Is the Curious Child Universal?

Examining the Frequency and Types of Questions Asked by Turkish Preschoolers from Middle-class and Low-income Families

by

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Is the Curious Child Universal? Examining the Frequency and Types of Questions Asked by Turkish Preschoolers from Middle-class and Low-income Families

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DEDICATION

To my mother, Selma Unlutabak, for being the best role model for me

with her diligence, perseverance, and sense of humor

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ABSTRACT

The purpose of this study was three-fold: 1) to examine the frequency and types of questions asked by mother-child dyads from middle-class and low-income Turkish families during a storybook reading activity, and to see whether they change by SES and age 2) to examine the frequency and types of questions asked by Turkish preschoolers from middle-class and low-income families in a question elicitation task and to see whether they change by SES and age, 3) to investigate whether mother-child conversations, particularly mothers' questions and explanations, help children acquire an "exploratory stance" and contribute to their learning from more knowledgeable others.

I carried out three studies to examine children's question-asking behavior. Study 1 examined the frequency and types of questions asked by 71 mother-child dyads (36 middle-class) during a storybook reading activity at home. The findings revealed no difference in the frequency and the types of mothers and children's questions across age and SES groups. There was a strong positive association between mothers' information-seeking questions and children's information-seeking questions.

Study 2 examined the frequency and the types of questions asked by Turkish preschoolers in a question-elicitation task about novel animals and objects to see whether children ask information-seeking questions and whether there were differences in the quantity and type of questions they asked depending on the scripted answers they received from the experimenter (informative vs. non-informative) across two experimental conditions. Seventy one children from Study 1 and 34 more children participated in this study (105 children; 55 middle-class) The findings indicated that children were more likely to ask questions when they received informative answers than

non-informative answers. There were also significant SES differences; children from middle-class families asked more questions than children from low-income families. There were no age differences; 3-, 4- and 5-year-olds asked similar number of questions.

Study 3 complemented Study 1 and 2 by examining whether mothers' explanatory talk about improbable and impossible events was related to children's judgments and explanations about similar events. The same participants from the first study participated in this study (71 mother-child dyads, 35 middle-class). Children first read a booklet with improbable and impossible events with their mothers and then participated in a child judgment task with the experimenter. There were no SES and age differences in mothers' questions and explanations in the mother-child booklet task. In the child judgment task, children from low-income families judged improbable and impossible events to be possible more frequently than children from middle-class families, and provided more non-informative explanations for their judgments than children from middle-class families. Also, there was a negative association between mothers' explanations-seeking questions and hypothetical explanations and children's "yes, it is possible" judgments in the low-income sample. This finding indicates that in the low-income sample, mothers who questioned and speculated more about why improbable and impossible events can or cannot happen had children who judged these events as not possible more frequently.

In sum, the present study provided evidence for the universal and socioculturally variable features of children's question-asking behavior across two SES groups in the Turkish cultural context. It also highlighted the importance of investigating mother-child conversations in relation to children's question-asking behavior.

CHAPTER 1

Introduction

How young children learn about the world around them is a question that has preoccupied developmental psychologists and educators for decades. Jean Piaget and contemporary developmental psychologists following his lead (e.g., Gopnik & Wellman, 1994; Wellman, 2002; Wellman & Gelman, 1998) describe young children as "active learners" who construct knowledge through their first-hand observations and experiences. But is it enough to say that children just learn from their observations and experiences? Retaining the idea of children as "active learners," Harris (2012) has argued that children also learn through communicating with others and asking questions because their first-hand experiences alone are limited. For instance, a young child may observe a tree losing its leaves in the fall. While this phenomenon is easy to observe and maybe describe, it is hard to explain. When young children ask questions such as "Why do trees lose their leaves?," "Are they dead?," and "How do they produce leaves again?," they ask for information that is not accessible by mere observation. In such cases, what adults tell them is as important as their first-hand experiences. They actively go through what they are told and integrate their first-hand experiences with the testimony of others, attempting to have a coherent conception of the given phenomena in their knowledge base (Harris, 2000; Harris & Koenig, 2006; Harris, 2012).

Research in Western cultures indicates that young children ask questions to acquire information from others, particularly as they become able to express themselves via language (e.g., Callanan & Oakes, 1992; Chouinard, 2007; Tizard & Hughes, 1984). For instance, in a key monograph, Chouinard (2007) examined young children's

questions by analyzing everyday parent-child conversations via a longitudinal dataset from ages 1 to 5 and showed that starting from age 2, children asked about 3 questions for every 2 minutes in the company of adults, and about 70% of these questions were information-seeking (as opposed to attention-seeking or asking permission). While 2- to 2.5-year-olds usually asked about facts or objects ("what is a drawer?," "where is the ball?"), 3-, 4- and 5-year-olds sought explanations ("where does the moon go?," "how do birds sleep?"), revealing their intense desire to understand the world. Moreover, children were found to be persistent in their questions and repeated them until they received adequate answers (Chouinard, 2007; Tizard & Hughes, 1984).

Studying children's questions as a tool of learning from others also highlights the role of parent-child conversations in creating informal learning environments for children by not only providing them with information, but also stimulating their natural curiosity and question-asking behavior. Previous work on children's question-answer exchanges with adults (e.g. Tizard & Hughes, 1984; Chouinard, 2007) has suggested that children's participation in question-answer exchanges with their parents could influence their question-asking behavior and help them acquire an "exploratory stance", which refers to their engagement in active question-asking behavior in different contexts (Harris, 2012, p. 34). In other words, parents' questions during their conversations with children could not only prompt children to think about phenomena in the world and come up with explanations, but also provide a context where they could model their parents' question-asking behavior. For instance, Tizard and Hughes' (1984) observations on mother-child question-answer exchanges at home showed that mothers'

question-asking behavior was strongly related to children's question-asking behavior both at home and in the school context.

In addition, relying on more knowledgeable others as sources of information is not merely confined to natural phenomena that children could observe but have difficulty in explaining in a coherent fashion on their own. There are also unobserved or unobservable phenomena such as past or historical events, culturally accepted beliefs about abstract or metaphysical entities and extraordinary events, which could mainly be learned through communication with others. When learning about such phenomena, parent-child conversations could be of particular importance by not only providing the background knowledge, but also enhancing children's reasoning about the past, current and possible state of affairs in the world (Callanan & Valle, 2008; Harris & Koenig, 2006; Harris, 2012; Nolan-Reyes, Callanan & Haigh, 2015).

While this area of research is gaining momentum and has significant implications for children's learning and cognitive development, the majority of the research has been conducted in Western cultures so far. To the best of my knowledge, there is only one cross-cultural study exploring variation in children's question-asking in families from different cultures. Gauvain, Munroe and Bebee (2013) compared the questions asked by children in four different traditional agrarian cultures (Garifuna in Belize, Logoli in Kenya, Newars in Nepal, Samoans in American Samoa). In each of these cultures, 3- to 5-year-olds were observed during their daily interactions with adults in natural settings. Children in these non-Western cultures were found to ask significantly fewer explanation-seeking questions than children in Western cultures. However, additional work, particularly in the non-Western developing countries, is

needed to examine universal and socioculturally variable features of children's question-asking behavior. To address this need, the present study aims to examine question-asking behaviors of preschool children in Turkey, comparing those from different socioeconomic status (SES) backgrounds. In addition, it explores the potential relationship between parent-child conversations and children's developing understanding about the world by examining Turkish mothers' question-asking behavior and explanations within these conversations.

Turkey offers a particularly interesting cultural context for addressing these questions. Having undergone many political, economic, and social transformations since the early 20th century, it is an industrialized and partly westernized culture with highly preserved traditional values (Ataca, 2009; Sunar 2009). Obedience and respect for authority are usually expected values from Turkish children. However, with the empowerment of women and mothers' increasing education levels, these values are changing, resulting in independence becoming a more desired value (Kagitcibasi, 1989; Boratav, 2009). Also, due to variations in available resources, mothers' education levels, and preservation of traditional values, these changes might be observed differently across social classes, affecting the way mothers interact with their children.

Thus, the present study aims to examine question-asking behavior of children growing up in middle-class and low-income Turkish families and whether their question-asking behavior change by age and SES. This study also explores whether parent-child conversations, particularly parents' questions and explanations, are related to children's question-asking behavior.

In the following sections of this chapter, I will provide the background for the present study by reviewing research on: 1) the emergence, frequency and function of children's questions, 2) the role of parent-child conversations in promoting children's question-asking behavior, and 3) the variability in children's question-asking behavior due to socioeconomic factors.

1.1.The Emergence, Frequency, and Function of Young Children's Questions

1.1.1. The emergence of questions in children's spontaneous speech. Most of the earlier work on children's questions examined the emergence of questions in children's daily conversations in the context of language acquisition (e.g., Davis, 1932; Tyack & Ingram, 1976; Bloom, Merkin & Wootten, 1982). These studies focused on the order of acquisition of various types of questions as well as the frequency of use in everyday conversations. The findings emerging from these studies suggested that children began to ask questions around 2 years of age.

Tyack and Ingram (1976) conducted a diary study with 22 children from American middle-class families, whose ages ranged between 2;0–3;11. Parents were asked to keep a record of their children's questions in everyday interactions until 225 questions were collected. The researchers did not give time restrictions; thus, parents recorded their children's questions across several occasions until the desired number of questions was reached. Analysis of these questions indicated that children asked wh- and yes/no questions as early as 2 years of age and the majority of the questions collected (50-60%) were yes/no questions. "What", "where", "who" and "when" questions were frequently encountered in children's conversations starting from age 2. "Why", "how"

questions were also encountered in the conversations of 2-year-olds but their percentage was very low; however, their frequency increased around 3 years of age.

Moreover, in their observational longitudinal study Bloom et al. (1982) followed 7 American middle-class children from 22 to 36 months of age during informal play sessions with their mothers. Their findings showed that children started using "what", "where" and "who" questions around 26-28 months of age with grammatically simple sentences (e.g., "what is it?, where is it?"). As they grew older, they formed these questions with grammatically more complex sentences (e.g., what is a drawer?," "where does the moon go?") and around 33-35 months of age, "how" and "why" questions targeting more abstract information emerged in their conversations (e.g., "how do birds sleep?," "why do I have a brother?").

These early psycholinguistic studies tell us about the onset and frequency of different types of questions including "why" and "how" questions in children's conversations, however, they do not tell us about whether children use questions to acquire information from more knowledgeable adults. Additional work has been conducted to establish the epistemic function of children's questions.

1.1.2. The function and frequency of young children's questions. Current research in developmental psychology is more concerned with the epistemic function of children's questions; specifically, whether children use questions as a means of gaining information from more knowledgeable others. This line of research particularly focuses on information-seeking questions as opposed to questions seeking for attention or permission and whether asking such questions help children to develop adult-like knowledge structures that would allow them to have a general understanding about the

workings of the world (e.g., Callanan & Oakes, 1992; Chouinard, 2007; Tizard & Hughes, 1984). In studying children's questions, these studies either examine parent-child conversations in longitudinal datasets (e.g., CHILDES database[1]) or use diary studies. There are also a few experimental studies examining children's questions. In the sections below, I review these studies by providing descriptive accounts of their methodology. Also, researchers interested in children's question-asking behavior mainly focus their attention on children's explanation-seeking questions, which target more abstract information about how the world works. Therefore, some of the work I describe in this section talks only about children's explanation-seeking questions.

1.1.2.1. Spontaneous observational data. There is a pioneering study conducted in the United Kingdom by Tizard and Hughes (1984) which examined the spontaneous conversations of 30 4-year-old girls (ages range from 3;9 to 4;3) from middle class and working class families both in their homes and at preschool. For this study, children were observed at their homes for 2.5 hours on 2 consecutive days and only the record from the second day was used in the analysis since the first was considered as warm-up. Similarly, children were recorded for 2.5 hours for 3 consecutive days in their preschools and only the last two days were used in the analysis. The researchers first examined all questions children asked in these everyday conversations by excluding repetitions, requests, and permission and clarification questions. Children's questions that seek information in general were called "curiosity-based" and they constituted the majority of the questions children asked, particularly when they were at home interacting with their parents (middle-class 72%, working class 53% at home, and

[1] The Child Language Data Exchange System (CHILDES) is a corpus established by MacWhinney & Snow in 1984 to store and share data on first language acquisition.

middle-class 62%, working class 24% at preschool). Further, the researchers zeroed in on children's explanation-seeking "why" and "how" questions within the curiosity-based questions and found that children again asked more questions at home (middle-class 31% and working class 22%) than at the preschool (middle-class 22% and working class 15%).

As these percentages indicated there was also a difference in the amount of questions asked by children across middle-class and working class backgrounds and this difference was greater at the preschool than at home. Similarly, as children engaged in question-answer exchanges with parents at home, they asked many related questions on a given topic and they asked the same questions over and over again if they did not get adequate answers. This type of persistent questioning further underlined the epistemic function of children's questions, indicating that children actively sought information to learn about a topic that confused them or fill in a gap in their knowledge base. The researchers called these question-answer exchanges as "passages of intellectual search" (p. 201) and found that engaging in such passages was more common in middle-class homes (13 children engaged in 41 passages) than low-income homes (4 children engaged in 13 passages).

In one relatively recent contribution to understanding young children's questions, Chouinard (2007) aimed to provide an in-depth analysis on how young children use questions as a tool of learning by focusing on both fact-seeking (e.g., "what" and "yes/no") and explanation-seeking (e.g., "why" and "how") questions. She analyzed the longitudinal data of four children's naturalistic conversations from the CHILDES database. Two of the children were from middle class families, one was from a working

class family and one was from an African American middle class family. She coded children's questions for frequency, type, and content within these conversations. The findings showed that majority of children's questions (about 70%) were information-seeking from ages 2 to 5. In other words, children were not simply trying to get the attention of the adult or ask for permission; but they were trying to get information from adults. Also, when children were around 2 years old, only 4% of these information-seeking questions were explanation-seeking. However, around 2 and half years of age, the percentages of children's explanation-seeking questions increased and stayed more or less stable over the years, comprising 23% of questions at ages 2;6-2;11, 25% of questions at 3;0-3;5, 27% of questions at 3;6-3;11, 23% of questions at 4;0-4;5 , 26% of questions at 4;6;4;11, and 30% of questions at 5;0-5;5.

To examine young children's search for explanatory information in everyday conversations, Hickling and Wellman (2001) analyzed four English-speaking children's (ages from 2;6 to 5) naturally occurring conversations in longitudinal data available in the CHILDES database (3 of them overlap with those used by Chouinard, 2007). Three of these children were from middle-class families while one child was from a working class family. Within these everyday conversations, they coded explanation-seeking questions. The findings revealed that explanation-seeking "why" questions appeared very early in children's talk (mean age for "why" was 2;6). The findings showed that children asked more explanation-seeking questions at 3 years of age (52%) and the percentage of such questions decreased around 4 years of age (36%). Although the sample size is rather limited, this is an interesting finding, which suggests that there might be a temporary period in early childhood when children engage in intense

question-asking. In sum, this study described four children's use of explanation-seeking questions in their everyday language, and hinted at their potential epistemic function in children's questions during their communicative exchanges with more knowledgeable others from early ages on.

In addition, Frazier, Gelman and Wellman (2009) examined the same longitudinal conversations from CHILDES database as used by Chouinard (2007) and Hickling and Wellman (2001), but included 2 more children and analyzed the spontaneous conversations of 6 children (ages from 2 to 5) in total by particularly focusing on children's explanation-seeking "why" and "how" questions. The researchers coded children's explanation-seeking questions as simple (i.e., including one or two words) and complex (i.e., including a sentence referring to the subject of the question). Simple questions consisted of 31.2% of the questions, while complex questions consisted 68.8% of the questions. Also, the frequency of complex questions increased over time showing that 53.6% of questions were complex at age 3, 69.3% were complex at age 4 and 79.2% were complex at age 5. These findings suggest that although children start asking "why" and "how" questions very early on to seek for explanation, there could be age related differences in the complexity level of the questions.

1.1.2.2. Diary studies. In addition to examination of children's questions in spontaneous observational data, there are also cross-sectional diary studies examining children's questions with larger sample of participants in wider range of contexts. For instance, Chouinard (2007) conducted a cross-sectional diary study with 68 middle-class children (1- to 5-year-olds) and asked parents to record their children's questions as they occurred for one week. Analysis of these questions for frequency and type supported the

findings from the CHILDES study and showed that information-seeking questions overall constituted majority of the children's questions across ages. Within these information-seeking questions, the percentages of explanation-seeking questions indicate an age-related difference in children's explanation-seeking questions but this was mainly due to a sharp increase in children's explanation-seeking questions around 3 and half years of age. (6% for 2;0-2;5, 23% for 2;6-2;11, 24% for 3;0-3;5, 42% for 3;6-3;11, 25% for 4;0-4;5, and 29% for 4;6;-4;11). This is consistent with Hickling and Wellman's (2001) findings from CHILDES database that I reported earlier.

Likewise, Callanan and Oakes (1992) conducted a cross-sectional diary study with middle-class families (parents kept record of their children's questions for 2 weeks) and examined the types and topics of questions asked by 3-, 4- and 5-year-old children. The findings revealed that children asked "why" and "how" questions about a wide range of topics including roughly equal amount of questions about physical and social knowledge domains. Moreover, "why" and "how" questions were prevalent even in the conversations of 3-year-olds and there were no age-related differences in the frequency and the types of questions asked by children (29 % in 3-year-olds, 45% in 4-year-olds and 45.5% in 5-year-olds). However, supporting the findings I reported above from Frazier et al.'s (2009) CHILDES study, the percentages of single word "why" and how" questions were 20% for 3-year-olds, 0 for 4-year-olds and 4% for 5-year-olds, indicating that only 9% of 3-year-olds "why" and "how" questions were with complete sentences while 4- and 5-year-olds rarely asked single word questions.

1.1.2.3. Experimental studies. Studies examining children's questions in experimental contexts are rather scarce, yet it is critical to examine children's questions

experimentally to see which factors are causally related to children's question-asking behavior. Previous research indicates that children's questions occur naturally during daily activities such as when preparing meal with their mothers or when on the car with their parents (e.g., Callanan & Oakes, 1992; Jipson & Callanan, 2001). Creating situations to elicit information-seeking questions from children in controlled experimental contexts has been found to be rather difficult. However, there are a few studies, which attempted to prompt children to ask questions to acquire information from the experimenter. For instance, Chouinard (2007) used a box task to see whether children update their knowledge state based on the information they received from the adults to solve a problem at hand. In this task, 4- and 5-year-old children were shown pictures of two different objects and were asked to guess which object was in the box. Children were tested in 2 conditions: 1) question and guess condition, 2) only guess condition (control condition). In the question-and-guess condition, children were allowed to ask questions that could help them to predict what is in the box, whereas, in the guess-only condition, they were told that the purpose of the game is to guess what is in the box so that no questions were allowed. This task did not particularly allow children to ask for explanation-seeking questions, but still children were required to ask more sophisticated questions over the course of 6 trials to be able to successfully differentiate between increasingly similar, and thus perceptually less distinct stimuli (e.g., fork vs. spoon). Children's correct guesses in both conditions and their questions in the question condition were analyzed. The results indicated that children were more accurate in guessing the items in the question-and-guess condition than in guess-only condition. Moreover, both 4- and 5-year-olds were more successful at asking

sophisticated questions such as asking about functions (43%), parts (35.5%) and properties (21.5%) that would yield useful information to help them guess what was hidden in the box. Although this study showed that children asked questions strategically to acquire the information they need from others, the structure of this task did not allow children to ask explanation-seeking questions.

Frazier et al. (2009) designed an experimental task where they particularly examined children's requests for explanations. The researchers tested 42 middle class preschool children (ages ranging from 3;5 to 5;3) using objects, storybooks, pictures and short videos designed to create inconsistent, question-provoking situations. For instance, they showed children a picture of bird's nest containing two baby birds and a turtle, or told a story about a boy who wore a scarf and mittens to play outside on a warm day. Question-asking was modeled with the help of a puppet before the testing trials; however, children did not always use a well-formed question to ask about the inconsistencies, but they also used requestive statements pointing out the inconsistencies during the testing trials. The results showed that children asked 4.6 questions and made 7.7 requestive statements on average, summing up to 12.3 requests for explanations across 16 different stimuli shown in the testing trials. These results further supported the argument that children actively search for explanations from others when their knowledgebase is not sufficient to make sense of the phenomena at hand.

To summarize, evidence from these studies using different methods suggests that starting from age 2, children ask questions to actively seek information from more knowledgeable others and there is sudden increase in children's explanation-seeking questions around age 3. Evidence from experimental studies also suggested that children

asked questions that target specific information that could help them clarify their ideas and solve a problem at hand. However, additional research, particularly in experimental contexts, is needed to examine children's information-seeking questions during their conversations with adults to see how children formulate a question to fill in a gap in their knowledge base and which factors influence their question-asking behavior.

1.2. Acquiring an Exploratory Stance: The Role of Parent-Child Conversations in Promoting Children's Questions

Parent-child conversations could serve as informal learning environments for children where they seek for information by asking questions and listen to their parents' explanations. Within these conversations, parents not only provide children with the information they asked for but also act as a model for children in how to evaluate the events they experience or hear about and scaffold their children's understanding by collaboratively exploring and explaining with them (Callanan, 2012; Legare, Sobel & Callanan, 2017). In this regard, parents' questions and explanatory talk could not only serve as an important tool of communicating knowledge and beliefs, but also instilling an "exploratory" and possibly a speculative stance to children (Harris, 2012; Nolan-Reyes, Callanan & Haigh. 2015). In the sections below, I will first present evidence for two important factors that could influence children's question-asking behavior: 1) parents' questions serving as a model for children's questions, and 2) the relationship between the quality of adults' answers and children's questions. Then I will share a relevant line of research suggesting that parents' explanatory talk could be related to children's judgments and explanations about improbable and impossible events, and potentially could help children acquire a speculative stance.

1.2.1. Parents' questions as a model for children's questions. One important finding emerging from Tizard and Hughes' (1984) observation of mothers' talk at home was a strong association between children's questions and mothers' question-asking behavior. In other words, the findings from this study showed that children who asked more questions had mothers who asked more questions as well. This finding hints at the possibility that children might be following the example of their parents in asking questions, and as Harris (2012) has argued, parents' question-asking behavior could help children to acquire an "exploratory stance" while they are gaining progressively more knowledge about the world.

