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MATERNAL EPISTEMIC LANGUAGE AS A SCAFFOLDING TOOL Bilkent University 2025

MIND BETWEEN THE LINES: MATERNAL EPISTEMIC LANGUAGE AS A
SCAFFOLDING TOOL FOR PRESCHOOLERS' FALSE BELIEF
UNDERSTANDING

A Master's Thesis

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To all children whose stories wait to be heard



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The Graduate School of Economics and Social Sciences
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I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Psychology.

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ABSTRACT

MIND BETWEEN THE LINES: MATERNAL EPISTEMIC LANGUAGE AS A SCAFFOLDING TOOL FOR PRESCHOOLERS' FALSE BELIEF UNDERSTANDING

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This study aimed to investigate whether mothers' epistemic talk differed by child characteristics (i.e., false belief understanding competence level, gender) and contextual features (i.e., story familiarity). A wordless picture book was narrated twice by 120 mothers to their preschool-aged children. Children were categorized as competent (FBU-Competent), in transition (FBU-Transition), or not competent (FBU-None) based on their performance on three first-order false belief tasks. Mothers' epistemic language was coded for type of referent (mother-child or story character), type of utterance function (question or statement), and type of expression (cognitive, certainty, contrastive). Evidencing mothers' sensitivity to their children's socio-cognitive abilities, mothers of FBU-transition children were found to initiate more interactive discourse through the use of epistemic questions. As expected, the mothers' epistemic language was found to be shaped by the interactive effects of child and contextual variables. Specifically, mothers of FBU-competent children

used more epistemic statements with story character reference when the story was familiar. This effect was especially observed in contrastive language, regardless of utterance type. The mothers of FBU-None boys used more epistemic statements with mother-child referents compared to the mothers of FBU-transition boys. Finally, mothers of FBU-Transition girls used more certainty expressions with mother-child referents than mothers of FBU-Competent girls. Overall, these results show that the nature of the epistemic language mothers use with their children is affected interactively by various child and contextual characteristics. Future work that focuses on the individual differences in the accuracy of mothers' epistemic scaffolding is warranted to lay the groundwork for much-needed intervention studies.

Keywords: false belief understanding, scaffolding, epistemic language, mother-child discourse, storytelling.

ÖZET

SATIR ARASINDAKİ ZİHİN: OKUL ÖNCESİ ÇOCUKLARIN YANLIŞ İNANÇ ANLAYIŞINI DESTEKLEYEN HASSAS BİR İSKELE OLARAK ANNELERİN EPISTEMİK DİLİ

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Bu çalışma, annelerin epistemik konuşmalarının çocuk özelliklerine (yanlış kanı anlama yeterlilik düzeyi, cinsiyet) ve bağlamsal özelliklere (hikâyeye aşinalık) göre farklılık gösterip göstermediğini araştırmayı amaçlamıştır. 120 anne, okul öncesi çağındaki çocuklarına iki kere sözsüz ve resimli bir kitap anlatmışlardır. Çocuklar, üç birinci düzey yanlış kanı görevindeki performanslarına göre yeterli (YKA-Yeterli), geçiş aşamasında (YKA-Geçiş) veya yetersiz (YKA-Yetersiz) olarak sınıflandırılmıştır. Annelerin epistemik dili; atfedilen kişi türü (anne-çocuk ya da hikâye karakteri), kullanılan cümlelerin işlevi (soru ya da ifade) ve epistemik ifadenin türü (bilişsel, kesinlik, karşıt gerçeklik) açısından kodlanmıştır. Annelerin çocuklarının sosyobilişsel becerilerine duyarlılığını ortaya koyan bulgulara göre, YKA-Geçiş çocukların anneleri, epistemik sorular yoluyla daha etkileşimli söylemler

başlatma eğilimindedir. Beklendiği üzere, annelerin epistemik dili çocuk ve bağlamsal değişkenlerin etkileşimli etkileriyle şekillenmiştir. Özellikle, YKA-Yeterli çocukların anneleri, hikâyeye aşinalığın olduğu durumda, hikâye karakterine göndermede bulunan epistemik ifadeleri daha sık kullanmıştır. Bu etki, özellikle karşıt gerçeklik içeren ifadelerde, kullanılan cümlelerin işlevinden bağımsız olarak gözlenmiştir. YKA-Yetersiz erkek çocukların anneleri ise, YKA-Geçiş erkek çocukların annelerine göre daha çok anne-çocuk atıflı epistemik ifadeler kullanmıştır. Son olarak, YKA-Geçiş kız çocukların anneleri, YKA-Yeterli kız çocukların annelerine göre daha fazla anne-çocuk atıflı kesinlik belirten ifade kullanmıştır. Bu sonuçlar, annelerin çocuklarıyla kullandığı epistemik dilin doğasının, çeşitli çocuk ve bağlamsal özelliklerin etkileşimli etkisiyle şekillendiğini ortaya koymaktadır. Gelecekte yapılacak çalışmaların, annelerin epistemik destekleme süreçlerindeki bireysel farklılıklara odaklanması, bu alandaki müdahale çalışmalarının temellerini atmak açısından önem taşımaktadır.

Anahtar Kelimeler: yanlış kanı anlama, gelişimsel destek, epistemik dil, anne-çocuk söylemi, hikâye anlatımı.

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CHAPTER I

INTRODUCTION

One of the key components of children's socio-cognitive development is false belief understanding (FBU), which entails the ability to understand that another individual may hold a belief that does not align with reality (Welman & Liu, 2004). FBU develops in interaction with other members of children's social reality (e.g., parents, peers, siblings). Studies that focus on the factors that support children's FBU in particular and theory of mind (ToM) in general point to child-directed mental state language as an important factor. Two meta-analyses have shown that parents' mental state (MS) language, especially their cognitive MS language, and children's FBU were consistently related for both English-speaking parent-child dyads (Tompkins et al., 2018) and across parent-child dyads with diverse native languages (Devine & Hughes, 2018).

A recent study by Ilgaz and colleagues (2025) has shown that mothers' MS language use functions in complementary ways to support children's FBU. Specifically, their MS language that is used with reference to themselves and their children (i.e., interpersonal MS) was related negatively to children's FBU cross-sectionally, but positively to their FBU longitudinally, one year later. In contrast, MS language used with reference to story characters (decontextualized MS) was always positively related to children's FBU. Ilgaz et al. (2025) concluded that MS language is a scaffolding tool that is used sensitively based on children's needs. Specifically, mothers of 3- and 4-year-olds used more MS language with mother or child referents than mothers of 5-year-olds. Conversely, mothers of 5-year-olds used more MS language with story character referents as compared to mothers of younger children. Ilgaz et al (2025) conjectured that mothers' language varied by children's need for support in FBU; however, their study did not identify children who needed more or less support in FBU.

The current study will focus on another storytelling context that is hypothesized to elicit variation in MS talk. Namely, the telling and retelling of a story. The considerable literature that focuses on mother-child MS talk has almost exclusively focused on the first telling of an unfamiliar story. Mothers' scaffolding behavior may be more pronounced in their second readings, when children are already knowledgeable about the characters and the sequence of story events.

The current study intends to extend the findings of Ilgaz et al (2025) in two ways. First of these pertains to investigating repeated narrations (i.e., twice) of the same wordless storybook to allow for variation in scaffolding behavior to be observed. Second pertains to a novel way of analyzing the data that matches the definition of

the scaffolding concept. In the literature MS language has been used to predict children's ToM or FBU competence. However, such analysis naturally falls short of exploring the sensitivity of MS language used with scaffolding purpose. In the current study, children were classified into three broad FBU competence categories (no competence, in transition, fully competent), which were then used to explore variation in maternal MS language. This approach allows us to see cross-sectional variation as a product of children's FBU competence.

The current study adopts a socio-cultural view of development. This view sees the individual developing as immersed in interactive environments where children are enculturated into thinking and talking about minds. In this framework, interaction is not taken as a constant, but a variable that emerges out of features of the persons, environment, stimulus, and time. This naturally brings forth a unique emphasis on context and the multiple features that create it. The current study takes these contextual features into account. These features included in the current study are child characteristics (i.e., gender, FBU competence), and contextual characteristics (first vs. second narrations).

1.1. False Belief Understanding (FBU)

FBU is typically assessed through several false belief tasks. These tasks generally contain scenarios where the character has a belief that is contrary to reality. For instance, in the *unexpected location task* (Wimmer & Perner, 1983), a character looks for an object in the place where they last put it, but the object has been moved. In the *unexpected contents task* (Perner et al., 1987), children are asked about the false belief of a person about the unexpected and surprising contents of a box. Another widely used FBU task is the *appearance-reality task* (Flavell et al., 1983) in

which children are asked about the misleading versus real identities of deceptive objects.

Children develop FBU around age 4 (Wellman et al., 2001). A study conducted with Turkish preschoolers' FBU showed that 17% of 3-year-olds, 40% of 4-year-olds, and 58% of 5-year-olds successfully passed the unexpected contents task (Ilgaz et al., 2022). Another study conducted with Turkish preschoolers showed that 10% of 3-year-olds, 65% of 4-year-olds 83% of 5-year-olds passed the unexpected contents task. Additionally, 40% of 3-year-olds, 60% of 4-year-olds, and 80% of 5-year-olds passed the unexpected location, and 12% of 3-year-olds, 70% of 4-year-olds, and 76% of 5-year-olds passed appearance-reality tasks (Şen Hastaoğlu, 2024).

1.2. Epistemic Language

MS language includes lexical labels and morpho-syntactic markers (in some languages) that refer to mental states and processes, such as wanting, being sad, or remembering (Bretherton & Beeghly, 1982). In the literature, most of the studies focus on three subcategories of MS language: cognition, desire, and emotion (e.g., Chan et al., 2020; Ensor et al., 2014). What is going to be referred to as epistemic language in the current study is most often coded under the general label of cognitive language, with some inconsistencies in the scope of this category (Ilgaz & Allen, 2021). Some of the studies have focused more intensely on words such as “to think” and “to know” (e.g., Adrián et al., 2007). For instance, a subset of studies has included certainty expressions that qualify epistemic processes and beliefs (e.g., maybe, definitely) (e.g., Ruffman et al., 2002; 2006) as well as contrastives (e.g., apparently), which are word-level labels that involve a comparative component and contrast belief with reality (e.g., Tompkins, 2015), while others have not (Adrián et al., 2005). A meta-analysis that included all studies that coded for cognitive

language, without regard for differences in the scope of the cognitive category, showed that parents' cognitive language consistently and significantly correlated with their children's FBU. This relation did not extend to desire or emotion language (Tompkins et al., 2018). The current study takes epistemic language as a comprehensive mental state category that includes all cognitive language, including contrastives and certainty markers.

It should be noted that in the relevant literature, the terms FBU and ToM are sometimes used interchangeably. In the current study, these terms are used with differentiation. When a study includes assessments of children's ToM abilities beyond FBU, such as desire or emotion understanding, it will be referred to as ToM. Conversely, if the study solely measures FBU tasks, it will be referred to as FBU. A similar differentiation is made with regard to MS language. When the findings are associated with various categories of MS language (e.g., cognition, desire, emotion), the term MS language is used. If the results pertain exclusively to epistemic language, the term epistemic language is used.

1.3. Theoretical Background: Relations between FBU & MS Language

In the literature, there are two main theories for the relationship between language and children's socio-cognitive understanding: the theory theory and the socio-cultural view.

1.3.1. The Theory Theory View

The theory theory framework posits that children develop FBU by acting as if they are young scientists (Gopnik & Wellman, 1992). According to this view, as young scientists, children form hypotheses (which are regarded as naïve psychological theories) that they either confirm or test based on provided evidence (Gopnik &

Wellman, 1992; Wellman, 1990). In other words, children constantly seek evidence for their hypothesis. Children are able to either align or differentiate their mental concepts through this hypothesis-testing process (Gopnik & Wellman, 1992; 1994). From this perspective (Wellman, 1990), MS language has been suggested to play an integral role by providing the necessary linguistic input that helps children form and differentiate mental concepts and categories (e.g., to know vs. to think, or truth vs. belief). Empirical studies examine the frequency of mental state expression with the belief that children who hear MS language more frequently will have more data to formulate and test their hypothesis about the mind (Gopnik & Wellman, 1992; 1994). Hence, hearing these mental state expressions used in their daily interactions helps children refine their FBU and develop the representational capacity required for understanding false beliefs.

1.3.2. The Socio-cultural View

The socio-cultural view emphasizes the interactional nature of cognitive development and argues that children co-construct their social understanding through social interactions (Carpendale & Lewis, 2004; Nelson, 2005; 2007). From a Vygotskian perspective, ToM abilities can be defined as a *higher mental function*. In line with Vygotskian tenets, language serves as the primary psychological tool that allows children to understand and comprehend their own and others' mental states (Ferryhough, 1996). Accordingly, the socio-cultural view argues that children's ToM emerges not only from exposure to mental state language but also from participation in guided, meaningful conversations in which adults adapt their discourse to the child's current level of understanding of these concepts. This sensitivity that leads to supportive and guiding pedagogical behavior is referred to as scaffolding (Bruner, 1986). Emphasizing the importance of co-construction through

social interactions, the socio-cultural view argues that a child's performance on their own reflects their potential only to a certain extent, and that children can go beyond that point through the help of a more knowledgeable other (Vygotsky, 1978).

