linguistic (Astington & Jenkins, 1999) and executive function abilities (Carlson & Moses, 2001), children may have difficulty in comprehension of elicited-response ToM task narratives, verbally reporting the answers and explicitly coordinating two perspectives (i.e., children's own *true belief* vs. protagonist's *false belief*). That is, elicited-response ToM tasks might demand more than correctly predicting the protagonist's behaviors based on the their mental states (See Baillargeon et al., 2010; Sodian, 2011 for reviews). For this reason, three main

paradigms (Violation of Expectation, VoE, anticipatory-looking, AL, and active-helping) were developed in order to test whether infants can attribute mental states or not.

1.2.1 Anticipatory-looking (AL) measure

The first task designed to measure infants' implicit ToM abilities, was developed by Clements and Perner (1994) in order to emphasize the distinction between implicit knowledge and explicit understanding in the development of ToM abilities. The spontaneous-response ToM task was designed based on measuring children's AL behavior instead of using verbal measures. In the task, children were presented with a false belief scenario in which the protagonist would falsely think that the object in one place while the real place of the object was another. When the children were asked where the protagonist would look for the object, 2 years 5 months to 10 months old children looked at the place where the actual object was. From 2 years 11 months of age, 90 % of children looked for the place that the protagonist would falsely think where the object was. Clements and Perner concluded that even very young children might represent the different states of the world, which is sufficient to look at the place where the protagonist would think the object is. Therefore, children younger than age 4 do not pass elicited-response ToM tasks because verbal and judgmental reports require simultaneous coordination of reality (i.e., true belief) with a different state of the world (i.e., false belief). From Perner's point of view, such a distinction between implicit and explicit ToM does not necessitate mental state attribution before age 4. Instead, such an ability requires children to appreciate the subjective nature of mental states to reason about others' perspectives (See Perner & Roessler, 2012).

In fact, new versions of AL studies were also developed and conducted with 25-month-old and younger infants (e.g., Senju, Southgate, White, & Frith, 2009; Senju et al., 2011; Southgate, Senju, & Csibra, 2007). However, the original study, Southgate et al., 2007, which other studies were based on, was not replicated by the authors, themselves (Kampis et al., 2020; also see Dörrenberg, Rakoczy, & Liszkowski, 2018 for the replicability and validity of the spontaneous-response measures in general). Therefore, the findings on this new version of the AL paradigm should be approached with caution.

1.2.2 Violation of Expectation, VoE measure

Another paradigm that was used to measure children's implicit ToM abilities, developed by Onishi and Baillargeon (2005) was based on the classic change of location task. It was argued that VoE could be used to design a spontaneous-response task, which allows the exclusion of additional task demands (i.e., linguistic and executive abilities). While AL measures assess children's visual anticipation about where the protagonist would look for the object, VoE tasks include whether children would significantly look longer at the location in which the protagonist acts inconsistent with his/her *false belief*. The results of this new VoE measure indicated a *violation of expectation* in 15-month-old infants' looking behaviors. In the false belief condition, infants expected the protagonist to reached to the place where she falsely believed the object was and looked significantly longer when the protagonist reached to the place where actually the object was. Onishi and Baillargeon concluded that infants' expectations (i.e., looking behaviors) change based on the protagonist's beliefs, which suggest "a rudimentary form of understanding of others' beliefs".

If infants' successes on attributing mental states to others in these spontaneous-response ToM measures were "essentially innate social sense", they should be *automatically and spontaneously* applied as in the case of representation of what we perceive in the environment from birth (Kovacs et al., 2010). For this reason, Kovacs et al. (2010) developed a new version of the classic VoE paradigm in order to see whether infants and adults *automatically* and *spontaneously* take others' perspectives into account. In the adult version of the task, it was shown that adults' reaction time for detecting the true location of objects was significantly slower when the protagonist had a *false belief* about the object's location. In the infant version of the task, instead of measuring reaction times, 7-month-olds' looking time was measured using a VoE paradigm. The results of the study indicated that 7-month-old infants looked significantly longer to the situation that resulted in a *violation of the protagonist's false belief* even though the infants, themselves, have a true belief about the objects' location. Kovacs et al. (2010) concluded that both infants and adults can *automatically* and *spontaneously* take others' perspectives into account in a way similar to their own mental states (See Kovacs, Teglas, & Csibra, 2021; Phillips et al., 2015 for empirical and theoretical debates on the validity and replicability of the task).

1.2.3 Active-helping measure

The third type of measure that was developed to assess implicit ToM abilities was through an active-helping paradigm (Buttlemann et al., 2009). In the active-helping paradigm, instead of measuring children's looking behaviors, a more active measure was developed based on the classic change of location task. In this task, 18-month-old infants watched a scenario in which the protagonist put a toy in one of the two

boxes in the room and in the absence of the protagonist, the object's place was changed. Then, when the protagonist returned to the room, she wanted help from the infant to open the box to get the toy. The results indicated that infants did not help to open the box, which the protagonist *falsely believes* the toy was. Instead, they significantly preferred to open the other box where actually the toy was to "help" the protagonist to get the toy. Buttlemann et al. (2009) concluded that infants' behaviors based on an understanding of the others' false belief (See Allen, 2015; Baillargeon, Buttlemann, & Southgate, 2018; Dörrenberg, Rakoczy, & Liszkowski, 2018; Priewasser, Rafetseder, Gargitter, & Perner, 2018; for empirical and theoretical debates on the measure)

1.2.4 Two-systems account to explain success on the spontaneous-response ToM tasks

An alternative, two-systems account, as a middle-ground approach was proposed to explain infants' and adults' success on the spontaneous-response ToM task (Apperly & Butterfill, 2009; Butterfill & Apperly, 2013). According to the two-systems account, infants' success on spontaneous-response ToM tasks might be explained without *automatic processing* the "full-blown" beliefs of others. Instead, infants, possibly also other animals, might have an *automatic awareness* of others beliefs. As shown by many implicit ToM studies, infants and adults' looking times might be influenced by others' beliefs, which may suggest "a minimal level of ToM abilities". Findings in the spontaneous-response ToM studies might be explained through the existence of two different systems, which enable human beings to build successful social interactions. The early-developing system that enables infants and adults to pass spontaneous-response ToM task might also serve as a base to build the *full-*

blown ToM abilities (i.e., later-developing system). After the development of the later-developing system, it might also be possible that the two systems operate together to make sense of social situation and to build robust social interactions.

The two-systems account proposes four principles for the existence of an early-developing system as being different from the later-developing system. The first principle is about *tracking* "goal-directed actions". In order to link bodily movements for the specific goals, the early-developing system needs to *track* intentional actions (Butterfill & Apperly, 2013). The second principle is about representations of *encounterings* (i.e., to understand what others see and do not see). Note that representation of *encounterings* is different from representations of perceptions. Even though infants and adults can appreciate that others *encounter* a situation, it does not mean that they represent what others perceive. The third principle is about understanding others' *registrations.* Appreciation of others' *encounterings* is not enough because *encountering* a situation does not necessitate "registering" the situation. For example, an agent might *encounter* a situation but if it does not *register* to the situation, they may not make correct predictions about the situation, which is closely related to the fourth principle. The fourth principle is about appreciation of casual consequences of *registration* to a situation. That is, infants and adults might understand that when others *register* to a situation, they will act accordingly (e.g., A competitor who saw food, eats the food). The set of these four principles is claimed to be sufficient to explain the characteristics of the early-developing system and also successes on the spontaneous-response ToM tasks.

The two-systems account also provides empirical evidences to support the existences of the two different systems in adulthood (Surtees, Butterfill, & Apperly, 2012). Surtees et al. (2012) presented participants with a situation that requires engaging in level-2 perspective taking. In the task, the participants were asked to judge what the number is on a table (e.g., "9") while an avatar sits facing the participants (i.e., sees the number as "6"). The results revealed that participants' performance to judge what the number is on the table was not affected by the avatar's perspective, conflicting with their own. That is, when the situation requires executive resources (e.g., mentally rotating the number "9" to see it as the number "6"), other's perspectives are not automatically taken into account. Butterfill & Apperly (2013) concluded that adults and infants do not "automatically" *process* others' perspectives. *Processing* other's mental states could be achieved through the later developing system because it requires executive resources (e.g., perspective coordination, mental rotation). Early developing system is sufficient to be *aware* of others' mental states but when the task demands were increased in the spontaneous-response ToM tasks, the limits of early-developing system can be observed.

The two-systems account also specifically disagrees with lower-level interpretations (e.g., behavioral rule strategies; Perner, 2010; Povinelli & Vonk, 2003) of infants and adults' success on the spontaneous-response ToM tasks. Specifically, relying on behavioral rules (e.g., a behavioral rule to solve the FB task: "People look for objects where they were last seen.") could not explain the findings on infants' and adults' responses in some versions of the spontaneous-response ToM tasks (e.g., Kovacs et al., 2010; Samson et al., 2010; Qureshi, Apperly, & Samson, 2010). In these spontaneous-response perspective-taking tasks, infants and adults were not presented

with any behavioral cues referring to the agent's mental states. As mentioned in Section 1.1.2, in Kovacs et al. (2010), adults and infants' responses were influenced only by *expectations* of others' beliefs about an object's location, which do not include behavioral cues to track others' mental states. However, according to the two-systems account, such findings might not support the idea that infants and adults can *automatically process* other's mental states (i.e., engaging in mental state attribution) but only tracking "belief-like" states of others. In other words, even though people can be *aware* about other's mental states, other-oriented mental state attribution may not be an *automatic process* (Apperly et al., 2006; Back & Apperly, 2010). *Full-blown* other-oriented mental state attribution might require the development of domain-general (e.g., executive function) and linguistic abilities (Apperly & Butterfill, 2009).

1.2.5 Action-based approaches to the spontaneous-response ToM tasks

The theoretical debate on ToM research has been mostly shaped based on the debate between "rich" mentalistic (Onishi & Baillargeon, 2005; Surian et al., 2007) and "lean" behavioral (Heyes, 2014; Perner, 2010; Povinelli & Vonk, 2003) explanations. However, action-based approaches provide an alternative possibility on the development of ToM abilities in particular and social-cognition more broadly (Allen & Bickhard, 2013a, b, 2018; Allen, 2015; Carpandale & Lewis, 2006; 2015). Even though action-based approaches do not make a differentiation between behavioral and mental phenomena, an action-based approach agrees with "lean" approaches in terms of their methodological critiques. That is, the spontaneous-response ToM tasks do not require mental state attribution of any sort. Even though the limits of infants and adults' implicit ToM abilities have been observed, it is

difficult to explain implicit ToM research without taking a mentalistic perspective (Allen, 2015). As pointed out by Butterfill and Apperly (2013), it is not clear, for example, how behavioral rules could explain the findings in implicit ToM research. However, according to an action-based approach, gradual nature of cognitive development is important to avoid providing superfluous explanations on how children begin to attribute mental state to *themselves* and *others.*

An action-based framework might provide a more substantive explanation than behavior-rules without providing mentalistic explanations. As in the case of reasoning about the physical environment (Bickhard, 2009a, b), social situations might become meaningful based on acting in the environment (Bickhard, 2008; Carpendale & Lewis, 2015). Through acting in the social world, children might build appropriate anticipations depending on the given situations (e.g., in the context of playing a hide-and-seek game, the seeker was expected to return and look for the "hider", see Allen, 2015). However, such anticipations do not necessitate mental state attribution. Accordingly, mentalistic perspectives may not be necessary to explain infants and adults' success on the spontaneous-response ToM tasks. Physical and social "objects" have affordances, which could determine these objects' actions or behaviors depending on the given situations. When the child experiences the affordances of physical and social objects and the consequences of such affordances, anticipations about social and physical interactions can be built. A child, for example, might represent a small wooden object based on a web of possible anticipations for possible interactions (e.g., *expectation* to find the object where it is left). Similarly, representations about agents' behaviors might be built based on such anticipations and the agents' inner states for the cause of such behaviors might be

gradually internalized through domain-general developments around age four (Allen & Bickhard, 2018).

Action-based approaches propose that the interactive affordances of agents in different situations might be sufficient to build "anticipations" about how others would behave. Comprehension of such behavioral affordances might be enough for children before age 4 to make sense of social situations and to build successful social interactions. Consequently, infants and adults' success on the spontaneous-response ToM tasks might result from considering the affordances of human behavior in social situations. The active-helping task, developed by Buttlemman et al. (2009), for example, introduced "a hide-and-seek game" into the false-belief condition. In turn, hide-seek-games include various affordances such as "the seeker's returning to look for the toy" (Allen, 2015, see also Priewasser et al., 2018). The explicit realization of mental states that creates affordances for human behavior might result from the domain-general developments around age four. Accordingly, adults might also build expectations about agents' behaviors without explicitly reasoning on the inner mental states even though they have the explicit ToM abilities to do so if required (i.e., to *process* others' mental states).

1.3 Self/Other Differentiation task: An *elicited-response* ToM task to see the limits of *implicit* ToM abilities

The ToM literature provides various empirical research on the limits of implicit ToM abilities (Apperly et al., 2006; Back & Apperly, 2010; Surtees & Apperly, 2012). As mentioned in the previous sections, other's perspectives are not taken into account when they are not *explicitly* asked because it requires executive resources. These

research emphasize the existence of social situations that implicit ToM abilities may not be sufficient to take other's perspectives into account. For example, as pointed out in section 1.2.4, in order to take the avatar's perspective and judge *how* a number ("9" vs. "6") is seen from different perspectives, level-2 perspective taking is needed, which requires explicit or "flexible" ToM abilities (e.g., mental rotation). Such limits in implicit ToM abilities might suggest that success on the elicited-response ToM tasks may necessitate executive abilities, which are specific to explicit ToM abilities. Besides, these results may suggest that even though implicit ToM abilities provide people with the required resources to be *aware* about others' mental states, *processing* other's mental states may not be possible without the development/usage of executive resources.

Implicit ToM research, however, leaves out the possibility that we might *automatically process* our own mental states even when the situation requires executive resources to reason on our own mental states in an *explicit* way. In other words, *processing* others' mental states might require executive resources, and therefore, explicit ToM abilities. However, *processing* self-oriented mental states may not require high level of executive resources and implicit ToM abilities might be sufficient to process self-oriented mental states. In order to investigate such a hypothesis, Bradford et al. (2015) conducted an elicited-response ToM task with adults based on the unexpected contents task that was developed for preschoolers (Perner et al., 1987). A Self/Other Differentiation task was specifically developed to explore whether people can *automatically process* their own mental states in contrast to *processing* others' mental states. The task might be especially important to understand the mechanism behind the development of ToM abilities. Specifically, if

people can *automatically process* their own mental states, it might be possible that they build explicit ToM abilities in order to attribute mental states to others based on the *automatic processing* of their own mental states.