Hart and Risley (1992) examined early language experiences of children growing up in 40 American families of different SES backgrounds by following them longitudinally. They observed children shortly after birth to 3 years of age (approximately for 2.5 years) by recording their naturalistic conversations every month for an hour. These observations showed that questions constituted 30% of parental utterances, and this percentage varied based on SES levels of the families (ranging from 20% to 45%). Families with lower SES levels provided more prohibitions and discouraging words such as directives "stop", "quit, or "don't" (20%) in their conversations with children, while families with higher SES levels provided more questions, and elaborations on a given topic. There was also strong positive correlation between the proportion of parents' questions and elaborations. That is, parents who asked more questions provided more elaborations for their children. However, there was a strong negative correlation between parents' prohibitive talk and the proportion of questions and elaborations. Parents who used more prohibitions asked fewer questions

and provided fewer elaborations for their children. These findings further suggested that there might be SES-related variations in the language parents' use at home and in the way parents ask questions, which could also lead to variations in children's question-asking behavior. Parents who ask information-seeking questions in their everyday conversations with children could model such an explanatory talk that encourages negotiating meanings, and exchanging information and explanations, rather than a talk that is more concerned about finishing basic tasks in daily activities.

1.2.2. Quality of answers promoting children's questions. Another important component of parent-child conversations that could be particularly influential in promoting children's question-asking behavior is the quality of the answers parents provided in response to children's questions. Research on children's questions has shown that children's use of questions to search for information were encouraged by parents' behavior as parents tended to pay attention to their children's questions and try to answer them in an informative way (e.g., Callanan & Oakes, 1992; Chouinard, 2007; Tizard & Hughes, 1984). For instance, Tizard and Hughes (1984) found that mothers from middle-class families used more complex language and different words in their conversations, and provided more general knowledge for their children than mothers from working class families. Mothers from middle-class families also reported enjoying question-answer exchanges with their children more than mothers from working class families. Researchers also explored whether the frequency and quality of the answers mothers gave to their children's questions could ultimately be related to differences in children's question-asking behavior. They found that middle-class mothers gave more adequate answers to their children's questions by providing explanations (44% of the

time) than working class mothers (27% of the time). Although there were no differences in the percentage of inadequate answers given by mothers from the two social classes, working class mothers (34%) were more likely to leave their children's questions unanswered than middle-class mothers (28%). To see if adequate answers reinforce children's questions, Tizard and Hughes also looked at the correlation between children's questions and mothers' answers. However, surprisingly, they did not find a relationship between quality of mothers' answers and children's question-asking behavior. One possible reason for this lack of relationship could be children's persistence in their requests for explanations as they were found to ask the same questions repeatedly if they did not receive adequate answers from adults (Tizard & Hughes, 1984).

Callanan and Oakes (1992) also found that parents provided explanatory answers to their children's "why" and "how" questions within conversational turns at least half of the time for 4 and 5 years of age (3-year-olds: 32%, 4-year-olds: 61%, 5-year-olds: 54%). Moreover, there were contingencies between children's questions and parents' answers; when children asked "how" questions to learn about the processes underlying an event, parents provided mechanism explanations describing the process how an event could occur (64%), and, when children asked "why" questions to learn about the causes underlying events, majority of parents' explanations referred to prior causes (48%), consequences (18%), or combined cause and consequence (13%) in their answers. These findings indicated that parents tailored their answers according to the informational needs of the children.

Further research on children's reactions to the answers they received for their explanation-seeking questions from adults also suggested that children were ready to listen to the answers offered by adults, and asked more questions when they did not feel satisfied with the information they received. For instance, Frazier et al.'s (2009) CHILDES study examined parents' answers to children's explanation-seeking questions and children's reactions to these answers. Their findings indicated that adults provided an explanation 37% of the time to children's explanation-seeking questions (specifically 41% for 2-year-olds, 38% for 4-year-olds and 30% for 4-year-olds), while the rest of their answers were non-explanatory. The examination of children's reactions showed that children found explanatory answers more satisfying increasingly over the years because they either agreed with the adult (11% of the time), or asked further questions to build upon the explanation (18% of the time) when they received explanatory answers. However, when they received non-explanatory answers they appeared to be puzzled and repeated the same questions (24 % of the time) and, by the time they were 3 and 4 years of age, they also provided their own explanations (10% of the time).

Findings from both Callanan and Oakes (1999) and Frazier et al. (2009) studies indicated that the percentage of parents' explanatory answers decreased with older children. Frazier et al. attributed these findings to the increasing complexity of children's questions. On the other hand, another possible explanation is that as children develop more sophisticated knowledge base about the world, they could participate more in the conversations, and therefore, parents could be listening to children more and talk less in the conversations. Rogoff (2003) calls this situation as "transfer of

responsibility". That is, parents might feel less obligated to give explanations with older children as they assume that they are more knowledgeable than younger children.

Frazier et al.'s (2009) experimental study, which I reported earlier, presenting 3- to 5-year-old children with surprising and question-provoking situations via objects, storybooks, pictures and short videos also examined reactions to the explanatory vs. non-explanatory answers they received from the experimenter. As children recognized the inconsistency in the situation or inquired about it by asking a question or making a statement, the experimenter gave them previously scripted answers that provide explanations half of the time, and non-explanations in the other half. The results focused on children's reactions to the answers they received and showed that children were more satisfied with adult answers that provided explanations compared to those that did not. In the cases where they did not receive an explanation, even the youngest children continued to seek the information by re-asking the question (21% of the time). Also, children were significantly more likely to agree (30% of the time) or ask a follow-up question to their original inquiry (21% of the time) when it was answered with an explanation than when it was not.

Finally, in one very recent study on young children's questions, Kurkul and Corriveau (2017) investigated the differences in children's information-seeking questions, parents' answers for these questions and children's reactions after receiving answers across middle-class and low-income groups. Researchers examined the naturalistic conversations of 37 4-year-olds from a corpus in CHILDES database (different from the corpus used by Chouinard, 2007 and Frazier et al. 2009). They did a keyword search in the database focusing on children's fact-seeking and explanation-

seeking questions and coded the conversational turns including parents' answers and children's reactions to their parents' answers. Their findings did not reveal any differences in children's information seeking questions across two SES groups. However, they found differences in parents' answers to children's explanation-seeking questions across SES groups and indicated that parents from middle-class families provided more explanatory answers to their children's questions (explanatory: middle-class 40% and low-income 22%) while parents from low-income families provided more non-explanatory answers (non-explanatory: middle-class 15% and low-income 35% of the time). In addition, Kurkul and Corriveau's examination of children's reactions demonstrated that upon receiving non-explanatory answers to their questions, children from middle-class families come up with their own explanations about 39% of the time while children from low-income families never provided their own explanations. Also, children from low-income families showed no reaction 40% of the time when they received non-explanatory answers while children from middle-class families showed no reaction to non-explanatory answers 21% of the time.

In summary, these studies suggest that adults cared about children's questions in everyday conversations and responded to their children's informational needs by answering their questions in an informative way, especially in middle-class homes. Also, as Frazier et al. (2009) showed, children' reactions varied depending on the quality of the answers they received from adults and children were more dissatisfied when they received inadequate or non-explanatory answers for their questions. These reactions further supported the function of children's questions as a tool of acquiring information from more knowledgeable others. Moreover, SES related differences found by

Corriveau and Kurkul (2017) in children's question-asking behavior, parents' answers and children's reactions to the parents' answers suggested that the quality of parents' answers might influence children's question-asking behavior. In other words, when children received informative or explanatory answers to their questions, they might be more encouraged to ask questions and this might be an underlying factor resulting in SES differences in children's question-asking behavior.

1.2.3. Acquiring a speculative stance. Research on children's explanations about everyday phenomena (e.g., Schult & Wellman, 1997; Hickling & Wellman, 2001; Gopnik & Wellman, 2012) shows that children build increasingly more complex knowledge structures about causal relations between events during the preschool years. For instance, Hickling and Wellman's (2001) CHILDES study (age from 2.5 to 5) examined children's explanatory statements as well as explanation-seeking questions. The findings showed that explanatory statements beginning with "because" also appeared very early in children's talk (mean age was 2;7) and explanatory statements constituted about 49% of children's explanatory utterances.

Moreover, studies investigating the relationship between preschoolers' causal thinking and ability to distinguish between possible and impossible events has also shown that young children are able to make a distinction between possible and impossible events by correctly rejecting the possibility of events that would violate basic natural laws in the world (e.g., Browne & Woolley, 2004; Kalish, 1998; Schult & Wellman, 1997; Sobel, 2004). For instance, Sobel (2004) presented preschoolers with stories about both possible events (e.g., a character who had been standing up wanting to lie down in his bed) and impossible events violating physical, psychological and

biological laws (e.g., a character wanting to jump up and float in air or a character wanting to sit down and not have thoughts for a long time). The findings showed that both 3- and 4-year-olds were successful in correctly rejecting the possibility of impossible events, while acknowledging the possibility of possible events. Also, when children were asked to explain how or why these events could or could not happen, they were able to provide relevant explanations for why impossible events could not occur.

But where do these judgments and knowledge about causal connections come from? A compelling line of research that could offer a particularly relevant context to investigate whether parents' explanatory talk is associated with children's beliefs and explanations about everyday phenomena is on children's thinking about improbable events, which represent "pseudo-impossibilities" versus impossible events. Although preschoolers are good at differentiating possible versus impossible events, recent research suggests that they might not be very good at differentiating between improbable and impossible events (Shtulman & Carey, 2007; Shtulman, 2009). Improbable events refer to events that could actually occur but are very unlikely to occur (e.g., eating pickle-flavored ice cream) while impossible events refer to events that violate physical laws (e.g., walking on water).

To examine children's and adults' reasoning about the possibility of such extraordinary events, Shtulman and Carey (2007) presented 4-, 6-, 8-year-olds and adults with a storybook containing improbable, impossible and ordinary events. Participants were asked to judge the possibility of these events and then justify their judgments. Their findings showed that young children have difficulty in differentiating between the possibility status of improbable and impossible events. That is, although

almost all children in different age groups and adults correctly rejected the possibility of impossible events, children's correct judgments about improbable events as possible increased with age (22% of 4-year-olds, 50% of 6-year-olds, 65% 8-year-olds and 99% of adults judged improbable events as possible).

In a follow-up experiment with only 4-year-olds, Shtulman and Carey (2007) presented children with a forced choice task that paired each impossible event with an improbable event and asked children to decide which one was possible. Children's performance significantly improved in this forced choice task and they correctly acknowledged the possibility of the improbable events. But why do they reject their possibility in the first place?

Shtulman and Carey (2007) proposed two possible explanations for children's failure to differentiate between improbable and impossible events. One possible explanation is that children might reject the possibility of these events as they find them bizarre and surprising, and the rejection could be their default reaction to such events because they cannot identify a physical law that violates them. Second possible explanation is that children might be unable to imagine the circumstances that would lead to the occurrence of such events. In other words, their rejections might not arise from their knowledge or lack of knowledge about physical laws that would prevent these events from occurring, but from their inability to think about circumstances under which these events could occur. Either way, the question is what type of knowledge children need so that they could correctly accept the possibility of improbable events just like adults. One possible context that children come to think about these events and discuss their possibilities could be parent-child conversations and parents' beliefs. Parents'

explanations about such events could affect children's thinking and explanations about them.

Building upon Shtulman and Carey's study, Nolan-Reyes, Callanan and Haigh (2015) examined whether parent-child conversations, particularly parent's explanations about impossible and improbable events could influence children's thinking about the possibility of such events. For this purpose, the researchers presented 56 parent-child dyads (4- and 6-year-olds) with booklets showing improbable and impossible events. Conversations of parent-child dyads when discussing these events were examined. In addition, children were tested separately in a judgment task with the experimenter where they were asked the possibility of similar improbable and impossible events and ordinary events to control for response bias. The findings showed that when discussing improbable events parents provided significantly more speculative mechanism explanations (explaining the process pertaining to how the event could occur such as "If they get a lion when it was a little baby and tamed it, then it could be a pet") for improbable events than for impossible events. On the other hand, parents provided more skeptical explanations (explaining the process why the event could not occur such as "Walls are really hard and people can't break through them") for impossible events. Moreover, regression analyses showed that frequency of parents' speculative mechanism explanations for improbable events was significantly associated with children's correct judgments about the possibility of these events and the frequency of their speculative mechanism explanations for their possibility judgments.

The findings from Nolan-Reyes et al. (2015) lends further support to the argument that parents' explanations during parent-child conversations could have critical

importance in guiding and shaping children's understanding about how the world works. In addition, parents' explanations could be playing an important role in providing children with a socially and culturally accepted framework to think about the events in the world. Specifically, parents' explanations might be showing children how to approach the information at hand and make the best use of it by paying attention to specific causal relationships (Gelman, 2009; Legare, Sobel & Callanan, 2017; Keil, 2006; Wellman, 2011). Therefore, it is essential to explore parent-child conversations across different family contexts and cultures to see what kind of information parents' explanations offer and whether parents' questioning and explanations influence children's understanding about the world, and acquisition of an exploratory as well as possibly a speculative stance. In the next section, I review the evidence for potential variations in children's question-asking behavior due to sociocultural and socioeconomic factors.

1.3. Variability in Children's Question-asking Behavior due to Sociocultural and Socioeconomic Factors

1.3.1. Sociocultural context. While research on young children's questions as a tool for gathering information from others is gaining momentum, almost all studies so far have been conducted in the US and the UK. These studies with children growing up in Western cultures bring out the role of young children's questions in initiating dialogue with others, and learning from them in everyday conversations, but these findings may not be generalizable to other cultures. Although asking questions is a spontaneous, and likely a universal way of showing curiosity, there could still be variations in the motivation for asking questions and their verbalization in different

families and cultural contexts (Harris, 2012). There could also be differences in the ways mothers model and encourage question-asking behavior and use explanatory talk in their conversations (Callanan & Valle, 2008; Tenenbaum, Callanan, Alba-Speyer & Sandoval, 2002)

Research shows that children's participation in a specific culture is associated with the way they interact with others and use language (e.g., Heath, 1983; Ochs & Schieffelin, 1995; Salomo & Liszkowski, 2013). In this regard, the amount and the quality of parents' talk within the family context, and the extent to which they model asking questions and encourage the child to talk could differ in different cultures. For instance, in non-Western cultures respect for authority and deferential stance is more valued than Western cultures (Gauvain & Munroe, 2012; LeVine & LeVine, Schell-Anzola, Rowe, Dexter, 2012; Kagitcibasi, 1990). This being the case, children growing up in non-Western cultures might be taught to see question-asking as a challenge to authority, and thus, come to acquire a conversational style that does not necessarily promote asking questions to seek information from others in their everyday conversations.

There is initial evidence (Gauvain, Munroe and Beebe, 2013) pointing at cross-cultural differences when children growing up in non-Western cultures are compared to children in Western cultures as well as when different non-Western cultures are compared to one another. Gauvain and colleagues investigated children's questions in four traditional agrarian cultures (Garifuna in Belize, Logoli in Kenya, Newars in Nepal, and Samoans in American Samoa) and compared their findings with Chouinard's (2007) findings with Western children. In these traditional agrarian cultures, most people made

a living through subsistence farming, and had access to only primary and some secondary education. Data were collected between 1978 and 1979 from 96 children (24 children per culture). In each of these cultures, 3- to 5-year-olds were observed by trained observers during their daily interactions with adults in natural settings for six weeks. A total of 30-35 observations per child were collected roughly around the same time of the day. Children's questions were coded for their frequency, type, and content. Compared with Chouinard's (2007) findings, children in these non-Western cultures were found to ask significantly fewer explanation-seeking (why and how) questions than children in Western cultures, although they asked similar number of fact-seeking questions. The amount of explanatory questions in the non-Western sample constituted only 4.5% of all information-seeking questions, while they were more frequent in the US sample, constituting 23-26% of all information-seeking questions. The researchers discussed these findings with regards to the authority relations and deferential stance valued in non-Western cultures, which could lead to seeing question-asking as a challenge to the authority.

In addition, when these cultural groups were compared with each other, it was observed that Samoan children asked significantly more questions than children in the other three cultures, while Kenyan children rarely asked any questions. The researchers attributed these differences to the levels of modernization and parental education in the culture (the school system was better in Samoa), arguing that educated mothers use the communicative styles they attained via schooling to encourage and model asking questions, thereby eroding the deferential stance valued in non-Western cultures (Gauvain et al., 2013; Gauvain & Munroe, 2012).

In sum, the results of this study lead us to expect variations in children's questions-asking behavior in different sociocultural contexts. These variations could arise from how families socialize their children with regards to the social and conventional ways of thinking and acting in the given community (Gauvain & Munroe, 2012). But all four cultures included in this study were traditional agrarian cultures. In the developing non-Western world, cultures also change due to globalization, economic growth, new employment opportunities and implementation of formal schooling. These changes also bring about changes in daily activities, and social practices, altering parental attitudes towards children, and possibly, their conversations and the way they encourage asking questions (Gauvain & Munroe, 2012; LeVine, et al., 2012).

1.3.2. Socioeconomic status. Social class differences within a sociocultural context could affect how parents socialize their children. In fact, social class differences enable us to observe the variability arising from access to schooling and economic welfare within the same community. Research examining the relationship between socioeconomic status and parent-child interactions has revealed that middle class children have very different daily routines than working class children (Lareau, 2000; Tizard & Hughes, 1984). Lareau (2000) reports that middle class children and their parents had very busy schedules, and the parents were very much involved in their children's school performance and they planned their daily activities beforehand, whereas working class children simply "hung out" during the day and usually spent time by watching TV, and talking and joking with family members.

Moreover, parents with relatively low education levels and disadvantageous economic conditions provided fewer opportunities for everyday conversations with their

children, and even when they talked, the content and quality of their language use were different than parents from high-SES backgrounds (Heath, 1989; Hart & Risley, 1994). These differences could be attributed to the variability in the opportunities that family structure allows for parent-child interaction, parental attitudes towards child rearing, and the educational and technological resources available for children's use in the household.

Also, as noted earlier, Tizard and Hughes (1984) found that middle class mothers responded more adequately to their children's questions and reported that they enjoyed question-answer exchanges with their children more often than working-class mothers. Therefore, the differences observed in middle-class and working class children's question-asking behavior could be attributed to the differences in mothers' question-asking behavior as well as quality of their answers for children's questions. In addition, their higher level of schooling is likely to have enabled middle-class mothers to bring in "cognitive, school-like intelligence" to the home context and communicate with their children differently (Rogoff, 2003).

1.4. The Current Study

Research with children growing up in Western cultures suggests that question-asking plays an important role in young children's everyday conversations and could serve as a tool for eliciting information and learning from others (Chouinard, 2007; Tizard & Hughes, 1984). However, currently little is known about whether children growing up in different sociocultural contexts also use questions to acquire information from others in their conversations. Therefore, in my dissertation, I aim to examine questions asked by Turkish preschoolers from middle-class and low-income families in

their conversations with adults to see whether their question asking and explanation giving behavior patterns might differ across SES groups in this cultural context.

Previous research on parent-child conversations indicates that parents from different socioeconomic backgrounds vary in the amount, content and style of talk that they use with their children (Hart & Risley, 1995; Heath, 1986, Rogoff, 2003; Tizard & Hughes, 1984). More significantly, it has been found that parents from middle-class families engage in longer conversations with their children and provide more general knowledge about the world, whereas parents from low-income families engage in shorter conversations, and imperative and prohibitive language is more prevalent in their conversations (Hart & Risley, 1995).

Based on the evidence from previous research, it is reasonable to expect differences in children's question-asking behavior across different social classes. Also, it is particularly interesting to examine social class differences in Turkish culture, which partakes of both Western and non-Western values and is regarded as on the line between being a developed and a developing a country (as retrieved from CIA World Factbook, https://www.cia.gov/library/publications/the-world-factbook/, n.d.). More specifically, since early 20th century, Turkey has gone through a massive industrialization and westernization process supported by social policies and mass media. Also, this process was accompanied by internal migration where people moved from rural to urban areas, had access to higher education and better jobs, and adopted new lifestyles and values (Ataca & Sunar, 1999). Nevertheless, there are differences that persist between families from different socioeconomic backgrounds, and maternal education levels could

particularly be related to these differences and possibly to children's question-asking behavior.

The observed political and socioeconomic changes in Turkey since early 20th century and their implications for Turkish family structure and child rearing practices are explained by Kagitcibasi's model of family change (Kagitcibasi, 1990; Kagitcibasi, 2005). She outlines three prototypical family interaction patterns to define cross-cultural family diversity and change: 1) traditional, 2) individualistic, 3) a dialectical synthesis of traditional and individualistic. Traditional family interaction values both material and psychological dependence between parents and children, and represents the family structure in collectivistic cultures. Individualistic family interaction refers to Western family structure and values independence of the children above everything else. A dialectical synthesis between these two entails a family interaction that values material independence but psychological interdependence. Kagitcibasi posits that developing non-Western countries where collectivistic culture has been common are experiencing transitions in their family structures due to global spread of urbanization, formal schooling, and socioeconomic development, which leads them to adopt a dialectical synthesis of traditional and individualistic values.

Turkey serves as a good example of this model of family change (Kagitcibasi, 1990). Within the more traditional sectors of the Turkish society, obedience, respect for authority and deference are expected values from children (Kagitcibasi, 1989; Boratav, 2009). However, in urban areas, families from different social backgrounds experience these changes at different paces. Low-income families tend to have less access to the resources in the society - in particular, maternal education - and may therefore be slower

in adopting the changes introduced by urbanization, and in experiencing change in traditional values. This variability in the pace of adopting the changes could also include the way parents interact with their children across different socioeconomic groups and possibly affect their question-asking behavior.

Furthermore, research exploring Turkish preschoolers' language abilities across different SES levels has shown that middle-class mothers used more complex language and rich vocabulary in their conversations with children than low-income mothers. Also, children had more access to learning materials at middle-class homes than low-income homes (Baydar, Kuntay, Yagmurlu, Aydemir, Cankaya & Goksen, 2014; Akturk, Kuntay & Aksu-Koc, 2011). Echoing the SES related differences in children's language and learning experiences at home as underlined by Tizard and Hughes (1984) and Hart and Risley (1992), these findings suggests that there could also be variations in children's question-asking behavior in the Turkish cultural context across middle-class and low-income families.