According to socio-cultural tenets, MS language is used with the purpose of supporting children's understanding of the perspective, and consequently, the pragmatics with which MS language is used contributes to children's formation of mental concepts (Ferryhough 2008; Nelson, 2007). This view de-emphasizes the frequency with which MS language is used and instead highlights the purposeful use of such language as a scaffolding device.

1.4. Storytelling

Parents' and children's MS language varies widely according to discourse context. Research has examined parent-child MS language in different contexts and daily routines such as storytelling (e.g., Tompkins, 2015), reminiscing (e.g., Ontai & Thompson, 2008), play (e.g., Meins et al., 2002), and mealtime (e.g., Ensor et al., 2014). Meta-analytic evidence showed that parents' MS language during the storytelling context is a more significant predictor of children's FBU compared to the play and reminiscing contexts (Tompkins et al., 2018).

The reason for the potency of storytelling for FBU is twofold. First and most simply, stories may contain FB themes where children learn about deception, or behavior that is influenced by false beliefs (Cassidy et al., 1998; Dyer et al., 2000). Secondly, stories contain multiple characters and actions, allowing the narrator (i.e., parents) to discuss the story characters' psychological worlds, such as beliefs, emotions, and knowledge, as well as false beliefs with their children (Cassidy et al., 1998).

Moreover, using the story and the story's characters, the adult narrator directs children to engage with a third-person perspective (Nelson, 2009). Parents monitor

their children's understanding of the story (Fernyhough, 1996) and guide them to focus on certain aspects, ask questions, or clarify the situation of the story/story's characters.

Stories with text contain rich MS language. Parents use similarly rich MS language when narrating wordless picture books. This has been the reason for the widespread use of wordless picture books to study MS language (Ziv et al., 2013). However, research seems to suggest that the type of referent with which MS words are used also matters. There is both conceptual and empirical support for this premise (Adrián et al., 2007; Chapman, 2013; Fernyhough, 2008; Ilgaz et al., 2025).

According to Fernyhough (2008), discourse about narratives serves a dialogic function. In storytelling discourse, the object of attention of a mother-child dyad simultaneously becomes the minds of the participants, their understanding of the story, and the minds of the characters whose actions constitute the story. It is possible to use Chapman's (2013) notion of the "epistemic triangle" to take this idea further. Michael Chapman (2013) proposed an epistemic triangle model that illustrates the dynamic process of knowledge construction. The triangle involves three main components: object of knowledge (story and characters), active subject (child), and interlocutor (adult-narrator) (Carpendale, 2013; Chapman, 2013). In this triangular model, the actors (child and mother) interact with the object (the story) as well as with one another (communicative interaction) (Carpendale, 2013; Chapman, 2013). Ilgaz and colleagues (2025) propose that this epistemic triangle model can be adapted to the mother-child storytelling interactions in which MS language is used at two layers. The first layer involves the here-and-now conversations between the adult and the child. These types of MS talk are used to explore, describe, probe, and explain the immediate minds, that of the child and the mother. The second layer

shifts beyond the immediate context, focusing instead on the story's characters' mental worlds.

Given the central importance of referent to narrative discourse, the current study included MS language with reference to immediate agents (i.e., mother, child) and references to decontextualized agents (i.e., story characters) as one of the main aspects of maternal discourse to be explored in relation to children's FBU.

1.5. Epistemic Language as a Scaffolding Tool in Storytelling

The sociocultural perspective proposes that parents are sensitive to their children's developmental limits, needs, and capabilities, adjusting their language according to their children's developing sociocognitive abilities (Fernyhough, 2008; Ilgaz et al., 2025). A recent study (Puri et al., 2025) investigated whether mothers' MS language differs based on their familiarity with the child (own vs. other's toddler). Their findings provide strong evidence for MS language as a tool that mothers use flexibly. Specifically, mothers who narrated the pictures to their own children produced more cognitive expressions compared to mothers who narrated the same pictures to an unfamiliar child of the same age, even when controlling for children's age, vocabulary, and MS language. It is important to note that these differences were only observed for cognitive talk.

If scaffolding is sensitive to children's level of competence, the types (e.g., cognitive, emotion) and aspects (referent, function) of MS language that are related to FBU should vary by developmental change. Findings support this conclusion. Different aspects of mothers' mental state language have been found to show either positive or negative associations depending on the child's age. For instance, Taumoepeau and Ruffman (2006; 2008) examined whether mothers' mental state talk predicted children's emotion understanding longitudinally using a picture description task.

Mothers' use of desire expressions with child referent when their children were 15 months old positively correlated with their emotion understanding at 24 months old and negatively correlated with their emotion understanding when they were 33 months old.

Similarly, Ilgaz and colleagues (2025) found that Turkish mothers' use of MS language with mother or child referents as well as their MS language with story character referents both predicted children's FBU abilities one year later. What is of note is that the cross-sectional analysis showed a consistent negative relation between MS language with mother-child referents. Ilgaz and colleagues explain the changing valence of the relationship with scaffolding. They assert that mothers whose children have lower FBU may use more MS language with interpersonal (i.e., mother-child) referents. Mothers' shifting the MS language through different types of references is taken as a sign of a sensitive scaffolding.

Given that Ilgaz and colleagues' (2025) sample was reported to be highly educated (86% university graduates) and middle or upper-class, this may be one reason for finding evidence of effective scaffolding via MS language. In a nationally representative Swedish sample, Sehlstedt and colleagues (2024) studied the longitudinal relation between maternal MS language and children's ToM abilities when they were 2, 3, 4, and 5 years old using a picture description task. They found that children whose parents used proportionally more cognitive words at age 2 and proportionally more desire words at age 3 showed lower ToM performance at age 4 (Sehlstedt et al., 2024). Children whose parents used proportionally more cognitive words at age 3 showed higher ToM performance at age 4 (Sehlstedt et al., 2024). These results are meaningful if we consider the changing nature of children's needs by age, which is a proxy for socio-cognitive competence.

1.6. Mental State (MS) Language and False Belief Understanding

A well-documented body of empirical studies examines the relation between mental state (MS) language and false belief understanding in different age groups across diverse cultures, and interaction contexts (e.g., Chan et al., 2020; Sehlstedt et al., 2024; Taumoepeau & Ruffman, 2006; 2008). Although there are inconsistencies in the MS language coding across studies, the findings consistently show similar patterns. In the following section, relevant studies conducted on the relation between three separate layers of MS language (i.e., type, referent, function) and FBU are presented.

1.6.1. Types of MS Language

Adrián and colleagues (2005) provided early evidence linking MS language and FBU in Spanish-speaking samples. Investigating Spanish mothers' MS language during picture-book narration in relation to their 4-to-5-year-old children's FBU (Adrián et al., 2005), they showed that the diversity and frequency of cognitive words positively correlated with 4-to-5-year-old children's FBU abilities. Not all studies find relations between the frequency of MSL use and FBU. Similar to Adrián et al., (2005), Slaughter and colleagues (2007) examined the relation between maternal MS language and their 3-to-4-year-olds' ToM performance during a wordless picture book narration. They found that mothers' use of cognitive clarifications (i. descriptions and ii. explanations about cognitive states or processes, iii. contrastives) and their inclusion of false belief endings (story characters' false beliefs) were positively correlated with children's ToM, even when children's age and mothers'

verbosity were controlled. However, they did not find any significant relation between mothers' use of simple cognitive expression and children's FBU.

A more recent study with English-speaking children examined whether cognitive state vocabulary, complement syntax with *to think*, and contrastives in mothers' extratextual talk during book sharing predicted their preschoolers' later FBU. The correlational results revealed that total cognitive talk was positively correlated with children's FBU six months later. Notably, contrastives emerged as the one unique category that predicted children's FBU (Tompkins, 2015).

Ruffman and colleagues (2002; 2006) have similarly paid close attention to different types of cognitive mental state language. Their studies consistently code for the modulation of assertion, "think and know" as a category, and other cognitive mental states in addition to desire and emotion. Ruffman et al. (2002) investigated whether English-speaking mothers' MS language in a picture-description task predicted their 2-to-4-year-old children's FB understanding, controlling for children's age and language abilities at three time points, 6 months apart. The results revealed that mothers' use of modulation of assertion, think, and know, and other mental state expressions in Time 1 positively correlated with children's ToM performance in Time 2. Moreover, mothers' use of modulation of assertion and think and know expressions in Time 2 positively correlated with children's ToM performance in Time 3, even after controlling for children's earlier ToM performance (Ruffman et al., 2002). These studies stand out among others as they shed light on issues of directionality of causation due to their longitudinal nature.

1.6.2. Referents of MS Language

Ilgaz and Allen (2021) argued that the specific referents adults use in their talk to children warrant closer examination, as they may play a significant role in the

development of children's social understanding. In this context, a group of studies (e.g., Adrian et al, 2007; Chan et al., 2020; Ilgaz et al., 2025; Liu et al., 2024) in the relevant literature focused on the type of referent as a second layer in addition to the types of MS language. For instance, Chan and colleagues (2020) examined the relation between mothers' MS language and their preschoolers' FB understanding from Hong Kong using a wordless picture book. Their findings revealed that the particular engagement in total MS language, where parents and the story characters were referents, positively correlated with children's FBU performance but not with children's referents. Moreover, the further analysis showed that only cognitive expression with a story character referent was positively related to children's FBU, but not other types of MS language (Chan et al., 2020).

In a recent study, Ilgaz and colleagues (2025) examined the relation both cross-sectionally and longitudinally between Turkish mothers' MS language and their preschoolers' FBU. They argued that mothers' use of referents serves complementary functions and accordingly distinguished referents into two categories: interpersonal (mother-child) and decontextualized (story character). They found that MS language with interpersonal referents was negatively correlated with children's FBU cross-sectionally, whereas decontextualized referents were positively correlated with children's FBU longitudinally. However, despite the negative cross-sectional correlation between MS language with interpersonal referent and children's FBU, longitudinal analyses revealed that MS language with interpersonal referent positively predicted children's FBU performance one year later. They argue that the difference in the valence of the relations between the within-time to longitudinal results matches how scaffolding operates. Meaning, support in the form of mother-child MS language is provided in the short term for areas of weakness, which results

in negative correlations. However, successful scaffolding yields positive relations in the long term.

1.6.3. Functions of MS Language

Three studies have coded for all three layers of MS language (types of MS language, referent, and function) that are investigated in the current study. The results of these studies underscore the importance of looking at MS language as situated within an interactional context through the coding of referents and pragmatic context by focusing on utterance functions.

Adrián and colleagues (2007) carried out one of the first studies that investigated the type, referent, and function of cognitive words across mothers' narration of several storybooks, some wordless, others with minimal text. In this longitudinal study, the nature of their analysis did not allow for understanding the interactive dynamics between type, referent, and function. In a rather disaggregated manner, they analyzed each variable separately. For instance, rather than analyzing cognitive words that are used in questions with character reference, they ran separate analyses on each variable (i.e., cognitive words, questions, character references). Despite these limitations, this study showed that each of these aspects of talk mattered, and more importantly, their importance could be relative in time. A factor analysis of mothers' talk revealed two factors: talk that (1) focused on mothers' shared meaning-making with their children (e.g., mother referent, asking questions, using *know*), and talk that (2) focused on story characters' mental worlds (e.g., explanations, usage of *think*). Importantly, Factor 1 predicted both concurrent and later children's ToM, while Factor 2 uniquely predicted one-year later ToM performance.

Tompkins and colleagues (2022) examined the bidirectional relation between mothers' and their preschoolers' MS language during wordless storybook narration

and did not have any hypothesis for children's social understanding. However, their findings give important insights into mother-child interactive storytelling dynamics. Their findings showed that mothers' cognitive expressions were more likely to be used in open-ended questions (e.g., Why do you think the boy left?) and less with comments (e.g., The child thinks about going out). In contrast, mothers' use of modulation of assertions was often involved in comments and less with questions. Moreover, mothers' use of cognitive expressions was more likely with child referents (e.g., "Why do you think he's sad?", *p.* 297), and modulation of assertions was likely with mother referents (e.g., Maybe he is sad because it's raining) (Tompkins et al., 2022). Additionally, when mothers used MS language with child referent or MS language in questions, their children were more likely to respond back with MS language. In contrast, children were less likely to join in the narration when mothers used MS language with story character referents (Tompkins et al., 2022). In a similar vein, Liu and colleagues (2024) examined the relation between Chinese mothers' MS language during wordless story book narration and their preschoolers' (3-to-5-year-olds) FBU. They found that total MS language was more strongly correlated with children's FBU in 4-year-olds than in 5-year-olds. Parallel with the previous studies, they found cognition expressions positively correlated with children's FBU performance. More specifically, they found that cognitive statements with mother referent and cognitive questions with child referent positively correlated with children's FBU, and there was no significant correlation with story character referents (Liu et al., 2024).