1.3.1 Rationale behind the Self/Other Differentiation task

Bradford et al. (2015) designed a Self/Other Differentiation task for adults in order to investigate whether people are able to *automatically process* their own mental states in an elicited-response ToM task. This task is an elicited-response ToM task because in the task, participants were explicitly asked question about one's own or others' belief about the content of a box. If people cannot *automatically process* their own mental states, their implicit ToM abilities would not have any impact on their performances in the elicited-response ToM task (i.e., Self/Other Differentiation task). Each trial of the task included two different stages related to belief states: Dilemma and Probe stages. In the Dilemma stage, the participants were given a "dilemma" about their own or another person's beliefs in a false belief scenario. In the Dilemma stage of each trial, the participants were first asked a question about their own or another person's perspective on the location of an object (e.g., self-oriented: *Where would you look?*; other-oriented: *Where would she look?).* Then, in the Probe stage of each trial, the participants needed to either shift from their own perspective to another person's perspective (or vice versa) on the belief about the content of the box (e.g., self-oriented: *Where did you think?*; other-oriented: *Where did she think?*).

The results of Bradford et al. (2015) revealed longer reaction times for shifting from a self-oriented perspective to an other-oriented perspective compared to shifting

from an other-oriented perspective to a self-oriented perspective. Bradford et al. interpreted these findings as indicating that while the participants were solving an other-oriented question at the Dilemma stage, they might *automatically process* their own perspective as well. If *processing* self-oriented perspectives are *automatic*, it would be reasonable to argue that when the participants shifted from an other-oriented question to a self-oriented question, the self-oriented question at the Probe stage would be easier to respond. However, when the participants shifted from a self-oriented question to an other-oriented question, the other-oriented question at the Probe stage would be harder to respond. Because *processing* others' mental states are not *automatic* and require explicit ToM abilities, while the participants were answering a self-oriented question at the Dilemma stage, they could not consider an other-oriented perspective which explains the relatively slower reaction time performances in shifting from a self-oriented question to the other-oriented question at the Probe stage.

Based on these findings, Bradford et al. (2018) argued that *automatic processing* of self-oriented mental states, as demonstrated in adults, might be a crucial factor to explore the development of ToM abilities. It might be possible that *automatic processing* of self-oriented mental states enables people to build more sophisticated ToM abilities (i.e., processing other-oriented mental states). Accordingly, if *processing* self-oriented mental states are *automatic* and "act as a stem" for appreciating others' mental states, there might be a "universal component of ToM abilities" and Bradford et al.'s findings should be universal. In order to test this hypothesis, Bradford et al. (2018) conducted the same task with Chinese participants in order to reveal the universal nature of processing self-oriented mental states. A

sample from collectivistic culture was deliberately chosen in order to test the findings observed in an individualistic culture. The similar findings of non-Western people on the Self/Other Differentiation task might indicate a "core" component of ToM abilities (i.e., *automaticity* of self-oriented mental state attribution). In other words, regardless of the cultural inputs, self-oriented mental state attribution might be a crucial mechanism to act as a foundation for understanding other-oriented mental states. The result of Bradford et al. (2018) showed that, similar to Western participants, non-Western participants were more accurate and quicker to respond while shifting from an other-oriented question to a self-oriented question compared to opposite. Since non-Western participants showed similar results with Western participants, there might be a universal aspect to ToM abilities that allow people to *automatically process* self-oriented mental states. These results also support the idea that the development of other-oriented mental state attribution might result from "an egocentric bias" that human beings have.

1.3.2 Non-mentalistic explanations to the findings on the Self/Other Differentiation task

In the Dilemma stage of the Self/Other Differentiation task, participants were asked to find where an object is located based on the type of box (e.g., looking for a candy box to find the candies). Then, the content of the targeted box was *revealed* with either an expected (True Belief condition, TB) or an unexpected content (False Belief condition, FB). After the Revelation stage, the participants were asked what she thought was inside the box (i.e., self-oriented question) or what another person would think was inside the box (other-oriented question). In the current study, we suggest that in the Probe stage of the task, self-oriented questions, always included

more concrete experience than other-oriented questions. For example, when a participant is asked where to look for candies at the Dilemma stage, she might build an expectation (true/false belief) about the box in which the candies are located. Then, she might easily answer a self-oriented question at the Probe stage based on her past expectation (i.e., a true/false belief of having candies inside the box). However, building such an expectation at the Dilemma stage may not mean "automatic" *processing* of one's own mental state. In other words, at the Dilemma stage, the participant may not automatically *process* what she would "think" was inside the candy box. Instead, she might build an expectation about the box's content and answer a self-oriented question of the Probe stage based on recalling her own past expectation (or belief). In the other-oriented question of the Probe stage, one's own past expectation would not be helpful to answer what another person would "think" was inside the box. Therefore, while the self-oriented question is about an event that happened in reality (i.e., participants had that true/false belief about the content of box), other-oriented question remained in a hypothetical state. This creates a contrast between the two conditions beyond being self- and other-oriented in terms of the recall of a concrete experience versus an abstract hypothetical.

Another issue with the characteristics of the task comes through perception of self-oriented questions in general. Any self-oriented questions might be easier to answer because they are questions about one's own perspective. To answer any self-oriented questions, one can rely on personal experience that would provide more "concrete cues" for an accurate response. However, in the Self/Other Differentiation task, other-oriented questions are about a hypothetical person's perspective. Participants, for instance, never experience whether another person saw the candy box or not. In

Bradford et al. (2015), there was no significant difference in participants' reaction time between self-to-self shift and other-to-other shifts (i.e., the no-perspective shift conditions). However, such a significant difference was observed in Bradford et al. (2018) where the number of trials was more than doubled for each condition. In other words, in Bradford et al. (2018), where the number of trials was increased compared to Bradford et al. (2015), self-oriented questions in each condition (i.e., in both no-perspective shift and perspective shift conditions) were processed faster than other-oriented questions at the Probe stage. These findings support the idea that self-oriented questions were always processed faster due to the ease of considering the situations from one's own perspective based on recall of personal memories. Other-oriented questions might always be difficult to process because they are always about another person who is hypothetical.

Consequently, self-oriented questions may not be *automatically processed* and the differences between the participants' performances in the self-oriented and other-oriented questions might result from the characteristics of the task across conditions (i.e., it is always faster to process self-oriented questions due to relying on the concreteness of past and personal experiences). This confound could also undermine the theory that there might be a universal component for ToM mechanisms that act as a foundation for understanding other-oriented mental states.

1.3.2.1 Evidentiality to provide concrete cues for other-oriented questions

In order to investigate whether the findings in the Self/Other Differentiation task was based on the concrete versus abstract characteristics of the task (rather than the

automatic processing of self-oriented mental states), other-oriented questions might also be presented with more "concrete cues". One possible way to make other-oriented questions "more concrete" may depend on changing the structure of the sentences. Namely, questions might include cues to emphasize that another person, who was referred in the question, experienced the false belief scenario (i.e., she saw the content of the box and had the false or true belief about the content of the box). Such a manipulation can be applied through evidential markers, which are specific to agglutinative languages, including Turkish. Turkish grammatical structure obligates its speakers to use one of the evidential markers while referring to the past events in order to provide evidence for their statements (Aksu-Koç, 1988). Although there are four different versions of the Turkish evidential markers, direct evidential marker, *–DI* and indirect evidential marker, *–mIş* are two main evidential morphemes that are used to refer to events that happened in the past (See Aksu-Koç, 1988; Aksu-Koç, Ögel-Balaban & Alp, 2009 for more information about the characteristics of Turkish evidential markers). In order to refer to an event in the past with a direct experience (e.g., the speaker *saw* the event), the speaker needs to use the direct evidential marker, *–DI*. In order to refer an event in the past with an indirect experience (e.g., the speaker *heard* the event), the speaker needs to use the indirect evidential marker, *–mIş*.

Evidential markers provide concrete (i.e., direct or indirect) evidence for speaker's own personal experience. Based on the evidential that is used, the hearer might appreciate whether the speaker's statement included any direct psychological states (e.g., perception, beliefs, desires) in a given situation. For example, when a person uses the direct evidential marker, *–DI* to state that "The vase was broken.", the

hearer might infer that the speaker's psychological states for the given situation included them "seeing" that the vase was broken. In other words, evidential markers might allow the hearers to more easily consider the situation from the speaker's point of view.

Evidential markers might be especially helpful for children to appreciate the protagonist's point of view in a false belief scenario. Özoran (2009), for instance, presented 4- to 7-year-old Turkish children with past-tense version of the false belief tasks. When children were presented the Turkish past-tense version of the false belief tasks (e.g., unexpected content, change of location) with the direct evidential marker, *–DI*, their performance significantly increased compared to the neutral version of the false belief task where the test question were asked in the Turkish present-tense. Özoran (2009) argued that children need "longer clues" to process others' representations and direct evidential marker, *–DI* might help children to actualize others' experiences of events and inner mental states that the events lead to. For example, false belief questions with the direct evidential marker, *–DI* might highlight the situation that "another" person also *saw* the candy box, which includes an unexpected content (i.e., a crayon). Children could hold the past event about another person's seeing of the candy box "longer" in their mind. This would allow them to more easily reason that the person also *experienced* the same false belief about the content of the candy box before. Even though adults may not need such concrete cues in their daily social interaction to attribute mental states to others, the existence of such cues might enable them to make the other-oriented questions of the Self/Other Differentiation task easier. Thus, presenting the task to participants with the direct evidential marker, *–DI* might allow to explore whether the characteristics

of the test questions across self- and other-oriented mental states create a discrepancy on the participants' responses at the Probe stage instead of the existence of *automaticity* in self-oriented mental state processing.

In the Self/Other Differentiation task, if the questions were asked in the past-tense while using the direct evidential marker, *–DI*, the other-oriented questions might be as concrete as self-oriented questions (e.g., "Before Alp saw what was inside this box, what did she think was inside?"; *Alp bu kutunun içindekini görmeden önce, içinde ne olduğunu düşündü?* in Turkish). The direct evidential marker, *–DI* might highlight the situation that the "other" person also *saw* the event and *experienced* the same false or true belief about the content of the box before. In other words, the direct evidential marker, *–DI* might enable participants to strengthen their representations about another person's mental state (i.e., true or false beliefs about the content of the boxes) which these events lead to in the person's mind. Thus, the participants might process other-oriented mental states as fast as processing self-oriented mental states.

1.4 The present study

The main aim of the current study is to investigate whether there is sufficient evidence for claiming that self-oriented mental states are automatically processed. The Self/Other Differentiation task was designed to measure whether people could *automatically process* their own mental states. The findings showed that people found it easier to shift from other-oriented questions to self-oriented questions compared to the opposite. Bradford et al. reasoned that the difference across conditions is because they *automatically processed* their own mental states when

they first encountered other-oriented questions. We argue that self-oriented questions might be considered faster because they included more concrete cues (i.e., while other-oriented questions are based on a hypothetical person, self-oriented ones are about one's own point of view). Based on Özoran's (2009) study on preschoolers' ToM abilities, we argue that concreteness cues, Turkish direct evidential marker, *–DI*, provided in the other-oriented questions could enable adults to actualize others' background experience about the false belief scenario. Based on Turkish evidential markers, adults could strengthen their representations about others' false beliefs on the other-oriented questions so that they could adopt other-oriented perspectives as easy as self-oriented perspectives. For this reason, the present study will present participants with the Turkish past-tense version of the Self/Other Differentiation task with the direct evidential marker, *–DI*. The Turkish present tense version of the task will also be presented to all participants as a baseline condition to replicate the effects of the original study (Bradford et al., 2015, 2018). Lastly, the Auckland Individualism and Collectivism Scale (AICS) was included in the study first to investigate whether our sample represent the collectivistic features common in Turkish culture (Kagitcibasi, 1996; Kagitcibasi & Ataca, 2005). This is important to control that the Self/Other Differentiation task was conducted in a Non-Western sample. Another aim of including the AICS to our study was to investigate whether individual differences in representation of collectivistic and individualistic features have an impact on the participants' processing of self- and other-oriented mental states.

Research Question: Could concreteness cues affect implicit ToM processing across the self-oriented vs. other-oriented perspective taking questions?

Hypothesis 1.1: Concreteness cues (i.e. evidential markers) enable participants to process the other-oriented perspective-taking questions as fast as self-oriented perspective-taking questions.

Prediction 1.1: The Shift condition *in the past tense*: There will be no significant performance difference between shifting from other-oriented questions of the Dilemma stage to self-oriented questions of the Probe stage and shifting from self-oriented questions of the Dilemma stage to other-oriented questions of the Probe stage.

Prediction 1.2: The No-Shift condition *in the past tense*: There will be no significant performance difference between shifting from self-oriented questions of the Dilemma stage to self-oriented questions of the Probe stage and shifting from other-oriented questions of the Dilemma stage to other-oriented questions of the Probe stage.

Hypothesis 2.1: Without the existence of concreteness cues, the self-oriented perspective-taking questions are processed faster than other-oriented perspective-taking questions.

Prediction 2.1: The Shift condition *in the present tense*: There will be a significant performance difference such that shifting from other-oriented questions of the Dilemma stage to self-oriented questions of the Probe stage will be faster than shifting from self-oriented questions of the Dilemma stage to other-oriented questions of the Probe stage.

Prediction 2.2: The No-Shift condition *in the present tense*: There will be a significant performance difference such that shifting from self-oriented questions of the Dilemma stage to self-oriented questions of the Probe stage

will be faster than shifting from other-oriented questions of the Dilemma stage to other-oriented questions of the Probe stage.

CHAPTER 2

METHOD

2.1. Participants

Sixty-five native Turkish participants were recruited through Bilkent University's email system (BAIS) and social media announcements. All participants, except for 2 high school graduates, were university students or had undergraduate or higher degrees. The age range was 18-29 (M = 22.65, SD = 2.71, 45 female). All participants gave informed consent at the beginning of the experiment and this study was approved by the Bilkent University's Human Research Ethics Committee to be conducted with human subjects. A minimum sample size of forty-four total participants was determined a priori through G*Power software (Faul, Erdfelder, Lang, & Buchner, 2007) with a medium effect size at 0.25 and the power of 0.95 while alpha was set at 0.05. However, we aimed to collect data from more participants because our study was based on Bradford et al. (2015) who collected data from sixty-three participants. Participants were either given 10 GE 250/251 points or a gift-card lottery where 4 of the participants was given gift-cards from a bookstore in the amount of 25 TL.

2.2 Stimuli and Procedure

Due to the Covid-19, the study was conducted fully online and participants were recruited via online task Builder Gorilla.sc where participants can complete the study through their own computer based on the experiment link sent to them. At the beginning of the experiment, the participants were connected to a Zoom link sent by the experimenter to explain the procedure of the study. Each participant was asked to connect through the Zoom link via computer and participate in the study only through his or her computer on a desk in a quite room. If the participants were connected to the Zoom in an environment, which was not quite, or did not have a desk to put their computer, they were kindly asked to fulfill the requirements to participate in the study.