Thus, the present study explores different aspects of children's question-asking behavior by raising three overarching research questions. The first question asks whether there are age and SES related differences in the frequency and function of questions asked by the Turkish mothers and their children from middle-class and low-income families during a storybook reading activity, and whether there is a relationship between mothers' questions and children's questions. The second question asks whether there are age and SES related differences in the frequency and the function of questions asked by Turkish preschoolers from middle-class and low-income families in an experimental context, and whether the quality of the answers that experimenter give for their

questions affects their question-asking behavior. Finally, the third question asks whether mothers' questions and explanations about improbable and impossible events influence children's judgments and explanations about similar events. While addressing these research questions, the present study also explores the influence of socioeconomic status on children's question-asking behavior as well as mothers' question-asking behavior and explanatory talk.

CHAPTER 2

General Method

2.1. Outline of Research Design

My dissertation project combined various observational and experimental methods to address my main research questions and consisted of three studies that are intended to shed light on different aspects of children's question-asking behavior. The first study is an exploratory study examining conversations of mother-child dyads during a storybook reading activity at home in order to determine the type and frequency of questions asked by mothers and children to see whether mothers' question-asking behavior is associated with children's questions.

The second study examined children's question-asking behavior in an experimental context. Using a question-elicitation task, I presented children with novel animals and objects and invited them to ask questions. I also specifically controlled for the quality of the answers children received for their questions by testing them in informative and non-informative answer conditions taking place through two experimental sessions on two consecutive days in a week.

Finally, the third study complemented the first two studies by examining mother-child conversations about improbable and impossible events and their role in children's judgments and explanations about similar events. Mother-child dyads were first asked to engage in mother-child booklets about improbable and impossible events. Then the experimenter tested the children in the child judgment task about improbable, impossible and ordinary events.

In this chapter, I present information about the research context, participants, and data collection process of the project as a whole. In subsequent chapters for each study, I present the specific research questions and information about participants, materials and procedure, coding and data reduction followed by its results.

2.2. Description of Research Context

The study was conducted in the large industrialized city of Kayseri in Central Turkey. With a population over 1 million, Kayseri is one of the most rapidly developing cities with a lot of small and medium-sized enterprises well known for their contribution to Turkey's economy. Besides its economic development and urbanization, Kayseri is also known as one of the most socially conservative cities in Turkey with highly preserved traditional values ("City of Kayseri" as retrieved from http://www.kayseri.gov.tr, n. d.).

Preschool education is still optional in Turkey. Private institutions serving predominantly children from middle-class families due to high attendance costs offer it. Preschool institutions for children from economically disadvantaged backgrounds are rather limited. The private preschools, which operate under the Ministry of Family and Social Policy, offer free admission to children from families who demonstrate an economic disadvantage (e.g., children of veterans, single moms, or parents with disabilities). However, this type of admission constitutes only 3% of the student population in these preschools ("Early Childhood Care and Education Regulations" as retrieved from http://ankara.aile.gov.tr, n.d.). There are also preschool classrooms serving 60 to 72 month-olds in most public primary schools. These classrooms are mainly established to encourage children's school preparedness one year before

compulsory education. The social and educational activities offered in these public primary schools are similar to private preschools. They both provide children with book reading and play activities with the guidance of teachers as well as teaching social conventions of eating together, cleaning-up, and self- care. However, private preschools offer additional classes in different subjects such as English, dance and gymnastics with specialized teachers. Children can attend private preschools full day or half day, while preschool classrooms in public primary schools are only half-day programs.

2.5. Selection of Research Sites

For the present study, I worked with 5 private preschools in Kayseri after meeting with their head coordinators and observing the operation of the preschools for 2 or 3 days before the recruitment process. Two of the schools were located in relatively low-income neighborhoods serving children from diverse backgrounds. To contact parents of the children in the targeted age groups, I attended parent-teacher meetings that were held at the beginning of the school year. I introduced myself and told them about the goals of the research project. I then contacted the parents who were interested in the study to get their consent for participating in the experimental study and the home visits.

Although I was able to recruit some participants from low-income backgrounds through private preschools, the majority of the participants in preschools were from middle-class backgrounds (see Table 2.2 and 2.4.). Since only some of low-income participants could be reached through private schools, to recruit participants from low-income backgrounds, I selected two public health centers in relatively poor neighborhoods where I could invite families who brought their children for routine

health check-ups to participate in the study. If parents gave consent for their children to participate in the study, I tested them in a private room at the health center.

All children were first tested in preschools or public health centers with the experimenter. Those families, who also gave consent for the home visit, were visited on a different day within the span of a week or two depending on families' schedule. Overall, 65% of the participants from middle-class families and 70% of the participants from low-income families gave consent for home visits (Study 1 and 3) following the question elicitation task with the experimenter (Study 2). Parents who did not give consents for the home visits usually stated their busy schedules or non-availability as a reason.

2.4. Recruitment of Participants

The two factors that formed the basis for selection were age and socioeconomic status. Three-, 4- and 5-year olds who belonged to middle class and low-income families were targeted. Two selection criteria were used for defining socioeconomic status: 1) family's monthly expenses, and 2) maternal education levels. Participants whose families reported having 3000 Turkish liras or less monthly expenses[2] were included in the low-income sample, while participants whose families reported more than 3000 Turkish liras monthly expenses were included in the middle-class sample. There was not an upper or lower bound for monthly expenses, however, in the low-income sample, 90% of the families reported to have expenses between 1200 to 3000 Turkish liras and 8% of the families reported 1200 Turkish liras or less, while in middle-class sample, 42% of the families reported to have expenses between 3000 to 5000 Turkish liras and

[2] The minimum wage in Turkey was 2000 tl (approx.. 550 dollars) in 2017

58% of the families reported to have expenses of 5000 Turkish liras or more. In addition, participants whose mothers had education levels ranging from primary to secondary school education (maximum of 11 years) were included in low-income sample (years of education: *M* = 8.6, *SD* = 3.7), while participants whose mothers had university degree or higher education level, that is, 12 years and above, were included in the middle-class sample (years of education: *M* = 15.6, *SD* = 1.4).

2.4.1. Participants in Study 2 (question elicitation task with the experimenter). A total of 105 Turkish preschoolers (31 3-year-olds, 11 boys; 38 4-year-olds, 18 boys; and 36 5-year-olds, 16 boys) were recruited through preschools and health centers to participate in the question-elicitation task with the experimenter. Fifty-five of the children were from middle-class families and 50 of them were from low-income families. The distribution of participants by age and SES groups are given in Table 2.1.

Table 2.1.

The Distribution of Participants in Study 2 across Age and SES groups

	Middle-class			Low-income		
	N	M_{age}	Range	N	M_{age}	Range
3-year-olds	16	3;5	3;2-3;11	15	3;6	3;1-3;11
4-year-olds	21	4;5	4;2-4;11	17	4;5	4;1-4;10
5-year-olds	18	5;3	5;0-5;11	18	5;3	5;0-5;11
Total	55			50		

There was some variability in the sample in terms of the participants' preschool attendance. There were children who were attending private preschools, or public preschool classrooms as well as children who did not attend any preschool. Table 2.2 summarizes the preschool attendance status of the sample across age and SES groups.

Table 2.2.

Mean Frequencies (Percentages) of Participants in Study 2 who Attended Preschools across Age and SES Groups

	Middle-class			Low-income		
	3-year-olds	4-year-olds	5-year-olds	3-year-olds	4-year-olds	5-year-olds
Private Full-day	16 (100%)	20 (95%)	13 (72%)	4 (27%)	6 (35%)	3 (17%)
Private Half-day	0	1 (5%)	4 (22%)	2 (13%)	0	0
Public half-day	0	0	1 (5%)	0	2 (12%)	6 (33%)
No school	0	0	0	9 (60%)	9 (53%)	9 (50%)

2.4.2. Participants in Study 1 and 3 (Storybook reading with mothers, mother-child booklets about improbable and impossible events and child judgment task about improbable and impossible events). The parents of the 105 preschoolers were contacted by the preschool teacher or the researcher and 71 agreed to participate in the home visit part of the study. Thus, a total of 71 mother-child dyads constitute the sample of Study 1 and Study 3. This sample consisted of 36 middle-class and 35 low-income mother-child dyads of three age groups (22 3-year-olds, 7 boys; 25 4-year-olds, 9 boys; and 24 5-year-olds, 12 boys). Mean years of maternal education for the middle-class is: $M = 15.7$, $SD = 1.4$ and for the low-income group is: $M = 8.9$, $SD = 3.5$. The distribution of participants by age and SES groups were given in Table 2.3 In addition, Table 2.4 summarizes the preschool attendance status of the sample in the home visit part of the study.

Table 2.3.

The Distribution of Participants in Study 1 and Study 3 across Age and SES groups

	Middle-class			Low-income		
	N	M_{age}	Range	N	M_{age}	Range
3-year-olds	10	3;5	3;2-3;11	12	3;6	3;1-3;11
4-year-olds	13	4;4	4;2-4;11	12	4;5	4;1-4;10
5-year-olds	12	5;3	5;0-5;11	12	5;4	5;1-5;11
Total	35			36		

Table 2.4.

Mean Frequencies (Percentages) of Participants in Study 1 and Study 3 who Attended Preschools by Age and SES

	Middle-class			Low-income		
	3-year-olds	4-year-olds	5-year-olds	3-year-olds	4-year-olds	5-year-olds
Private Full	10 (100%)	13 (100%)	8 (67%)	4 (33%)	4 (33%)	0
Private Half	0	0	3 (25%)	0	0	0
Public Half	0	0	1 (8%)	0	2 (17%)	5 (42%)
No school	0	0	0	8 (67%)	6 (50%)	7 (58%)

2.5. Summary of Data Collection

During data collection, I split my time in preschools and health centers to test children in the question elicitation task during the weekdays. Then I arranged home visit with the families on the evenings or on weekends of the same week or the following week. Below I provide brief descriptions of the tasks and when and where they were presented to children or mother-child dyads.

2.5.1. Question elicitation task with the experimenter. I administered this task to children individually in a private room in their preschools or in the health center where I recruited them. I had an initial warm-up conversation with each child before testing where I told them about my new game with novel animals and objects. Then I asked them whether they wanted to play this game with me. I tested all children who agreed to do so in two experimental conditions: 1) informative answer condition, 2) non-informative answer condition. I always tested children in the informative answer condition on the first day and told them that we were going to continue the same game the next day. Then the next day, I tested them in the non-informative answer condition. I recorded the task sessions audiovisually using both a small audio recorder and a camera. Each session lasted about 30-40 minutes. Further details about the materials and procedure of this task are included in method section in Chapter 5.

2.5.2. Storybook reading activity with mothers. As the home visit part of the study always happened after children's participation in the question elicitation task with the experimenter, children were already familiar with me during the home visits and expecting to have me as a visitor on the scheduled date. In each home visit, I had an initial warm-up conversation with parents where I described them the activities I asked them to engage with their children and answered their questions. After the initial warm-up, I presented mothers with a wordless picture book (*Wacky Wednesday* by Dr. Seuss) and waited for them to look over the pictures and familiarize themselves with the content of the book briefly. Then I asked them to read this book as they normally would with their children. I either left the room if the family had another room while the mother and the child engaged in storybook reading. I left a small audio recorder in the

room with the mothers to record mother-child conversations during storybook reading. Storybook reading with mothers took 15-30 minutes depending on the mother-child dyads pace. I describe the materials and procedure of this activity in method section of Chapter 4.

2.5.3. Mother-child booklets about improbable and impossible events. In addition to storybook reading activity, I asked mothers to discuss improbable and impossible events presented via a booklet depicting such events and asking scripted questions regarding whether such events could happen in real life or not. This booklet was presented to the mothers following the storybook reading and mothers were asked to discuss these events as they normally would with their children. I again waited in another room while mother-child dyads were engaged in this task and their conversations were audio recorded. This session took about 10-15 minutes.

2.5.4. Child judgment task with the experimenter. After mothers finished reading the booklet with improbable and impossible events with their children, I tested the children using a booklet depicting improbable and impossible events with the same structure in mother-child booklets but also including ordinary events. This was a controlled task where I asked children their judgments about whether the events are possible or not in real life. And then depending on children's judgment, I also asked them how the event could happen or why it could not happen. I asked the mothers/parents to wait in another room while I administered this task to the children and I audio recorded the session. Each session lasted about 10 minutes. I describe the details of mother-child booklets with improbable and impossible events and child judgment task in the method section of Chapter 6.

2.5.5. Additional Measures

2.5.5.1. Child vocabulary. To ensure that children were normally developing in terms of linguistic skills The Turkish Receptive Language Test (TRLT), a subscale of Turkish Receptive and Expressive Vocabulary Test (TIFALDI RT) (Berument & Guven, 2013) was included as a control measure. I administered this task, individually to each child in the preschools or in health centers on the second day of testing.

2.5.5.2. Demographics questionnaire. A demographics questionnaire was distributed out to the parents along with the consent forms for the participation of their children. All parents whose children participated in the question elicitation task filled out the demographics questionnaire and sent it back to the experimenter.

2.5.5.3.* Home Observation for Measurement of Environment *(HOME) Inventory. The Turkish version of the HOME inventory adapted by Baydar & Bekar (2007) to be used in the Turkish culture was used to assess the factors associated with child rearing practices and materials in the home context. Only the parents who participated in the home visit part of the study received HOME Inventory. I administered this inventory with the parents at the end of the home visits following the completion of all other activities. It took about 15 minutes to complete HOME Inventory (see Appendix A for items in Demographics questionnaire and HOME Inventory).

CHAPTER 3

Demographic and Background Characteristics of the Participants

This chapter summarizes the information related to demographic and background characteristics of the participants such as children's vocabulary knowledge, parents' child rearing values and practices, and factors related to socioeconomic background of the participants as recorded by additional measures I listed in the previous chapter.

3.1. Child Vocabulary Scores

All children who participated in the question elicitation task with the experimenter took the vocabulary test (*N* = 105: 55 middle-class and 50 low-income). The Turkish Receptive Language Test (TRLT) is a standardized test appropriate for children of 2 to 12 years of age with 157 items. For each word in the vocabulary test, the child is shown a page with four pictures and asked to identify the one that depicts the meaning of the word presented by the experimenter, similar to the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981). The test starts with the age level appropriate for the child's age and basal and ceiling levels are determined depending on children's correct responses. Basal level is established when children answer 8 successive items correctly and the test is terminated when children answers 8 items incorrectly out of 12 items.

For the vocabulary test, I first calculated the raw scores based on the number of words children correctly recognized by selecting the appropriate picture among 4 pictures. Then I converted the raw scores into age standardized latent ability scores (*M* = 100, *SD* = 15). Table 3.1 summarizes children's vocabulary scores across age and SES groups.

Table 3.1.

Mean Scores (Standard Deviations) in the TIFALDI Vocabulary Test across Age and SES Groups

	Middle-class	Low-income
3-year-olds	125.94 (5.25)	121.13 (11.59)
4-year-olds	119.38 (11.6)	113.65 (12.29)
5-year-olds	122.44 (10.62)	112.89 (12.45)

I conducted a two-way between subjects ANOVA to to see the effects of Age and SES on children's vocabulary scores. The analysis yielded a main effect of Age, $F(2, 99) = 3.86$, $p < .05$, $\eta_\rho^2 = .072$. Pairwise comparisons using Bonferroni corrections indicated that 3-year-olds ($M = 123.6$, $SD = 9.1$) had higher scores than 4- ($M = 116.8$, $SD = 12.1$), $p < .05$ and 5-year-olds ($M = 117.7$, $SD = 12.4$), $p = .089$. There was also a main effect of SES, $F(1, 99) = 9.64$, $p < .01$, $\eta_\rho^2 = .089$, indicating that children from low-income backgrounds ($M = 115.89$, $SD = 12.44$) scored lower in the vocabulary test than children from middle-class ($M = 122.59$, $SD = 10.01$) backgrounds. These Age differences could be explained by increasing difficulty of items for children from low-income backgrounds at older ages.

3.2. Parental Values in Demographics Questionnaire

All parents whose children participated in question elicitation task with the experimenter ($N = 105$: 55 middle-class and 50 low-income) filled out the demographics questionnaire about their family's monthly expenses, and parental education levels. In this questionnaire, mothers also answered 4 forced-choice questions about the values they wanted to instill in their children. These values were 1) independence vs. respect

for elders, 2) obedience vs. self-reliance, 3) curiosity vs. good manners, 4) considerate vs. well-behaved. Independence, self-reliance curiosity and being considerate were characterized as more Western values, while the others were characterized as more non-Western values (Feldman & Stenner, 1997).

I examined mothers' forced-choice selection of these values in middle-class and low-income samples by looking at the frequencies of responses. I examined whether Western (1) and non-Western (0) values also reflect on SES differences or not. A chi square test of independence was calculated comparing the frequency of Western and non-Western values in middle-class and low-income samples. A significant difference was observed for respect for elders vs. independence, $\chi^2(1) = 9.91$, $p < .01$. Mothers from low-income families selected respect for elders more frequently than mothers from middle-class families, and mothers from middle-class families selected independence more frequently than mothers from low-income families (see Table 3.2 for within SES percentages). Another significant difference was found for obedience vs. self-reliance, χ^2 (1) = 4.57, $p < .05$. A few mothers in the low-income sample selected obedience while none of the mothers in the middle-class sample selected obedience as a value they wanted to instill in their children. There was also a marginally significant difference between preference for considerate vs. well-behaved $\chi^2(1) = 3.59$, $p < .058$. Contrary to my expectations, the frequency of considerate was higher in the low-income sample while well-behaved was higher in the middle-class sample. Table 3.2 presents the summary of chi square analyses for each value across middle-class and low-income samples.

Table 3.2.

Crosstabulation between Parental Values and SES (% within SES level)

	Middle-class	**Low-income**	χ^2	***P***
Independence	31 (56.4%)	13 (26%)	9.91	< .01
Respect for elders	24 (43.6%)	37 (74%)		
Obedience	0 (%)	4 (8%)	4.57	< .05
Self-reliance	55 (100%)	46 (92%)		
Curiosity	27 (49%)	19 (38%)	1.31	.33
Good manners	28 (51%)	31 (62%)		
Considerate	2 (3.6%)	7 (14%)	3.59	.08
Well-behaved	53 (96.4%)	43 (86%)		

3.3. HOME Inventory

I used the Turkish version of HOME inventory during the home visits (N=71: 36 middle-class and 35 low-income). The Turkish version was based on a structured interview with close-ended questions, but there were also some sections based on experimenter's observation. The inventory had 7 subscales based on items in the inventory: 1) experience variety, 2) academic stimulation, 3) learning materials, 4) language stimulation, 5) physical environment, 6) responsivity, 7) harsh discipline (see Appendix A for items in each subscale).

The majority of the items in the inventory were dichotomous (1=yes; 0=no). The items for experience variety and academic stimulation were non-dichotomous. I recoded these items as 1 and 0 based on the HOME Inventory coding manual. I summed the

scores of the items to create subscales. Next, I examined whether and how the responses to these subscales differed in middle-class and low-income samples. I conducted independent samples *t* tests to compare the two SES groups for each subscale. Table 3.3 summarizes the results of these analyses.

Table 3.3.

HOME Inventory Subscales Means (Standard Deviations) for Middle-class and Low-income Samples

Subscales	**Middle-class**	**Low-income**	***t***	***P***
Experience Variety (8 items)	7.2 (0.9)	6.47 (1.25)	2.77	< .001
Academic Stimulation (7 items)	5.06 (0.6)	4.83 (1.2)	.97	.33
Learning Materials (9 items)	8.23 (0.9)	5.17 (2.1)	8.1	< .001
Language Stimulation (8 items)	8 (0)	5.67 (2.03)	6.8	< .001
Physical Environment (8 items)	6.74 (1)	5.28 (1.3)	5.35	< .001
Responsivity (9 items)	8.91 (0.5)	5.25 (2.7)	8.02	< .001
Harsh Discipline (3 items)	0 (0)	0.03 (0.17)	-.99	.32
Hours spent watching TV per day	2.09 (1.5)	3.06 (1.97)	-2.3	< .05

The results of the *t* tests showed middle-class families had significantly higher scores in the subscales of experience variety, learning materials, language stimulation, and physical environment. I also examined the average time children spent watching TV per day as their mothers reported and the results showed that children from low-income families spent longer time watching TV everyday than children from middle-class families.

CHAPTER 4

Study 1: Examination of Turkish Preschoolers and Mothers' Question-asking Behavior during a Storybook Reading Activity at Home

The goal of the first study was to examine the frequency and the types of questions asked by Turkish mothers and preschoolers from middle-class and low-income families while reading *Wacky Wednesday*, a wordless picture book depicting extraordinary events at home. This book was particularly chosen to provide mothers and children from middle-class and low-income backgrounds with equally surprising and question-provoking situations in a semi-structured context. Moreover, expanding on previous research, this study concentrated on mothers' questions as well as children's questions and explored whether there was a positive association between mothers' questions and children's questions indicating that mothers who asked more questions had children who asked more questions as well. My specific research questions and hypotheses for this study are presented below.

4.1. Research Questions and Hypotheses

Research question 1. What types of questions do mothers and their children ask during a book reading activity, and what is the frequency of their questions? Do the types and the frequencies of questions vary by children's age and family SES?

Hypothesis 1a. There will be no difference in the frequency of information-seeking questions asked by mothers across age groups.

Hypothesis 1b. Mothers from middle-class families will ask more explanation-seeking questions than mothers from low-income families, while there will be no differences in the frequency of fact-seeking questions across SES groups.

Hypothesis 1c. Children will ask more information-seeking questions (fact-seeking and explanation-seeking) than non-information seeking questions to their mothers during the storybook reading activity.

Hypothesis 1d. The frequency of explanation-seeking questions will be higher among 4- and 5-year-olds than among 3-year-olds, while there will be no difference in the frequency of fact-seeking questions across age groups.

Hypothesis 1e. Children from middle-class families will ask more explanation-seeking questions than their peers from low-income families, while there will be no difference in the number of fact-seeking questions across SES groups.