1.7. Mental State (MS) Language and Children's Gender

Children's gender can be one of the parameters that mothers consider when they talk to their children. Meta-analytic evidence showed that mothers tend to talk more and

use more supportive talk, which includes elaborative, encouraging talk with their girls compared to their boys (Leaper et al., 1998). Another meta-analysis specifically focuses on whether parents' MS language differed by children's gender (Farrel et al., 2025), and they found that the findings of the studies were mixed. Most of the studies did not find gender effects on parents' MS language (e.g., Laranjo et al., 2014; Pearson & Pillow, 2016). Moreover, the findings of studies that found a significant gender effect on parents' MS language have also been inconsistent. For instance, LaBounty and colleagues (2008) found that mothers used more cognitive and desire expressions with their girls than boys, whereas Roger and colleagues (2012) found that parents used more MS language with boys than with girls.

The relation between parents' use of MS language and their children's gender may also be influenced by the culture they live in. Chang and colleagues (2017) compared the U.S. and Chilean mothers' use of MS language toward their daughters and sons. Their findings showed that Chilean mothers did not show any gender-related differences in their use of MS language, whereas U.S. mothers engaged in more causal talk with their girls compared to their boys. In the literature, no study has yet investigated whether the maternal MS language, in general and specifically epistemic language, varies depending on the child's gender within a Turkish sample.

1.8. Repeated Storytelling

All research that looks at the relation between parent-child storytelling and children's FBU has used the language data from a single telling of an unfamiliar story (e.g., Adrián et al., 2005; Chan et al., 2020; Liu et al., 2024). Focusing on the first telling of an unfamiliar story inherently harbors some limitations. The most notable limitation regards our inability to observe the dynamics of mothers' scaffolding behavior. It is commonplace for parents to share the same storybook with their

children multiple times. It is plausible to think that mothers' talk would change to accommodate their children's changing level of knowledge of the story. Focusing on whether and in what ways mothers' talk changes by children's familiarity with the story would provide a deeper understanding of how mothers alter their language to accommodate their children's needs.

An early study conducted by McDonnell and colleagues (2003) examined whether mothers' extratextual talk changes when they narrate the same storybook for 3 weeks. They observed 14 mother-child dyads across four sessions of narration when the children were two to three years old. Findings showed that across repeated readings children's talk increased. Conversely, mothers' talk decreased. In addition, in the first reading, children were more likely to take the role of responders, whereas mothers were more likely to assume the role of responders as their children became more talkative across repeated readings (McDonnell et al., 2003).

Another reason why it is important to observe parent-child storytelling interaction in multiple sessions is the differences in the dimensions that the parents focus on during storytelling. Specifically, through repeated readings, they may gradually shift their focus from the general structure of the story to the psychological worlds of the story's characters (e.g., Schapira et al., 2020). Previous research on this topic has generally followed Bruner's (1986) dual landscape model. Bruner (1986) suggested that narratives have two levels (landscape): the action level and the consciousness level. At the action level, the narrator focuses on the characters' behaviors, main events, and actions in the story. In contrast, in the consciousness level, the narrator focuses more on the story characters' psychological worlds, such as beliefs, thoughts, and emotions.

Considering this distinction, two studies were conducted to investigate parent and child dyads' repeated readings, one of which is used on a commercial book (McArthur et al., 2005) and the other uses a wordless picture book (Schapira et al., 2020). McArthur et al. (2005) studied English-speaking mothers and their 24- to 36-month-old children's dyads' storytelling discourse when they narrate two unfamiliar books three times. They found no significant effect of sessions on the mothers' utterance difference landscape of action and consciousness. On the other hand, Schapira et al. (2020) examined 50 Israeli parent-preschooler (4-to-5-year-olds) dyads' discourse when they narrated the same storybook three times. Findings revealed that parents focused more on the action level and less on the consciousness level of the story in the first reading. However, in the second and third readings, they focused more on the consciousness level of the story and less on its action level.

1.9. The Current Study

The current study examined whether mothers' use of epistemic language (EL) during storytelling differed based on their child's FBU competence level (FBU-None, FBU-transition, and FBU-competent) and the child's familiarity with the story (familiar vs. unfamiliar) in a Turkish-speaking sample. The current study investigates maternal epistemic language in repeated storytelling in three different layers: (1) referent (mother-child vs. story character), (2) function (question vs. statement), and (3) type (i.e., cognitive, certainty, contrastive). In the current study, all components of mothers' epistemic language will be examined in relation to the referents they attribute.

The first motivating question is whether mothers change their epistemic talk according to children's familiarity with the story (familiar vs. unfamiliar)? Firstly, the current study hypothesized that mothers' epistemic language (EL) would vary

between two storytelling sessions according to their use of types of referents, types of function, and types of epistemic expressions. Parallel with the previous literature (e.g., Schapira et al. 2020), in the second storytelling session, when the story is familiar to the mother-child dyad, we expected that mothers use more epistemic language for each type (cognitive, certainty, contrastive) and more epistemic expressions with story character referents compared with the first storytelling session when the story is unfamiliar.

The second motivating question is whether mothers change their epistemic language according to children's FBU. If adults use epistemic language as a scaffold for children's FBU, they would be expected to tailor their use of epistemic language sensitively to the child's needs (Fernyhough, 2008; Ilgaz et al., 2025). In line with the previous findings, the current study hypothesized that mothers would change their talk according to their children's FBU competence level. More specifically, mothers of children with higher FBU competence levels would engage in more story character-referenced epistemic language with their children, whereas mothers of children with lower FBU competence levels would engage in more mother-child-referenced epistemic language.

The final motivating question regards the possible interactive effects between important contextual variables (familiarity) and child variables (gender, FBU competence). Based on the tenets of sociocultural theory, especially a deep reading of Vygotskian ideas of scaffolding, the expectation would be that the contextual variables and child variables would interactively shape mothers' epistemic language. It should be noted that the inclusion of gender in this study is truly exploratory since the literature did not point to consistent gender effects, and no similar study has been conducted with Turkish samples to investigate possible gender-based differences in

maternal language. Regardless, we believe that not including gender would mean excluding a potentially significant child variable. Hence, it was included in the analysis.



CHAPTER II

METHOD

2.1. Participants

The data were obtained from the Bilkent University Developmental Psychology Laboratory archive (TUBITAK Grant No: 217K169). The study was carried out in two sessions. A total of 126 Turkish-speaking mother-child dyads participated in the study. One mother-child dyad was excluded due to a technical recording error during storytelling in the first session, but the data from the second session were used. In addition, five of these dyads did not participate in the second session, resulting in the utilization of their data from the first session. In summary, there were 125 mother-child dyads in the first session and 121 mother-child dyads in the second session.

There were 46 3-year-olds (24 girls, mean age = 40.22 months), 42 4-year-olds (22 girls, mean age = 52.19 months), and 38 5-year-olds (22 girls, mean age = 65.71

months). The education level of the sample was high. 82.54% of mothers and 83.33% of fathers have undergraduate and/or a postgraduate education. Additionally, 98% of the mothers reported that their household income was at an average level or above.

2.2. Materials

2.2.1. Demographic Information Questionnaire

Mothers completed a questionnaire regarding the age and educational level of the parents, household and perceived income, as well as their children's age, number of children, and children's educational background.

2.2.2. False Belief Tasks

Children were presented with three first-order false belief tasks. Then, they were divided into three categories based on their scores on the first-order false belief tasks. Children who failed all tasks were categorized as ***FBU-None***, those who passed one or two of the tasks were categorized as ***FBU-Transition***, and those who passed all three tasks were categorized as ***FBU-Competent***. The three given tasks are as follows:

2.2.2.1. Appearance- Reality Tasks

In the appearance-reality task, children were asked to discriminate between the appearance of an object and what it is in reality (Flavell et al., 1983). In this task, two deceptive objects were used: a safe-box that looked like a book and a silicone pencil case that looked like a banana. First, children were shown the object and were asked to name it. If children could identify the object's real identity at first glance, an alternative deceptive object was presented (e.g., an eraser that looked like a walnut).

Then, after the real identity of the object was revealed, the children were asked questions regarding: (1) what the object looked like, (2) what the object's real identity was, and (3) what they initially thought the object was before learning about its true identity. If a child correctly answered all questions about the object, they received one point. Children had to correctly answer all questions for both deceptive objects to be considered passing this task (1 point).

2.2.2.2. Unexpected Location Task

This task was adapted from Wimmer and Perner (1983). In this task, children were presented with a six-picture story, and the main character was gender-matched. In this story, a mother gives her child (the main character) a piece of chocolate, which the child puts into a drawer and then goes outside to play. While the character is outside, the mother changes the location of the chocolate from the drawer to the refrigerator. Later, the mother sleeps, and the child returns home.

Children are first asked two control questions to ensure they track the story: “Where did the child put their chocolate before they went out to play?”, “Where is the chocolate now?”. Then, they are asked a test question: “Where will the child look first for the chocolate when they return home?” The answer options in the test question are counterbalanced. If the child answered both control and test questions correctly, they received one point.

2.2.2.3. 1st order ToM Task

This task assesses children's ability to understand that another person can hold a false belief, and that one person can have beliefs about another person's beliefs (Astington et al., 2002). In this task, children were presented with a story consisting of five pictures. The story consists of two characters, Character 1 (all characters were

gender-matched), who does not want to show Character 2 a picture she made, puts the picture under the blanket on her bed to hide it from Character 2, and leaves the room. In her absence, Character 2 takes the picture under the blanket (old location), looks at it, and hides it in a drawer (new location). As Character 2 hides the picture in the new location, Character 1 comes back, and Character 1 observes Character 2. Most importantly, Character 2 does not realize that Character 1 watched him change the picture's location. At this point in the story, the participant is asked three control questions to ensure the child understands the story: "Where did Character 1 put the picture before going to her mother?", "Where did Character 2 put the picture?", "Does Character 1 know where the picture is now?". Then, a first-order false belief question is presented: "Does Character 2 know that Character 1 saw them change the location of the picture?". Answer options were counterbalanced across children. All counterbalancing was designed to be equal according to the age and gender of the children. If the child correctly answered all control and first-order false belief questions, they received one point.

2.2.2.4. Turkish Receptive and Expressive Language Test (TIFALDI, Berument & Güven, 2013)

The Turkish Receptive and Expressive Language Test is a standardized test used to measure the vocabulary knowledge of Turkish-speaking children aged 2 to 12. In the receptive vocabulary test, children are presented with a book consisting of four pictures on each page. Each respective page has one target image and three distractor images. Participants' receptive vocabulary is assessed by the tester saying a target word and asking children to identify the target word from a set of images. There were two trial pictures and 104 test pictures. The baseline score is where the child got 8 correct in a row at the start of the test. The ceiling score is where the child gets

8 wrong in 10 pictures. Expressive vocabulary is assessed by presenting the child with an image and asking them to name the corresponding word. There were 80 pictures. The baseline score is where the child got 8 correct in a row at the start of the test. The ceiling score is where the child gets 6 wrong in 8 pictures.

2.2.3. Wordless Picture Book

Mothers were asked to narrate a wordless picture book *Frog, Where Are You?* (Mayer, 1969), which consists of 24 sequential pictures, for their children. Before the storytelling, mothers were given 5 to 10 minutes to familiarize themselves with the book. They were informed that there were no time constraints during the storytelling and were encouraged to narrate it as they typically would when reading to their children at home. All participating mothers reported no prior familiarity with the book. While their children were completing the tests, the mothers were given a picture book to review. Moreover, mothers were encouraged to ask any questions to the experimenter.

2.3. Procedure

The present study was carried out as part of a broader 3-year research project that has been completed. The findings of longitudinal research published by Ilgaz et al. (2025). In their research, Ilgaz et al. (2025) focused on the second reading of mothers in one year apart. The present study focuses on the first and second readings of mothers in Time 1.

The mothers and their children visited the Bilkent University Developmental Psychology Laboratory for the first session. Initially, a 10-minute warm-up session was conducted to familiarize the children with the lab environment and help them feel comfortable. Then, the researcher began the testing session with the child, who

completed an executive function task, false belief tasks (Appearance Reality- 1st Object, Unexpected Location, 1st and 2nd order ToM, Appearance Reality-2nd Object), and Comprehension of Complement Clauses tasks. The executive function and syntactic comprehension tasks were part of a larger study. Meanwhile, the mother was asked to fill out a demographic information form and a home literacy form in the waiting room. Afterward, she was given a picture book named “Frog, Where are you?” (Mayer, 1969) that she would later read to her child to familiarize herself with the narrative. Once the child’s testing session was completed, the mother joined the child in the playroom for 10 minutes of free play. After the play session, the mother read the picture book to her child. Approximately one week later ($M=8.58$, $SD = 2.29$, $R = 5-19$ days), the experimenters visited the mother-child dyads at their homes. First, children were assessed with TIFALDI receptive and expressive vocabulary tasks. Then, mothers re-narrated the same story, “Frog, Where are you?” (Mayer, 1969) to their children.