The study included three phases (i.e., the Self/Other Differentiation Task in Present Tense, Past Tense and the AICS questionnaire). The order of the first two phases (the Self/Other Differentiation Task in Present tense and Past Tense) was counterbalanced across participants and the AICS questionnaire was always presented at the end of the testing session. Considering the quite low internet connection networks in Turkey (OECD, 2014), after explaining the study, the participants were asked to close the each window on their computer, including the Zoom window in order not to decrease their internet speed limits to process the experiment in an accurate way (e.g. complete upload of the photos and sentences). The participants were kindly asked to enter to the Zoom meeting again after the end of the first phase, depending on the condition they were in (i.e., Present Tense to Past Tense vs. Past Tense to Present Tense) in order to explain the second and third phases of the study. They were also kindly asked to enter to the Zoom meeting for

the last time after they completed the remaining two phases and read the Debriefing form to be fully informed about the study and have a time for asking questions to the experimenter about the study. In total, the Self/Other Differentiation task and the AICS questionnaire took approximately 35 – 40 minutes to complete.

2.2.1 Auckland Individualism and Collectivism Scale (AICS)

The questionnaire (Shulruf et al., 2007; also see Shulruf et al., 2011) was conducted to measure the participants' level of individualism and collectivism. The questionnaire included 30 questions in total with three dimensions of individualism and two dimensions of collectivism (See Appendix A). The three dimensions of individualism include "responsibility", "uniqueness" and "competitiveness" while the two dimensions of collectivism include "advice" and "harmony". In the questionnaire, the participants were expected to answer based on a Likert-type scale of 1 (Strongly disagree) to 5 (Strongly agree). In the three dimensions of individualism, the maximum score a participant could get was a score of 70 while the minimum score was 14. In the two dimensions of collectivism, the maximum score a participant could get was a score 80 while the minimum score was 16. For the comparability of the two scores, the two raw scores were scaled with linear transformations to acquire an individualism score ((raw individualism score – 14) / 70) and a collectivism score ((raw collectivism score – 16) / 80). In order to verify the Turkish version, the scale was translated and back translated by our lab – Bilkent Developmental Psychology Lab (Bil-Ge).

2.2.2 Self/Other Differentiation Task

The task was created via online task builder Gorilla.sc and presented in a written format based on Bradford et al. (2015; 2018). Before the 120 test trials, the participants completed eight practice trials. (See Table 1 for the number of trials for each condition in Turkish past and present tense). All participants were presented with each condition. The tenses (i.e., past vs. present), presented to the participants, were counterbalanced across participants such that half of the participants were first presented with the present-tense version of the task and, then, the past-tense version of the task while the reverse order was applied for the other half. The trials of each condition were randomly presented to the participants. Each trial included three stages in both of the Turkish past- and present-tense versions: (1) dilemma stage, (2) content revelation stage, and (3) probe stage (See Figure 1 for the description of each stage with a specific timeline for the presentation order). The locations of the answer options in each stage were also counterbalanced for each participant. In the practice trials, the participants were not asked belief attribution questions (See Appendix B for the exemplary of each condition in Turkish past- and present-tenses). As in Bradford et al. (2015; 2018), we acquired the colored pictures from the Bank of Standardized Stimuli (Brodeur, Dionne-Dostie, Montreuil, & Lepage, 2010) and the Amsterdam Library of Object Images (Geusebroek, Burghouts, & Smeulders, 2005). The pictures were shown on a white background in the centre of the screen while the texts of the questions were black. The Gorillla.sc online task builder recorded the reaction time, starting at the time that three images of possible answers were shown, in both Dilemma and Probe stages.

2.2.2.1 Dilemma Stage

The Dilemma stage was included in order to create a belief-state through selecting one of three container options. The options were presented in a horizontal line in order to find a specific object that would be inside the container. Dilemma questions were presented as either self-oriented in both past-tense: “You looked for coffee to drink in the car. Where did you look for it?” (*Arabada içmek için kahve aradınız. Nereye baktınız?* in Turkish, 30 trials) and present-tense: ”You want to wash your hair and are looking for shampoo. Where do you look for it?” (*Saçınızı yıkamak istiyorsunuz ve şampuan arıyorsunuz. Nereye bakarsınız?* in Turkish, 30 trials) or other-oriented in both past-tense: “Nur wanted to take notes and looked for a pencil. Where did she look for it?” (*Nur derste not almak istedi ve kalemini aradı. Nereye baktı?* in Turkish, 30 trials) and present-tense: “Cem have a headache and want to take medicine. Where does he look for it?” (*Cem'in başı çok ağrıyor ve ilaç içmek istiyor. Nereye bakar?* in Turkish, 30 trials). In the practice trials, the participants were always asked to select one of the three options (e.g., “Select the wet towel pack”; *Islak mendil paketini seçiniz* in Turkish, 8 trials). The questions were presented for 1500 ms before the options as images were shown. The three options as images were shown for a maximum of 5000 ms. If the participants did not select the correct container or could not select any of the options, an “X” was shown for 1000 ms and the dilemma trial was presented again until the correct option was selected (See Figure 1).

In order to eliminate any discrepancy between right- and left-handed participants’ reaction times due to the location of the buttons on the keyboard, two different versions were created and participants’ hand-preferences were asked before

beginning to the experiment. Left-handed participants were asked to press the key "1" to select the option in the left, the key "2" to select the option in the middle and the key "3" to select the option in the right. Right-handed participants were asked to press the key "8" to select the option in the left, the key "9" to select the option in the middle and the key "0" to select the option in the right. Participants were also kindly asked to only use the number buttons in the upper part of their keyboard which all types of keyboard have (i.e., not the numeric keyboard separately existing in the right part of some keyboards).

2.2.2.2 Contents Revelation Stage

After the correct answer that was given at the dilemma stage, the contents of the container were revealed. Contents of the container were shown for 2000 ms. The contents could be either expected (e.g., revealing some milk from a milk bottle) or an unexpected (e.g., revealing a dish sponge from a coffee pack). The practice trials only included the expected contents. After the participants were presented self/other oriented-dilemma questions, the pictures of the content were shown, half of which were expected and the other half were unexpected. The participants were not expected to press any key at this stage (See Figure 1).

2.2.2.3 Probe Stage

The probe stage was included to measure participants' mental state attribution abilities. In each question of the Probe stage, the participants were asked one of the three options, presented in a horizontal line in order to chose their own belief or another person's belief about the content of the presented container. Probe questions were also presented as either self-oriented in both past-tense: "Before you saw what

was inside this box, what did you think was inside?" (*Siz bu kutunun içindekini görmeden önce, içinde ne olduğunu düşündünüz?* in Turkish, 20 trials) and present-tense: "Think that you did not see what is inside this box. What do you think is inside this box?" (*Bu kutunun içinde ne olduğunu görmediğinizi düşünün. Kutunun içinde ne olduğunu düşünürsünüz?* in Turkish, 20 trials) or other-oriented in both past-tense: "Before Nil saw what was inside this box, what did she think was inside?" (*Nil bu kutunun içindekini görmeden önce, içinde ne olduğunu düşündü?* in Turkish, 20 trials) and present-tense: "Think that Alp did not see what is inside this box. What does he think is inside this box?" (*Alp'in bu kutunun içinde ne olduğunu görmediğini düşünün. Kutunun içinde ne olduğunu düşünür?* in Turkish, 20 trials). In practice trails, the participants were always asked to choose the object that was actually in the box/container (i.e., true belief/reality). Distracter questions were also included at the Probe stage trials of both past-tense (e.g., "Which color was the table that you have just seen; *Az önce gördüğünüz masa hangi renkti?* in Turkish, 20 trials) and present-tense (e.g., "Which color is not on the packet that you have just saw?; *Az önce gördüğünüz paketin üzerinde hangi renk yoktur?* in Turkish, 20 trials). Distracter trials were included in order to prevent participants from building an expectation about the correct answer before seeing the probe questions.

Since Turkish is an agglutinative language, the length of the sentences between self-oriented and other-oriented sentences could not be matched to that of Bradford et al. (2018). The sentences were syntactically matched across self-oriented and other-oriented sentences in both Turkish past and present tense versions of the task. In order to match the syntax, the length and structure of the sentences could also not be matched. However, since we followed the same manipulations, applied by Bradford

et al. (2015; 2018), including using the same databases for material acquisition, we did not expect to have any difference in responses due to these disparities. Further, since the reaction time recording started when the options appeared, the participants had a separate 1500 ms to read the question in each trial for both the Dilemma and Probe stages. All names used in the other-oriented trials were one syllable to make the length of the sentences between self-oriented and other-oriented trials similar. The probe questions were shown for 1500 ms before the options as images were shown. The three options as images were shown for a maximum of 8000 ms (See Figure 1).

In contrast to the Dilemma stage, when the participant incorrectly answered any of the questions or did not answer within the time limit, the task continued to the next trial without repeating the same Probe stage question. The same key pressing procedure with the Dilemma stage was applied at the Probe stage such that the left-handed participants pressed the keys “1”, “2”, and “3” while the right-handed participants pressed the key “8”, “9”, and “0”.

Table 1. The number of trials for each condition of the Self/Other Differentiation task in Turkish past- and present-tense

	Self Dilemma			Other Dilemma			
	Self Probe	Other Probe	Distracter	Self Probe	Other Probe	Distracter	
EC (Past)	5	5	5	5	5	5	30
EC (Present)	5	5	5	5	5	5	30
UC (Past)	5	5	5	5	5	5	30
UC	5	5	5	5	5	5	30
Total	20	20	20	20	20	20	120

Note. EC: Expected Contents; UC: Unexpected Contents

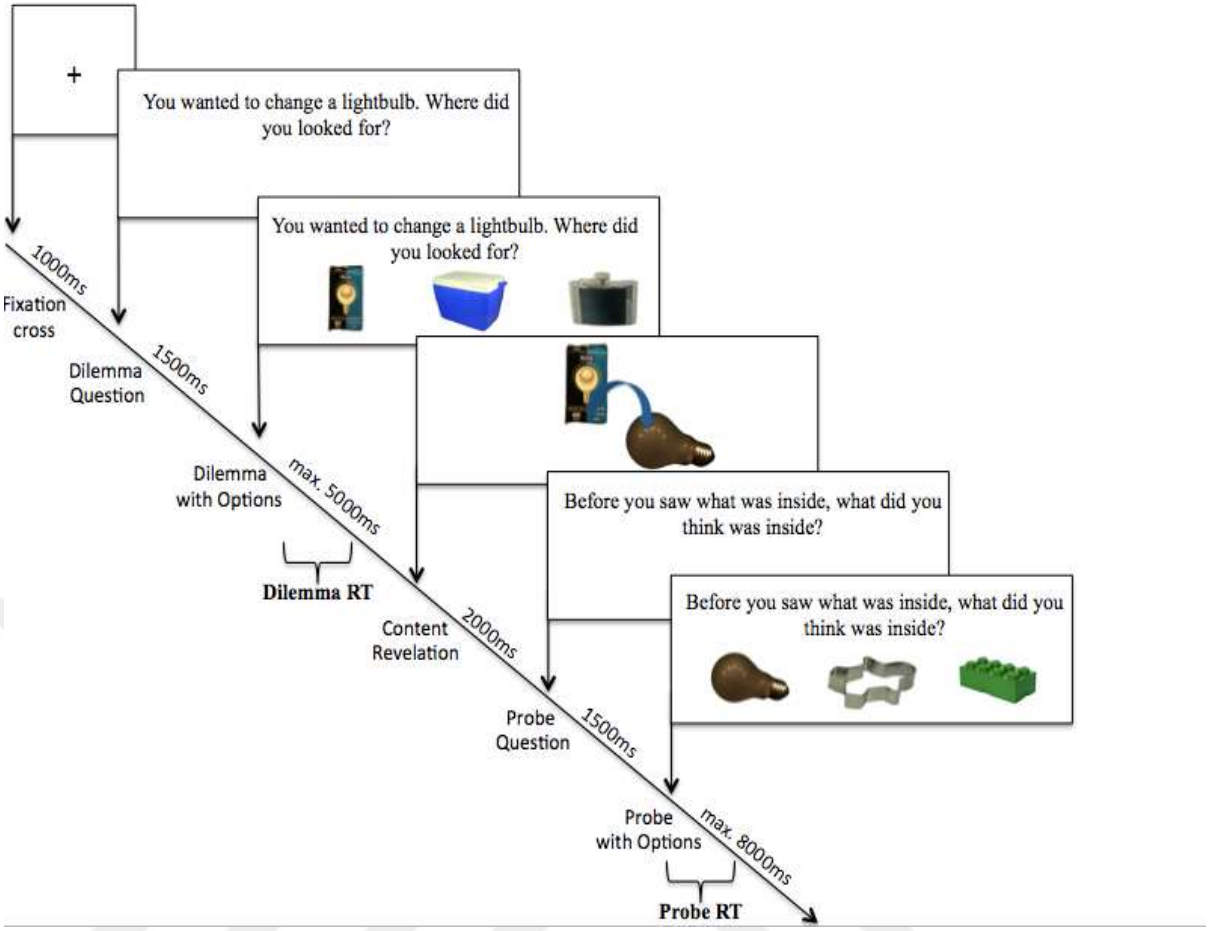

Figure 1. Description of each stage of a single trial in the Turkish past tense version of the Self/Other Differentiation task: the Dilemma stage (Self or Other), Revelation stage (Expected or Unexpected), and Probe stage (Self, Other, or Distracter)

CHAPTER 3

RESULTS

Outliers in the data were explored based on the overall reaction time means in the present- and past-versions of the Self/Other Differentiation task. Namely, we checked whether there were participants with scores that were three standard deviations (or more) away from the reaction time mean. Based on this criterion, no outlier was detected in the overall reaction time means of the participants. However, one participants' data was excluded from the analyses because there were no correct answers in two conditions of the Self/Other Differentiation task trials. The exclusion resulted in a final sample of 64 participants (44 females, 20 males; mean age 22.64 years, range 18-29).

3.1 Analysis Plan

As Bradford et al. (2015; 2018), in order to explore whether participants' responses significantly differ across the self and other-oriented questions at the Dilemma stages of both the present- and past-tense versions of the task, two separate t-tests were conducted. In order to investigate whether participants' shifting performances differ across the past- and present-tense versions of the task, a Repeated-Measures ANOVA was conducted. For the ANOVA, dependent variable was the reaction time

and independent variables were Perspective-shift, Probe and Tense Types. In order to investigate whether concreteness cues enable to answer other-oriented questions as easy as self-oriented questions at the Probe stage (i.e., past-tense version of the task), two separate Repeated-Measures ANOVAs were conducted. In one of these ANOVAs, the dependent variable was the reaction time while in the other ANOVA, the dependent variable was the error rate. In the ANOVAs conducted for the past-tense version of the task, Perspective-shift, Probe and Contents Types were independent variables. Finally, in order to investigate whether self-oriented questions are more easily answered than other-oriented questions at the Probe stage in the absence of concreteness cues (i.e., present-tense version of the task), two separate Repeated-Measures ANOVAs were conducted. In one of these ANOVAs, the dependent variable was participants' reaction time while in the other ANOVA, participants' error rate was the dependent variable. For both of these ANOVAs, Perspective-shift, Probe and Contents Types were again independent variables.