Research question 2. What is the relationship between mothers' information-seeking questions and children's information-seeking questions as displayed in the storybook reading activity at home?

Hypothesis 2. There will be positive association between mothers' questions and children's questions. Mothers who ask more questions will have children who ask more questions as well.

4.2. Method

4.2.1. Participants. Participants in this study were 71 mother-child dyads who were recruited for the home visit part of the study. Three-, 4- and 5-year-olds were distributed across 2 SES groups with 35 families from middle-class (10 3-year-olds, M_{age} = 3;5; 13 4-year-olds, M_{age} = 4;4; 12 5-year-olds, M_{age} = 5;3) and 36 families from low-income backgrounds (12 3-year-olds, M_{age} = 3;6; 12 4-year-olds, M_{age} = 4;5; 12 5-year-olds, M_{age} = 5;4). See Chapter 2: General Method for the details of participant recruitment process.

4.2.2. Materials. The experimenter asked the mothers to read a wordless picture book (*Wacky Wednesday* by Dr. Seuss, 1974) with their children as they typically would read a storybook.

4.2.2.1. Wacky Wednesday (Dr. Seuss, 1974). This book is about a young boy who wakes up one day and finds that more and more things are wacky, that is, strange or extraordinary, and nobody notices them except for him. The illustrations on each page show extraordinary situations such as a shoe on the ceiling of the boy's bedroom, a banana tree in the toilet, and a mouse chasing a cat. There are more and more wacky things on each page, and in the end, the boy needs to count all the wacky things so that Wacky Wednesday ends and everything goes back to normal. This commercially available book was shortened and turned into a wordless picture book by erasing the few words it had. In addition, the storybook was adapted into Turkish culture by modifying and removing some parts of the pictures (e.g., giving the book a Turkish title and removing or replacing items belonging to American culture). Both the extraordinary events depicted in the pictures and the lack of a text were intended to provide mother-child dyads with a context to talk more, to ask questions and to provide explanations spontaneously. See Appendix B for the examples pictures of the storybook.

4.2.3. Procedure. When introducing the book, the experimenter described the subject matter of the book in one or two sentences to the mothers (e.g. "Here is a book about a boy who sees strange and extraordinary things everywhere when he wakes up one morning"). The mothers were allowed to take a look at the pictures of the storybook before they started reading it and they took as much time as they wanted while reading the storybook with their children.

4.3. Data Preparation and Coding

4.3.1.Conversational turns. Mother-child conversations during the storybook reading were transcribed verbatim and segmented into conversational turns. Conversational turns were operationalized as an utterance or any set of utterances by one of the speakers that were followed by the other speaker. Once the conversation started, each turn taking between the mother and child was counted as one conversational turn. The last conversational turn was determined when the mother or the child signaled that their conversation about the story had ended. The number of conversational turns per transcription was a gross measure of the length of mother-child conversations.

4.3.2.Question types. In each transcript, the frequency of questions asked by mothers and children was counted. First, questions were divided into two categories as information-seeking versus non-information seeking questions. Then information-seeking questions were further divided into two categories as fact-seeking ("what" and "yes/no" type of questions) and explanation-seeking ("why" and "how" questions) questions using the same coding scheme as Chouinard, 2007 (see Table 4.1 for the description of the types of questions and examples).

Table 4.1.

Coding Categories for Questions in the Mother-Child Storybook Reading Activity (Wacky Wednesday)

Information-seeking Questions		Non-information Seeking Questions
Fact-seeking	Explanation-seeking	Other
What is it? *(Ne?)*	Why? *(Neden/Niçin/Niye?)*	Tag Questions: Isn't it? *(Değil mi?)*
When? *(Ne zaman?)*	How? *(Nasıl?)*	Requests: Could you look at this picture? *(Bakar mısın?)*
Who/Whose is it? (*Kim/ Kimin?)*	What is it for? *(Ne için?)*	Confirmation: *Is it so? (Öyle mi?)*
Which color is it? *(Hangi renk?)*	Do you know why? *(Neden olduğunu biliyor musun?)*	Reported Speech Questions: "What is this?," she said. ("Bu ne?," dedi)
What is it made of? *(Ne-y-den yapılmış?)*	Is this why? *(Öyle olduğu için mi?)*	
What is it doing? *(Ne yapıyor/Napıyor?)*		
Where is it? *(Nerede?)*		
Yes/No "Does it live in water?"*(Suda mı yaşıyor?)*		
What kind? *(Ne çeşit?)*		
What happened? *(Ne oldu/Noldu?)*		
What else? *(Başka ne var/yapıyor?)*		

4.4. Results

4.4.1. Number of conversational turns. First, I examined the number of conversational turns between mother-child dyads to see whether there are differences in the amount of talk by age and SES. Table 4.2 shows the mean number of mother-child conversational turns across Age and SES groups.

Table 4.2.

Mean Frequencies (Standard Deviations) of Mother-Child Conversational Turns across Age and SES Groups

# of Conversational Turns	Middle-class	Low-Income
3-year-olds	96.3 (70.13)	87.67 (53.41)
4-year-olds	120.67 (79.84)	106.27 (76.46)
5-year-olds	137.1 (116.72)	80.1 (67.8)

To examine whether there were Age and SES-related differences in the number of mother-child conversational turns, I conducted a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle-class and low-income) factorial ANOVA on the frequencies of conversational turns. There was a non-significant main effect of Age, p = .65 and a non-significant main effect of SES, p = .173. The mean frequencies of conversational turns in middle-class (M = 119.3, SD = 91) and low-income (M = 91, SD = 65.2) mother-child dyads were found to be similar.

4.4.2. Frequencies and types of questions asked by mothers and children. My first research question was concerned with the frequency and the types of spontaneous questions asked by Turkish mothers and preschoolers while reading Wacky

Wednesday together, and whether the frequency and types of questions varied by age and SES. To address these questions, I conducted two mixed factorial ANOVAs, first one on mothers' questions and second one on children's questions. I report these analyses separately.

4.4.2.1. Mothers' questions. First, I examined mothers' information-seeking (fact- and explanation-seeking) and non-information seeking questions. Table 4.3 reports the mean frequencies of mothers' questions across Age and SES groups**.**

Table 4.3.

The Mean Frequencies (Standard Deviations) of Mothers' Fact-seeking and Explanation-seeking Questions during the Book Reading Activity

Question Type	Middle-class			Low-income		
	Age 3	Age 4	Age 5	Age 3	Age 4	Age 5
Information-seeking						
Fact-seeking	64.4 (64.5)	60 (72.2)	71 (82.3)	43.2 (21.5)	61.6 (51.5)	41.7 (33.3)
Explanation-seeking	4.3 (4.8)	5.2 (7.7)	7.4 (13.5)	4.8 (7.02)	4.9 (6)	3.9 (5.04)
Non-information-seeking	19 (15.2)	27.3(18.6)	21.3(24.2)	23.9 (15.4)	21.9 (18.7)	16 (16.5)

The majority of mothers' questions were information-seeking (76 % middle-class and 72% low-income) questions rather than other type of questions (24% middle-class and 28% low-income)**.** In addition, the majority of mothers' information-seeking questions were fact-seeking (70 % middle-class and 66% low-income) rather than explanation-seeking (6% middle-class and 6% low-income). To compare mothers'

information-seeking and non-information seeking questions, and to find out whether there were Age and SES related differences, I conducted a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle-class and low-income) X 2 (Question Type: information-seeking, non-information seeking) mixed factorial ANOVA. This analysis revealed a main effect of Question Type, $F(1, 63) = 39.67$, $p < .001$, $\eta_p^2 = .386$, indicating that mothers asked more information-seeking questions ($M = 61.81$, $SD = 63.05$) than non-information seeking questions ($M = 21.65$, $SD = 18.07$). There was not a significant main effect of Age, $p = .879$, or a main effect of SES, $p = .310$ suggesting that mothers from middle-class and low-income backgrounds asked similar amount of questions to their children across all three age groups.

Next, I focused on mothers' information-seeking questions and investigated whether the frequency of mothers' fact-seeking and explanation-seeking questions changed by Age and SES. I conducted a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle-class and low-income) X 2 (Question Type: fact-seeking, explanation-seeking) mixed factorial ANOVA on mothers' questions. The analysis indicated that there was a significant main effect of Question Type, $F(1,63) = 67.13$, $p < .001$, $\eta_p^2 = .516$, indicating that mothers asked more fact-seeking questions ($M = 56.7$, $SD = 57.1$) than explanation-seeking questions ($M = 5.12$, $SD = 7.8$). Neither the main effect of Age, $p = .928$ nor SES, $p = .267$ was significant.

Overall, these results suggested that Turkish mothers asked more information-seeking questions than non-information seeking questions when reading a wordless storybook with their children. Within these information-seeking questions, they asked more fact-seeking questions than explanation-seeking questions. Contrary to my

expectation, there were not any age or SES related differences in the frequency of mothers' information-seeking questions; mothers from middle-class and low-income families asked similar number of questions to their 3-, 4- and 5-year-olds.

4.4.2.2. Children's questions. Second, I examined children's information-seeking versus non-information seeking questions during the book reading activity. Table 4.4 reports the mean frequencies of children's questions across age and SES groups.

Table 4.4.

Mean Frequencies (Standard Deviations) of Children's Questions during the Book Reading Activity across Age and SES Groups

Question Type	Middle-class			Low-income		
	Age 3	Age 4	Age 5	Age 3	Age 4	Age 5
Information-seeking						
Fact-seeking	6.6 (5.9)	5.7 (9.9)	5.6 (7.3)	5.3 (6.5)	7.9 (13.5)	5.8 (5.6)
Explanation-seeking	2.1 (2.03)	3 (5.03)	1 (1.3)	2.5 (6.5)	0.9 (1.7)	0.9 (1.3)
Non-information-seeking	1.4 (2.2)	0.9 (1.2)	.75 (1.4)	0.75 (1.5)	0.2 (0.4)	1.7 (4.6)

The majority of children's questions were information-seeking (89 %) rather than non-information-seeking (11%). A 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle-class and low-income) X 2 (Question Type: information-seeking, non-information seeking) mixed factorial ANOVA showed that there was a main effect of

Question Type, $F(1, 63) = 26.82$, $p < .001$, $\eta_p^2 = .299$. Children asked more information-seeking questions ($M = 7.89$, $SD = 11.24$) than non-information seeking questions ($M = 0.94$, $SD = 2.27$). Neither the main effect of Age, $p = .898$, nor the main effect of SES, $p = .522$ was significant.

Next I examined whether there were Age and SES differences in children's information-seeking questions by conducting a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle-class and low-income) X 2 (Question Type: fact-seeking, explanation-seeking) mixed factorial ANOVA on children's questions, with Age and SES as the between-subjects factors, Question Type as the within-subjects factor. This analysis yielded a non-significant main effect of Age, $p = .808$. The frequency of children's information-seeking questions did not differ across three age groups. There was also a non-significant main effect of SES, $p = .528$. There was a significant main effect of Question Type, $F(2,126) = 31.264$, $p < .001$, $\eta_p^2 = .332$, indicating that children asked more fact-seeking questions ($M = 6.16$, $SD = 8.4$) than explanation-seeking questions ($M = 1.74$, $SD = 3.6$).

To summarize, Turkish preschoolers asked more information-seeking questions than non-information seeking questions, confirming my hypothesis that children would ask questions to seek information from others. However, contrary to my expectations, there were not any age or SES related differences.

4.4.3. The relationship between mothers' questions and children's questions. My second research question in this study was concerned with whether the frequency of mothers' information-seeking questions was associated with the frequency of children's information-seeking questions during the book reading activity. More

specifically, I asked whether mothers' who asked more information-seeking questions have children who also asked more information-seeking questions. I computed Pearson product-moment correlation coefficients to assess the relationship between the frequency of mothers' information-seeking questions and children's information-seeking questions. The correlation matrix for these variables is provided in Table 4.5.

Table 4.5.

Bivariate Correlations between Mothers' Questions and Children's Questions during the Book Reading Activity

		1	2	3	4
1	Mother Fact-seeking Questions		.741**	.525**	.308**
2	Mother Explanation-seeking Questions			.393**	.286*
3	Child Fact-seeking Questions				.706**
4	Child Explanation-seeking Questions				

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

The frequency of mothers' fact-seeking questions was positively associated with the frequency of children's fact-seeking questions, $r(70) = .525$, $p < .01$, and explanation-seeking questions, $r(70) = .308$, $p < .01$. In addition, the frequency of mothers' explanation-seeking questions was positively associated with the frequency of children's fact-seeking questions, $r(70) = .393$, $p < .01$, and explanation-seeking questions, $r(70) = .286$, $p < .05$. These findings supported the hypothesis that mothers who asked more information-seeking questions had children who asked more information-seeking questions as well.

4.5. Summary and Discussion

This study examined whether there were differences in the frequency and the types of questions asked by Turkish mothers and preschoolers while reading a wordless picture book at home, and whether mothers' question-asking behavior was associated with children's question-asking behavior. Examination of mother-child conversational turns suggested that all mothers engaged in more or less equal amount conversational turns with their children during this book reading activity across older or younger age groups. With respect to the frequency and the types of questions, both mothers and children asked more information-seeking questions than non-information seeking questions regardless of Age and SES. Also, fact-seeking questions were more frequent than explanation-seeking questions within information-seeking questions. The absence of SES differences in mothers' and children's questions could be attributed to the subject matter of the storybook, which could have obscured possible differences between SES groups in terms of having acquired different amounts of knowledge.

The second leading interest of this study was the relationship between mothers' information-seeking questions and children's information-seeking questions. The findings showed that mothers' question-asking behavior was significantly associated with children's questions during the book reading activity. In other words, mothers who asked more fact-seeking and explanation-seeking questions had children who asked more fact-seeking and explanation-seeking questions. These findings imply that mothers' information-seeking questions could serve as a model for children to ask similar questions during mother-child conversations.

CHAPTER 5

Study 2: Examination of Turkish Preschoolers' Question-asking Behavior in An Experimental Question Elicitation Task

This study aimed to extend Study 1 by examining the frequency and types of questions asked by children in an experimental question elicitation task controlling for the quality of answers they received from the experimenter. The sample of 105 preschoolers participated in this study.. For this study, I designed a question elicitation task, in which I presented children with pictures of novel animals and objects and invited them to ask questions. In designing this task, I was inspired by the methodology used by Greif, Kemler-Nelson, Keil and Gutierrez (2006) in studying children's questions about animal and artifacts. . In this study, they presented 3- to 5-year-olds with pictures of novel animals and objects on a laptop screen and prompted children to ask questions. They responded children's initial questions (e.g., What is it?) that could either request the name of the item or ask about the function/behavior of the item only by providing the name of the item. Then all the later questions children asked were answered with appropriate information. With this methodology, each child asked 26.1 questions on average over the course of 12 trials.

As I concentrated on children's both fact-seeking and explanation-seeking questions in this study, I expanded on their method and showed children two pictures of the same item; one showing the item alone and the other showing the item in context. This way, I aimed to elicit explanation-seeking questions as well as fact-seeking questions from children. I also tested all children in two answer conditions: informative answer condition and non-informative answer condition. In the informative answer

condition, I gave scripted informative answers (facts and explanations) to children's questions while in the non-informative answer condition, I did not give children any information; I either repeated their question or told them "I don't know." This manipulation allowed me to examine whether children's question-asking behavior is influenced by the quality of the answers they received from the experimenter or not.

In addition, I wanted to explore whether elicitation context has an effect on the frequency of children's questions and whether children who asked more questions in one context (i.e. storybook reading with mothers) also asked more questions in the other context (question-elicitation task with the experimenter). For this purpose, I focused on the subsample of participants who participated in both mother-child storybook reading and question-elicitation task. I first examined the relationship between children's questions as displayed by storybook reading activity and in the question-elicitation task with the experimenter. Then I also explored the relationship between mothers' questions as displayed by storybook reading activity and children's questions in the question elicitation task with the experimenter. My specific research questions and hypotheses for this study are presented below.

5.1. Research Questions and Hypotheses

Research question 1. What types of questions do children ask in order to learn about novel entities they encounter in an experimental context and what is the frequency of their questions? Do the types and the frequencies of the questions vary by age, SES and quality of the answer they receive?

Hypothesis 1a. Children will ask more information-seeking questions (fact-seeking and explanation-seeking) than non-information seeking questions to the experimenter during the question-elicitation task.

Hypothesis 1b. The frequency of explanation-seeking questions will be higher among 4- and 5-year-olds, while there will be no difference in the frequency of fact-seeking questions across age groups

Hypothesis 1c. Children from middle-class families will ask more explanation-seeking questions than children from low-income families, while there will be no difference in the frequency of fact-seeking questions across SES groups.

Hypothesis 1d. Children will ask more fact-seeking and explanation-seeking questions in the informative answer condition than non-informative answer condition.

Hypothesis 1e. There will be an interaction between SES and answer condition. Children from middle-class families will ask more fact-seeking and explanation-seeking questions than children from low-income families in the informative answer condition.

Research question 2. What is the relationship between children's information-seeking questions as displayed with the storybook reading activity at home and children's information-seeking questions as displayed in the question-elicitation task in the experimental context?

Hypothesis 2. There will be a positive association between children's information-seeking questions with the storybook reading activity with mothers and children's information-seeking questions in the question elicitation task. Children who ask more information-seeking questions during the book reading activity will ask more

information-seeking questions during the question-elicitation task than children who ask less information seeking questions during the storybook reading activity with mothers.

Research question 3. What is the relationship between mothers' information-seeking questions as displayed with the storybook reading activity with mothers and children's information-seeking questions as displayed in the question-elicitation task in the experimental context?

Hypothesis 3. There will be a positive association between mothers' information-seeking questions and children's information-seeking questions. Children of mothers who ask more information-seeking questions during the book reading activity at home will ask more information-seeking questions during the question-elicitation task in experimental context than children of mothers who ask less information seeking questions during the book-reading activity at home.

5.2. Method

5.2.1. Participants. A total of 105 children participated in this study. Three-, 4- and 5-year-olds were distributed across 2 SES groups with 55 families from middle-class (16 3-year-olds, M_{age} = 3;5; 21 4-year-olds, M_{age} = 4;5; 18 5-year-olds, M_{age} = 5;3) and 50 families from low-income backgrounds (15 3-year-olds, M_{age} = 3;6; 17 4-year-olds, M_{age} = 4;5; 18 5-year-olds, M_{age} = 5;3). See Chapter 2: General Method for the details of participant recruitment process.

5.2.2. Materials.

5.2.2.1. Question elicitation task. First, I presented children with training trials including familiar animals and objects. In the training trials, there were pictures of 2 familiar items (1 object and 1 animal). Each item had two pictures: item alone and item

in context (showing its habitat/function/activity). Then I presented children with testing trials. In the testing trials, there were pictures of 8 novel items (4 objects and 4 animals), which were selected from the Internet and Greif, Kemler-Nelson, Keil and Gutierrez (2006) study. See Table 5.1 for the list of familiar and novel items used in the question elicitation task. Also, see Appendix C for the pictures and Turkish names used for the items used in this task.

Table 5.1.

Familiar and Novel Animals and Objects (with given Turkish names) used in Question Elicitation Task

	Animals	Objects
Familiar Items	Polar bear	Umbrella
	Leopard	Citrus juicer
Novel Items	Sea otter (Su samuru)	Ball dispenser (Beket)
	Mearkat (Mirket)	Meatball maker (Toparlak)
	Mexican axolotl (Meksika semenderi)	Towel flattener (Garfo)
	Pangolin (Karincayiyen)	Carpet sweeper (Girgir)
	Saiga (Sayga)	Shoe stretcher (Tayfel)
	Chipmunk (Cipmunk)	French fry cutter (Patkes)
	Crocuta crocuta (Krokuta krokuta)	Seeder (Raypa)
	Binturong (Ayi kedisi)	Ball launcher (Filsap)

Children were randomly assigned to one of the 4 possible picture arrangements (A1, A2, B1, B2). For testing trials in order A1, one set of items (4 animals and 4

objects) were selected and randomly ordered, and order A2 reversed the order presented in the A1 (like a mirror image: the first item presented the last and the last item presented the first and all the items in between were arranged accordingly in reverse order). Similarly, for testing trials in order B1, a different set of items (4 animals and 4 objects) were selected and randomly ordered and order B2 reversed the order presented in B1. If children were tested in A1 or A2 orders in the informative answer condition, they were tested in B1 or B2 orders in the non-informative condition, and vice versa.

5.2.3. Procedure. Children were tested individually in a quiet room in their preschool or in the health center. As there were two answer conditions, children were tested twice on two consecutive days. All children were initially tested in the informative answer condition, and then in the non-informative answer condition across two testing sessions. Each testing session lasted about 30 minutes and both sessions were audiovisually recorded.

The experimenter and the child sat at a small table next to each other. Following a short warm-up conversation, the experimenter introduced the task saying they were going to look at pictures of novel animals and objects on a laptop screen. There was a blue box with a question mark on the laptop screen. The child was instructed to use the button with an arrow on the keyboard to open up the box and see what was inside. All children quickly grasped how to use the button to open the box and the same box opening procedure was repeated for each animal and object. Children first saw familiar items in the training trials and then saw the novel items in the testing trials.

The procedure for training and testing trials were exactly the same. Upon the presentation of each picture, the experimenter invited the child to ask questions by

asking whether there was anything s/he wanted to know. The child saw two successive pictures about each item. The first one showed the item alone and the second one showed the same item in the context that signifies one of its features, function or activity such as a pangolin rolling into a ball or a shoe stretcher stretching a shoe. Upon the presentation of first picture, the experimenter first waited for the child to ask about the item. If the child asked, "What is it?," the experimenter told the name of the animal or the object and waited for the child to ask more questions. If the child did not ask anything, the experimenter prompted the child: "What do you want know about it? You can ask me." If there was a pause in the child's talk, experimenter again prompted the child: "What else do you want to know about it? You can ask me." Then upon presentation of the second picture, the experimenter again said: "Here we go. So what do you want to know about what is happening here? You can ask me." The experimenter prompted the child to ask questions if s/he was silent or did not respond. The child was allowed to ask as many questions as s/he wanted for each picture. When the child told the experimenter that these were all questions s/he wanted to ask, s/he moved to the next picture.