2.4. Maternal Epistemic Language Coding

All mother-child interactions during storytelling were video-recorded and transcribed verbatim. Only the interactions directly related to the story were included in the coding. The current coding schema was adapted from Ilgaz et al.’s (2025) mental states language coding scheme used in narrative discourse. While Ilgaz et al. (2025) coded perception, motivation, physical and emotion expressions, the current study’s coding only focused on epistemic expressions. First, the utterances were coded based on whether they were related to the story. Only the epistemic expressions related to the story were coded. The coding scheme was designed to analyze the language used by mothers during storytelling across three layers: type of epistemic expressions

(cognitive, certainty, contrastive), type of referent (mother-child vs story character), and type of utterance function (question vs. statements).

2.4.1. Length (C-Units)

The mother's narrative discourse was segmented into utterances (communication units). One communication unit (C-unit) is composed of either a main clause or a subordinate clause that depends on the main clause (MacWhinney, 2000). Mothers narrated the same story to their preschoolers twice, approximately one week apart, between sessions ($M = 8.58$, $SD = 2.29$, $R = 5-19$ days).

A paired-samples t-test was conducted to compare mothers' talk across the two storytelling sessions. The results revealed that mothers talk significantly used fewer C-units during the second session ($M = 129.46$, $SD = 51.67$) compared to the first session ($M = 152.84$, $SD = 59.77$; $t(119) = 6.00$, $p < .001$, $d = .55$). Due to the variation in the overall length of mothers' storytelling across the two storytelling sessions, maternal epistemic language was analyzed using proportion scores rather than raw frequencies. The proportion scores are calculated as follows: the frequency of each coded category is divided by the total number of C-units. All subsequent analyses were conducted based on these proportion scores.

2.4.2. Type of Epistemic Expression

The current coding schema has three types of epistemic expression categories: cognitive, certainty, and contrastive. In Turkish, epistemic expressions can be observed not only through word-level form but also through grammatical markers (i.e., certainty markers and adverbial perspective suffix) that represent cognitive processes and the degree of certainty associated with these processes. Consequently, the coding scheme incorporates epistemic expressions at both the lexical and

morphosyntactic levels (Göksel & Kerslake, 2005). All the examples are presented in Table 1.

2.4.2.1. Cognitive Expressions

The words in this category express a cognitive state or process (e.g., to know, think, predict, remember). Additionally, the **-cE** suffix in Turkish, coded under this category, transforms the pronouns' utility to convey that particular pronoun's perspective (e.g., in my/your opinion, '*bence*', '*sence*') when attached to any personal pronoun (e.g., I, you).

2.4.2.2. Certainty Expressions

Certainty expressions were coded at both the lexical and morphosyntactic levels: (a) the words in this category are used to evaluate the certainty of a cognitive process or states (e.g., maybe, probably, definitely), (b) **-(y)Abilir** suffix which conveys a sense of possibility and **-mAIl**, the obligative form of the copular/auxiliary verb *ol-* (i.e., *olmalı*) which gives the meaning of inference were also coded under this category.

2.4.2.3. Contrastive Expressions

These expressions emphasize the difference between two realities or the contrast (opposite reality) between a person's thought and a prior thought, reality, or another person's thought (e.g., it turns out, falsely think, surprise).

2.4.3. Type of Referents

Mothers' use of epistemic expressions was coded into two categories based on their referents: (a) mother-child and (b) story characters. This coding was followed by the Ilgaz et al. (2025) mental states language coding scheme used in narrative discourse.

2.4.3.1. Mother-Child Referents

Epistemic expressions in which mothers refer to both themselves and their children during narrative are included in this category.

2.4.3.2. Story Character Referents

Epistemic expressions in which mothers refer to story characters are included in this category.

2.4.4. Type of Utterance Function

The epistemic expressions used by the mothers were divided into two categories based on their utterance functions.

2.4.4.1. Questions

Questions in which the mother inquires about the mental states of the story characters, their child, or herself, are coded under this category.

2.4.4.2. Statement

Statements in which the mother identifies, explains, or discusses the mental states of either herself, the child, or the story characters were coded under this category.

Table 1
The Coding Schema (with examples)

Categories	Levels	Examples (Mother- Child) Question	Statement	Examples (Story Character) Question	Statement
Cognitive	Word	TR: Köstebek mi acaba ? EN: I wonder , is it a mole?	TR: Ben de kurbağası nereye gittiğini bilmiyorum . EN: I don't know where his frog went either.	TR: Kerem ordan bi köstebek çıkacağını düşünemedi . EN: Kerem didn't think that a mole would come out of there	TR: Sonra dışarıya çıkmaya karar vermişler . EN: Then they decided to go outside.
	Morpho-syntactic	TR: Fino arıları kızdırınca ne olacak sence ? EN: What do you think will happen when Fino makes the bees angry?	TR: Mergin ve kurbağaya sesleniyo bence . EN: In my opinion he is calling out to Mergin and the frog.	TR: Baykuşa " Sence kurbağam nereye gitmiştir?" diye sormuş. EN: He asked the owl, "Where do you think my frog went?"	TR: " Bence kurbağam çok uzağa gitmemiştir" EN: " In my opinion my frog hasn't gone very far."
Certainty	Word	TR: Belki de orda sincaplar yaşıyodur. EN: Maybe squirrels are living there	TR: Bu kurbağa onların yavruları değilmiş galiba . EN: Probably , this frog isn't their baby.	TR: " Belki de şu deliktedir" diye oraya bakmış. EN: He looked over there and said, " Maybe it's in that hole."	TR: Ondan sonra çocuk demiş ki "Şşş, sessiz ol. Sanırım kurbağa sesleri duyuyorum demiş." EN: Then the child said, "Shhh, be quiet. I suppose I hear frog sounds."
	Morpho-syntactic	TR: Bi yuva olabilir mi o? EN: Could that be a nest?	TR: Kurbağacığı arıyolar olmalı . EN: They could be looking for the little frog.	TR: "Kurbağacık nereye gitmiş olabilir ?" EN: "Where could the little frog have gone?"	TR: Demiş ki köpüşüne: " Şşş ! Sessiz ol, bi ses duydum, bu kurbağanın sesi olabilir ." EN: The child said to his puppy: "Shhh! Be quiet. I heard a sound— maybe it's the frog."
Contrastive		TR: Yusuf burda aslında bi su birikintisi olduğunu gördün mü? EN: Yusuf, did you see that there was actually a puddle here?	TR: Meğersem onlar dal değilmiş,. EN: It turns out they weren't branches.	TR: Ali köpeğine "Kurbağayı burada mı sandın ?" diye sordu. EN: Ali asked his dog, "Did you falsely think the frog was here?"	TR: Kurbağasını ararken bir ağaç dalına tutundum sanmış . EN: While looking for his frog, he falsely thought he was holding onto a tree branch.

2.5. Reliability

The primary coder and two undergraduate students coded all the data. The three-person team divided the transcripts among themselves so that two coders coded each transcript. The first five transcripts were coded as a team for training purposes. The reliability 20% of the data was assessed using intraclass correlation coefficients (ICCs) for each coding category across three coders. The ICCs indicated excellent agreement for all categories (ranged from .83 to .99 across coder pairs). All Cronbach's alpha (α) values across three coders are presented in Table 2.

Table 2
Interrater Reliability (ICC) Scores Between Coders for Each Coding Category

	Coder 1 – Coder 2	Coder 1 – Coder 3	Coder 2 – Coder 3
Cognitive Expressions.	.99	.93	.92
Certainty Expressions.	.97	.98	.99
Contrastive Expressions	.99	.85	.87
Mother-Child Referent	.99	.98	.90
Story Character Referent	.93	.83	.98
Questions	.98	.96	.98
Statements	.97	.97	.97

CHAPTER III

RESULTS

First, the result of children's performance on the cognitive tasks (i.e., language and FB understanding) will be presented. A repeated-measures analysis of variance (ANCOVA) was conducted to investigate whether maternal epistemic language (EL) differed by story familiarity and children's false belief understanding (FBU) performance. The independent variables were story familiarity (within-subjects) and children's FBU (between-subjects). The dependent variable was mothers' epistemic language in three layers: (a) the type of referent (i.e., mother-child, story character), (b) the type of function (i.e., statement, question), and (c) the type of epistemic expression (i.e., cognitive, certainty, contrastive).

3.1. Children's Cognitive Task Performance

Two separate factorial analyses of variance (ANOVA) were conducted on children's cognitive task performance (i.e., false belief understanding and language abilities).

The primary aim of these analyses was to examine whether the participants' cognitive task performance showed the expected developmental trajectories. The independent variables (IVs) were children's age and gender, and the dependent variable (DV) was children's cognitive task performance. Additionally, correlational analyses were conducted to test whether cognitive task performances were related to one another in the expected direction. In what follows, the results of the ANOVAs and correlational analyses will be presented.

3.1.1. False Belief Understanding

To investigate group differences in FBU performance, performance on the different FBU tasks (i.e., appearance-reality, unexpected location, 1st order ToM) was aggregated (max = 3 pts). A factorial ANOVA with children's age and gender as the independent variables revealed a main effect of age ($F(2, 115) = 31.90, p < .001$, partial $\eta^2 = .35$). In congruence with the literature, all age groups were significantly different than one another (all $ps \leq .006$; $M_{3 \text{ years}} = .70, SE_{3 \text{ years}} = .14, M_{4 \text{ years}} = 1.32, SE_{4 \text{ years}} = .14, M_{5 \text{ years}} = 2.32, SE_{5 \text{ years}} = .15$). There was a trend for gender where girls ($M = 1.59, SE = .11$) performed marginally better than boys ($M = 1.31, SE = .12$), $F(1, 115) = 2.92, p = .09$, partial $\eta^2 = .02$. An age by gender interaction was observed at the trend level ($F(2, 115) = 2.65, p = .07$, partial $\eta^2 = .04$). Follow up analyses showed that while 3- and 4-year-old girls' and boys' performance did not differ from each other, in the 5-year-old group girls ($M = 2.64, SE = .20$) performed significantly better than boys ($M = 2.00, SE = .23; p = .04$). The percentage of children who passed each of the FBU tasks are presented in Table 3.

Table 3*The percentage of children who passed each of the FBU tasks.*

	3 years old	4 years old	5 years old
Appearance Reality – Book	19.6%	52.4%	78.9%
Appearance Reality- Banana	36.9%	52.4%	81.6%
Appearance Reality- TOTAL	10.9%	38.1%	73.7%
Unexpected Location	39.1%	42.9%	81.6%
1st order FB	19.6%	52.4%	81.6%

In the current study, children's FBU performance is taken as a grouping variable when investigating whether mothers of children with different FBU competency levels show variance in their use of epistemic expressions. Accordingly, children who could not pass any of the FBU tasks were categorized as FBU-None, those who passed some of the tasks were categorized as FBU-Transition, and those who were successful in all FBU tasks were categorized as FBU-Competent. The percent distribution of children by FBU success categories is presented in Table 4.

Table 4*The percent distribution of children by FBU competence level categories*

	3 years old	4 years old	5 years old
FBU-None	50%	26.8%	8.1%
FBU-Transition	47.8%	61.00%	27.0%
FBU- Competent	2.2%	12.2%	64.9%

3.1.2. Language Performance

Two separate factorial ANOVAs on the raw receptive and expressive scores showed the expected main effect of age in both receptive ($F(2, 115) = 42.04, p < .001$, partial

$\eta^2 = .42$) and expressive vocabulary ($F(2, 115) = 34.28, p < .001$, partial $\eta^2 = .37$) scores. Children's receptive vocabulary scores did not differ by gender ($p = .34$). However, there was a marginal effect of gender on expressive vocabulary $F(1, 115) = 3.93, p = .05$, partial $\eta^2 = .03$. This effect was largely driven by an interaction of age and gender in expressive vocabulary scores ($F(2, 115) = 4.65, p = .01$, partial $\eta^2 = .08$) where 3-year-old boys ($M = 48.43, SE = 2.26$) scored higher than 3-year-old girls ($M = 36.96, SE = 2.11$). There was no difference in any of the other age-by-gender groups. There was no main effect of gender on receptive vocabulary. A similar performance profile was observed for receptive vocabulary between 3-year-old boys and girls. A significant age by gender interaction on the receptive vocabulary scores ($F(2, 115) = 5.19, p = .007$, partial $\eta^2 = .08$) was due to higher scores obtained by 3-year-old boys ($M = 61.10, SE = 2.80$) as compared to 3-year-old girls ($M = 48.46, SE = 2.62$).

In the current study, the standardized scores of children's receptive and expressive vocabulary performances will be used. Evidencing the validity of the standard scores, no difference was observed in receptive or expressive standardized vocabulary scores by age groups ($p > .05$). The observed gender effect on the expressive vocabulary scores as well as the age-by-gender effects on the expressive and receptive raw vocabulary scores disappeared when standardized scores were analyzed (all $ps > .05$). The descriptive values of children's raw and standardized language scores by children's age are presented in Table 5.