3.2 Self/Other Differentiation Task

Reaction time data only included the correct responses. That is, all correct responses in the Dilemma and Probe stages of the data were included in the analyses. Reaction time data of the Dilemma and Probe stage were separately analyzed. Namely, when an incorrect answer (including no response) was recorded in a given trial of the Dilemma stage, the answer was excluded from the analyses, but the correct answers, recorded in the Probe stage of the same trial was included in the analyses. For the error rate data, all answers in the Dilemma and Probe stages were included in the analyses. In both Dilemma and Probe stages, if no response was given within the

time limit (i.e., 5000 ms in the Dilemma stage and 8000 ms in the Probe stage), the answer was coded as incorrect.

3.2.1 Analyses on the Probe stage of Self/Other Differentiation task across Tense Type

The analyses were conducted to investigate whether the levels of Perspective-shift presented in the Self/Other Differentiation task affect the RTs and error rates at the Probe stage across the levels of Tense Type (Past vs. Present). Therefore, for these analyses, the levels of Contents Type were collapsed. The Probe stage conditions resulted in three factors ("Perspective-shift", "Probe Type" and "Tense Type"). The analyses were conducted with a 2 (Perspective-shift: Shift vs. No-shift) x 2 (Probe Type: Self vs. Other) x 2 (Tense Type: Past vs. Present) Repeated-Measures ANOVA.

3.2.1.1 Reaction time data

The analyses revealed a main effect of Perspective-shift, $F(1, 63) = 21.335$, $p < .001$, $\eta_p^2 = .253$ with slower responses to shifting questions ($M = 1297$) than no-shifting questions ($M = 1171$). Results revealed a main effect of Probe Type, $F(1, 63) = 6.719$, $p = .012$, $\eta_p^2 = .096$ with slower responses to other-oriented questions ($M = 1271$) than self-oriented questions ($M = 1198$). The results also revealed a main effect of Tense Type, $F(1, 63) = 4.250$, $p = .043$, $\eta_p^2 = .063$, with slower responses to the trials in present-tense ($M = 1271$ ms) than the trials in past-tense ($M = 1198$ ms).

There was a significant interaction between Perspective-shift and Tense Type for RT, $F(1, 63) = 8.549$, $p = .005$, $\eta_p^2 = .119$ (See Figure 2). The results revealed that RTs in the past-tense trials (M = 1298 ms, SD = 47 ms) were slower than the present-tense trials (M = 1296 ms SD = 52 ms) in the Shift condition while the present-tense trials (M = 1246 ms, SD = 48 ms) were also slower than the past-tense trials (M = 1098 ms, SD = 44 ms) in the No-shift condition. A post-hoc Holm-Bonferroni test showed that there was a significant difference between the levels of Tense Type (i.e., "Past" vs. "Present") in the No-Shift condition, $t(63) = -3.382$, $p = .004$, $d = -0.423$, but no significant difference in the Shift condition, $t(63) = 0.039$, $p = .969$, $d = 0.005$.

There was also a three-way interaction between Perspective-shift, Probe Type, and Tense Type, $F(1, 63) = 42.924$, $p < .001$, $\eta_p^2 = .405$. In order to understand the source of the three-way interaction, two separate Repeated-Measures ANOVAs conducted for the Shift and No-Shift trials, with Probe and Tense Types as within-subjects variables. The results revealed that there was a significant interaction between Probe Type and Tense Type for the Shift condition, $F(1, 63) = 14.168$, $p < .001$, $\eta_p^2 = .184$. RTs in the present-tense trials (M = 1347 ms, SD = 61 ms) were slower than the past-tense trials in the self-oriented perspective questions (M = 1178 ms SD = 45 ms) while the past-tense trials (M = 1419 ms, SD = 57 ms) were slower than the present-tense trials in the other-oriented trials (M = 1246 ms, SD = 50 ms). A post-hoc Holm-Bonferroni test showed that there were significant differences between the levels of the Tense Type (i.e., "Past" vs. "Present"), $t(63) = -3.534$, $p = .002$, $d = -0.442$, in both the self-oriented perspective questions and the other-oriented perspective questions, $t(63) = 3.605$, $p = .002$, $d = 0.006$.

The results revealed that there was an interaction between Probe Type and Tense Type for the No-shift condition, $F(1, 63) = 33.830$, $p < .001$, $\eta_p^2 = .349$. As being contrary to the Shift condition, RTs in the past-tense trials (M = 1134 ms SD = 62 ms) were slower than the present-tense trials (M = 1133 ms, SD = 44 ms) in the self-oriented perspective questions while the present-tense trials (M = 1358 ms, SD = 64 ms) were slower than the past-tense trials (M = 1062 ms, SD = 46 ms) in the other-oriented trials. As being different from the Shift condition, A post-hoc Holm-Bonferroni test showed that there was a significant difference between the levels of the Tense Type (i.e., "Past" vs. "Present") in the other-oriented perspective questions, $t(63) = -4.473$, $p < .001$, $d = -0.589$, but not in the self-oriented perspective questions, $t(63) = 0.009$, $p = .993$, $d = 0.001$. Two-way interaction between Perspective Type and Probe Type and the two-way interaction between Probe Type and Tense Type were not significant (See Figure 3 for different responses to the Probe questions across past vs. present tense versions of the task).

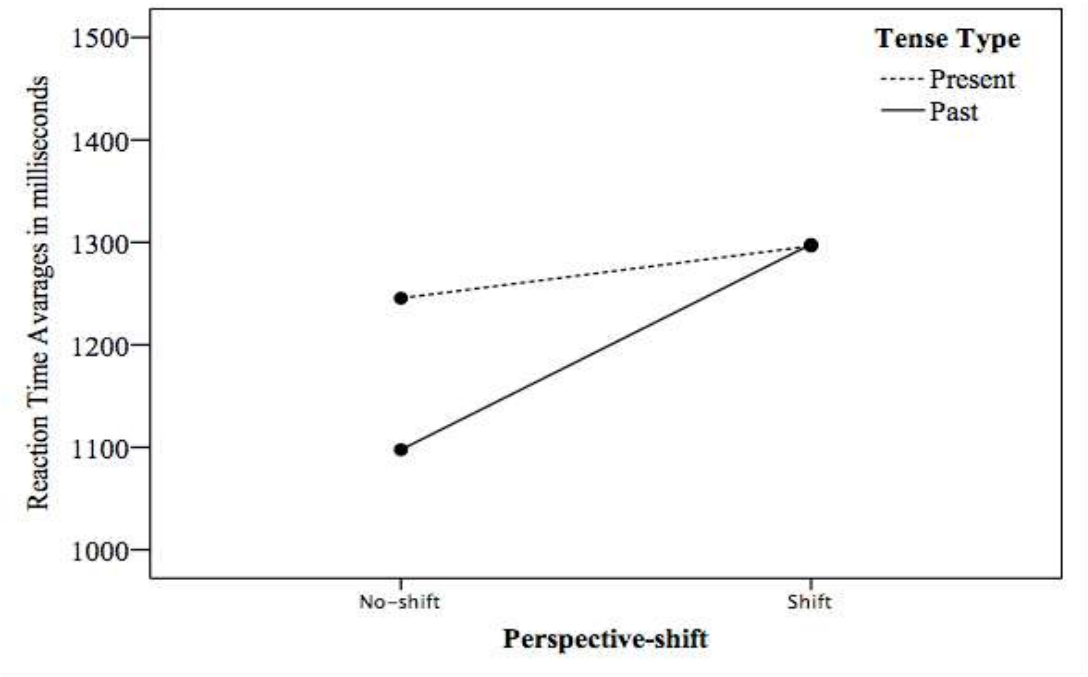

Figure 2. Perspective-shift by Tense Type Interaction for the Self/Other Differentiation task

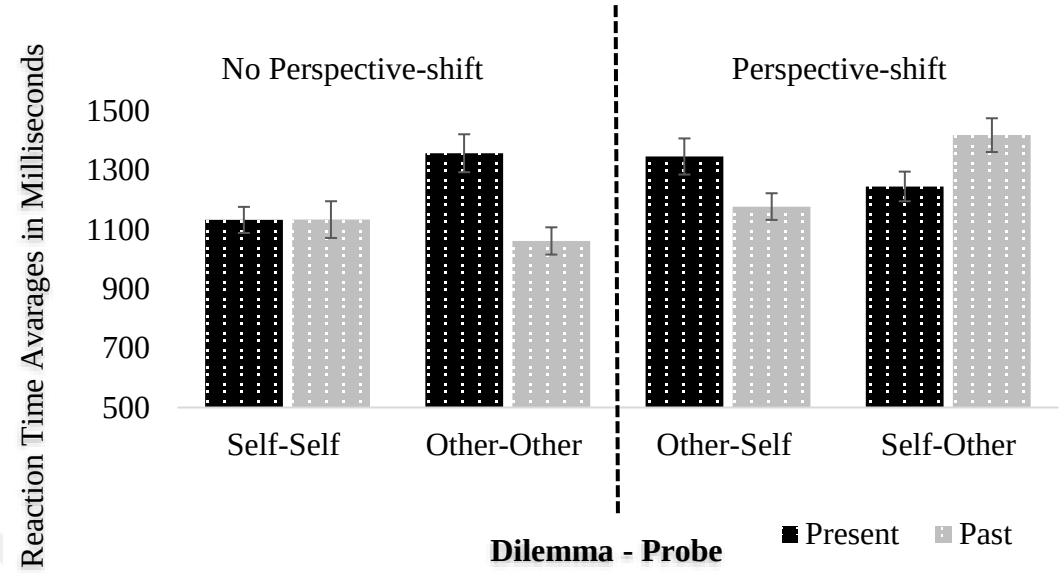

Figure 3. Means of (A) Reaction Time across the past- and present-tense version of the task. Error bars represent the standard error of the mean.

Note. Perspective type used at the Dilemma stage is indicated before the dash and perspective type used at the Probe stage is indicated after the dash**.**

3.2.2 Past-tense version of the Self/Other Differentiation task

As Bradford et al. (2015; 2018), the Turkish past-tense version of the task was included in the study in order to investigate whether concreteness cues on the false belief scenarios could affect RTs and error rates at the Probe stage. Specifically, we aimed to investigate whether other-oriented perspectives were processed as fast as self-oriented perspectives based on more concrete cues, provided through Turkish direct evidential markers.

3.2.2.1 Reaction time data at the Dilemma stage

In the past-tense version of the task, a t-test revealed a significant difference between other-oriented Dilemma RTs and self-oriented Dilemma RTs, $t(63) = 6.245$, $p < .001$, $r = .78$, with longer RTs in the other-oriented Dilemma trials ($M = 1666$ ms) than self-oriented Dilemma trials ($M = 1499$ ms).

3.2.2.2 Reaction time data at the Probe Stage

The conditions in the Probe stage resulted in three factors ("Perspective-shift", "Probe", and "Contents") that could affect Probe stage RTs and error rates. Perspective-shift (included two levels: "Shift" and "No-shift") was considered as a factor to explore whether the levels of the Dilemma stage ("Self" or "Other") affect RTs and error rates at the Probe stage. The trials with "No-shift" at the Probe stage included either self- (i.e., Self-Self) or other- (i.e., Other-Other) oriented trials. The trials with "Shift" at the Probe stage included either a shift from an other- to self-oriented perspective (i.e., Other-Self) or a shift from a self-perspective to other-oriented perspective (i.e., Self-Other). The analyses at the Probe stage were conducted with a 2 (Perspective-shift: Shift vs. No-shift) x 2 (Probe Type: Self vs. Other) x 2 (Contents Type: Expected vs. Unexpected) Repeated-Measures ANOVA. The analyses revealed a main effect of Perspective-shift, $F(1, 63) = 26.502$, $p < .001$, $\eta_p^2 = .296$ with slower responses to shifting questions ($M = 1298$) than no-shifting questions ($M = 1098$). Results revealed a main effect of Probe Type, $F(1, 63) = 4.719$, $p = .034$, $\eta_p^2 = .070$ with slower responses to other-oriented questions ($M = 1240$) than self-oriented questions ($M = 1156$). Results also revealed a main effect of Contents Type, $F(1, 63) = 8.731$, $p = .004$, $\eta_p^2 = .122$, with slower responses to unexpected contents ($M = 1253$ ms) than expected contents ($M = 1143$ ms).

There was a significant interaction between Perspective-shift and Probe Type for RT, $F(1, 63) = 17.823$, $p < .001$, $\eta_p^2 = .221$ (See Figure 4). The results revealed that the RT perfomances in the other-oriented perspective trials (M = 1419 ms, SD = 57 ms) were slower than the self-oriented perspective trials (M = 1178 ms SD = 45 ms) in the Shift condition while self-oriented perspective trials (M = 1134 ms, SD = 62 ms) were slower than the other-oriented perspective trials (M = 1062 ms, SD = 46 ms) in the No-shift condition. A post-hoc Holm-Bonferroni test showed that there was a significant difference between the levels of the Probe Type (i.e., "Self" vs. "Other") in the Shift condition, $t(63) = 4.484$, $p < .001$, $d = 0.561$, but not in the No-shift condition, $t(63) = -1.337$, $p = 0.367$, $d = -0.167$.

There was also an interaction between Perspective-shift and Contents Type, $F(1, 63) = 5.178$, $p = .026$, $\eta_p^2 = .076$. The results revealed that the RT differences between the Unexpected contents trials (M = 1398 ms, SD = 54 ms) and the Expected contents trials (M = 1199 ms, SD = 48 ms) in the Shift condition was higher than the difference between Unexpected (M = 1108 ms, SD = 38 ms) and Expected (M = 1087 ms, SD = 68 ms) contents trials in the No-shift condition (See Figure 5).A post-hoc Holm-Bonferroni test showed that there was a significant difference between the levels of the Contents Type in the Shift condition, $t(63) = -3.684$, $p < .001$, $d = -0.460$, but not in the No-shift condition $t(63) = -0.379$, $p = .705$, $d = -0.047$.

The results also revealed a marginal significant interaction between Contents Type and Probe Type, $F(1, 63) = 3.950$, $p = .051$, $\eta_p^2 = .059$. The results revealed that the RT difference between self-oriented perspective (M = 1062 ms, SD = 503 ms) and

other-oriented perspective (*M* = 1224 ms, *SD* = 452 ms) trials in the Expected contents condition was higher than the difference between self-oriented perspective trials (*M* = 1249 ms, *SD* = 356 ms) and other-oriented perspective trials (*M* = 1256 ms, *SD* = 372 ms) trials in the Unexpected contents condition. A post-hoc Holm-Bonferroni test showed that there was a significant difference between the levels of the Probe Type (i.e., "Self" and "Other") in the Expected contents condition, $t(63) = 2.941$, $p = .016$, $d = 0.368$, but not in the Unexpected contents condition, $t(63) = 0.119$, $p = 1.000$, $d = 0.015$ (See Figure 6). None of the other analyses revealed significant results.