On the first day when the child was tested in the informative answer condition, the experimenter gave informative answers to the child (facts and explanations) based on a previously scripted knowledge repertoire. For instance, upon seeing the first picture, if the child asked "What does the pangolin do?," the experimenter answered the child by saying "It climbs trees using its tail," and upon seeking the second picture, if the child asked "Why does the pangolin roll into a ball?," the experimenter answered "It rolls into ball because it is hiding from predators." Even if some children did not ask questions or

asked fewer questions, the experimenter still provided them with the scripted facts and explanations in the knowledge repertoire to make sure that all children had access to same knowledge base in the informative answer condition. Also, as children's questions were spontaneous, there were a few occasions where the scripted answers were not sufficient. In these cases, the experimenter still gave the child an informative answer by paying attention to the child's question but staying within the limits of scripted knowledge repertoire (see Appendix D for the facts and explanations given to children in the informative answer condition).

On the second day when the child was tested in the non-informative answer condition, the experimenter did not give any informative answers to the child. For instance, if the child asked "What does the pangolin do?," the experimenter answered the child by either repeating the question "What does the pangolin do?" or saying "I don't know" and if the child asked "Why does the pangolin roll into a ball?," the experimenter again either repeated the questions or said "I don't know" to the child. Also, Appendix E for examples from experimenter-child interactions during the question elicitation task.

5.3. Data Preparation and Coding

5.3.1. Question types. Children's questions during the testing trials of the task were transcribed verbatim. Then their questions were coded as information-seeking or non-information seeking questions. Information-seeking questions were further divided into two categories as fact-seeking and explanation-seeking questions. Questions seeking for factual information were coded as fact-seeking (e.g. "What is it?," "Is it fish?"), and questions seeking for explanations ("How does it work?," Why does it have

a long tail?”) were coded as explanation-seeking. Other questions, which ask for permission, action, or confirmation, were coded as non-information-seeking questions. Table 5.2 shows the coding categories for questions as adopted from Chouinard (2007).

Table 5.2.

Coding Categories and Examples for Question Types

Information-seeking Questions		Non-information-seeking Questions
Fact-seeking	Explanation-seeking	Action, permission, confirmation-seeking
What is it? (*Ne?*), When? (*Ne zaman?*), Who? (*Kim?*), Which color is it? (*Hangi renk?*), What is it made of? (*Ne(y)den yapılmış?*), What is it doing? (*Ne yapıyor?*), Whose is it? (*Kimin?*), Where is it? (*Nerede?*), Yes/No type of questions (*Uyuyor mu?/Bu kulağı mı?*), What kind (*Ne çeşit?*), What happened? (*Ne oldu?*), What else? (*Başka ne var/yapıyor?*), What does it work with? (*Neyle çalışıyor?*)	Why? (*Neden?*), How? (*Nasıl?*), What would happen if? (*Olsa ne olurdu?*), What is it for? (*Ne için?*), Do you know why? (*Neden olduğunu biliyor musun?*), Is this why? (*Bu yüzden mi?*)	Shall I press the button? (*Basayım mı?*), Can you do this? (*Bunu yapar mısın?*)

5.3.2. Calculation of question frequency. I calculated the frequency of children's questions for testing trials (8 items in total: 4 animals and 4 objects) in both informative answer and non-informative answer conditions. I added the number of questions children asked for each question type across 8 items.

5.3.2.1. Data reduction. Before calculating total frequencies**,** I first examined whether children used one question type exclusively in first picture or second picture of the same item and compared the frequencies of fact-seeking and explanation-seeking questions in both informative and non-informative answer conditions. In the informative-answer condition, the results were significant for both fact-seeking, $t(104) = 11.15$, $p < .001$, and explanation-seeking questions, $t(104) = 2.152$, $p < .05$, showing that children asked the majority of their questions during the presentation of the first picture (fact-seeking: $M = 9.01$, $SD = 7.44$, explanation-seeking: $M = 1.51$, $SD = 2.31$) and asked a few more questions during the presentation of the second picture (fact-seeking: $M = 3.21$, $SD = 3.5$, explanation-seeking: $M = 1.11$, $SD = 1.79$). Similarly, in the non-informative answer condition, children asked majority of their fact-seeking questions during the first picture ($M = 7.52$, $SD = 6.14$) than during the second picture ($M = 2.91$, $SD = 3.24$), $t(104) = 9.88$, $p < .001$. However, there was not a significant difference in children's explanation-seeking questions across pictures, (first picture: $M = .82$, $SD = 1.8$; second picture: $M = .7$, $SD = 1.57$), $t(104) = .74$, $p = .46$. These results indicated that the first picture of a novel item was successful at eliciting both fact-seeking and explanation-seeking questions from children, and children continued to ask questions on the second picture but to a lesser degree. Based on these results, when calculating

question frequency, I decided to use a composite score by adding the number of questions asked in both pictures.

5.4. Results

Over the course of 8 testing trials, children asked an average of 18.5 questions in the informative answer condition (12.2 fact-seeking, 2.6 explanation-seeking, 3.7 non-information seeking), and they asked an average of 14.7 questions per child in the non-informative answer condition (10.4 fact-seeking, 1.5 explanation-seeking, 2.8 non-information seeking). Table 5.3 shows the mean frequencies of the questions children asked during the task across Age and SES groups in the two Answer Conditions.

Table 5.3.

The Mean Frequencies (Standard Deviations) of Question Types across Age, SES and Answer Conditions

Condition	Question Type	Middle-class			Low-income		
		3-year-olds	4-year-olds	5-year-olds	3-year-olds	4-year-olds	5-year-olds
Informative Answer Condition	**Information-seeking**						
	Fact-seeking	14.5 (11)	15.3 (12.6)	14.8 (11.6)	7.33 (6.8)	11.9 (9.9)	8.3 (6.2)
	Explanation-seeking	3.3 (4.3)	5 (5.2)	3.2 (3.1)	1.1 (2.3)	1.5 (1.9)	1.1 (1.6)
	Non-information seeking	6.6 (5.1)	3.1 (3.4)	2.2 (3)	4.7 (5.4)	4.7 (4.6)	1.5 (2.5)
Non-informative Answer Condition	**Information-seeking**						
	Fact-seeking	13.8 (8.9)	13.6 (10)	11.6 (9.2)	7.33 (6.3)	7.6 (6.4)	7.9 (7.5)
	Explanation-seeking	0.8 (1.1)	3.2 (4.8)	2 (2.9)	0.6 (1.1)	0.6 (1.7)	1.3 (2.2)
	Non-information seeking	3.88 (3.24)	2.71 (3.88)	2.28 (4.39)	3.33 (4.55)	3 (5.72)	1.94 (2.18)

5.4.1. The effect of Age, SES and Answer Condition on children's questions.

My first research question asked what were the frequencies and the types of questions that Turkish preschoolers asked and whether these frequencies and types vary depending on children's Age, SES groups and Answer Conditions. To address this question, I conducted two four-way mixed ANOVAs by entering Age and SES as between subject factors, and Question Type and Answer Condition as within subject factors. First ANOVA was on the frequency of information-seeking versus non-information seeking questions. The second ANOVA zeroed in on information-seeking questions and compared fact-seeking and explanation-seeking questions. Since preliminary analyses showed no significant effects or interactions for order of presentation of the 8 items; order was removed from all subsequent analyses.

5.4.1.1. Information-seeking versus non-information seeking questions. I conducted a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle and low) X 2 (Question Type: information-seeking and non-information seeking) and 2 (Condition: informative answer and non-informative answer) mixed factorial ANOVA on the frequency of children's questions. There was a main effect of Answer Condition, F (1,99) =18.99, $p < .001$, η_{ρ}^{2}=.16. Children asked more questions in the informative answer condition (M = 18.5, SD = 14.2) than in non-informative answer condition (M = 14.78, SD = 12.39). The main effect of Age was not significant, p = .465. But there was a main effect of SES, F (1,99) = 10.44, $p < .01$, η_{ρ}^{2}=.095. Children from middle-class families (M = 20.3, SD = 13.15) asked more questions than children from low-income families (M = 12.6, SD = 10.6). There was also a main effect of Question Type, F (1,99)

= 123.24, $p < .001$, η_ρ^2=.56. Children asked more information-seeking questions (M = 13.4, SD = 10.57) than non-information seeking questions (M = 3.24, SD = 3.72).

There was a significant interaction between Answer Condition and Question Type, F (1,99) = 4.6, $p < .05$, η_ρ^2 = .044. To interpret this interaction, the simple effect of Question Type was calculated for each Condition. The analysis was significant for both Conditions but means suggested that the decrease in the frequency of children's information-seeking questions was higher for informative (M = 14.86, SD = 12.5). to non-informative answer conditions (M = 12, SD = 10.1), F (1,99) = 12.56, $p < .001$, η_ρ^2 =.113 than decrease in the frequency of children's non-information seeking questions (informative answer condition: M = 3.67, SD = 4.3; non-informative answer condition: M = 2.82, SD = 4.1), F (1,99) =6.33, $p < .05$, η_ρ^2=.06 (see Figure 5.1).

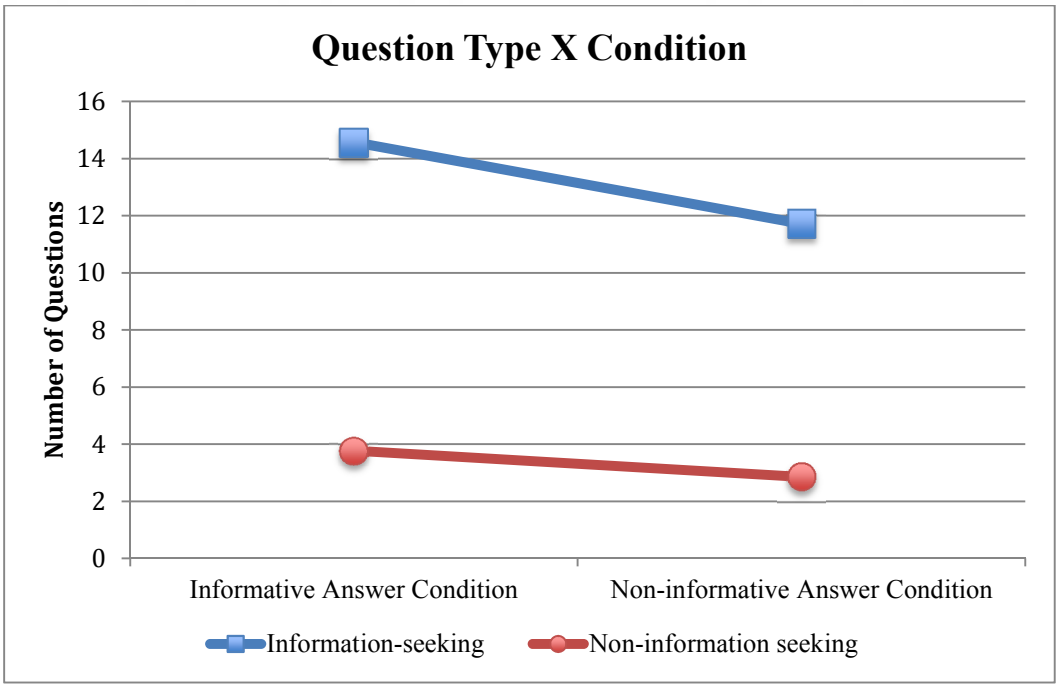

Figure 5.1. Interaction between Question Type (Information-seeking vs. Non-information seeking) and Condition

There was also a significant interaction between Question Type and SES, F (1,99) = 16.32, $p < .001$, $\eta_p^2 = .142$. An analysis of simple effects showed that the effect of SES was significant for information-seeking questions, $F(1, 99) = 14.15$, $p < .001$, $\eta_p^2 = .125$, but not for non-information-seeking questions, $F(1, 99) = 142$, $p = .71$, $\eta_p^2 = .001$. This finding showed that children from middle-class backgrounds asked more information-seeking questions ($M = 17$, $SD = 11.6$) than children from low-income backgrounds ($M = 9.5$, $SD = 7.6$). On the other hand, there was no SES difference in the frequency non-information seeking questions; children from middle-class ($M = 3.4$, $SD = 3.5$) and low-income backgrounds ($M = 3.1$, $SD = 4$) asked similar amount of non-information seeking questions (see Figure 5.2).

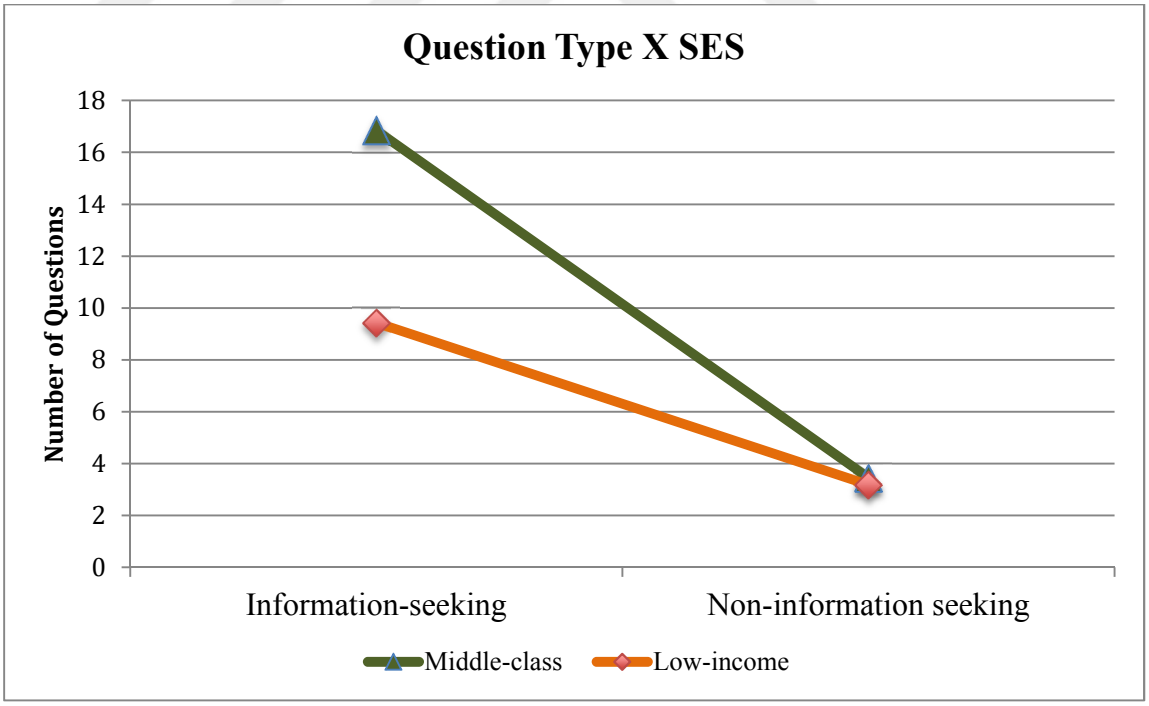

Figure 5.2. Interaction between Question Type (Information-seeking vs. Non-information seeking) and SES

5.4.1.2. Fact-seeking versus explanation-seeking Questions. Next, I focused on children's information-seeking questions and examined whether there were differences in the frequency of fact-seeking and explanation-seeking questions across Age groups, SES, and informative versus non-informative Answer Conditions. I conducted a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle and low) X 2 (Question Type: Fact-seeking and Explanation-seeking) X 2 (Answer Condition: informative- answers and non-informative-answers) mixed factorial ANOVA. The results revealed that there was a significant main effect of Answer Condition, F (1,99) = 12.67, $p < .001$, $\eta_\rho^2 =$ .113. Children asked more questions when they received informative answers to their questions (M = 14.8, SD = 12.5) than when they received non-informative answers (M = 12, SD = 10.1). In addition, there was a significant main effect of question type (F (1,99) = 143.52, $p < .001$, $\eta_\rho^2 = .592$). Children asked more fact-seeking questions (M = 11.3, SD = 8.8) than explanation-seeking questions (M = 2.1, SD = 3.04) across both conditions. There was not a main effect of age, $p = .526$. The frequency of questions did not differ across the three age groups. There was a significant main effect of SES, F (1,99) = 14.19, $p < .001$, $\eta_\rho^2 = .125$. Children from middle-class families asked more questions (M = 17, SD = 11.6) than children from low-income families (M = 9.5, SD = 7.6).

In addition, there was a significant interaction between Question Type and SES F (1,99) = 5.66, $p < .05$, $\eta_\rho^2 = .054$. To interpret the interaction, the simple effect of SES was calculated for each Question Type. The analysis showed that children from low-income backgrounds asked fewer fact-seeking questions (M = 8.4, SD = 6.6) than children from middle-class backgrounds (M = 14, SD = 9.7), F (1,99) = 10.94, $p < .001$,

η_p^2=.1. Similarly, children from low-income families asked fewer explanation-seeking questions (*M* =1.04 , *SD* = 1.7), *F* (1,99) = 11.3, *p* < .001, η_p^2=.102 than middle-class children (*M* = 3, *SD* = 3.7) but the difference in the frequency of fact-seeking questions across SES groups was larger than the difference in the frequency of explanation-seeking questions (see Figure 5.3).

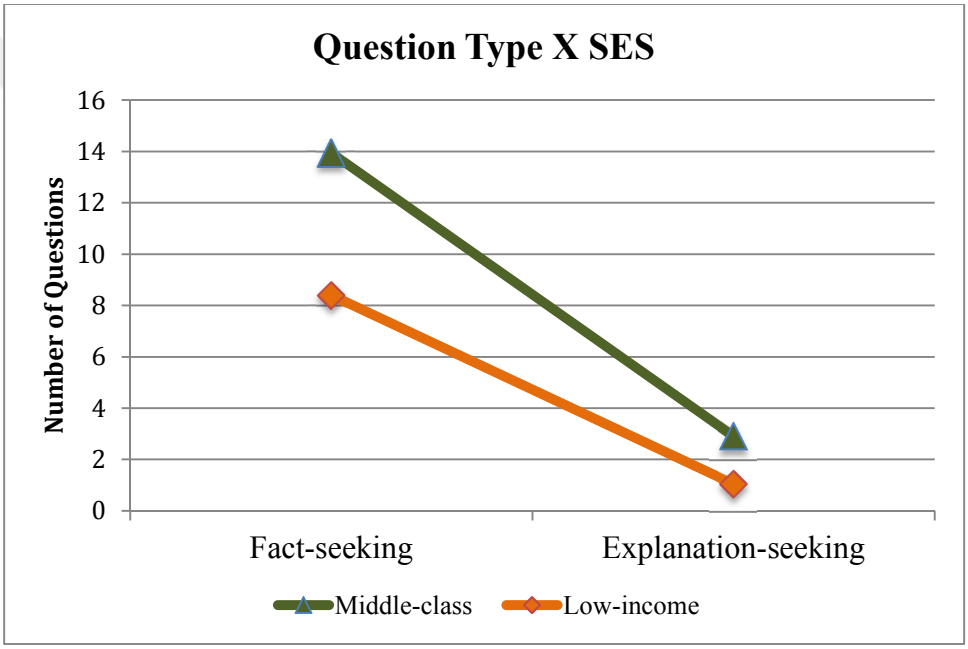

Figure 5.3. Interaction between Question Type (Fact-seeking vs. Explanation-seeking) and SES

5.4.1.3. Initial versus subsequent questions. In the question-elicitation task, over the course of 8 testing trials, children from both middle-class and low-income families quickly became accustomed to ask the question of "What is it?" after they opened the box and saw the picture of a novel item. However, what is more critical was the frequency of the subsequent questions they asked after the initial question. In addition,

as I described in the method section for the question-elicitation task, children were given the name of the item in both informative and non-informative answer conditions. But they were given facts and explanations for subsequent questions only in the informative answer condition. Therefore, I separated children's initial questions from their subsequent questions and explored whether children continued to ask questions after their initial questions on each novel item. Also, if they continued to ask questions, I explored what type of questions they asked and whether these questions varied across informative and non-informative answer conditions.

To investigate this question, I divided children's questions into two categories as initial and subsequent questions. Initial questions were operationalized as the questions children asked as soon as they saw the first picture and second picture of a novel item, while subsequent questions were operationalized as additional questions children asked after their initial questions to seek for more information as they were receiving informative vs. non-informative answers from the experimenter. For this purpose, I calculated the frequencies of children's fact-seeking and explanation-seeking questions by separating and summing up the initial and subsequent questions they asked across 8 testing trials. Table 5.4 provides the mean frequencies of the initial and subsequent questions children asked in informative and non-informative answer conditions.

Table 5.4.

Mean Frequencies (Standard Deviations) of Initial and Subsequent Questions by Age and SES group in Answer Conditions

	Middle-class			Low-income		
Informative Answer Condition	3-year-olds	4-year-olds	5-year-olds	3-year-olds	4-year-olds	5-year-olds
Initial Fact-seeking	5.5 (3.5)	5 (3.6)	4.3 (3.1)	4.8 (4.9)	4.4 (3.2)	3.7 (2.6)
Subsequent Fact-seeking	9 (8.6)	10.4 (9.9)	10.6 (9.7)	2.6 (2.5)	7.6 (8.1)	4.6 (4.7)
Initial Explanation-seeking	0	0.5 (1)	0	0	0	0
Subsequent Explanation-seeking	3.3 (4.3)	4.5 (4.8)	2.4 (2.2)	1 (2.1)	1.4 (1.9)	1.1 (1.5)
Non-informative Answer Condition						
Initial Fact-seeking	5.9 (2.9)	5.5 (4.1)	4.9 (3.9)	5.3 (5.1)	4.1 (3.6)	3.2 (2.7)
Subsequent Fact-seeking	7.9 (7.1)	8.1 (6.9)	6.7 (6.8)	2 (2.3)	3.5 (3.7)	4.7 (5.4)
Initial Explanation-seeking	0	0.24 (0.4)	0.1 (0.2)	0	0	0.1 (0.2)
Subsequent Explanation-seeking	0.8 (1.1)	3 (4.5)	1.9 (2.8)	0.6 (1.1)	0.6 (1.7)	1.3 (2.1)

Initial Questions. First, I examined whether children's initial questions varied by Age (3-, 4- and 5-year-olds), SES (middle-class vs. low-income) and Answer Condition (informative vs. non-informative). As children's initial questions were mainly fact-seeking questions, and they rarely asked explanation-seeking questions upon the presentation of the pictures, I examined only fact-seeking questions. The analysis revealed that there was not a main effect of age, $p < .25$; SES, $p < .16$; or Answer Condition, $p < .43$. Regardless of Age and SES, all children asked initial ("what is it?") questions across two Answer Conditions.