Table 5*The descriptive values of children's raw and standardized language scores.*

	3-year-olds	4-year-olds	5-year-olds
Receptive Language (raw)	54.36 (17.11)	70.67 (12.07)	80.76 (8.28)
Expressive Language (raw)	42.31 (12.83)	53.85 (9.47)	61.70 (9.44)
Receptive Language (std.)	129.87 (8.23)	127.97 (8.81)	125.84 (9.81)
Expressive Language (std.)	126.40 (10.43)	126.95 (9.95)	127.60 (12.35)

3.2. The Relation Between Children's FBU and Language Performance

Bivariate correlation analyses were conducted to investigate the relations between children's first-order false belief (FB) tasks and expressive and receptive language scores. Expressive and receptive language were positively correlated with each other ($r = .58, p < .001$). All first-order FB tasks positively correlated with one another, r s ranging from .38 to .53, p s $< .001$. Moreover, the unexpected location task positively correlated with expressive ($r = .40, p < .001$) and receptive language ($r = .02, p < .05$). To further investigate these correlations, partial correlations controlling for children's age (in months) were conducted, and all significant correlations remained significant, indicating that these links were robust beyond the effects of children's age (see Table 6).

Table 6

Bivariate and partial (age-controlled) correlations between children's 1st-order FB performance and expressive and receptive language scores

	ARE	ULT	1st order FB	Exp. Lang.	Rec. Lang.
ARE	-	.22*	.30***	.15	.14
ULT	.41***	-	.18*	.42***	.31***
1st order FB	.53***	.38***	-	.08	.25**
Exp. Lang.	.13	.39***	.07	-	.59***
Rec. Lang.	.03	.21*	.12	.58***	-

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. ARE: Appearance reality task; ULT: Unexpected location task; Exp. Lang: Expressive Language; Rec. Lang: Receptive Language. Partial correlations controlling for children's age in months are presented above the diagonal, whereas bivariate correlations are presented below the diagonal.

3.3. The Change in Maternal Epistemic Language by Story Familiarity, Children's FBU Competence Level, and Children's Gender

Seven separate mixed-factorial 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVAs were conducted on various aspects of maternal epistemic talk. In all analyses, proportion scores of maternal epistemic language were used. In addition, children's age and language abilities were taken as the covariates in all analyses. Differences in language use are a significant source of individual variability in language research (e.g., Hoff, 2006). Although the current study utilizes proportion scores to counter this problem, an outlier analysis was also necessary to eliminate mothers whose epistemic speech characteristics could bias the results. In what follows, the outlier analysis is

presented, followed by the findings from analyses of maternal epistemic language, including the type of referent, type of function, and type of epistemic expression.

3.3.1. Data Screening and Preliminary Analyses

Prior to the main analyses, an outlier analysis was conducted to detect extreme values of the total number of mothers' epistemic expressions. Figure 1 and Figure 2 present box plots illustrating the distribution of the total number of mothers' epistemic expressions across Sessions 1 and 2, highlighting the extreme values. Data was considered an outlier if its z-score was greater than 3.29 or smaller than -3.29 SD (Tabachnick & Fidel, 2013). In session 1, the total number of epistemic expressions of the three mothers exceeded the Z-score threshold of ± 3.29 ($Z = 5.58$, 3.98 , and 3.65) and were removed prior to analyses. No cases exceeded ± 3.29 SDs for Session 2. The final analyses were conducted on the remaining 117 mother-child dyads.

Figure 1

Outlier analysis of mothers' total epistemic language in the first storytelling

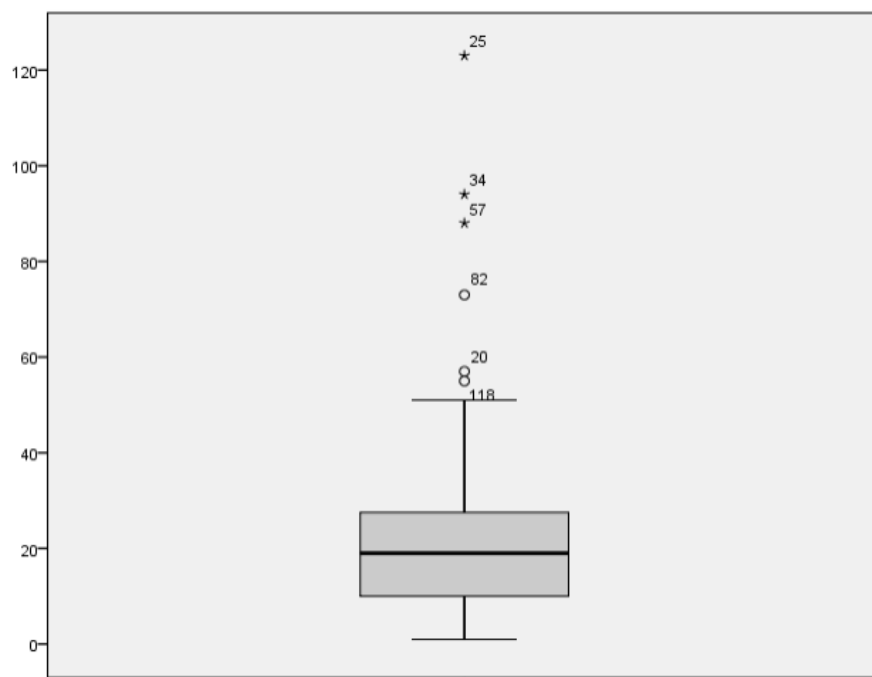
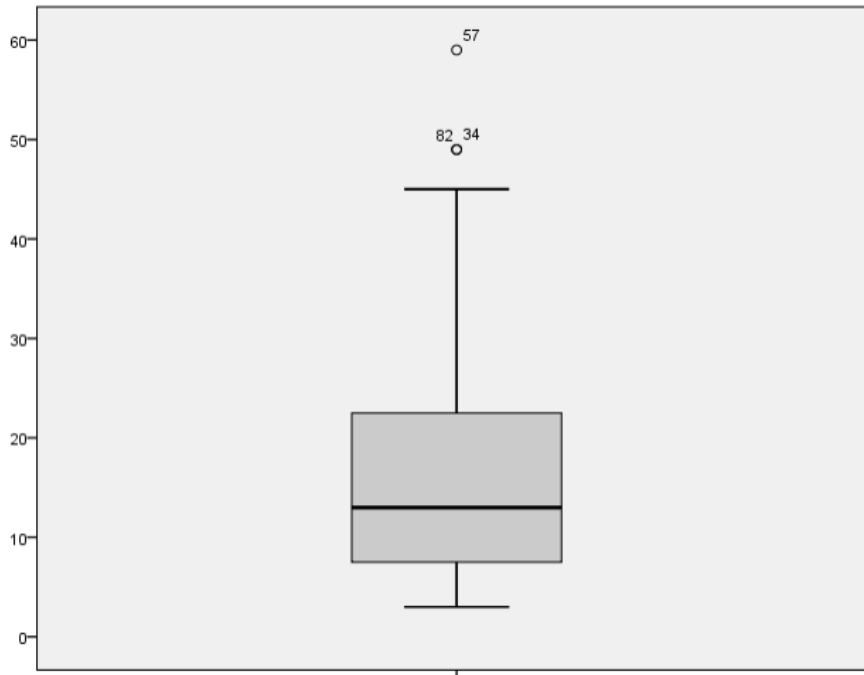


Figure 2

Outlier analysis of mothers' total epistemic language in the second storytelling



3.3.2. The Change in Maternal Epistemic Language Depending on the Type of Referents

Bivariate correlation analyses were conducted to examine the relationship between the type of referents used in maternal epistemic language across the two storytelling sessions, the first session when the story was unfamiliar and the second session when it was familiar, and children's FBU as presented in Table 7. Mothers showed consistency in their use of epistemic language with mother-child referent ($r = .58, p < .001$) and epistemic language with story character ($r = .44, p < .001$) across sessions. Mothers' epistemic language with story character referent in both storytelling sessions was positively correlated with children's FBU ($r = .19, p < .05$ and $r = .25, p < .01$, respectively). In addition, mothers' use of epistemic language with mother-child referent in the 2nd storytelling was negatively correlated with children's FBU ($r = -.22, p < .05$).

To further investigate these relations, partial correlations controlling for children's age (in months) were conducted (see Table 7). After controlling for children's age, children's FBU remained positively correlated with maternal epistemic language with the story character in the 1st storytelling at trend level ($r = .17, p < .10$) and significantly and positively correlated in 2nd storytelling ($r = .22, p < .05$). The negative correlation between FBU scores and maternal epistemic language with the mother-child referents in the 2nd storytelling was no longer significant ($r = -.11, p > .10$). The consistency maternal epistemic language with mother-child referent across storytelling sessions remained ($r = .57, p < .001$), as did the correlation between maternal epistemic language with story character across the two storytelling sessions ($r = .43, p < .001$).

Table 7

Bivariate and partial (age-controlled) correlations between children's FBU and maternal epistemic language with mother-child and story character referents

	1.	2.	3.	4.	5.
1. Children's FBU Scores	-	-.01	.17 [†]	-.11	.22*
2. S1- Mother-Child	-.10	-	-.09	.57***	-.06
3. S1- Story Character	.19*	-.10	-	-.13	.43***
4. S2- Mother-Child	-.22*	.58***	-0.15	-	-.20*
5. S2- Story Character	.25**	-.08	0.44***	-0.22*	-

Note. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$; FBU: False Belief Understanding,

S1: Storytelling session 1, S2: Storytelling session 2. Partial correlations controlling for children's age in months are presented above the diagonal, whereas bivariate correlations are presented below the diagonal.

3.3.2.1. Maternal Epistemic Language with Mother-Child Referents

A 3 (children's FBU: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: unfamiliar vs familiar) x 2 (gender: girl vs boy) repeated-measures ANCOVA was conducted to examine the effects of children's FBU competence level, story familiarity, and children's gender on maternal epistemic language (EL) with mother-child referent, controlling for children's age and language abilities. There was no significant main effect of story familiarity ($F(1,109) = .68, p = .41$), no main effect of children's FBU competence level ($F(2,109) = 2.17, p = .12$), and no main effect of children's gender ($F(1,109) = .05, p = .82$). There were no significant interaction effects between session and children's FBU competence level ($F(2, 109) = .24, p = .81$), between story familiarity and children's gender ($F(1, 109) = .63, p = .43$), between children's FBU competence level and gender ($F(2, 109) = 2.13, p = .12$), and no three-way interaction between story familiarity, children's FBU competence level and gender ($F(2, 109) = .24, p = .79$).

3.3.2.2. Maternal Epistemic Language with Story Character Referent

A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: unfamiliar vs familiar) x 2 (Children's gender: girl vs boy) repeated-measures ANCOVA was conducted to examine the effects of the differences of children's FBU competence level, story familiarity, and children's gender on maternal epistemic language (EL) with story character referent, controlling for children's age and language abilities. There was no significant difference in mothers' use of epistemic language with story character referent for story familiarity ($F(1,109) = .00, p = 1.00$), children's FBU competence level ($F(2, 109) = .19, p = .19$), children's gender ($F(1, 109) = .31, p = .58$), no significant interaction between story familiarity and children's FBU ($F(2, 109) = 1.91, p = .15$), no significant

interaction between story familiarity and children's gender ($F(1, 109) = 1.22, p = .27$), no significant interaction between children's FBU competence level and gender ($F(2, 109) = .24, p = .19$), or no three-way interaction between story familiarity, children's FBU competence level and gender ($F(2, 109) = .26, p = .77$).

3.3.3. The Change in Maternal Epistemic Language Depending on the Type of Function

Pearson's bivariate correlations were conducted to examine the relationship between the type of function by referent used in maternal epistemic language across the story familiarity and children's FBU as presented in Table 8. Children's FBU competence level was significantly and positively correlated with maternal epistemic statements with the story characters referent in 1st storytelling ($r = .22, p < .05$) and in 2nd storytelling ($r = .33, p < .001$). Conversely, the children's FBU competence level was negatively correlated with epistemic questions with mother-child referent in 2nd storytelling ($r = -.22, p < .05$), and with epistemic statements with mother-child referent in 1st storytelling ($r = -.22, p < .05$).

In addition, there were significant correlations between maternal epistemic questions and epistemic statements across storytelling sessions and the type of referents.

Between 1st storytelling and 2nd storytelling, maternal epistemic questions with mother-child referents ($r = .48, p < .001$) and story characters referents ($r = .34, p < .001$) were significantly correlated. Similarly, between 1st storytelling and 2nd storytelling, maternal epistemic statements with the mother-child referents ($r = .55, p < .001$) and story character referents ($r = .44, p < .001$) were correlated.

Partial correlations controlling for children's age (in months) revealed a similar pattern (Table 8). Children's FBU competence level remained significantly and

positively correlated with maternal epistemic statements with story character referent in 2nd storytelling ($r = .25, p < .01$) and positively correlated with maternal epistemic statements with story character referent in 1st storytelling, although only at the trend level ($r = .15, p < .10$). The correlation between children's FBU and epistemic questions with mother-child referent in 2nd storytelling, was no longer significant when controlling for children's age ($r = -.10, p > .10$). Between 1st storytelling and 2nd storytelling, there were significant correlations between maternal epistemic questions with mother-child referents ($r = .47, p < .001$) as well as maternal epistemic statements with mother-child referents ($r = .54, p < .001$). Similarly, between 1st storytelling and 2nd storytelling, maternal epistemic statements with story character referents remained highly correlated ($r = .42, p < .001$).