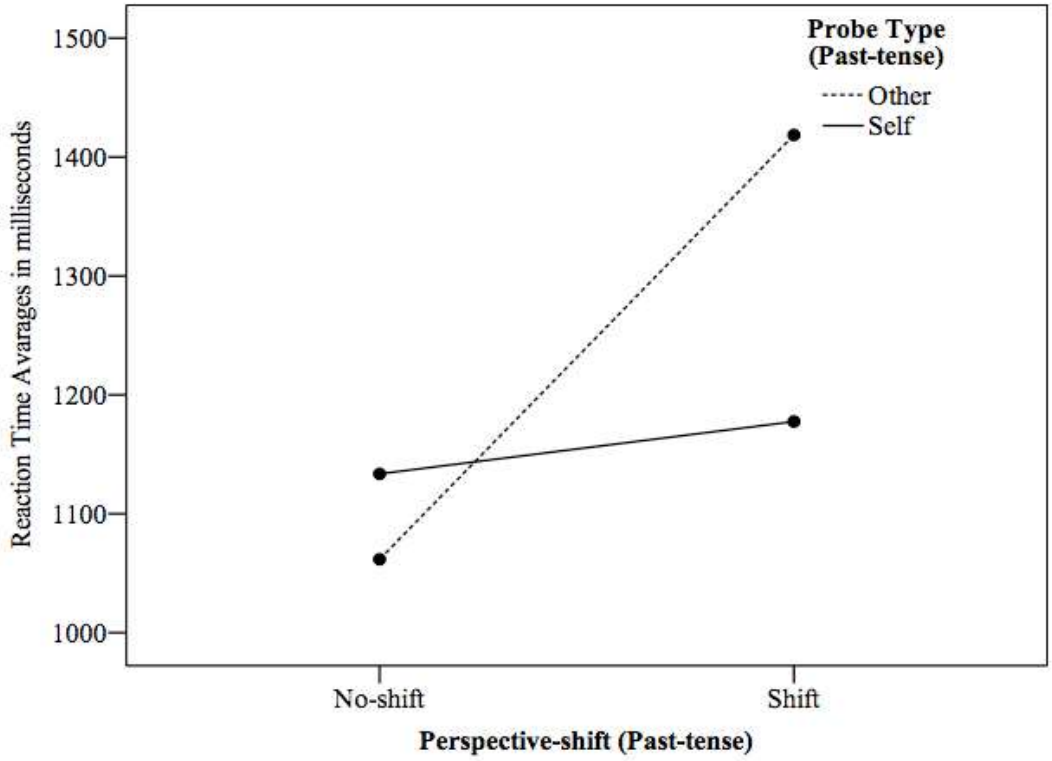

Figure 4. Perspective-shift by Probe Type Interaction for the Self/Other Differentiation task (Past-tense)

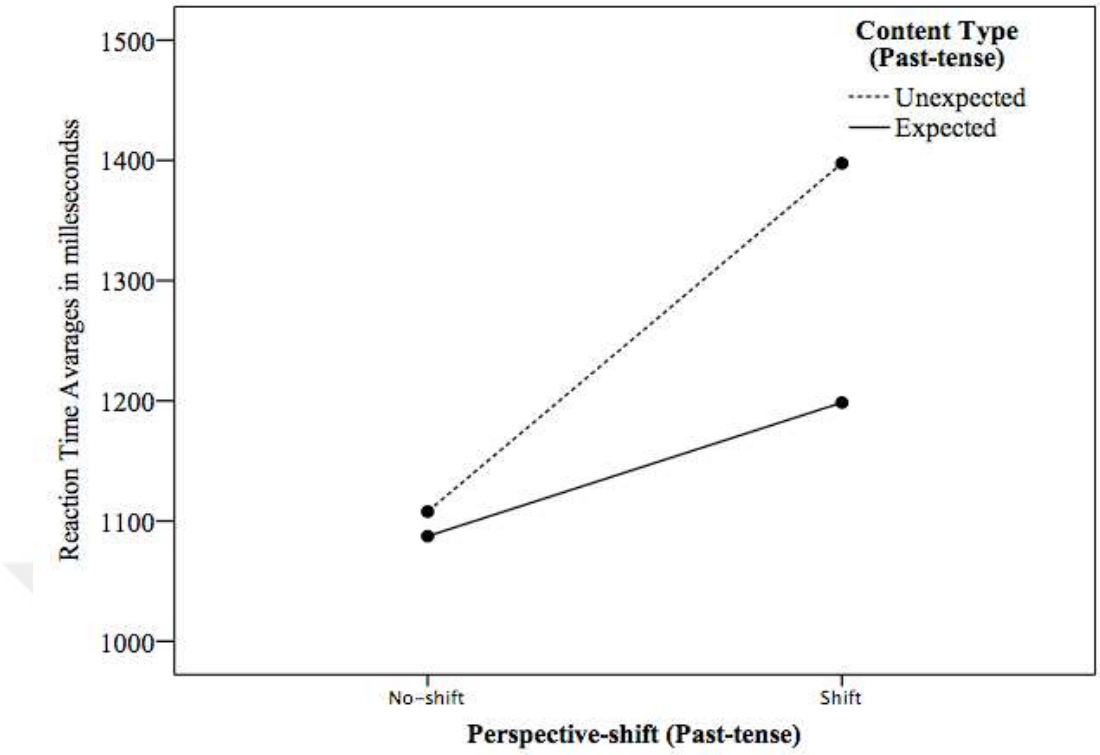

Figure 5. Perspective-shift by Contents Type Interaction for the Self/Other Differentiation task (Past-tense)

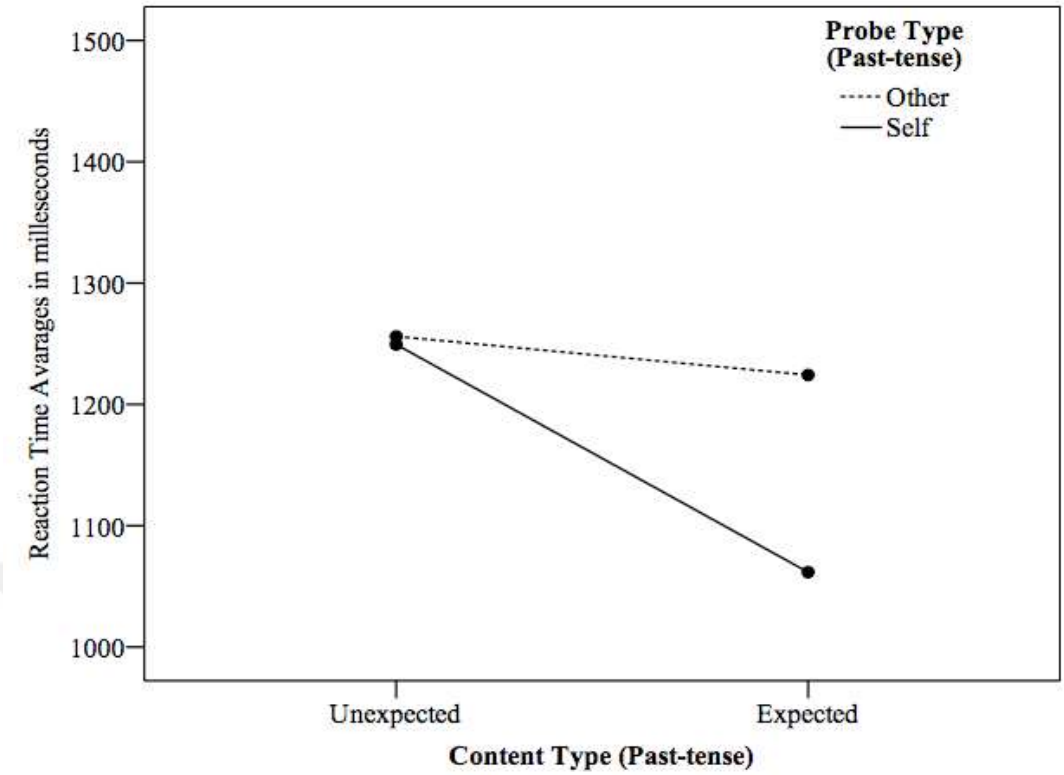

Figure 6. Contents by Probe Types Interaction for the Self/Other Differentiation task (Past-tense)

3.2.2.3 Error rate data at the Dilemma stage

In the past-tense version of the task, a t-test revealed no significant difference between other-oriented Dilemma error rates (M = 3.59% errors) and self-oriented Dilemma error rates (M = 4.14% errors), $t(63) = -0.556$, $p = .580$, $r = -.03$.

3.2.2.4 Error rate data at the Probe stage

The analyses revealed a main effect of Contents Type, $F(1, 63) = 18.485$, $p < .001$, $\eta_p^2 = .227$, with less accurate responses to unexpected contents (M = 5.94% errors) than expected contents (M = 1.56% errors). Results revealed no main effects of Perspective-shift, $F(1, 63) = 1.653$, $p = .203$, $\eta_p^2 = .026$, and Probe Type, $F(1, 63) =$

1.482, $p = .228$, $\eta_p^2 = .023$. There was also a significant interaction between Perspective-shift and Contents Type, $F(1, 63) = 6.818$, $p = .011$, $\eta_p^2 = .098$. The results revealed that the error rate difference between the Unexpected contents trials ($M = 7.19\%$ errors, $SD = 1.25\%$ errors) and the Expected contents trials ($M = 1.25\%$ errors, $SD = 0.47\%$ errors) in the Shift condition was higher than the error rate differences between Unexpected ($M = 4.69\%$ errors, $SD = 1.02\%$ errors) and Expected ($M = 1.88\%$ errors, $SD = 0.48\%$ errors) contents trials in the No-shift condition. A post-hoc Holm-Bonferroni test showed that there was a significant difference between the levels of the Contents Type in both the Shift, $t(63) = -5.030$, $p < .001$, $d = -0.629$, and No-shift conditions, $t(63) = -2.383$, $p = .038$, $d = -0.298$. None of the other analyses revealed significant results (See Figure 7 for different responses to the Probe questions in the past-tense version of the task).

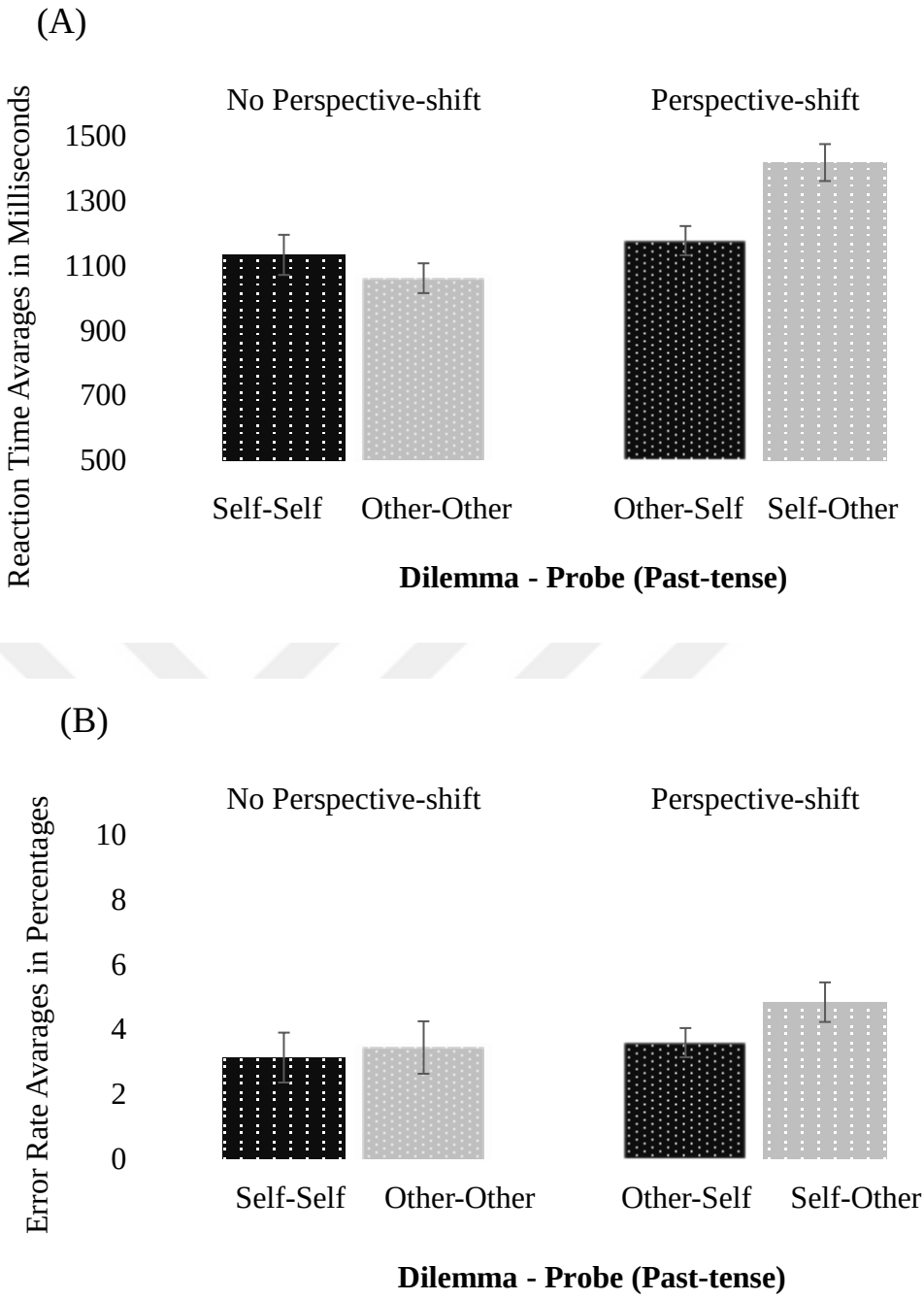

Figure 7. Means of (A) Reaction Time and (B) Error Rate (percentage of errors) in Past-tense version of the task. Error bars represent the standard error of the mean. Note. Perspective type used at the Dilemma stage is indicated before the dash and perspective type used at the Probe stage is indicated after the dash.

3.2.3 Present-tense version of the Self/Other Differentiation task

The Turkish present-tense version of the task was included in the analyses as a baseline condition to explore whether Bradford et al.,'s findings (2018) could be replicated and the performance difference in RTs and error rates between shifting conditions was observed when no tense manipulation was applied.

3.2.3.1 Reaction time data at the Dilemma stage

In the present-tense version of the task, a t-test revealed a significant difference between other-oriented Dilemma RTs and self-oriented Dilemma RTs, $t(63) = 10.279$, $p < .001$, $r = .76$, with longer RTs in the other-oriented Dilemma trials (M = 1661 ms) than self-oriented Dilemma trials (M = 1381 ms).

3.2.3.2 Reaction time data at the Probe Stage

The Probe stage factors in the present-tense version of the task were the same with the factors ("Perspective-shift", "Probe Type" and "Contents Type"), included in the past-tense version of the task. The analyses were also conducted with a 2 (Perspective-shift: Shift vs. No-shift) x 2 (Probe Type: Self vs. Other) x 2 (Contents Type: Expected vs. Unexpected) Repeated-Measures ANOVA.