Subsequent Questions. Second, I examined children's subsequent questions. Subsequent questions were the main interest of this analysis because children asked these questions as they were receiving answers from the experimenter. I conducted a factorial ANOVA including Age (3-, 4- and 5-year-olds), SES (middle-class vs. low-income), Answer Condition (informative vs. non-informative) and Question Type (fact-seeking and explanation-seeking) as factor. The analysis showed a main effect of Answer Condition, $F(1, 99) = 15.9$, $p < .001$, η_p^2=0.14. Children asked more questions in the informative Answer Condition ($M = 10$, $SD = 10.1$) than non-informative Answer Condition ($M = 7$, $SD = 7.5$). There was a main effect of Question Type, $F(1, 99) = 69.4$, $p < .001$, η_p^2=0.41. Means suggested that children asked more fact-seeking questions ($M = 6.6$, $SD = 6.5$) than explanation-seeking questions ($M = 1.9$, $SD = 2.8$). The main effect of Age was not significant, p =.27. There was a main effect of SES, $F(1, 99) = 17.6$, $p < .001$, η_p^2=0.15. Children from middle-class backgrounds ($M = 5.7$, $SD = 4.5$) asked more questions than children from low-income backgrounds ($M = 2.6$, $SD = 2.7$). Finally, there was a significant interaction between Question Type and SES, $F(1,$

99) = 6.89, $p < .01$, η_p^2=0.07. An analysis of simple effects showed that comparing Question Type for each level of SES showed that overall children from low-income backgrounds asked fewer questions than children from middle-class backgrounds but the difference was higher for fact-seeking questions (middle-class *M* = 8.8, *SD* = 7.3; low-income *M* = 4.3 *SD* = 4.5) than explanation-seeking questions (middle-class *M* = 2.7, *SD* = 3.3; low-income *M* = 1, *SD* = 1.6) (see Figure 5.4).

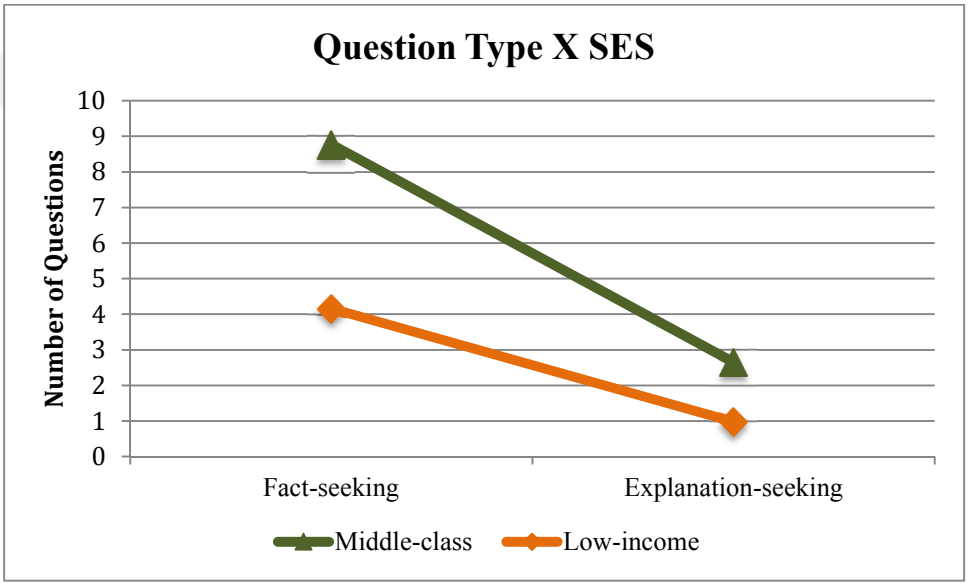

Figure 5.4. Interaction between Question Type and SES for Subsequent Questions

5.4.2. The relationship between children's questions as displayed in Study 1 (storybook reading with mother) and the question elicitation task with the experimenter. My second research question explored the relationship between children's questions as displayed with the storybook reading activity with mothers and as displayed in the question-elicitation task with the experimenter. I expected that children who asked more questions during the storybook reading activity with their

mothers would also ask more questions in the question elicitation task. For this purpose, I examined the subset sample of children who participated both in the home visits (71 3-, 4- and 5-year-olds) and question-elicitation task because mother's question-asking behavior was available only for the subset sample. I collapsed children's fact-seeking and explanation-seeking questions across informative and non-informative answer conditions to have one composite score for each question type. Before examining the correlations among these variables, I first examined whether there were differences in the frequency of children's questions depending on the elicitation methods (storybook with mothers and question elicitation task). Thus, I conducted a mixed factorial ANOVA on the frequency of children's questions by adding elicitation method as a factor. The analysis yielded a significant main effect of elicitation method, F (1, 63) = 12.59, p < .001, η_p^2=.17. There was also a significant interaction between elicitation method and question type, F (1, 63) = 20.3, p < .001, η_p^2=.24. An analysis of simple effects for each question type showed that both storybook with mothers (M = 1.7, SD = 3.6) and question elicitation task (M = 1.9, SD = 3.1) elicited similar number of explanation-seeking questions, p = .704; whereas, question elicitation task (M = 11.4, SD = 8.9) elicited more fact-seeking questions than storybook with mothers (M = 6.2, SD = 8.4), F (1, 63) = 17.5, p < .001, η_p^2=.218.

Next, I examined the correlations among variables related to children's questions including age in months, SES (dummy coded as 1=middle-class and 0=low-income), children's vocabulary scores, children's preschool attendance (1=going to preschool, 0= not going to preschool) and mother's fact-seeking and explanation-seeking questions. The correlation matrix for these variables are given in Table 5.5.

Table 5.5.

Bivariate Correlations among Children's Questions in the Storybook Reading with Mothers and Children's Questions in the Question Elicitation Task

	Variables	1	2	3	4	5	6	7	8
1	Age in months		-0.007	-0.169	-0.062	-0.067	-0.219	-0.075	0.038
2	SES			.300*	.529**	0.06	0.072	.288*	.286*
3	Vocabulary				.261*	0.16	0.212	0.225	0.221
4	Preschool attendance					-0.102	0.054	-0.123	-0.162
5	Child Fact-seeking Qs in Storybook						.706**	.245*	0.182
6	Child Explanation-seeking Qs in Storybook							.304*	.270*
7	Child Fact-seeking Qs in the Experimental Task								.470**
8	Child Explanation-seeking Qs in the Experimental Task								

Pearson product moment correlations showed that the frequency of children's fact-seeking questions in the storybook with mothers was strongly related children's fact-seeking questions in the question-elicitation task with the experimenter, $r(70) = .245$, $p < .05$. Also, the frequency of children's explanation-seeking questions in the storybook with mothers was strongly associated with children's fact-seeking, $r(70) = .304$, $p < .05$; and explanation-seeking questions, in the question elicitation task with the experimenter, $r(70) = .27$, $p < .05$. Confirming my expectations, children who asked more questions in the storybook reading activity with their mothers also asked more questions in the question elicitation task with the experimenter. Children's vocabulary and preschool attendance was strongly associated with family SES levels, $p < .05$ and $p < .01$ respectively; but aside from SES, neither of these variables was associated with the frequency of children's questions.

5.4.3. The relationship between mothers' questions Study 1 (storybook reading with mother) and children's questions in the question elicitation task with the experimenter. My third research question explored the relationship between the frequency of mothers' information-seeking questions during the storybook reading activity at home and the frequency of children's information-seeking questions during the question-elicitation task in the experimental context. More specifically, I asked whether children whose mothers asked more questions during book reading activity at home have children who also asked more questions in the question elicitation task.

Table 5.6.

Bivariate Correlations among Mothers' Questions in the Storybook Reading and Children's Questions in the Question Elicitation Task

	Variables	1	2	3	4	5	6	7	8
1	Age in months		-0.007	-0.169	0.042	-0.044	-0.026	-0.075	0.038
2	SES			.300*	.639**	0.154	0.08	.288*	.286*
3	Vocabulary				.296*	0.074	0.105	0.225	0.221
4	Preschool attendance					0.229	0.127	0.106	0.187
5	Mother Fact-seeking Qs						.741**	-0.036	0.071
6	Mother Explanation-seeking Qs							0.042	-0.056
7	Child Fact-seeking Qs in the Experimental Task								.470**
8	Child Explanation-seeking Qs in the Experimental Task								

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

Correlations indicated that the frequency of mothers' fact-seeking questions were not related to the frequency of children's fact-seeking questions, $r(70) = -.036$, $p = .77$ or explanation-seeking questions, $r(70) = .071$, $p = .56$. Similarly, the frequency of mother's explanation-seeking questions were not related to the frequency of children's fact-seeking, $r(70) = .042$, $p = .73$ or explanation-seeking questions, $r(70) = -.056$, $p = .65$. In contrast to my expectations, mothers who asked more information-seeking questions during the book reading activity did not have children who asked more information-seeking questions during the experimental task.

5.5. Summary and Discussion

The findings from this study suggested that Turkish preschoolers asked questions to gather information from more knowledgeable others. Both fact- and explanation-seeking questions were prevalent in their language even when they were 3 years old. Children asked more questions when they received informative answers to their questions than when they received non-informative answers. Confirming the earlier findings in the literature, the findings revealed that children from middle-class families asked more fact and explanation-seeking questions than children low-income families.

Taking a closer look at children's initial and subsequent questions also revealed that children's fact-seeking questions were not just limited to "what is it?" questions that they asked in the beginning to learn the identity of the item. They continued to ask fact-seeking questions afterwards to seek information about the item. Moreover, the results indicated that children from middle-class families asked more questions in the informative answer condition and the frequency of their questions dropped significantly in the non-informative answer condition. More specifically, the drop in the frequency of

subsequent fact-seeking and explanation-seeking questions from informative to non-informative answer condition was less dramatic for children from low-income families than children from middle-class families.

Children asked more fact-seeking questions in the question elicitation task than they asked in the storybook reading with mothers; but the frequency of explanation-seeking questions were similar across two activities. Correlations showed that children who asked more questions in the storybook with mothers also asked more questions in the question elicitation task. Unlike the positive association I found between mother's information-seeking questions and children's information-seeking questions within the storybook reading activity in Study 1, I found no association between mothers' information-seeking questions during the storybook reading activity at home and children's information-seeking questions in the experimental task. SES was the only factor that was positively associated with children's information-seeking questions in the question elicitation task.

CHAPTER 6

Study 3: Mother-Child Conversations about Improbable and Impossible Events and Their Influence on Turkish Preschoolers' Judgments and Explanations

In the previous study, I found that the frequency of children's questions could vary depending on their SES backgrounds and the quality of the answers they received from the experimenter. Building upon these findings, the next question is what happens when children asks fewer questions? Are there any discrepancies in their learning about the phenomena and building conceptual knowledge? To address these questions, in this study, I examined whether mothers' explanatory talk about unobserved and unobservable events were related to children's thinking and explanations about such events. Particularly, in this study, I aimed to complement Study 1 and Study 2 by examining not only the questions but also the explanations provided by mothers while discussing improbable and impossible events with their children. In addition, I examined whether mothers' questions and explanations about improbable and impossible events are associated with children's judgments and explanations about similar events.

For this study, I adopted the methodology used in Nolan-Reyes et al. (2015) study, which investigated parent-child conversations as a context where children learn to reason about possibilities. I first asked mothers to discuss booklets with improbable and impossible events with their children. Open-ended structure of this mother-child activity enabled me to evaluate the frequency and types of questions and explanations mother provide for their children when discussing the possibility of improbable and impossible events. Then I tested children individually in a child judgment task where I gauged their possibility judgments and explanations about similar improbable and impossible events.

This task not only allowed me to assess children's understanding about the possibility of improbable and impossible events systematically; but also allowed me to examine whether mother-child discussions about such events influence children's judgments and explanations. In addition to replication of Nolan-Reyes et al. study, this study expanded on it by examining whether parents' questions and explanations about improbable and impossible events vary by family SES in a different sociocultural context.

I argued that the way mothers from middle-class and low-income backgrounds discuss improbable events with their children could influence children's stance on the possibility of improbable events. For instance, a mother from a middle-class background with higher education level might ask more hypothetical questions (e.g., what would happen if we had a lion as pet?) and provide more hypothetical explanations about improbable events (e.g., having lion as a pet is possible if it is a baby lion) than a mother from a low-income background with lower education level. Such questions and explanations could provide guidance to children about how to use their knowledge base and experience to reflect on the possibility of these events and also explain them in everyday conversations with adults. My specific research questions and hypotheses for this study are presented below.

6.1. Research Questions and Hypotheses

Research question 1. In regards to the likelihood of improbable and impossible events with their children, what are the types of questions asked and explanations given by the mothers, and with what frequency? Do these types and frequencies vary by the children's age, by SES and by event type (improbable versus impossible)?

Hypothesis 1a. Mothers will ask both fact-seeking and explanation-seeking questions to their children and there will be no difference across age groups.

Hypothesis 1b. Mothers from middle-class families will ask more explanation-seeking questions than mothers from low-income families, while there will be no difference in the frequency of fact-seeking questions across SES groups.

Hypothesis 1c. There will be no age difference in the frequency of mothers' factual and hypothetical explanations about improbable and impossible events.

Hypothesis 1d. Mothers from middle-class families will provide more factual and hypothetical explanations than mothers from low-income families.

Hypothesis 1e. There will be an interaction between explanation type and event type. Mothers will provide more hypothetical explanations for improbable events than impossible events, while they will provide more factual explanations for impossible events than improbable events.

Research question 2. What is the relationship between mothers' information-seeking questions and explanations about improbable and impossible events and children's judgments and explanations about similar events?

Hypothesis 2a. There will be a positive association between mothers' information-seeking questions and children's judgments and explanations about improbable and impossible events. Mothers who asked more questions will have children who correctly judge that improbable events could be possible and provide more factual and hypothetical explanations.

Hypothesis 2b. There will be a significant association between mothers' explanations and children's judgments and explanations about extraordinary events.

Mothers who provided more hypothetical explanations will have children who correctly judge that improbable events could be possible and provide more hypothetical explanations. And mothers who provided more factual explanations will have children who correctly reject the possibility of impossible events and provide more factual explanations.

6.2. Method

6.2.1. Participants. The same mother-child dyads that participated in Study 1 also participated in this study.

6.2.2. Materials.

6.2.2.1. Booklets with improbable and impossible events. I created booklets by adopting pictures of improbable and impossible events from Nolan-Reyes, Callanan and Haigh (2015) study. Sixteen unusual events (8 improbable and 8 impossible) were divided equally and randomly across two booklet versions (Booklet A and Booklet B). Each booklet contained 8 unusual event pictures (4 impossible and 4 improbable). Same booklets were used both with mother-child dyads and in the child judgment task with the experimenter. If mother-child dyad received booklet version A, the experimenter used booklet version B. The version of the booklets used in the child judgment task contained four ordinary events in addition. The ordinary events in the child judgment task were randomly distributed to assess any possible response bias from the child. Both booklet versions had a three-page pattern for each event. For example, in Booklet A, the first page read, “The person in the next picture is eating pickle-flavored ice cream.” Page 2 depicted the event with no words, and page 3 read, “Could a person eat pickle-flavored

ice cream in real life?" See Table 6.1 for how events are distributed across two booklet versions and see Appendix F for pictures and scripts used in the booklets.

Table 6.1.

Improbable, Impossible and Ordinary Events in Two Booklet Versions

	Version A	Version B
Mother-child Booklet	*Eat pickle-flavored ice cream*	**Open a window with his mind**
	Have money tree	**Make a car vanish**
	Jump through a brick wall	*Drink onion juice*
	Have a lion for pet	*Find an alligator under bed*
	Have a mug shaped building	*Get struck by lightning*
	Have a polka-dot airplane	*Have a beard down to his toes*
	Go back in time	**Walk on water**
	Eat lightning for dinner	**Turn applesauce back into apple**
Child Judgment Task	**Open a window with his mind**	*Eat pickle-flavored ice cream*
	Make a car vanish	Wash a car
	Wear a sports hat	**Have money tree**
	Drink onion juice	**Jump through a brick wall**
	Find an alligator under bed	*Have a lion for pet*
	Wash a car	Clean a closet
	Get struck by lightning	*Have a mug shaped building*
	Meet a clown	Meet a clown
	Have a beard down to his toes	*Have a polka-dot airplane*
	Walk on water	**Go back in time**
	Turn applesauce back into apple	**Eat lightning for dinner**
	Clean a closet	Wear a sports hat

Note: Impossible events in bold, improbable events in italics, and ordinary events in normal fonts.

6.2.3. Procedure. Mothers were asked to just read and discuss the improbable and impossible events in the booklets, as they would normally do with their children. The experimenter waited in a different room while mother and child completed the task. Mother-child discussions were audio recorded. Following mother-child discussions, the experimenter engaged in child judgment task with the child in a private room. She proceeded through the picture booklet while asking the child about each picture. For example, the experimenter said, "This picture shows a person opening a window with his mind. Could a person open a window with his mind in real life?" If the child answered as "yes", the experimenter followed up with a "how" question, that is, " How would a person open a window with his mind?" On the other hand, if the child answered "no" the experimenter followed up with "why" question, that is, "Why couldn't a person open a window with his mind?" If the child answered, "I don't know," the experimenter prompted the child to give a response by asking the same question one more time.

6.3. Data Preparation and Coding

6.3.1. Coding mothers' questions. I transcribed mother-child conversations verbatim and coded mother's questions related to real-life possibility across 4 improbable and 4 impossible events after they specifically started to discuss whether the given event is possible or not. The coding scheme for mothers' questions was created based on the coding schemes I used in Study 1 and Study 2; questions were coded as fact-seeking, explanation-seeking and non-information seeking questions. Fact-seeking questions were "what" and "yes/no" type of questions asking for relevant information from children about improbable or impossible events. Explanation-seeking questions were "why" and "how" questions asking children why an event could or could not

occur. Finally, non-information seeking questions were confirmatory questions or tag questions, which do not seek information from children. See Table 6.2 for the details of coding categories for mothers' questions.

Table 6.2.

Coding Categories for Mother's Questions about Improbable and Impossible Events

Fact-seeking Questions *"What" and "Yes/No" Questions*	E.g. • What is this? • What do lions eat? • Are the walls soft or hard? • Would it fit in your bed? • Wouldn't it taste bitter?
Explanation-seeking Questions *"How" and "Why" Questions*	E.g. • How are we going to put money on your grandfather's trees? • Why is it different? • Is it because of its colors? • How would it taste? • If it wants to eat the girl, how is she going to protect herself?
Non-information seeking Questions *Irrelevant or Confirmatory Questions*	E.g. • Did you try it before? • Is he a superhero? • Don't you like cats?

6.3.2. Coding mothers' explanations. I coded mother's explanations related to real-life possibility across 4 improbable and 4 impossible events after they specifically started to discuss whether the given event is possible or not. Unlike Nolan-Reyes et al. (2015), I categorized mothers' explanations as factual and hypothetical following Shtulman and Carey's (2009) coding scheme because it provided better analogy to my categorization of questions as fact-seeking and explanation-seeking. Factual explanations referred to the current state of the world or gave background knowledge to the child about why an event could or could not occur. Hypothetical explanations referred to imagined circumstances in which the event could occur and these explanations were linguistically distinct from factual explanations as they included modals such as "could", "would", "maybe" and so on. Factual and hypothetical explanations comprised informative explanations. The rest of the statements giving irrelevant information or referring to magic were coded as non-informative explanations. Table 6.3 provides the further details of coding categories for mothers' explanations.

Table 6.3

Coding Categories for Mother's Explanations about Improbable and Impossible Events

Factual Explanations *Provides factual/background knowledge*	*E.g.* • But ice cream is sweet and the pickles are sour. • Lions are too big so they can't fit into the house. • Alligators live in rivers. • Water is liquid.
Hypothetical Explanations *Provides hypothetical explanations discussing the possibility of the event using modals such as "would", "could", "might", "perhaps", "maybe" and "will"*	*E.g.* • If there was money on trees, we wouldn't go to work. • If he jumped though the wall, he would hit his head. • But lions would bite people. • There would be water everywhere in a mug-shaped building.
Non-informative Statements *Irrelevant/ Non-explanatory information*	*E.g.* • I haven't seen that before either. • Maybe he is a magician. • I think he is dreaming.

6.3.3. ***Coding children's judgments in the child judgment task.*** I coded children's "yes" and "no" responses to the experimenter's "Can this happen in real life?" question. In the case of impossible events, children's "No, it cannot happen" responses were considered correct judgments, and in the case of improbable and ordinary events, "Yes, it can happen" responses were considered as correct judgments.

6.3.4. ***Coding children's explanations in the child judgment task.*** I coded children's explanations only for improbable and impossible events, as ordinary events were included as control items to check for children's response biases. I considered children's first explanations about how an event could happen or why an event could not happen without further prompting. Children's explanations following both "no" and "yes" judgments were coded. I used the same coding scheme for children's explanations as the one I used for mothers' explanations. First, I divided explanations into two categories as informative and non-informative. Then, I further divided informative explanations into two categories as factual and hypothetical explanations. Table 6.4 provides the details and examples for coding categories.

Table 6.4

Coding Categories of Children's Explanations about Improbable and Impossible Events

Factual *Current state of the world/factual knowledge*	No, it is not possible because… • Alligators live in the rivers • Lions attack and bite people • Money isn't fruit • You get money from work not from trees Yes, it is possible because… • Lightning comes from the clouds
Hypothetical *Statements with "would", "could", "might", "perhaps", "maybe" and "will"*	No, it is not possible because… • The lightning would burn you • You could step on your long beard and fall • You would just sink in the water • You could get a new apple from the store Yes, it is possible because… • You could walk on water if the water is frozen. • You could have a lion as pet if it is a baby • You could tape money on tree branches
Non-informative *Irrelevant/referring to magic*	No, it is not possible because… • You need to be a magician • I haven't seen it before • No one can do it • I don't know Yes, it is possible because… • It looks nice • I don't know

6.4. Results

6.4.1. Mother-child booklet task. My first research question in this study explored the frequency and the types of questions and explanations mothers used when discussing improbable and impossible events with their children. Preliminary analyses showed no significant effect or interactions involving book version; therefore, this factor was removed from all subsequent analyses. Before going on to report separate analysis on mothers' questions and explanations, I present a descriptive table to provide a summary of mothers' talk related to the real life possibility of improbable and impossible events across age and SES groups.