Table 8

Bivariate and partial (age-controlled) correlation between children's FBU and maternal epistemic language utterance function with mother-child and story character referents

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Children's FBU Scores	—	.01	-.05	-.10	-.08	.15	.13	.05	.25**
2. S1 – Question with MC Referents	-.11	—	.38***	.47***	.33***	.02	-.10	.11	-.10
3. S1 – Statement with MC Referents	-.07	.39***	—	.28**	.54***	-.09	-.08	-.07	-.11
4. S2 – Question with MC Referents	-.22*	.48***	.28**	—	.40	-.11	-.08	-.16 [†]	-.18 [†]
5. S2 – Statement with MC Referents	-.14	.34***	.55***	.42***	—	-.14	-.05	-.13	-.06
6. S1 – Question with SC Referents	.02	.042	-.09	-.08	-.119	—	.19*	.33***	.15
7. S1 – Statement with SC Referent	.22*	-.13	-.08	-.12	-.077	.16	—	.13	.42***
8. S2 – Question with SC Referent	-.02	.12	-.06	-.13	-.117	.34***	.11	—	.30***
9. S2 – Statement with SC Referent	.33***	-.13	-.12	-.22*	-.088	.11	.44***	.27**	—

Note. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. S1: Storytelling Session 1, S2: Storytelling Session 2, MC: Mother-Child, SC: Story Character.

Partial correlations controlling for children's age in months are presented above the diagonal whereas bivariate correlations are presented below the diagonal.

3.3.3.1. Maternal Epistemic Language Used in Questions

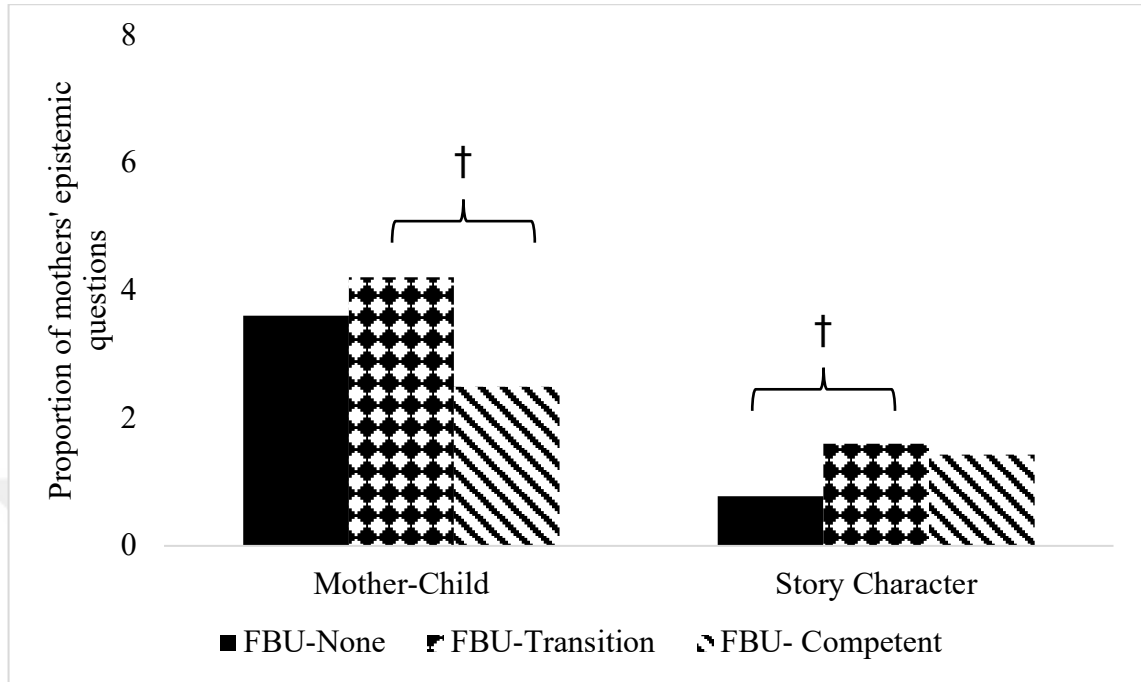
A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine whether mothers' epistemic questions with mother-child referents differed by children's FBU competence level, story familiarity, and children's gender, controlling for children's age and language abilities. Mothers' epistemic questions with mother-child referents varied by children's FBU competence level at trend level ($F(2, 109) = 2.81, p = .06, \eta^2 = .05$). Follow-up analyses indicated that mothers of FBU-transition children ($M = 4.21, SE = .36$) asked marginally more epistemic questions with mother-child referents compared to mothers of FBU-competent children ($M = 2.50, SE = .66, p = .09$). There was no significant effect of story familiarity ($F(1, 109) = .28, p = .60$), children's gender ($F(1, 109) = .00, p = .99$), no significant interaction between story familiarity and children's FBU ($F(2, 109) = .89, p = .42$), no significant interaction between story familiarity and children's gender ($F(1, 109) = .01, p = .92$), no significant interaction between children's FBU competence level and gender ($F(2, 109) = .96, p = .39$), or no three-way interaction between story familiarity, children's FBU competence level and gender ($F(2, 109) = .09, p = .92$).

Another 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine whether mothers' epistemic questions with story character referents differed by story familiarity, children's FBU competence level, and children's gender. Mothers' use of epistemic questions with story character referents differed by children's FBU at trend level ($F(2, 109) = 2.87, p = .06, \eta^2 = .06$). Follow-up analyses revealed that mothers of FBU-transition

children ($M=1.61$, $SE=.20$) asked marginally more epistemic questions with story character referents compared to mothers of FBU-None children ($M=.79$, $SE=.29$, $p=.06$). In addition, there was a trend-level effect of interaction between story familiarity and children's gender ($F(1, 109) = 3.05$, $p = .08$, $\eta^2=.02$). However, follow-up analysis did not reveal any significant differences between groups (all $ps > .10$). Parallel with the previous analysis, there was no significant effect of story familiarity ($F(1, 109) = 1.19$, $p = .28$), gender ($F(1, 109) = .30$, $p = .58$), no significant interaction between session and children's FBU ($F(2, 109) = 1.17$, $p = .32$) no significant interaction between story familiarity and children's gender ($F(1, 109) = 3.05$, $p = .08$), no significant interaction between children's FBU competence level and gender ($F(2, 109) = .83$, $p = .44$), or no three-way interaction between story familiarity, children's FBU competence level and gender ($F(2, 109) = .24$, $p = .79$). The proportions of mothers' epistemic questions with mother-child and story character referents across children's FBU competence level are presented in Figure 3.

Figure 3

Proportion of mothers' epistemic questions across children's FBU competence level



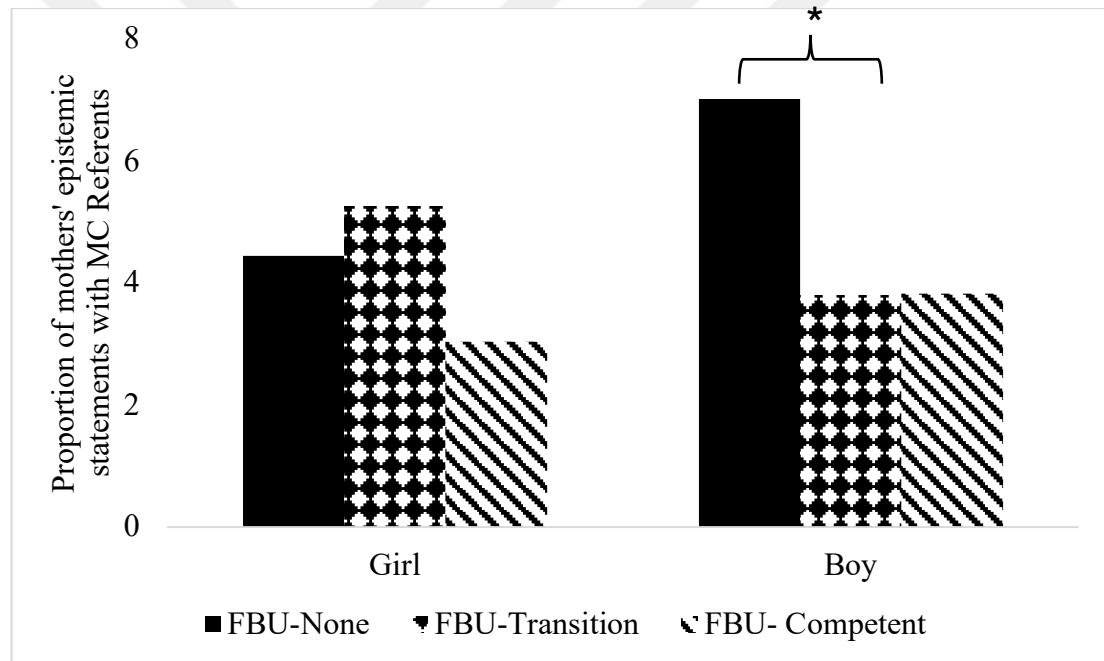
3.3.3.2. Maternal Epistemic Language Used in Statements

A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine the effects of children's FBU competence level, story familiarity, and children's gender on mothers' use of epistemic statements with mother-child referents, controlling for children's age and language abilities. There was a trend-level effect of interaction between children's FBU competence level and gender ($F(2,109) = 2.78, p = .07$). Follow-up analysis revealed that mothers of FBU-None boys ($M = 7.02, SE = .99$) significantly use more epistemic statements with mother-child referent compared to mothers of FBU-Transition boys ($M = 3.80, SE = .78, p = .04$). However, these differences were not observed for mothers of girls. There was no significant effect of story familiarity ($F(1, 109) = 1.00, p = .66$), or of children's FBU competence level ($F(2, 109) = 1.09, p$

= .34), and no significant interaction between story familiarity and children's FBU competence level ($F(2,109) = .92, p = .40$), no significant interaction story familiarity and gender ($F(2,109) = .003, p = .40$), and no three-way interaction between story familiarity, children's FBU competence level and gender ($F(2,109) = 1.92, p = .15$). The proportion of mothers' epistemic statements with mother-child referents across children's gender and FBU competence level is presented in Figure 4.

Figure 4

The proportion of mothers' epistemic statements with mother-child referents across children's gender and FBU competence level

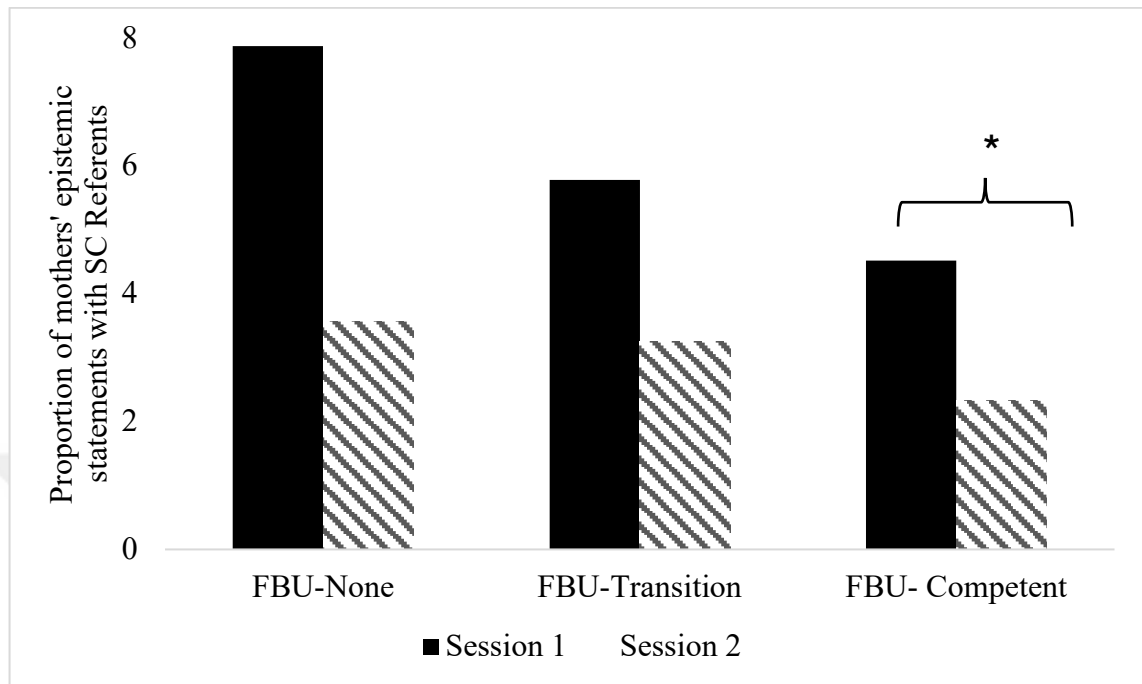


A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine the effects of children's FBU competence level, story familiarity, and children's gender on mothers' use of epistemic statements with story character referents, controlling for children's age and language abilities. There was no significant effect of story familiarity ($F(1,109) =$

.43, $p = .51$), children's FBU competence level ($F(2,109) = .52, p = .59$), children's gender ($F(1,109) = .17, p = .69$), or no significant interaction between story familiarity and children's gender ($F(1,109) = .12, p = .73$), and no significant interaction between children's FBU competence and gender ($F(1,109) = 1.11, p = .33$). However, there was a significant interaction between story familiarity and children's FBU ($F(2,109) = 3.97, p = .02, \eta^2 = .07$). Follow-up analysis revealed that mothers of FBU-competent children used significantly more epistemic statements with story character referent when the story was familiar ($M = 5.16, SE = .73$) compared to when the story was unfamiliar ($M = 2.95, SE = .82, p = .01$). In addition, one covariate, children's language abilities, showed a significant effect ($F(1,109) = 4.42, p = .04, \eta^2 = .04$) on mothers' use of epistemic statements with story characters. The proportion of mothers' use of epistemic statements with mother-child story character referents across children's FBU competence level and story familiarity is presented in Figure 5.