The analyses revealed a main effect of Contents Type, $F(1, 63) = 9.447$, $p = .003$, $\eta_p^2 = .131$, with slower responses to the unexpected contents trials (M = 1327 ms) than expected contents trials (M = 1214 ms). Results also revealed a marginal main effect of Probe Type, $F(1, 63) = 2.944$, $p = .091$, $\eta_p^2 = .045$ with slower responses to other-oriented questions (M = 1302) than self-oriented questions (M = 1240). Results

revealed no significant main effect of Perspective-shift, $F(1, 63) = 2.029$, $p = .159$, $\eta_p^2 = .031$.

There was a significant interaction between Perspective-shift and Probe Type for RT, $F(1, 63) = 27.485$, $p < .001$, $\eta_p^2 = .304$ (see Figure 8). The results revealed that RTs in the self-oriented perspective trials (M = 1347 ms, SD = 61 ms) were slower than the other-oriented perspective trials (M = 1246 ms SD = 50 ms) in the Shift condition while other-oriented perspective trials (M = 1358 ms, SD = 64 ms) were slower than the self-oriented perspective trials (M = 1133 ms, SD = 44 ms) in the No-shift condition. A post-hoc Holm-Bonferroni test showed that there was a significant difference between the levels of Probe type (i.e., "Self" vs. "Other") in the No-Shift condition, $t(63) = 4.709$, $p < .001$, $d = 0.589$, but a marginal difference in the Shift condition, $t(63) = -2.099$, $p = .084$, $d = -0.262$. There was also a marginal interaction between Perspective-shift and Contents Type, $F(1, 63) = 3.534$, $p = .065$, $\eta_p^2 = .053$. The results revealed RT difference between the Unexpected (M = 1330 ms, SD = 55 ms) and Expected contents trials (M = 1161 ms, SD = 54 ms) were higher in the No-shift condition than the difference between Unexpected (M = 1325 ms, SD = 53 ms) and Expected (M = 1268 ms, SD = 59 ms) contents trials in the Shift condition. A post-hoc Holm-Bonferroni test showed that there was a significant difference between the levels of Contents Type in the No-shift condition, $t(63) = -3.574$, $p = .003$, $d = -0.447$, but not in the Shift condition, $t(63) = -1.202$, $p = .679$, $d = -0.150$ (See Figure 9). Two-way interaction between Probe Type and Contents Type and the three-way interaction among the factors were not significant.

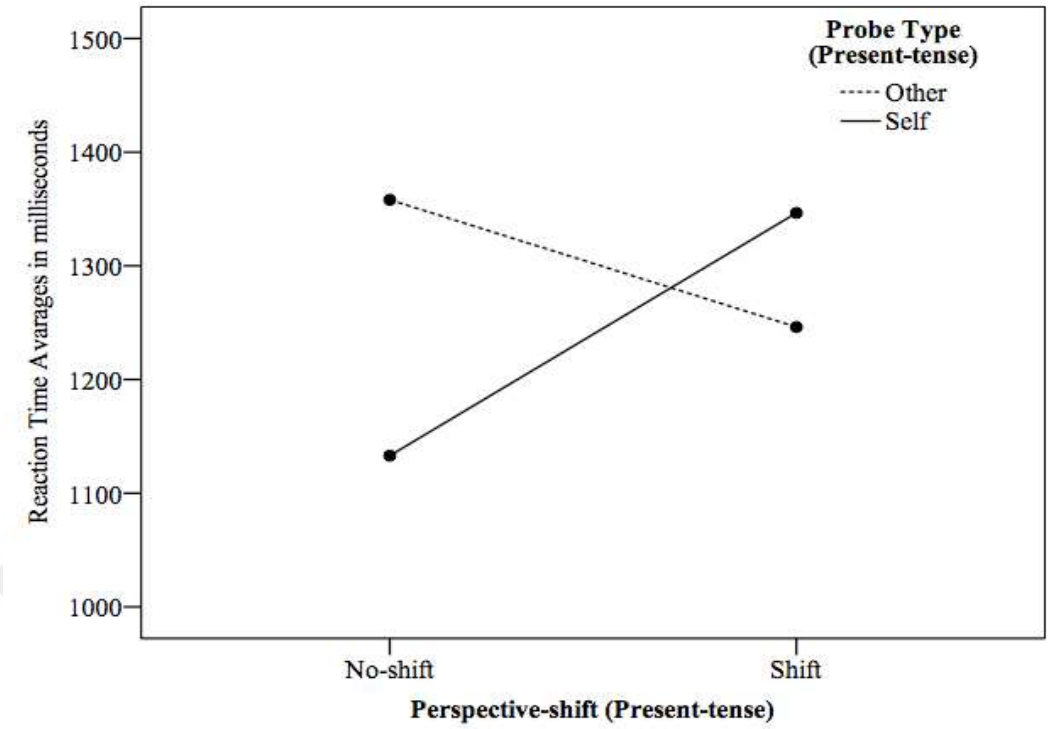

Figure 8. Perspective-shift by Probe Type Interaction for the Self/Other Differentiation task (Present-tense)

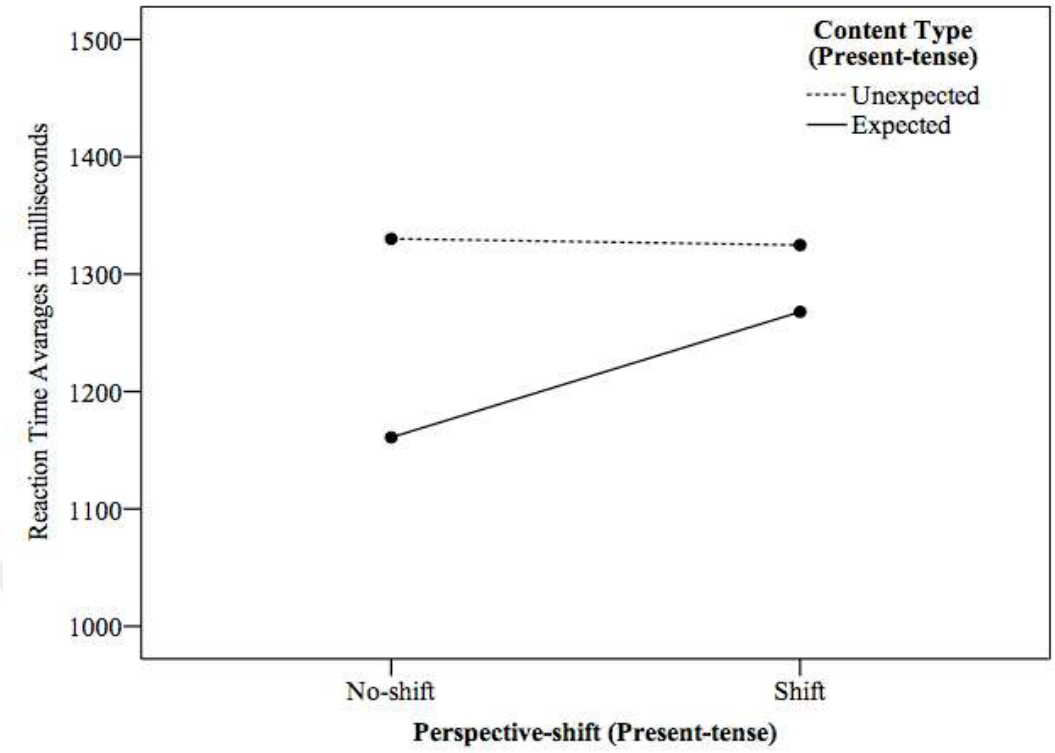

Figure 9. Perspective-shift by Contents Type Interaction for the Self/Other Differentiation task (Present-tense)

3.2.3.3 Error rate data at the Dilemma stage

In the past-tense version of the task, a t-test revealed a significant difference between other-oriented Dilemma error rates and self-oriented Dilemma error rates, $t(63) = 3.995$, $p < .001$, $r = .19$, with more errors made in the other-oriented Dilemma trials ($M = 3.83\%$ errors) than self-oriented Dilemma trials ($M = 1.56\%$ errors).

3.2.3.4 Error rate data at the Probe stage

The analyses revealed a main effect of Contents Type, $F(1, 63) = 26.695$, $p < .001$, $\eta_p^2 = .298$, with more errors in the unexpected contents trials ($M = 1.43$ % errors) than the expected contents trials ($M = 0.43\%$ errors) The analyses revealed no main

effects of Perspective-shift, $F(1, 63) = 1.684$, $p = .199$, $\eta_p^2 = .026$, and Probe Type, $F(1, 63) = 0.425$, $p = .517$, $\eta_p^2 = .007$. There was a significant interaction between Perspective-shift and Contents Type, $F(1, 63) = 4.040$, $p = .049$, $\eta_p^2 = .060$. The results revealed that RT difference between the Unexpected (M = 5.63% errors, SD = 0.94 errors) and Expected contents trials (M = 1.09% errors, SD = 0.39% errors) in the No-shift condition was higher than the difference between Unexpected (M = 3.48% errors, SD = 0.68% errors) and Expected (M = 1.71% errors, SD = 0.57% errors) contents trials in the Shift condition. A post-hoc Holm-Bonferroni test showed that there was a significant difference between the levels of the Contents Type in the No-shift condition, $t(63) = -4.986$, $p < .001$, $d = -0.623$ but not in the Shift condition, $t(63) = 1.714$, $p = .178$, $d = -0.214$. There was also a marginal three-way interaction between Perspective-shift, Probe Type, and Contents Type $F(1, 63) = 3.937$, $p = .052$, $\eta_p^2 = .059$. The results revealed that there was a marginal interaction between Perspective-shift and Probe Type for the Unexpected contents trials, $F(1, 63) = 2.849$, $p = .096$, $\eta_p^2 = .043$ but not for the Expected contents trials, $F(1, 63) = 1.000$, $p = .321$, $\eta_p^2 = .016$. None of the other analyses revealed significant results (See Figure 10 for different responses to the Probe questions in the present-tense version of the task).

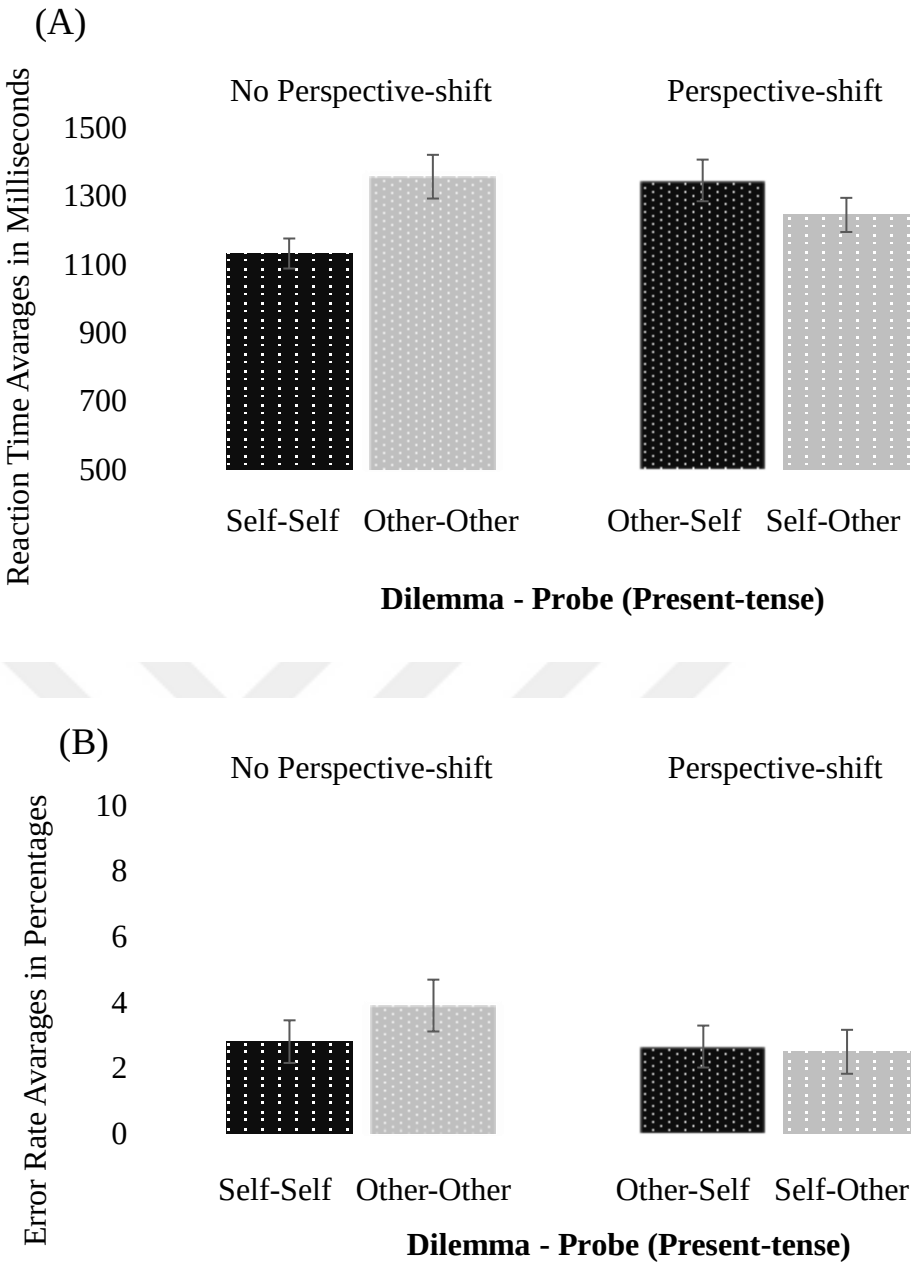

Figure 10. Means of (A) Reaction Time and (B) Error Rate (percentage of errors) in Present-tense version of the task. Error bars represent the standard error of the mean. Note. Perspective type used at the Dilemma stage is indicated before the dash and perspective type used at the Probe stage is indicated after the dash.

3.3 Auckland Individualism and Collectivism Scale (AICS)

All participants (N = 64) completed the AICS survey. The survey was included in the study in order to measure whether our sample reflected more collectivistic features than individualistic ones. However, a paired-sample t-test showed that Turkish participant's standardized individualism scores (M = 54.06, SD = 08.47) were significantly higher than their standardized collectivism scores (M = 45.23, SD = 08.03), $t(63) = 5.848$, $p < .001$, $d = 0.731$ (See Figure 11 for the illustration of the relation between participant's individualism and collectivism scores). Second, in order to explore whether cultural factors affect participants' shifting performances across the conditions at the Probe stage, correlation analyses among the AICS scores and reaction times were conducted in both past- and present-tense versions of the Self/Other Differentiation task (See Table 2 for the correlations between the AICS scores, reaction times). The results showed no significant correlation between participants' performances across shifting conditions and AICS scores in both present- and past-tense versions of the task.