Table 6.5

Mean Frequencies and Ranges of Mothers' Possibility Related Statements (Questions and Explanations Combined) across Age and SES Groups

	Middle-class			**Low-income**		
Statements	M	SD	Range	M	SD	Range
3-year-olds	24.10	20.06	4-67	20.83	17.28	0-56
4-year-olds	25.23	14.21	0-47	22.92	21.92	0-80
5-year-olds	21.33	11.86	0-38	20.92	21.23	0-77

Table 6.6

Frequency of Mothers who Provided Possibility Related Statements (Questions and Explanations Combined) Across Age and SES groups

	Middle-class				**Low-income**			
Number of Statements	**Age 3**	**Age 4**	**Age 5**	**Total**	**Age 3**	**Age 4**	**Age 5**	**Total**
0	0	1	1	2	1	1	1	3
1-20	6	4	4	14	7	5	7	19
20-40	2	6	7	15	2	5	2	9
40-60	2	2	0	4	2	1	1	4
60-80	1	0	0	1	0	1	1	2

First of all, the descriptive summary of mothers' talk showed that there was a huge variability in the number of possibility related statements (questions and explanations) mothers provided to their children, especially in the low-income sample. Majority of the mothers provided about 20-25 possibility related statements on average to their children over the course of 8 events (4 improbable and 4 impossible). There was one mother in the middle-class sample and there were two mothers in the low-income sample that provided 60-80 possibility related statements to their children. In the following sections, I examined mothers' possibility related statements separately for improbable and impossible events. I also first examined mothers' possibility related questions and then possibility related explanations.

6.4.1.1. Mothers' possibility related questions. The mean frequencies for fact-seeking, explanation-seeking and non-information seeking questions were provided in Table 6.7.

Table 6.7

The Mean Frequencies (Standard deviations) of Mothers' Possibility Related Questions by Event Type, Age and SES

Middle-class						
	Age 3		Age 4		Age 5	
	Improbable	Impossible	Improbable	Impossible	Improbable	Impossible
Information-seeking						
Fact-seeking	3.7 (3.7)	1.6 (1.83)	2.15 (3.34)	2 (1.7)	2 (1.81)	2.08(1.73)
Explanation-seeking	2.3 (3.23)	1.5 (1.6)	1.54 (2.3)	0.77 (1.24)	1.5 (2.4)	1.75 (1.91)
Non-information seeking	3.4 (3.3)	2.7 (4.11)	2.62 (2.9)	3.1 (2.2)	0.67 (0.98)	1.3 (2.4)
Total	9.4 (8)	5.8 (6.4)	6.3 (5.9)	5.8 (3.9)	4.2 (4.7)	5.2 (4.5)
Low-income						
Information-seeking						
Fact-seeking	1.25 (1.4)	2.08 (2.81)	2.67 (3.73)	1.5 (1.4)	1.58 (2.02)	2 (2.6)
Explanation-seeking	1 (1.21)	0.92(1.3)	1.92 (1.73)	0.75 (1.22)	1.08(1.6)	1.25 (1.66)
Non-information seeking	1.42 (1.31)	1.42 (2)	3 (4.3)	1.92(2.8)	1.3 (2.4)	1.25 (1.8)
Total	3.7 (2.5)	4.4 (5.4)	7.6 (8.3)	4.2 (4.5)	4 (4.6)	4.5 (5)

Information-seeking versus non-information seeking questions. In order to examine whether mothers' information-seeking and non-information seeking questions change by Age, SES, and Event Type, I conducted a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle-class and low-income) X 2 (Event Type: Improbable or Impossible) X 2 (Question Type: Information-seeking and Non-information seeking) mixed factorial ANOVA. The results indicated that there was not a significant main effect of Age, $p = .496$, or SES, $p = .233$. Mothers of 3-, 4- and 5-year-olds from middle-class and low-income families asked similar amount of questions. There was not a significant main effect of Event Type, $p = .16$. However, there was a main effect of Question Type, $F\ (1,65) = 21.98$, $p < .001$, $\eta_p^2 = .25$ indicating that mothers asked more information-seeking questions ($M = 3.37$, $SD = 3.1$) than non-information seeking questions ($M = 2.01$, $SD = 2.36$).

Fact-seeking and explanation-seeking questions. Next, I focused on mothers' fact-seeking and explanation-seeking questions and conducted the same ANOVA analysis by changing Question Type. There was not a main effect of Age, $p = .95$ or SES, $p = .27$. Mothers of 3-, 4- and 5-year-olds from middle-class and low-income families asked similar amount of fact-seeking and explanation-seeking questions. There was a marginally significant main effect of Event Type, $F\ (2,130) = 3.027$, $p = .09$, $\eta_p^2 = .044$. Means suggested that mothers asked more questions during improbable events ($M = 3.7$, $SD = 4.1$) than impossible events ($M = 3$, $SD = 2.97$). The analysis also showed a main effect of question type, $F\ (2,130) = 10.82$, $p < .01$, $\eta_p^2 = .143$. Mothers asked more fact-seeking questions $M = 4.1$, $SD = 3.9$) than explanation-seeking questions $M = 2.7$, $SD = 3.1$) to their children.

Altogether, these findings suggested that mothers asked both fact-seeking and explanation-seeking questions to their children. Contrary to my expectations, they were no Age and SES related differences in mothers' information-seeking (i.e. fact-seeking and explanation-seeking) questions. Mothers asked more information-seeking questions about improbable events than impossible events. In addition, mothers asked more fact-seeking questions than explanation-seeking questions.

6.4.1.2. **Mothers' possibility related explanations.** The mean frequencies for factual, hypothetical and non-informative explanations in mothers' talk are provided in Tables 6.8.

Table 6.8

The Mean Frequencies (Standard Deviations) of Mothers' Possibility Related Explanations by Event Type, Age and SES

	Middle-class					
	Age 3		Age 4		Age 5	
	Improbable	Impossible	Improbable	Impossible	Improbable	Impossible
Informative						
Factual	0.9 (0.9)	0.6 (0.52)	2.08 (1.8)	1.54 (2.7)	1.42 (1.4)	1 (1.7)
Hypothetical	0.6 (1.6)	1.1 (2.8)	1.08 (1.9)	0.54 (0.9)	1.67 (2.7)	0.67 (0.8)
Non-informative	2.3 (2)	3.4 (3.2)	3.15 (2.9)	4.69 (2.7)	3.33 (2.3)	3.92 (2.5)
Total	3.8 (3.4)	5.1 (5.9)	6.3 (4.5)	6.8 (4.6)	6.4 (4.6)	5.6 (3.8)
	Low-income					
Informative						
Factual	1.42 (1.9)	1.75 (2.5)	1.92 (3.9)	0.5 (1)	1.83 (2.8)	1.67 (3.5)
Hypothetical	1.42 (2.3)	1 (1.7)	1.08 (2.6)	0.67 (0.8)	1.92 (2.9)	1.33 (1.8)
Non-informative	2.75 (2.9)	4.42 (5.2)	4.08 (4.3)	2.92 (2.5)	2.92 (2.5)	2.75 (2.4)
Total	5.6 (5.7)	7.2 (6.1)	7.1 (10.2)	4.1 (3.6)	6.7 (7.8)	5.8 (5.9)

Informative versus Non-informative Explanations. First, I examined mothers' informative and non-informative explanations during the mother-child booklet task varied by children's Age, SES levels and Event Type. I conducted a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) x 2 (SES: middle-class and low-income) X 2 (Event Type: improbable or impossible) X 3 (Explanation Type: Informative and Non-informative) mixed factorial ANOVA on mothers' explanations. The analysis yielded a non-significant main effect of Age, $p = .89$, and a non-significant main effect of SES, $p = .76$. The main effect of Event Type was not significant either, $p = .67$. On the other hand, the main effect of Explanation Type was significant, $F\ (2,65) = 6.37$, $p < .05$, $\eta_\rho^2 = .09$ indicating that mothers provided more non-informative explanations ($M = 3.39$, $SD = 2.71$) than informative explanations ($M = 2.47$, $SD = 3.27$). There was also a significant interaction between Event Type and Explanation Type, $F\ (1,65) = 7.2$, $p < .01$, $\eta_\rho^2 = .1$. An analysis of simple effects showed that mothers provided more non-informative than informative explanations for impossible events, $F(1, 65) = 11.99$, $p < .001$, $\eta_\rho^2 = .16$; but provided an equal amount of informative and non-informative explanations for improbable events, $F(1, 65) = .23$, $p = .64$, $\eta_\rho^2 = .003$ (see Figure 6.1)

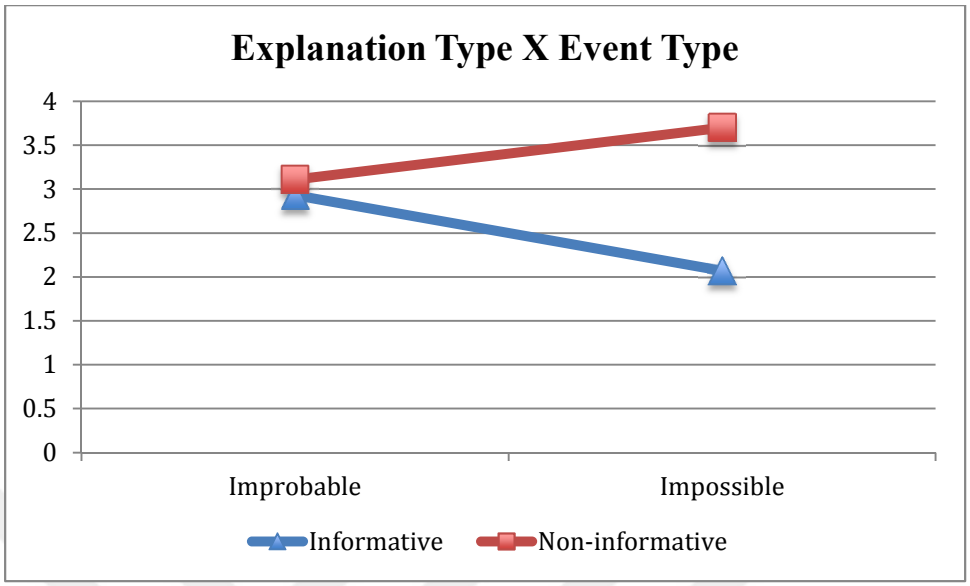

Figure 6.1. The Interaction between Explanation Type (Informative and Non-informative) and Event Type

Factual and hypothetical explanations. Next, I focused only on informative explanations and examined whether factual and hypothetical explanations varied by age and SES. The results revealed that there was not a significant main effect of Age, $p = .77$ or SES, $p = .49$. There was a marginally significant main effect of Event Type, F (2,130) = 3.81, $p = .06$, $\eta_\rho^2 = .055$. Mean frequencies suggested that mothers provided more explanations for improbable events ($M = 2.93$, $SD = 4.2$) than impossible events ($M = 2.07$, $SD = 3.1$). There was not a significant main effect of explanation type (F (2,130) = 1.7, $p = .2$, $\eta_\rho^2 = .03$) indicating that mothers provided similar amount of factual ($M = 2.82$, $SD = 3.96$) and hypothetical explanations ($M = 2.18$, $SD = 3.55$).

In sum, these findings indicate that mothers provided both factual and hypothetical explanations to their children when discussing improbable and impossible events. Contrary to my expectations, there were not any age or SES related differences in mothers' explanations. Mothers used similar amounts and types of explanations for 3-, 4-

and 5-year-olds. I also expected an interaction between explanation type and event type, with mothers providing more hypothetical explanations for improbable events than impossible events, and providing more factual explanations for impossible events than improbable events. There were not any differences in mothers' factual and hypothetical explanations between improbable and impossible events. However, the findings indicated that mothers provided more informative explanations for improbable events than impossible events.

6.4.2. Child judgment task.

6.4.2.1. Children's possibility judgments. I examined the possibility judgments of Turkish preschoolers for improbable, impossible and ordinary events in the child judgment task with the experimenter and whether these judgments varied by age and SES. In the child judgment task, children provided a total of 12 possibility judgments: 4 improbable, 4 impossible, and 4 ordinary. As none of the children responded as "I don't know" in the child judgment task, the mean frequencies of " yes" and "no" judgments for three event types were calculated. "Yes" judgments mean that children judged events to be possible and "no" judgments mean that they judged events to be not possible. See Table 6.9 for mean frequencies of "yes" judgments for improbable and impossible events across age and SES groups.

Table 6.9

Mean Frequencies (Standard Deviations) of "Yes" Judgments by Event Type, Age and SES

	Middle-class			Low-income		
	Improbable	Impossible	Ordinary	Improbable	Impossible	Ordinary
3-year-olds	0.3 (.67)	0.4 (.52)	2.6 (1.35)	1.42 (1.05)	1.33 (1.37)	3.1 (1)
4-year-olds	0.69 (1.18)	0.46 (1.12)	2.85(1.28)	0.92 (1.31)	1 (1.35)	3.1(.67)
5-year-olds	0.83 (1.03)	0.67 (.88)	3.75 (.87)	1.08 (1.16)	0.92 (.99)	2.83 (1.12)

Figures 6.2 and 6.3 shows the percentages of "yes" and "no" judgments across middle-class and low-income samples.

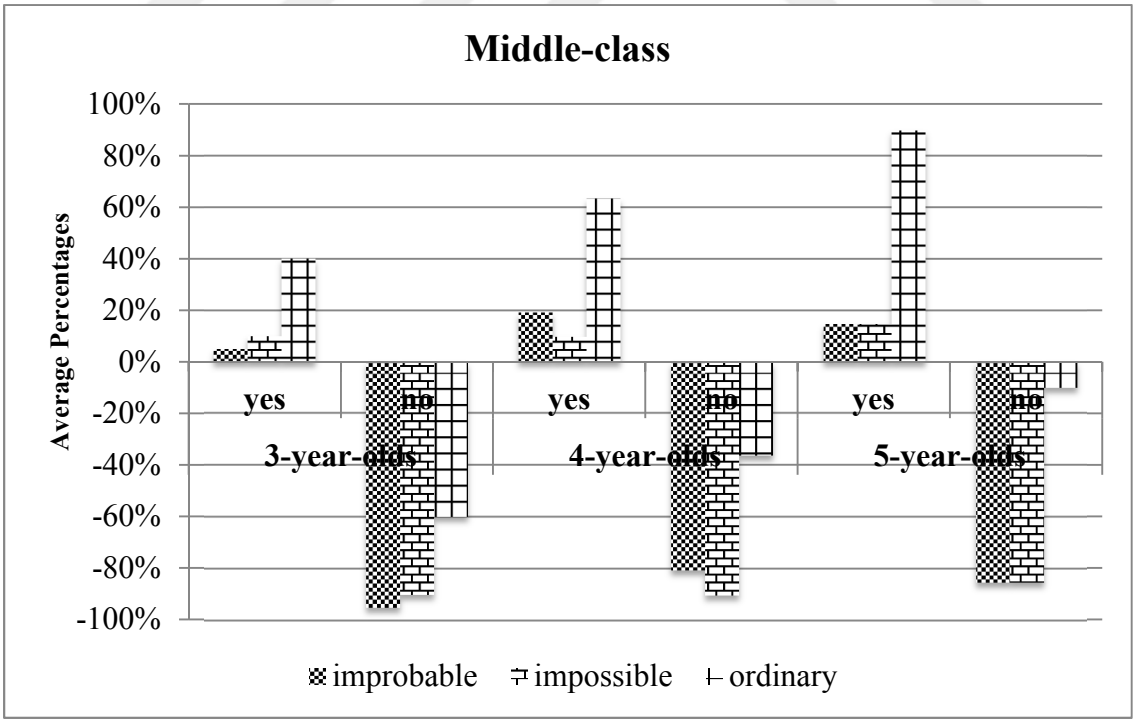

Figure 6.2. Percentages of Children's "Yes" and "No" Judgments in Middle-class

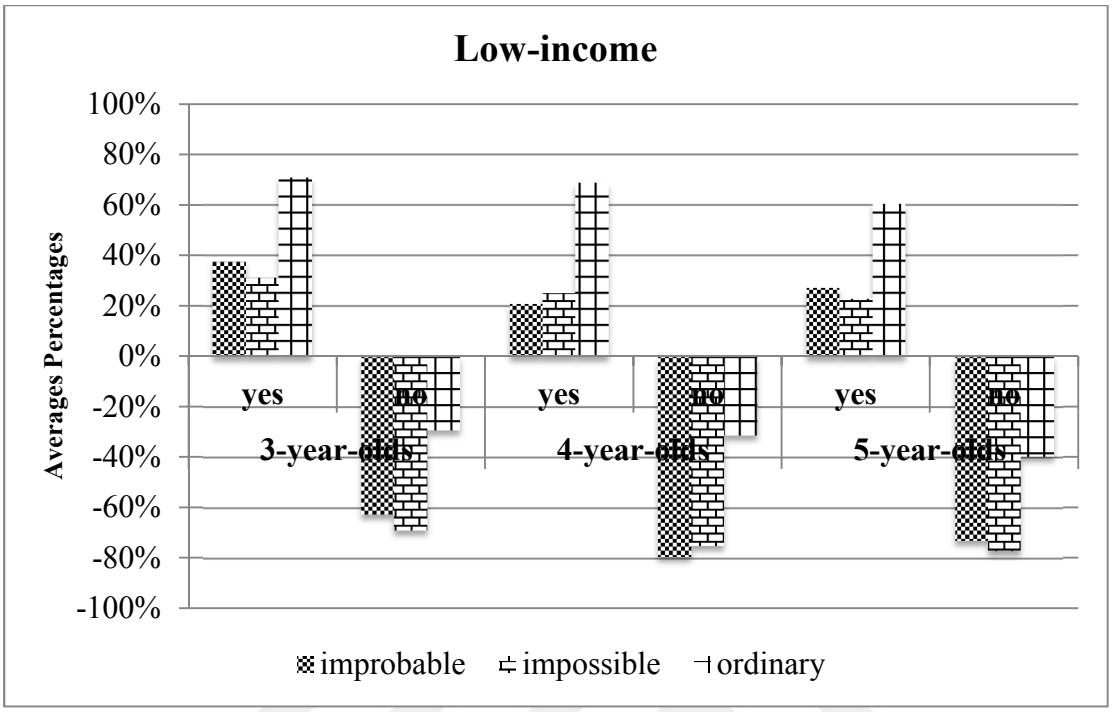

Figure 6.3. Percentages of Children's "Yes" and "No" Judgments in Low-income

I investigated whether children's possibility judgments varied by age and SES by conducting a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle and low) X 3 (Event Type: improbable, impossible, ordinary) mixed ANOVA, with Age and SES as the between-subjects factors, and Event Type as the within-subjects factor. There was not a significant main affect of Age, $p = .76$. There was a main effect of SES (F (1,65) = 2.54, $p = .12$, $\eta_\rho^2 = .04$) indicating that children from low-income families ($M = 1.1$, $SD = 1.05$) gave more "yes" judgments to "Can it happen in real life?" questions for all events than children from middle-class families ($M = 0.5$, $SD = 0.8$). There was a significant main effect of Event Type (F (2,65) = 183.71, $p < .001$, $\eta_\rho^2 = .74$). Children judged ordinary events ($M = 3.04$, $SD = 1.09$) to be possible more frequently than improbable and impossible events (improbable: $M = 0.89$, $SD = 1.2$; impossible: $M = 0.8$, $SD = 1.1$). The analysis also yielded a significant interaction between event type and SES (F (2,65)

= 3.64, $p < .05$, $\eta_p^2 = .05$). An analysis of simple effects showed that children from low-income families judged both improbable, $F(1, 65) = 5.65$, $p < .05$, $\eta_p^2 = .08$, and impossible events, $F(1, 65) = 6.29$, $p < .05$, $\eta_p^2 = .09$, as possible more frequently than children from middle-class families although their possibility judgments about ordinary events did not differ, $F(1, 65) = .83$, $p = .78$, $\eta_p^2 = .001$. See Figure 6.4 for this interaction effect.

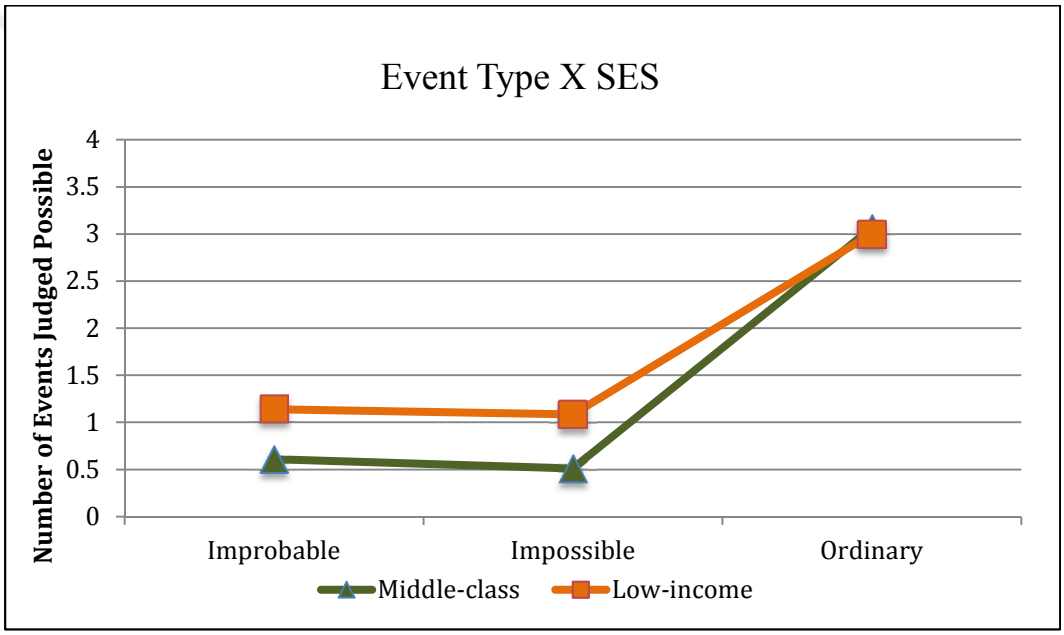

Figure 6.4. The Interaction between Event Type and SES in the Child Judgment Task

6.4.2.2. Children's possibility related explanations. I explored children's explanations for their possibility judgments to see whether they were related to mothers' possibility related explanations in the mother-child booklet task. First, I examined whether children's explanations for why questions following "no, it is not possible" judgments and for how questions after "yes, it is possible" judgments varied by Age and SES. As children varied in their numbers of "yes" and "no" judgments, I converted the

frequency of each type of explanation into proportions and calculated them separately for "yes" and "no" judgments to do the further analyses. First, I examined children's explanations in response to "why" questions following their "no, it cannot happen/is not possible" judgments for improbable and impossible events. The mean proportions of children' s explanations by age, SES groups and event type are provided in Table 6.10.