Figure 5

The proportion of mothers' epistemic statements with story character referents across children's FBU competence level and story familiarity



3.3.4. The Change in Maternal Epistemic Language Depending on the Type of Epistemic Expression

Pearson's bivariate correlations were conducted to examine the relationship between the type of epistemic expressions (cognitive, certainty, contrastive) by referent used in maternal epistemic language across the two sessions and children's FBU as presented in Table 9. Children's FBU was positively correlated with maternal cognitive expressions with story character referents in 1st storytelling, ($r = .23, p < .05$), and 2nd storytelling, ($r = .28, p < .01$). Similarly, children's FBU was positively correlated with maternal contrastive expressions with the story character referents in Session 2, ($r = .26, p < .05$). In contrast, children's FBU was negatively correlated with certainty expressions with the mother-child referents in the 2nd storytelling, ($r = -.21, p < .05$).

Moreover, mothers' use of cognitive expressions with mother-child referents in the 1st storytelling was highly correlated with those in the 2nd storytelling, ($r = .56, p < .001$) and use of cognitive expressions with the story character referent between 1st storytelling and 2nd storytelling were highly correlated, ($r = .51, p < .001$). Similar significant correlation patterns were seen for mothers' use of certainty expressions with the mother-child referent between 1st storytelling and 2nd storytelling, ($r = .46, p < .001$), and for mothers' use of contrastive expressions with the mother-child context between 1st storytelling and 2nd storytelling, ($r = .34, p < .001$).

Partial correlations controlling for children's age largely revealed the same pattern as the bivariate correlations (see Table 9). Children's FBU remained positively correlated with mothers' use of cognitive expressions with the story character in 1st storytelling, ($r = .23, p < .05$). In contrast, its correlation with mothers' use of cognitive expressions with the story character in the 2nd storytelling was no longer significant, ($r = -.08, p > .10$). Notably, children's FBU competence level remained significantly and positively correlated with mothers' use of contrastive expressions with the story character in Session 1, ($r = .23, p < .05$).

Consistent with the bivariate correlations, mothers' use of cognitive expressions with the mother-child referents between 1st storytelling and 2nd storytelling 2 remained correlated after controlling for age, ($r = .56, p < .001$), as did mothers' use of cognitive expressions with the story character referent between 1st storytelling and 2nd storytelling, ($r = .50, p < .001$). Similar patterns were observed for mothers' use of certainty expressions with the mother-child referents between Session 1 and Session 2, ($r = .55, p < .001$), and for mothers' use of contrastive expressions with

the mother–child referent between 1st storytelling and 2nd storytelling, ($r = .34, p < .001$)



Table 9*Bivariate and partial (age-controlled) correlations between children's FBU and maternal epistemic language type*

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Children's FBU Scores	—	-.02	-.03	.18 [†]	.16 [†]	-.07	-.09	.09	.02	.09	-.17	.11	.23*
S1- Cognitive Exp. MC Referent	-.06	—	.56***	-.09	-.02	.45***	.25**	-.17 [†]	-.03	.32***	.05	-.12	-.14
S2- Cognitive Exp. MC Referent	-.015	.56***	—	-.09	-.09	.22*	.21*	-.12	-.18 [†]	.16 [†]	.19*	.05	-.08
S1- Cognitive Exp. SC Referent	.023*	-.10	-.12	—	.50***	-.10	-.19 [†]	.54***	.26*	.20*	-.02	.35***	-.03
S2- Cognitive Exp. SC Referent	.028**	-.05	-.13	.51***	—	-.04	-.09	.28**	.44***	.05	-.07	.15	.06
S1- Certainty Exp. MC Referent	-.019	.46***	.24**	-.12	-.07	—	.55***	.03	.02	.22*	.06	-.07	-.06
S2- Certainty Exp. MC Referent	-.021*	.27**	.24**	-.22*	-.14	.56***	—	-.04	-.03	.09	.05	.05	-.13
S1- Certainty Exp. MC Referent	-.00	-.16 [†]	-.10	.52***	.24**	.04	-.02	—	.38***	.06	.07	.35***	.10
S2- Certainty Exp. SC Referent	-.10	-.01	-.13	.22*	.38***	.05	.01	.39***	—	.10	-.02	-.02	.04
S1- Contrastive Exp. MC Referent	.07	.32***	.16	.19*	.05	.022*	.09	.06	.10	—	.34***	.14	-.07
S2- Contrastive Exp. MC Referent	.00	.028	.14	.01	-.02	0.03	.01	-.09	-.06	.34***	—	.09	-.10
S1- Contrastive Exp. SC Referent	.17	-.13	.03	.36***	.18 [†]	-.009	.02	.33***	-.04	.14	.11	—	.15
S2- Contrastive Exp. SC Referent	.26*	-.14	-.09	-.02	.07	-.007	-.14	.10	.03	-.07	-.09	.16 [†]	—

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$. S1: Session 1, S2: Session 2, Exp: Expressions, MC: Mother-Child, SC: Story Character.

Partial correlations controlling for children's age in months are presented above the diagonal, whereas bivariate correlations are presented below the diagonal.

3.3.4.1. The Change in Mothers' Use of Cognitive Expressions

A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine whether mothers' use of cognitive expression with mother-child referent differed by children's FBU competence level, story familiarity, and children's gender when controlling for children's age and language abilities. There was no significant effect of story familiarity ($F(1, 109) = .40, p = .84$), children's FBU competence level ($F(2, 109) = 1.25, p = .29$), or children's gender ($F(1, 109) = .50, p = .82$), and no significant interaction between story familiarity and children's FBU competence level ($F(2, 109) = .43, p = .65$), or story familiarity and children's gender ($F(1, 109) = .02, p = .90$), or children's gender and FBU competence level ($F(2, 109) = .19, p = .83$) or no significant interaction between story familiarity, children's FBU competence level and children's gender ($F(2, 109) = .19, p = .83$).

A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine whether mothers' use of cognitive expression with story character referents differed by children's FBU competence level, story familiarity, and children's gender when controlling for children's age and language abilities. Parallel with the previous analysis, there was no significant main effect of story familiarity ($F(1, 109) = .10, p = .75$), children's FBU competence level ($F(2, 109) = 1.10, p = .34$), or children's gender ($F(1, 109) = 2.04, p = .16$). There was no significant interaction between story familiarity and children's FBU competence level ($F(2, 109) = .77, p = .47$), or story familiarity and children's gender ($F(1, 109) = .78, p = .38$), or children's gender and FBU competence level (F

(2, 109) = .17, $p = .85$) or no significant interaction between story familiarity, children's FBU competence level and children's gender ($F(2, 109) = .44, p = .65$).

3.3.4.2. The Change in Mothers' Use of Certainty Expressions

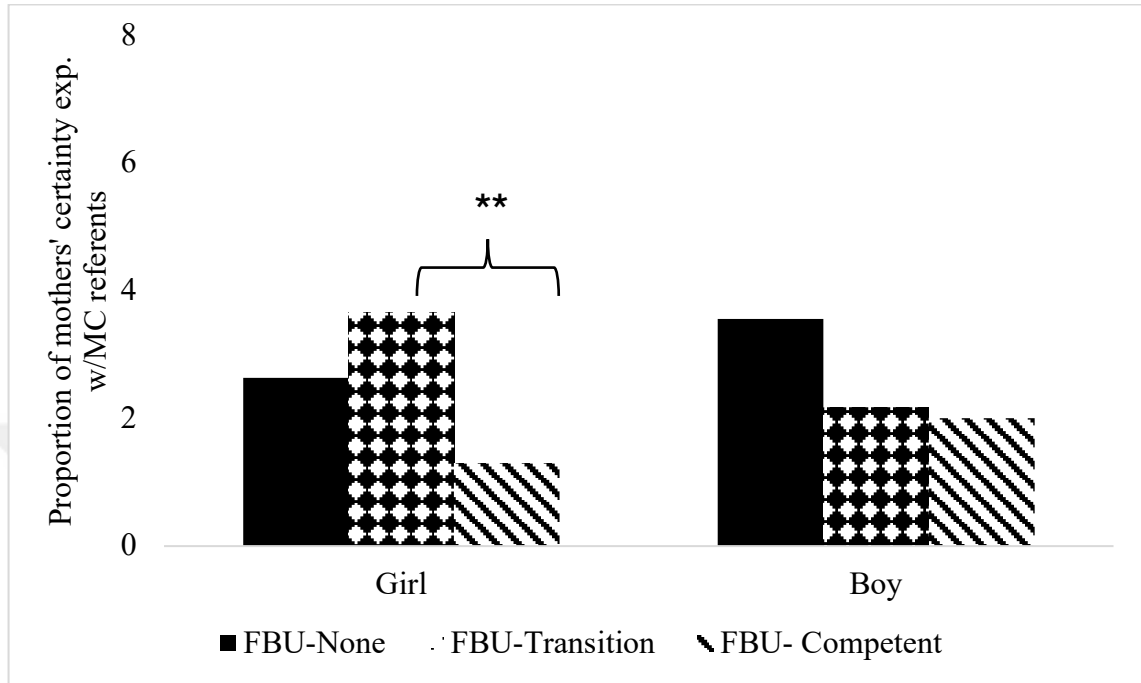
A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine whether mothers' use of certainty expression with mother-child referents differed by children's FBU competence level, story familiarity, and children's gender when controlling for children's age and language abilities. There was trend-level effect of story familiarity ($F(1, 109) = 3.32, p = .07, \eta^2 = .03$). There was significant interaction effect between children's FBU competence level and children's gender ($F(2, 109) = 3.50, p = .03, \eta^2 = .06$) on mothers' use of certainty expressions with mother-child referents. There was also a trend-level interaction effect between story familiarity and children's language abilities. ($F(1, 109) = 3.19, p = .08, \eta^2 = .03$). Follow-up analysis showed that mothers used more certainty expression with mother-child referents when the story was unfamiliar ($M = 2.85, SE = .30$) compared to when it was a familiar story ($M = 2.26, SE = .23, p = .03$). Mothers of FBU-Transition girls ($M = 3.67, SE = .45$) significantly use more certainty expression compared to FBU-Competent girls ($M = 1.30, SE = .64, p = .01$). These differences were not significant for mothers of boys. There was no significant effect of children's FBU competence level ($F(2, 109) = 1.80, p = .17$) and children's gender ($F(1, 109) = .008, p = .93$). In addition, there was no interaction between story familiarity and children's FBU competence level ($F(2, 109) = 1.03, p = .36$) or no interaction between story familiarity and children's gender $F(1, 109) = .95, p = .33$) or no three-way interaction between story

familiarity, children's FBU competence level, and children's gender $F(2, 109) = .55$, $p = .58$).

A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine whether mothers' use of certainty expression with story character referents differed by children's FBU competence level, story familiarity, and children's gender when controlling for children's age and language abilities. There was a trend-level interaction between story familiarity and children's gender $F(1, 109) = 3.39$, $p = .07$, $\eta^2 = .03$). Follow-up analysis showed that mothers of girls significantly used more certainty expressions with story character referents when story was unfamiliar ($M = 1.29$, $SE = .18$) compared to when the story was familiar ($M = .89$, $SE = .16$, $p = .04$). There was no significant effect of story familiarity ($F(1, 109) = 1.31$, $p = .25$), children's FBU competence level ($F(2, 109) = 1.36$, $p = .26$) or children's gender ($F(1, 109) = .05$, $p = .83$). In addition, there was no interaction between story familiarity and children's FBU competence level ($F(2, 109) = .31$, $p = .73$) and no interaction between children's FBU competence level and children's gender ($F(2, 109) = .64$, $p = .53$) or no three-way interaction between story familiarity, children's FBU competence level, and children's gender $F(2, 109) = .41$, $p = .67$). The proportion of mothers' use of certainty expressions with mother-child referents across children's gender and FBU competence level is presented in Figure 6.