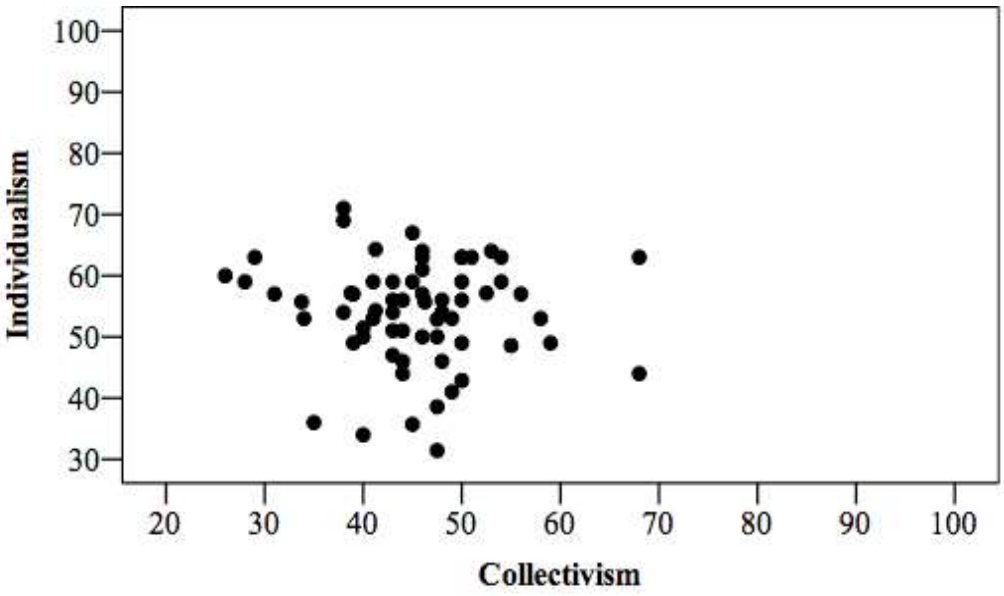

Figure 11. The scatterplot of the relation between standardized Individualism and Collectivism scores on the AICS questionnaire

Table 2. Bivariate correlations among AICS questionnare scores and Reaction Time (RT) performances in Shifting Conditions of the Self/Other Differentiation Task

Variables	1	2	3	4	5	6	7	8	9	10
1. Individualism	-									
2. Collectivism	−.069	-								
3. Self-Self (Past)	−.224	.117	-							
4. Other-Other (Past)	.163	.178	.338**	-						
5. Self-Other (Past)	−.036	.086	.411***	.585***	-					
6. Other-Self (Past)	−.025	−.119	.428***	.549***	689***	-				
7. Self-Self (Present)	.184	−.112	.287*	.346**	576***	597***	-			
8. Other-Other (Present)	.222	.003	.276*	.419**	603***	536***	597***	-		
9. Self-Other (Present)	.146	−.063	.290*	.439***	617***	667***	568***	737***	-	
10. Other-Self (Present)	.067	−.080	.263*	.384**	537***	627***	571***	586***	689***	-

Note ***. Correlation is significant at the 0.001 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

CHAPTER 4

DISCUSSION

4.1 Discussion of the results from the current empirical and theoretical critiques

It has been argued that young infants and adults are equipped with implicit ToM abilities that allow them to build rudimentary forms of mental state attribution (Onishi & Baillargeon, 2005; Surian et al., 2007) or to track mental states (Apperly & Butterfill, 2009; Butterfill & Apperly, 2013). Limits on these implicit ToM abilities for appreciating others' mental states have been showed in various empirical studies (Apperly et al., 2006; Back & Apperly, 2010; Ferguson, Apperly, & Cane, 2017; Qureshi, Apperly, & Samson, 2010; Surtees, Butterfill, & Apperly, 2012). However, it is not certain whether such limits on implicit ToM abilities are valid for appreciating one's own mental states (i.e., appreciation of self-oriented perspectives). Based on an unexpected contents task, developed for adults, Bradford et al. (2015; 2018) showed that other-oriented mental state attribution is harder for people compared to self-oriented mental state attribution. More specifically, shifting from self-oriented perspectives to other-oriented perspectives resulted in longer reaction times and more errors than shifting from other-oriented perspectives to self-oriented perspectives. Bradford et al. concluded that self-oriented mental states are

"always" and "automatically" *processed* while other-oriented mental states require explicit resources to be *processed*.

The current study aimed to investigate whether the ease of self-oriented mental state attribution resulted from characteristics of the task that led to different task demands across self- and other-oriented mental state attributions. Self-oriented questions were about events that the participants might have had personal (past) experience with (e.g., a person could reason about what she would think is inside the candy box based on her past experiences with the box). Thus, the self-oriented questions included more concrete cues, which may allow people to adopt self-oriented perspectives faster. This argument was supported by the empirical findings of Bradford et al. 2018. Specifically, that participants generally found the self-oriented questions easier than the other-oriented questions. If the self-oriented questions are easier due to relying on one's own concrete experiences, then the other-oriented questions could be answered as easy as self-oriented questions when they are also provided with concreteness cues. In order to investigate whether concreteness cues would allow one to process other-oriented questions as fast as self-oriented questions, participants were provided with a Turkish past-tense version (direct evidential marker, *–DI*: the test condition) of the Self/Other Differentiation task (also with a Turkish present-tense version: the baseline condition). It is thought that the Turkish direct evidential marker could indicate that others' had background experiences (i.e., concreteness) about the given false belief scenario. As in Bradford et al. (2018), we also included the AICS questionnaire to explore our sample's collectivism/individualism tendencies and the impact of cultural variability's on participants' implicit ToM performances in the Self/Other Differentiation task.

4.1.1 Discussion of the results in the past-tense version of the Self/Other Differentiation task

The past-tense version of the task with the direct evidential marker, *–DI,* was conducted in order to enable participants to adopt other-oriented perspectives as fast as self-oriented perspectives. The first prediction in the current study was that in the Shift condition of the past-tense version, the levels of Probe Type (i.e., Other vs. Self) would not significantly differ from each other. However, in the Shift condition of the past-tense version, the current RT findings indicated that participants had more difficulty while shifting from self-oriented perspectives to other-oriented perspectives (i.e., Self-Other) compared to shifting from other-oriented perspectives to self-oriented perspectives (i.e., Other-Self). The current RT findings in the Shift condition were very similar to the results in Bradford et al. (2015; 2018). Critically, these findings might specifically support Bradford et al.'s argument (2015; 2018) that self-oriented questions were "always" and "automatically" *processed* first regardless of the targeted mental state type (i.e., self-oriented or other oriented). Other-Self trials were easier than Self-Other trials because while shifting from an other-oriented to self-oriented questions, self-oriented questions are automatically *processed* by the participants at the Dilemma stage. Consequently, *processing* self-oriented mental states might be a prerequisite for appreciation of other-oriented mental states.

The second prediction in the current study was that in the No-shift condition of the past-tense version, the levels of Probe Type (i.e., Self-Self vs. Other-Other) would not significantly differ from each other. The results supported our predictions such that there was no performance difference in RTs of participants between Other-Other

and Self-Self trials (i.e., other-oriented trials were as easy as self-oriented trials) in the past-tense version of the current study. This result differs from Bradford et al.'s findings (2018), which indicated that Self-Self trials were easier than Other-Other trials. However, we do not argue that the tense manipulation we provided (i.e., presenting the task in the past-tense) caused the difference between our and Bradford et al.,'s findings (2018). The findings in the Shift condition of the current study showed that self-oriented questions in the Probe stage (i.e., Other-Self trials) were easier than other-oriented questions in the Probe stage (i.e., Self-Other) trials. The findings in the Shift condition showed that despite the concreteness manipulation (i.e., evidential markers), self-oriented trials could be answered easier than other-oriented questions. This is contrary to our hypothesis that the existence of personal experience makes self-oriented mental states easier to process than other-oriented questions.

The current study showed that participants adopt self-oriented perspectives faster than other-oriented perspectives in the Shift condition of the past-tense version. The findings in the Shift condition of the past-tense version indicated that the Turkish evidential marker, *–DI,* might be an inadequate cue for adults to more easily take another person's perspective in a given scenario. Özoran (2009) showed that the Turkish direct evidential marker, *–DI* could enable children, who have developing ToM abilities, to strengthen their representation of another person's false belief. That is, before the acquisition of ToM abilities, evidential markers could be helpful to grasp others' background experience on the situation (e.g., false belief scenarios). Thus, children could actualize others' direct experiences on a given scenario and more easily take other-oriented perspectives. However, the direct Turkish evidential

marker may not be adequate to process other-oriented perspectives as fast as self-oriented perspectives especially after the acquisition of ToM abilities. The findings in the current study showed the evidential marker, *–DI*, could not help adults to adopt other-oriented perspectives as fast as self-oriented perspectives. Instead, the current findings in both the Shift and No-shift conditions could be seen as a support for Bradford et al.'s argument (2015; 2018) that self-oriented perspective-taking is an "automatic" *processing*.

Bradford et al. argues that self-oriented perspectives at the Probe stage were more easily adopted at the Shift condition because self-oriented perspectives were *automatically processed* at the Dilemma stage while answering other-oriented questions. Thus, when the task requires shifting from other-oriented to self-oriented questions, self-oriented perspectives were become "already available" at the Probe stage. Accordingly, one possible explanation for the current findings is that self-oriented perspectives are automatically processed while other-oriented perspectives are not. In both the current study and Bradford et al., 2015, in the No-shift condition, Self-Self and Other-Other trials did not significantly differ from each other while in the Shift condition, Other-Self trials were easier than Self-Other trials. The findings in the current study and Bradford et al., 2015 might be seen as a support for Bradford et al.'s argument that shifting condition affects the participants' performances at the Probe stage. That is, shifting from other- to self-oriented trials are easy due to the *automatic processing* of self-oriented mental states. In the No-shift condition, there is no difference between Self-Self and Other-Other trials because other-oriented perspectives are being explicitly asked at the Dilemma stage so that other-oriented questions at the Probe stage could be as easy as self-oriented trials.

We believe, however, the theoretical critique that we provided related to the inclusion of concrete experience still holds for the Turkish past-tense version of the Self/Other Differentiation task. Regardless of the question orientation (self or other) provided in the Dilemma stage, self-oriented questions at the Probe stage were based on the existence of concrete experience. However, these sorts of experiences do not seem to involve meta-representational processes. Consider that the participants were asked to find where to look for a certain object based on the different types of boxes at the Dilemma stage. Regardless of the type of question that they were asked, participants might build an expectation (i.e., a true/false belief) about the content of the boxes. Therefore, it might be easy for them to answer a self-oriented question about the content of the box compared to an other-oriented question at the Probe stage. Building such expectations about object's contents does not require an implicit (i.e., spontaneous and automatic) *processing* of self-oriented perspectives. That is, a participant does not need to engage in any sort of "automatic" metarepresentational reasoning about where they would "believe" the targeted object was. For example, at the Dilemma stage, if a participant was asked where she or another person looks for candies, regardless of question orientation (self or other), she might built a "belief" that the candies are in the candy box. Note that this does not require meta-representational reasoning (i.e., *thinking* where she would *believe* the candies are). Then, at the Probe stage, a self-oriented question that asks what she thinks was inside the candy box, might be easy to respond through recalling her own past belief (i.e., candies are in the candy box).

An indirect critique of Bradford et al.'s interpretation of the findings on the Self/Other Differentiation task could be provided though preschool children's

performance on the unexpected contents task. If self-oriented mental state attribution is a prerequisite for other-oriented mental state attribution, then one would expect the former to proceed the latter in development. However, children do not pass self-oriented questions earlier than other-oriented questions (Gopnik & Astington, 1988) Further, if self-oriented mental states could be implicitly *processed*, it might be reasonable to expect that self-oriented questions ("What did you think?") would be easier for children to pass compared to other-oriented questions ("What would your mom think?"). In other words, Gopnik and Astington's findings (1988) are counter-evidence for Bradford et al. (2018)'s claim that the "self acts as a stem" for appreciating others' mental states (at least developmentally). Nevertheless, it might be argued that before age 4 children do not only have limited executive and metarepresentational but also linguistic abilities which prevent them to specifically pass self-oriented questions before other-oriented questions. Therefore, Self/Other Differentiation task should be used to test young children's implicit ToM abilities. If self-oriented mental state attribution "acts as a stem" for appreciating other's mental states, young children with relatively developed language should show similar findings with adults (i.e., more easily shifting from other- to self-oriented questions compared to shifting from self- to other-oriented questions).

The error rate data in the past-tense version of the current study should be approached with caution to interpret adult participants' performances in this specific ToM task. Out of all conditions, participants did not make more than five percent of errors, which is lower than Bradford et al.'s results (2018) but similar to Bradford et al. (2015). This means that participants accurately answered most of the self- and other-oriented questions across different conditions (Contents and Perspective-Shift

Types) throughout the study. The results also revealed that the error rates were higher in the unexpected contents trials compared to the expected contents trials. These results support the RT findings that coordinating conflicting perspectives (i.e., true and false beliefs) in a given situation is difficult for even adults.

4.1.2 Discussion of the results in the present-tense version of the Self/Other Differentiation task

The present-tense version of the task was included in the study to show that the current study could provide similar findings with Bradford et al.'s findings (2018) when there is no tense manipulation. We expected that in the present-tense version of the Self/Other Differentiation, self-oriented perspectives would be processed faster than other-oriented perspectives. That is, Self-Self trials would be easier than Other-Other trials in the No-shift condition and Other-Self trials would be easier than Self-Other trials in the Shift condition. However, the analyses of the present-tense version of the task revealed that this was not the case. Instead, the results showed a partial replication of Bradford et al., 2015 such that in the No-shift condition, participants' performances were significantly faster in the Self-Self trials than the Other-Other trials. As being different from both Bradford et al., 2015 and 2018, Self-Other and Other-Self trials did not significantly differ from each other.

One possible interpretation of the current findings in the present-tense version of the task is that the sentence structure used for present-tense (i.e., sentences with the imperative form of words) encouraged participants to process a hypothetical/imaginary situation. The emphasis on taking a hypothetical self- or other-oriented perspective based on the sentence structure in the present-tense

version of the task might slow the participants' RT performances across the Shift and No-shift trials. For example, self-oriented questions at the Probe stage were in the following sentence form: "Think that you did not see what is inside this box. What do you think is inside this box?". While they are shifting from other-oriented to self-oriented questions in the Shift condition, instead of thinking about their "expectation" of what they thought was inside the box at the Dilemma stage, they might try to imagine a hypothetical situation about what they would think was inside the box if they hadn't seen inside. Therefore, even though shifting from other- to self-oriented questions would be easier in the past-tense version of the task, the present-tense version of the task may have caused participants to think about an imaginary situation about the content of the box such that shifting from other- to self-oriented perspectives became slower.

There is some support from the results to support the explanation that the present-tense version of the task led to thinking about hypothetical situations, which, slowed participants' RTs at the Probe stage across the Perspective-shift condition. First, there was a main effect of Tense Type such that RTs in the present-tense version of the task were slower than the past-tense version of the task. Second, the three-way interaction among Perspective-shift, Probe and Tense Types showed mixed findings. In the Shift condition, RTs in the present-tense version of the Other-Self trials were slower than the past-tense version of the Other-Self trials. This finding supports our reasoning that at the Probe stage, participants might think about a hypothetical situation that they hadn't seen inside the box and respond more slowly. However, in the Self-Other trials, the opposite findings were observed such that past-tense version of the task revealed slower RTs than present-tense version of the task. In

both past- and present-tense version of the task, other-oriented trials at the Probe stage are actually based on "a hypothetical person" (e.g., "Think that Alp did not see what is inside this box."). Besides, the present-tense version of the task with the imperative form of the verb might encourage more thinking about a hypothetical situation. Therefore, participants might make more sense of adopting other-oriented questions in the present-tense version of the task when the other-oriented questions were first asked at the Probe stage. Therefore, Self-Other trials in the present-tense version of the task might be easier than Self-Other trials in the past-tense version of the task.

In the No-shift condition, Other-Other trials across Tense Type also supports our explanation that the sentence structure in the present-tense version of the task leads to thinking about a hypothetical situation about another person's perspective on the belief scenarios. The RTs in the present-tense version of the Other-Other trials were slower than the RTs in the past-tense version of the Other-Other trials. At the Dilemma stage of the Other-Other trials, the participants were asked questions about a hypothetical person's perspective about where to look for a certain object. However, additional emphasis on the hypothetical nature of other-oriented questions through the imperative form of verb at the Probe stage might have led to confusion on participants' reasoning and slow RTs in the past-tense version of the Other-Other trials. In the Self-Self trials, RTs in the Probe stage did not significantly differ between past- and present-tense versions of the task. At the Dilemma stage, participants were asked a question about self-oriented perspectives on where to look for a certain object. When they were again asked a self-oriented question at the Probe stage, regardless of tense in which the question was presented, they might

answer what they thought was inside the box through thinking about self-oriented perspective at the Dilemma stage. In the Self-Self trials of the present-tense version of the task, the sentence structure again emphasizes a hypothetical situation to suppose that they hadn't seen inside the box. Yet, they were explicitly asked a question about self-oriented perspective in the Dilemma stage. Therefore, they might easily ignore the hypothetical nature of the situation, created due to providing questions in the present-tense version, and answer the question in the Probe stage based on the self-oriented perspective that they took on the content of the box in the Dilemma stage. Therefore, no difference between present- and past-tense versions of the task could be observed in the Probe stage RTs of Self-Self trials.

Note that the explanation that we provided for why the present-tense version of the task is harder than the past-tense version of the task also holds for other languages (e.g., English). That is, since the present-tense version of the task did not include evidentials and were built based on the imperative form of the verb, English present-tense version of the task would also create discrepancy in participants performances across Perspective-shift conditions. In other words, the sentence structure that was used in the present-tense version of the task could not provide a precise replication of neither Bradford et al., 2015 nor Bradford et al., 2018 regardless of the medium of language. Overall, the current unexpected findings showed that the present-tense version of the Self/Other Differentiation task could not be used as a baseline condition to compare the participants' performances between the existence and absence of concreteness cues.

Similar to the past-tense version of the task, adult participants made few errors while answering self- and other-oriented questions in the present-tense version of the task.

There were no more than four percent errors across different conditions (i.e., Perspective and Contents Types). Therefore, the findings related to the error rates in the present-tense version of the task should be also approached with caution. Given that, the results showed that similar to the past-tense version of the task and Bradford et al. (2015; 2018), adult participants found unexpected contents trials more difficult than expected contents trials based on the RT and error rate results. This specifically suggests that regardless of the tense manipulation that we created, coordinating two conflicting perspectives (i.e., true vs. false beliefs) on a given situation is difficult even for adult participants than the situations that no coordination of conflicting beliefs is required.

4.1.3 Discussion of the results related to the AICS questionnaire

AICS was included in the current study for two reasons: (1) To understand whether the current sample accurately represented the collectivistic aspects of Turkish culture. (2) To investigate whether individual differences in AICS have an impact on participants' shifting behaviors across the types of mental states (i.e., self- and other-oriented mental states). Analyses related to the first reason showed that the Turkish participants in the current study had more individualistic traits than collectivistic traits. The individualistic tendency of Turkish participants could be explained by the fact that the sample in the current study was largely constituted by an educated urban population, which has been exposed to more Western culture. Besides, the collectivism scores in the current study were relatively low compared to the existing literature on the Non-Western samples (Fu et al., 2010; Oyserman et al., 2002; Shulruf et al., 2007).

Analyses related to individual differences in collectivism/individualism showed no relations between adults' AICS scores and their performances in the Shift and No-Shift conditions (See Table 2). Specifically, there was no correlation between adults' performances in the Self-Other trials and collectivism scores, which suggests that having more collectivistic traits may not enable participants to shift more easily from self-oriented perspectives to other-oriented perspectives. Accordingly, there was also no correlation between adults' performance in the Other-Self trials and individualism scores, which suggests that having more individualistic traits may not enable participants to shift more easily from other-oriented perspectives to self-oriented perspectives. Finding no relation between perspective shifting and participants' individualism and collectivism scores may also support the idea that cultural inputs do not have an impact on the basic mental state attribution skills in adults even though culture has a significant impact on the development of explicit ToM abilities (Liu, et al., 2008; Shahaeian et al., 2011; 2014).

4.2 Discussion of the results from the Two-systems account

The two-systems account provides an explanation to understand infants and adults' success on spontaneous-response ToM measures. It argues that in order to pass spontaneous-response ToM tasks, both human and non-human species do not need to represent propositional attitudes but that an altercentric bias is sufficient for them to build expectations about agents' behaviors (Apperly & Butterfill, 2009; Butterfill & Apperly, 2013). More specifically, infants' and adults' success on the implicit ToM can be explained without mental state attribution. For example, in the spontaneous-response ToM tasks used to measure infants' false belief understanding, infants may build an expectation about the protagonist's behaviors based on her false beliefs

through tracking the belief-like states of the agents (Butterfill & Apperly, 2013). Accordingly, results from the current study support the two-systems' claim that others' perspectives are not automatically *processed*.

Bradford et al. (2015; 2018) agrees with the two-systems' account on the idea that an appreciation of other-oriented perspectives is not automatic. They also argue, however, that self-oriented perspectives could be *processed* in an automatic way. It was claimed that since the Self/Other Differentiation task is an elicited ToM tasks, the task questions could only be answered through *processing* of one's own or others' beliefs. From Bradford et al.'s perspective, the findings in the Self/Other Differentiation task showed that shifting from other- to self-oriented questions are easier because while processing other-oriented mental states, self-oriented questions are also considered in an automatic (i.e., implicit) way. However, the consideration of self-oriented mental states while answering other-oriented questions could not be only *awareness* of self-oriented perspectives but self-oriented mental state attribution because the task is an elicited-response task.

It is specifically claimed that the idea of automatic *processing* of self-oriented perspectives is aligned with the two-systems account (Bradford et al., 2015). From our understanding, *processing* self-oriented perspectives means self-oriented "mental state attribution" in an implicit way. However, the two-systems account (Butterfill & Apperly, 2013) deliberately argues that implicit ToM (i.e., early developing system) does not require "representing propositional attitudes" (i.e., mental state attribution). Specifically, being *aware* of beliefs in a fast and efficient way requires representing belief-like states not beliefs per se. Therefore, also from the two-systems'

perspective, the results in the Self-Other Differentiation task (i.e., shifting from other- to self-oriented questions more easily) could not be explained by the claim that self-oriented perspectives are automatically *processed*. Our idea that self-oriented perspectives are always easier to adopt due to the existence of concreteness cues in the self-oriented questions could not be supported by the results of the current study. However, the theoretical critique that we provided could still hold such that participants might build a representation about the content of the box in the Dilemma stage that are not *meta*-representational. This representation would allow them to more easily answer self-oriented questions at the Probe stage regardless of the Probe Type provided in the Dilemma stage.

For some researchers, an understanding (i.e., *processing*) of beliefs has been claimed to be achieved only after the acquisition of explicit ToM abilities based on the development of meta-representation (Perner, 1991; Perner, Stummer, Sprung, & Doherty, 2002; Low & Perner, 2012; Perner & Roessler, 2012), executive functions (Benson, Sabbagh, Carlson, & Zelazo, 2013; Frye, Zelazo, & Palfai, 1995; Zelazo, 2004) or reflective abilities (Allen & Bickhard, 2018). This is actually why the two-systems account proposes two different systems to understand others' mental states. The two-systems account especially emphasizes the existence of various empirical studies in the current literature that support the idea that before age 4 children could not coordinate two conflicting perspectives, which might prevent them from the ability to "attribute" beliefs to others (Fizke, Butterfill, van de Loo, Reindl, & Rakoczy, 2017; Oktay-Gür, Schulz, Rakoczy, 2018). Therefore, implicit ToM abilities may not be have the sufficient cognitive (executive) tools to *process* both self- and other-oriented mental states.

4.3 Discussion of the results from action-based approaches

Action-based frameworks provide an alternative approach to social (and physical) cognition that argues that social situation are appreciated through acting in the environment (Bickhard, 2008; Carpendale & Lewis, 2015). Specifically, children need to participate to the social situations in order to build robust social interactions. From action-based perspectives, children do not need to engage in mental state attribution before age 4 to comprehend social situations and predict others' behaviors in their social environment (Allen, 2015, Allen & Bickhard, 2018). Domain-general developments are specifically important for the acquisition of explicit ToM abilities that would enable children to *process* mental states, including one's own. From our perspective, Bradford et al.'s (2015; 2018) cognitively rich interpretation of the findings in the Self/Other Differentiation task (i.e., the relatively faster consideration of self-oriented mental states) might not be the only possible explanation of the findings. Specifically, the Self/Other Differentiation task may not actually tap into "implicit ToM" abilities while considering both self- and other-oriented questions. Our theoretical critique is that the easier shift from other-oriented questions to self-oriented questions could be explained by the existence of concrete experience (i.e., building an expectation as a true/false belief about the content of the boxes). As a result, this task might not be used as a support for implicit processing of one's own mental states (i.e., self-oriented "mental state attribution").

One of the well-known explanations for infants' and adults' performance comes through two-systems account's *mentalistic* proposal that infants and adults are *aware* of mental states. The two-systems account, for example, argues that non-mentalistic accounts (e.g., behavioral regularities account; Povinelli & Vonk, 2004) are not

sufficient to explain researches on implicit ToM abilities. Implicit ToM abilities might be mentalistic in their nature and *awareness* of mental states is needed to explain infants' and adults' success on the spontaneous-response tasks. However, action-based approaches provide comprehensive explanations on how to achieve successful social interaction and pass spontaneous-response ToM tasks without attribution of mental states at any level (e.g., Allen, 2015 on infants' success in active-helping measures). Acting in the social environment and the development of domain-general cognitive abilities (but not self-oriented "mental state attribution") could be a prerequisite for understanding other-oriented mental state attribution (Allen & Bickhard, 2018).

4.4 Conclusion

To conclude, the current study investigated whether the less effortful adaptation of one's own mental states results from the characteristics of the Self/Other Differentiation task. We argued that the self-oriented questions include more concrete cues (e.g., past and personal experiences) than other-oriented questions that could enable adopting a self-oriented perspective faster. Empirical findings suggested that the Turkish direct evidential marker, *–DI* did not provide more concrete cues for the adaptation of other-oriented perspectives. Besides, another person's perspective could be adopted as fast as one's own perspectives in certain situations regardless of the tense in which the questions were provided. (e.g., No-Shift condition in the past-tense version of the task). However, automatic *processing* of one's own beliefs is not the only possible explanation for faster adaptation of one's own beliefs in the Self/Other Differentiation task. Adaptation of self-oriented perspectives would also be faster based on relying on past experiences, which are not

meta-representational expectations about the content of the boxes. As with others (e.g., Dörrenberg et al., 2018; Priewasser et al., 2018), the current study was an attempt to emphasize that cognitively rich interpretations of the adults' and infants' performance on spontaneous-response tasks may not be the only possibility. Accordingly, future research should more systematically investigate confounding variables and alternative explanations of the findings in both the infant and adult versions of spontaneous-response tasks.

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APPENDICES

APPENDIX A: AUCKLAND INDIVIDUALISM AND COLLECTIVISM SCALE (AICS)

		Seçenekler				
		Kesinlikle Katılmıyorum	**Katılmıyorum**	**Ne katılıyorum ne de katılmıyorum**	**Katılıyorum**	**Kesinlikle katılıyorum**
1	Öğrenim veya çalışma hayatım ile ilgili sorunları ebeveynlerimle tartışırım.					
2	Önemi bir karar almadan önce aileme danışırım.					
3	Önemli bir geziye çıkmadan önce ailemden ve arkadaşlarımdan çoğu kişiye danışırım.					
4	Karar almadan önce yakın arkadaşlara danışmak ve tavsiyelerini almak önemlidir.					
5	Grubumun üyelerinden şiddetli bir şekilde farklı düşünsem bile tartışmaktan kaçınırım.					
6	Grubumdaki diğer kişilerle farklı düşünmekten nefret ederim.					
7	Yöneticinizde iyi izlenim bırakmak önemlidir.					
8	Üstlerimle iletişim kurarken daima kibarımdır.					
9	Benden üst mevkilerde çalışanların ihtiyaçlarını dikkate almak önemlidir.					

10	Grubumun yararı için kendi çıkarlarımı göz ardı ederim.					
11	Kendim hakkında kişisel olan şeyleri paylaşırım.					
12	Başkalarıyla olan ilişkilerimin kendi başarılarımdan daha önemli olduğu kanısındayım.					
13	İyi arkadaşlarıma yakın yaşamayı severim.					
14	Benim için mutluluk, üstlerimle vakit geçirmektir.					
15	Benim için mutluluk, başkalarıyla vakit geçirmektir.					
16	Zahmetli bile olsa tanıdıklara yardım ederim.					
17	Kendimi rekabetçi bir insan olarak tanımlarım.					
18	Başkalarıyla rekabet içeren durumlarda çalışmaktan keyif alırım.					
19	Rekabet olmadan iyi bir topluma sahip olmak mümkün değildir.					
20	Rekabet doğa kanunudur.					
21	Kendimi diğerlerinden farklı, benzersiz bir kişi olarak tanımlarım.					
22	Benzersiz ve diğerlerinden farklı olmaktan keyif alırım.					
23	Kendimi "benim kendi kişim" olarak görürüm.					
24	Kendi davranışlarımın sorumluluğunu alırım.					
25	Bağımsız bir insan olarak hareket etmek benim için önemlidir.					
26	Kendime bakabilmek, benim için birincil bir düşüncedir.					
27	Üstlerime iş ile ilgili konuları danışırım.					
28	Kendi kendine yetebilen bir insan olmayı başkalarına bağlı bir insan olmaya tercih ederim.					
29	Kendi istediklerimden vazgeçmek pahasına olsa bile aileme bakmak benim görevimdir.					
30	Kişisel zor bir sorun ile karşılaştığımda kendim karar vermem başkalarının tavsiyelerini dinlememden iyidir					

APPENDIX B: THE EXEMPLARY OF EACH CONDITION IN TURKISH PRESENT AND PAST TENSES

B.1: PRESENT TENSE

B.2: PAST TENSE