Figure 6

The proportion of mothers' certainty expressions with mother-child referents across children's gender and FBU competence level



3.3.4.3. The Change in Mothers' Use of Contrastive Expressions

A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine whether mothers' use of contrastive expression with mother-child referents differed by children's FBU competence level, story familiarity, and children's gender when controlling for children's age and language abilities. There was no significant effect of story familiarity ($F(1,109) = .07, p = .79$), children's FBU competence level ($F(2,109) = .35, p = .71$) or children's gender ($F(1,109) = 2.83, p = .10$) on mothers' use of contrastives with mother-child referents. In addition, there was no significant interaction between story familiarity and children's FBU competence level ($F(2,109) = 1.64, p = .20$), no interaction between story familiarity and children's gender ($F(1,109) = 1.94, p =$

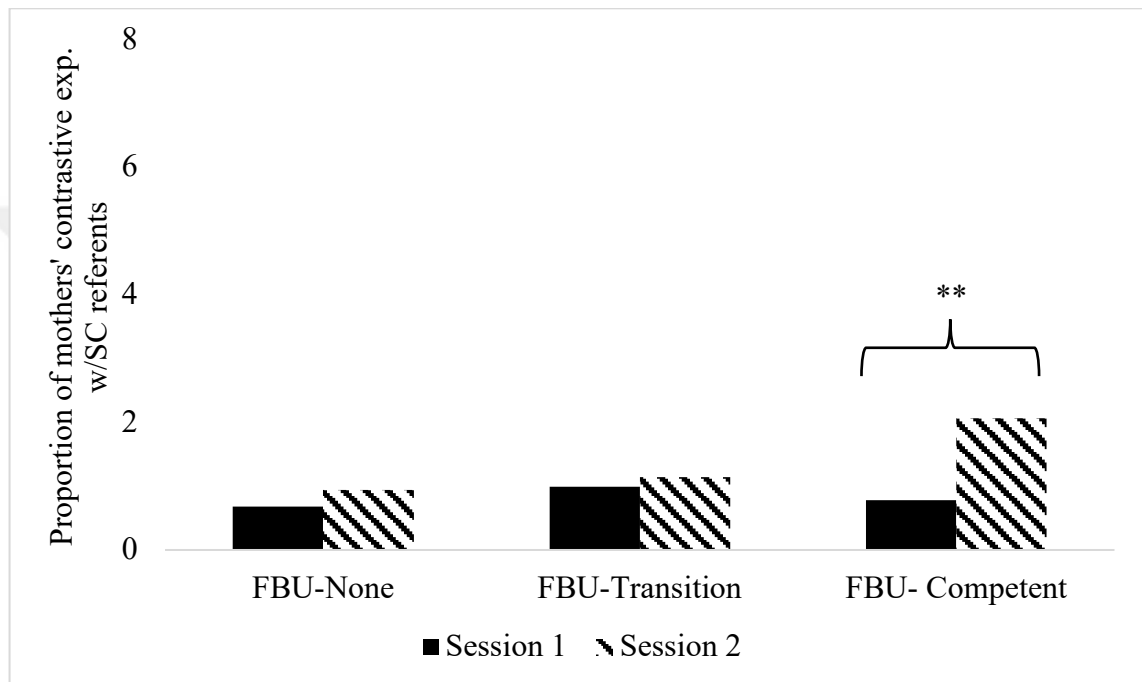
.17), no interaction between children's FBU competence level and children's gender ($F(2, 109) = 1.97, p = .15$) or no three-way interaction between story familiarity, children's FBU competence level, and children's gender ($F(2, 109) = .48, p = .62$). However, there was a trend-level interaction between story familiarity and children's age on mothers' use of contrastives with mother-child referents ($F(1, 109) = 3.88, p = .05, \eta^2 = .03$).

A 3 (FBU competence level: FBU-None, FBU-Transition, FBU-Competent) x 2 (story familiarity: familiar, unfamiliar) x 2 (children's gender: girl, boy) repeated-measures ANCOVA was conducted to examine whether mothers' use of contrastive expressions with story characters referents differed by children's FBU competence level, story familiarity, and children's gender when controlling for children's age and language abilities. There was a trend level main effect of children's gender ($F(1, 109) = 2.94, p = .09, \eta^2 = .03$). Follow-up analysis showed that mothers of girls ($M = 1.26, SE = .12$) marginally use more contrastive expression compared to mother of boys ($M = .93, SE = .15, p = .09$). Moreover, mothers' use of contrastives with story characters referent varied by interaction between story familiarity and children's FBU at the trend level ($F(2, 109) = 2.65, p = .08, \eta^2 = .05$). Follow-up analysis revealed that mothers of FBU-competent children used significantly more contrastive expressions with story character ($M = 2.07, SE = .39$) when the story was familiar compared to when the story were unfamiliar ($M = .77, SE = .23, p = .003$) as presented in Figure 7). There was no significant effect of story familiarity ($F(1, 109) = .24, p = .63$) or children's FBU competence level ($F(2, 109) = 1.50, p = .23$) on mothers' use of contrastives with story character referent. In addition, there was no significant interaction between story familiarity and children's gender ($F(1, 109) = .06, p = .81$), no significant interaction between children's FBU competence level and children's

gender ($F(2, 109) = .16$ $p = .86$), or no three-way interaction between story familiarity, children's FBU competence level, and children's gender ($F(2, 109) = .41$ $p = .66$).

Figure 7

The proportion of mothers' contrastive expressions with story character referents across children's FBU competence level and story familiarity



CHAPTER IV

DISCUSSION

This study investigated whether mothers' epistemic language varies according to children's FBU competence level, story familiarity, and children's gender. If mothers use epistemic language with the implicit intent to support children's understanding of others' minds, we expect all three of these variables to have the potential to affect the nature of their epistemic talk. For instance, mothers may use more epistemic language with children who are in the process of acquiring FBU competence or may focus more explicitly on story characters' mental worlds when the story is familiar to their children. Similarly, mothers may emphasize certain aspects of the epistemic world differently by children's gender. More importantly, these child and context variables would be expected to interact to shape mothers' epistemic language.

In addition to child and context variables, MSL is used with different linguistic purposes and functions, to talk about immediate actors (mother and child) versus

decontextualized actors' mental world, to describe versus to inquire about mental worlds, and finally to label mental states and processes, to evaluate mental states, or contrast them. This study aimed to contribute to the literature by examining whether these linguistic purposes varied by child and context variables. Specifically, the current study closely examined whether maternal epistemic language varied by child knowledge (familiarity with a particular story) and characteristics (gender, FBU competence) across three layers: (1) the type of referent (mother-child or story character) (2) type of utterance function (question or statement), and (3) types of epistemic language (cognitive, certainty, contrastive).

In line with the literature, mothers' epistemic language with story character reference was positively correlated with children's FBU competence in both sessions, even when children's age was controlled (session 1 trend level) (e.g., Slaughter et al., 2007). Similarly, supporting previous findings (e.g., Ilgaz et al., 2025), epistemic language with the mother-child reference was negatively correlated with children's FBU competence only in the second storytelling session. However, in contrast with our hypothesis, mothers' total epistemic language with mother-child or story character referents did not vary by children's FBU competence level, gender, or story familiarity.

A nuanced yet consistent pattern of results showed that the effects of children's FBU competence by utterance function (i.e., statement, question) were different for epistemic language with mother-child referents versus epistemic language with story character referents. Specifically, mothers of FBU-Transition children asked more epistemic questions with mother-child referent compared to mothers of FBU-Competent children. Similarly, mothers of FBU-Transition children asked more

epistemic questions with story character referent compared to mothers of FBU-None children. The results supported the main premise of the study. In that, mothers implicitly scaffolded and sensitively adapted their epistemic language depending on their children's FBU competence. Mothers of FBU-Transition children used proportionally more epistemic questions with mother or child referents (e.g., *Where do you think the frog is?*) as compared to mothers of FBU-Competent children. This is possibly an indicator of these mothers' quest to get their children to engage more deeply in the story. Mothers of FBU-Transition children used proportionally more epistemic questions with story character reference as compared to mothers of children who uniformly failed all FBU tasks. Mothers of FBU-None children may intentionally have kept the interaction at a level where the children could engage with the story rather than experiencing frustration and disengagement from being posed epistemic questions that are above the FBU competence level.

In line with the motivating premise of the study, mothers' epistemic language was found to be shaped simultaneously and interactively by both child characteristics and contextual features. The effect of story familiarity was most clearly observable in the language of mothers whose children were fully competent in FBU. These mothers used more epistemic statements with story character referents and more contrastive expressions with story character referents when the story was familiar (2nd storytelling session) compared to when the story was unfamiliar (1st storytelling session). Previous work has shown that Turkish mothers of 5-year-olds tell shorter narratives with fewer mental state language than mothers of 4-year-olds (Bürümlü-Kisa et al., 2023; Ilgaz et al., 2025). It is plausible to think that Turkish mothers focus on telling the story, rather than interacting about the story through conversational turns, and use more complex epistemic language in the process when

their children are fully competent in basic level of FBU and their children are familiar with the story.

In a scoping review examining the relationship between parents' MS language and children's gender in English-speaking samples, Farrel et al. (2025) showed that children's gender and parents' MS language were seldom found to be significantly related, and when found, the valence of the relationship was not consistent (e.g., Mcquaid et al., 2008 more MSL with girls; Roger et al., 2012 more talk with boys). In the current study, gender emerged as a significant factor only in interaction with other variables. Mothers' scaffolding behavior was observed more clearly in boys who showed uniformly poor performance in FBU tasks. These mothers used more epistemic statements with mother-child referents compared to mothers of FBU-Transition boys. Gender, when associated with uniform success, also affected the use of certainty expressions. It was found that mothers of FBU-Transition girls used more certainty expressions with mother-child referents than mothers of FBU-Competent girls. This finding implies that mothers are willing to use more sophisticated epistemic language to support their children, but only females, which may signal that they have more trust that such complex language may support, but their judgment is selective based on gender. In a similar vein, mothers of girls were also found to use marginally more contrastive expressions as compared to mothers of boys. It should be noted that the sample of the current study did not display a gender difference in favor of girls. In fact, 3-year-old boys were found to have better receptive and expressive vocabulary scores as compared to 3-year-old girls.

The current study adds to the literature that shows sensitivity in maternal mental state language in general or epistemic language in particular. Among the variables that

may shape maternal language, age has been more consistently studied. Previous work has documented sensitivity according to children's age (e.g., Brown & Dunn, 1991). Mothers of older children use more complex language in general (e.g., Rowe, 2012), and language with more MS talk in particular (e.g., Ruffman et al., 2002). The current study aimed to extend this line of research and investigate the nuances in how major child (gender, FBU competence level) and contextual variables (i.e., story familiarity) shape maternal epistemic language at three levels of analysis (type of referent, type of utterance function, and type of epistemic expression). The major take-home message is that mothers attempt to scaffold their children's understanding of the mental world through the using different types of epistemic language, varying the functions with which utterances are used, and which perspective they choose to elaborate on those of the immediate actors (i.e., mother-child) or the decontextualized actors (i.e., story character).

One of the major strengths of the study is also a significant limitation. The sample of this study is a relatively homogeneous, highly educated, and middle-class sample of Turkish speakers. This study generally included children who had optimal circumstances in terms of family environment and schooling, which enabled us to observe relations between maternal language and significant child and contextual variables. The next step would need to involve participants from more diverse socioeconomic statuses (SES). Such research could help identify parents who are less sensitive to their children's capabilities and developmental needs and who do not effectively tailor their scaffolding accordingly. SES may not be the only factor that influences mothers' scaffolding behavior or explains individual differences in their use of language. Some mothers may not have thoroughly assessed their children's FBU competence level. Accordingly, they may not have adapted epistemic language

sensitively in accordance with their children's developmental strengths and weaknesses. Future research should examine how a mother can identify as better or poorer at scaffolding children's false belief understanding, and what the outcomes of having a mother who is good at scaffolding versus bad at scaffolding are for false belief understanding. Such studies would provide valuable insights into how parental scaffolding affects children's socio-cognitive development and may contribute to intervention programs that aim to enhance parental support for children's social understanding development.

One of the parameters mothers may use to adjust their epistemic language is their perception of their children's story comprehension. One limitation is that the present study did not measure children's story comprehension because it was considered that mothers would intentionally change their language while sharing the story. Related to this, another limitation was that the current study only focused on mothers' epistemic language, and the child's epistemic language was not examined. To understand the dynamic nature of maternal scaffolding, future research should also investigate the children's language and interaction.

Moreover, mothers' perceptions of their children's socio-cognitive abilities might have also affected the way they used epistemic language. Although mothers' use of more complex expressions, such as contrastive, with their daughters may be related to their perception that their daughters have advanced verbal/language abilities compared to boys, even the 3-year-old boys have better language performance than 3-year-old girls. One limitation of the current study is that it did not assess mothers' perception of their children's socio-cognitive abilities. Future studies should measure

mothers' perceptions of their children. This would allow for a better understanding of how maternal language use is shaped by their perceptions of their children.

Finally, scaffolding can truly be understood within the scope of longitudinal studies.

Whether mothers use more or less of a type of epistemic language in response to children's FBU competence level and whether the rate at which they use such language supports FBU development can only be investigated with studies that include testing and language sampling at multiple time points in development. Future studies that adopt a longitudinal design may provide stronger scientific support for epistemic language as a scaffolding tool.

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