Table 6.10

The Mean Proportions (Standard Deviations) of Explanations for "No" Judgments by Event Type, Age and SES

	Middle-class					
	Age 3		Age 4		Age 5	
	Improbable	Impossible	Improbable	Impossible	Improbable	Impossible
Informative						
Factual	0.31 (0.23)	0.2 (0.14)	0.21 (0.21)	0.33 (0.36)	0.32 (0.25)	0.26 (0.33)
Hypothetical	0.32 (0.3)	0.28 (0.17)	0.44 (0.42)	0.26 (0.21)	0.47 (0.32)	0.32 (0.18)
Non-informative	0.38 (0.23)	0.53 (0.18)	0.33 (0.28)	0.33 (0.25)	0.28 (.03)	0.42 (0.34)
	Low-income					
Informative						
Factual	0.15 (.29)	0.19 (.27)	0.22 (.21)	0.24 (.29)	0.15 (.21)	0.17 (.23)
Hypothetical	0.23 (.36)	0.27 (.28)	0.32 (.31)	0.13 (.21)	0.29 (.32)	0.22 (.21)
Non-informative	0.45 (.4)	0.53 (.35)	0.46 (.28)	0.58 (.33)	0.63 (.34)	0.72 (.38)

Informative versus non-informative explanations for "no" judgments. I conducted a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle and low) X 2 (Event Type: improbable, impossible), 3 (Explanation Type: informative, non-informative) ANOVA to compare children's informative and non-informative explanations for their "no" judgments. The results showed that there was not a significant main effect of Age, $p = .102$ or SES, $p = .95$. Three-, 4- and 5-year-olds from both middle-class and low-income backgrounds provided similar amount of explanations for improbable and impossible events. The main effect of Event Type was not significant either, $p = .85$. Children's explanations did not differ across improbable and impossible events. There was not a significant main effect of Explanation Type, $p = .27$. However, there was a significant interaction between Explanation Type and SES, $F(1, 65) = 14.11$, $p < .001$, $\eta_\rho^2 = .018$. An analysis of simple effects showed that children from middle-class families provided more informative explanations (M = 0.62, SD = 0.22), than children from low-income families (M = 0.43, SD = .24), $F(1, 65) = 11.25$, $p < .001$, $\eta_\rho^2 = .15$; whereas children from low-income families provided more non-informative explanations for their "no" judgments (M = 0.42, SD = 0.22) than children from middle-class families (M = 0.6, SD =0.2), $F(1, 65) = 14.11$, $p < .001$, $\eta_\rho^2 = .16$ (see Figure 6.5).

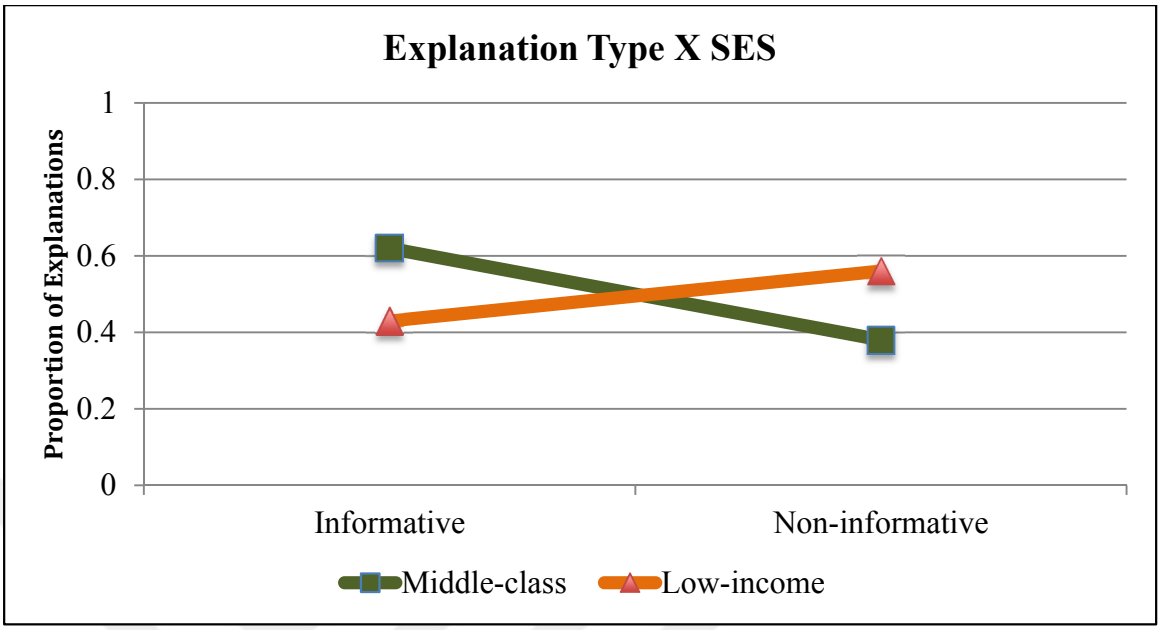

Figure 6.5. The Interaction between Explanation Type (Informative and Non-informative) and SES for "no" judgments

Finally, there was a marginally significant interaction between Event Type and Explanation Type, $F(1, 65) = 3.93$, $p = .052$, $\eta_p^2 = .06$. The simple effect of Explanation Type was calculated for each Event Type. Children gave marginally more informative explanations ($M = 0.57$, $SD = 0.34$) than non-informative explanations ($M = 0.47$, $SD = 0.3$) for improbable events, $F(1, 65) = 3.58$, $p = .063$, $\eta_p^2 = .05$. On the other hand, children gave marginally more non-informative explanations ($M = 0.55$, $SD = 0.3$) than informative explanations ($M = 0.48$, $SD = 0.3$) for impossible events, $F(1, 65) = 3.4$, $p = .07$, $\eta_p^2 = .05$.

Factual and hypothetical explanations for 'no' judgments. Second, I focused only on children's informative explanations and examined whether there were differences in their factual and hypothetical explanations across age and SES groups. For this purpose, I conducted a 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle and low) X

3 (Event Type: improbable, impossible), X 2 (Explanation Type: factual and hypothetical) mixed factorial ANOVA. The analysis revealed a non-significant main effect of Age, p = .64. But there was a significant main effect of SES, $F(1, 65) = 11.25$, $p < .001$, $\eta_\rho^2 = .15$. Children from middle-class families provided more factual (M = 0.27, SD = *0.17*) and hypothetical (M = 0.35, SD = 0.22) explanations than children from low-income families (factual: M = 0.19, SD = 0.18; hypothetical: M = 0.24, SD = 0.19). The analysis yielded a marginally significant main effect of Event Type, $F(1, 65) = 3.58$, p = .063, $\eta_\rho^2 = .05$. Proportion of explanations for improbable events ((M = 0.28, SD = 0.17) were higher than proportion of explanations for impossible events (M = 0.24, SD = 0.15). Finally, there was a marginally significant main effect of Explanation Type, $F(1, 65)$ = 3.07, p = .085, $\eta_\rho^2 = .045$. Children provided more hypothetical explanations (M = 0.3, SD = 0.21) than factual explanations (M = 0.23, SD = 0.18). See Figures 6.6 and 6.7 for percentages of explanation types across age and SES groups.

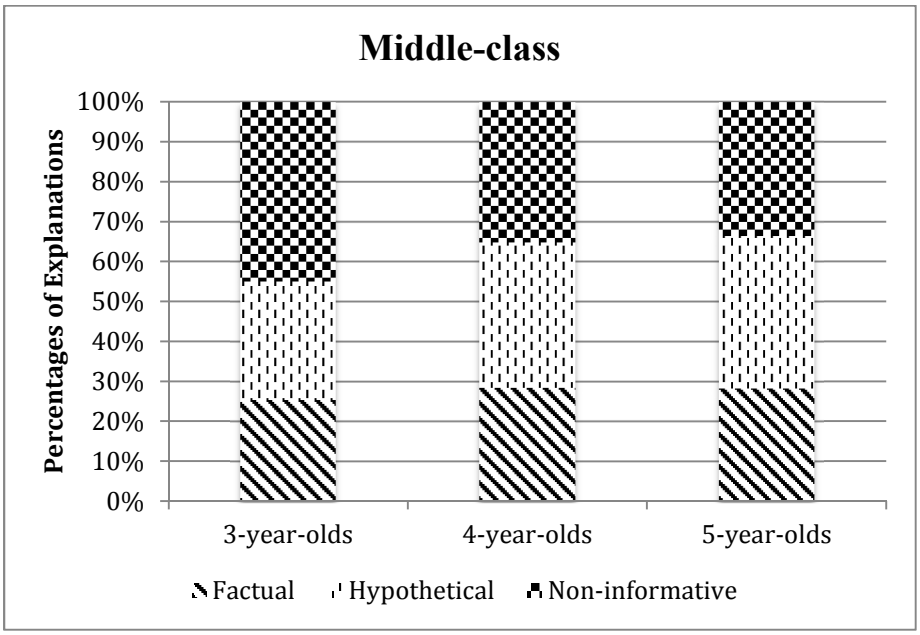

Figure 6.6. Percentage of Explanation Types for "No" Judgments in Middle-class (collapsed for improbable and impossible events)

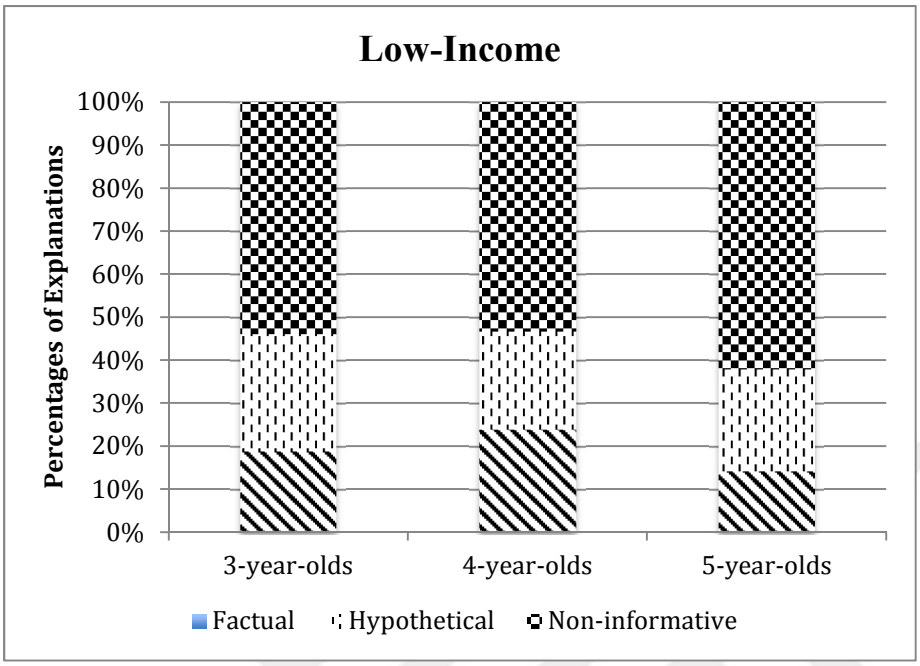

Figure 6.7. Percentage of Explanation Types for "No" Judgments in Low-income (collapsed for improbable and impossible events)

In addition to children's explanations for their "no" judgments, I also examined children's explanations for "how" questions after their "yes" judgments for improbable and impossible events. The mean frequencies of children' s explanations by age, SES groups and event type are provided in Table 6.11.

Table 6.11

Mean Frequencies of Explanations for "Yes" Judgments by Event Type, Age and SES

	Middle-class					
	Age 3		Age 4		Age 5	
	Improbable	Impossible	Improbable	Impossible	Improbable	Impossible
Informative						
Factual	0	0	0	0	0.08 (.3)	0
Hypothetical	0	0.2 (0.42)	0.25 (.43)	0	0.17 (.39)	0.25 (.45)
Non-informative	0.2 (.42)	0.2 (0.42)	0.13 (.33)	0.15 (0.38)	0.25 (.45)	0.16 (0.39)
Low-income						
Informative						
Factual	0	0	0	0	0	0
Hypothetical	0.25 (0.39)	0.14 (0.3)	0.19 (0.39)	0.83 (0.29)	0.42 (0.63)	0.33 (0.49)
Non-informative	0.5 (.48)	0.53 (0.48)	0.31 (.46)	0.5 (0.52)	0.25 (.4)	0.33 (0.49)

Informative versus non-informative explanations for "yes" judgments. As Table 6.11 shows the majority of children's informative explanations for their "yes" judgments were hypothetical. Only one 5-year-old from middle-class sample provided a factual explanation for his "yes" judgment for the improbable event of getting struck by lightning by saying that "Yes, it is possible because lighting comes from the sky/clouds." Therefore, I examined children's informative and non-informative explanations by combining factual and hypothetical explanations and I did not conduct any further analysis by focusing on factual and hypothetical explanations. A 3 (Age: 3-year-olds, 4-year-olds, 5-year-olds) X 2 (SES: middle and low) X 2 (Event Type: improbable, impossible) X 2 (Explanation Type: informative and non-informative) mixed factorial ANOVA revealed that there was not a significant main effect of Age, $p = .4$. However, there was a significant main effect of SES, $F(1, 65) = 9.36$, $p < .01$, $\eta_p^2 = .13$. Children from low-income families provided more informative (i.e. hypothetical in this analysis) and non-informative explanations ($M = .4$, $SD = .35$) for their "yes" judgments than children from middle-class families ($M = .18$, $SD = .31$). There was not a significant main effect of Event Type, $p = .79$, or Explanation Type, $F(1, 65) = 2.58$, $p = .113$, $\eta_p^2 = .038$ (see Figures 6.8 and 6.9) .

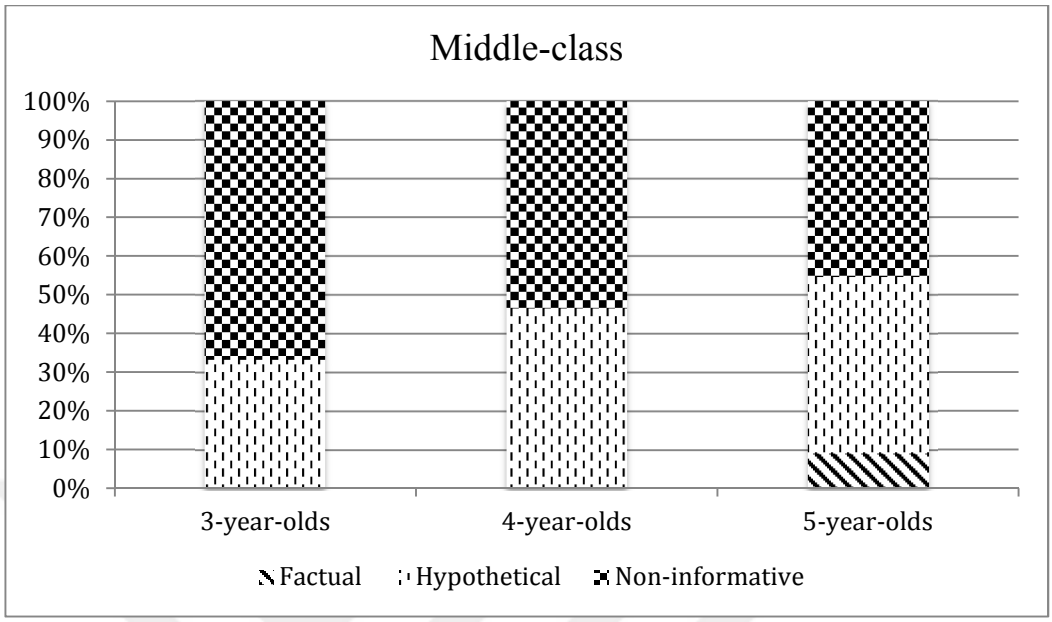

Figure 6.8. Percentages of Explanation Types for "Yes" Judgments in Middle-class

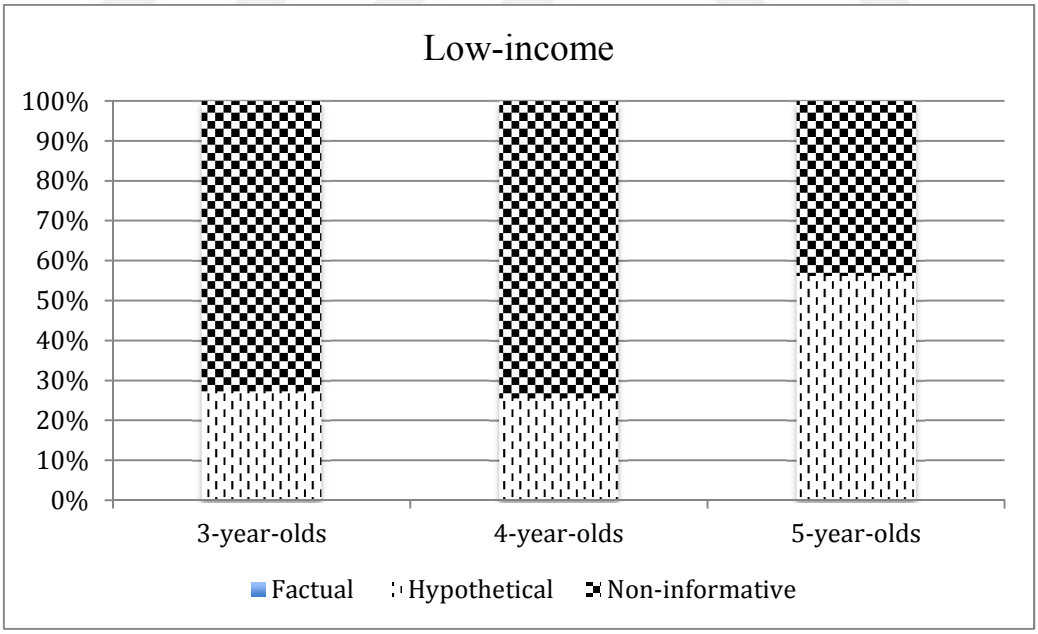

Figure 6.9. Percentages of Explanation Types for "Yes" Judgments in Low-income

These findings indicated that there were not any age-related differences in the judgments and types of explanations children provided for improbable and impossible events. Overall, children from low-income families provided more "yes" judgments for both improbable and impossible events. Also, the examination of children's explanations for their judgments showed that children from low-income families gave more non-informative explanations for their judgments than children from middle-class families. Also, just like their mothers, children tended to provide more informative explanations for improbable events than impossible events.

6.4.3. Relationship between mothers' possibility related questions and explanations and children's possibility judgments and explanations. The main purpose of this study was to examine the relationship between mothers' possibility related questions and explanations about improbable and impossible events and children's possibility judgments and explanations about similar events. For this purpose, I examined the correlations between mothers' possibility related questions and explanations in the mother-child booklet task and children's possibility related judgments and explanations in the child judgment task. I created the correlation matrices for middle-class and low-income samples separately. I also separated improbable and impossible events to see whether mothers' explanations and questions were related to children's judgments and explanations about these events differently. See Tables 6.12-6.15 for correlation matrices for improbable and impossible events across SES groups.

Table 6.12

Bivariate Correlations between Mothers' Talk and Children's Judgments and Explanations for Improbable Events in Middle-class

		Middle-class						
	Variables	1	2	3	4	5	6	7
1	Improbable Mother Factual Explanation		0.258	0.157	0.058	-0.144	-0.183	-0.075
2	Improbable Mother Hypothetical Explanation			-0.075	-0.073	-0.011	0.069	-0.103
3	Improbable Mother Fact-seeking Qs				.414*	-0.268	0.061	-0.278
4	Improbable Mother Explanation-seeking Qs					-0.214	0.012	-0.11
5	Improbable Child "Yes" Possible Judgments						-0.001	.555**
6	Improbable Child Informative Explanations for "no" Judgments							.521**
7	Improbable Child Informative Explanations for "yes" Judgments							

***$p < .001$, **$p < .01$, *$p < .05$, $t<.09$

Table 6.13

Bivariate Correlations between Mothers' Talk and Children's Judgments and Explanations for Improbable Events in Low-income

		Low-income						
	Variables	1	2	3	4	5	6	7
1	Improbable Mother Factual Explanation		.763**	.731**	.395*	-0.278	0.288	-0.117
2	Improbable Mother Hypothetical Explanation			.583**	.334*	-.340*	0.224	-0.211
3	Improbable Mother Fact-seeking Qs				.334*	-0.171	0.329	-0.06
4	Improbable Mother Explanation-seeking Qs					-0.325t	.377*	-0.056
5	Improbable Child "Yes" Possible Judgments						-.447**	0.106
6	Improbable Child Informative Explanations for "no" Judgments							.329*
7	Improbable Child Informative Explanations for "yes" Judgments							

***$p < .001$, **$p < .01$, *$p < .05$, $t<.09$

Table 6.14

Bivariate Correlations between Mothers' Talk and Children's Judgments and Explanations for Impossible Events in Middle-class

	Middle-class							
	Variables	1	2	3	4	5	6	7
1	Impossible Mother Factual Explanation		0.112	.354*	-0.028	-0.079	-0.108	-0.192
2	Impossible Mother Hypothetical Explanation			.398*	0.055	0.109	0.111	0.015
3	Impossible Mother Fact-seeking Qs				0.236	0.129	-0.137	-0.125
4	Impossible Mother Explanation-seeking Qs					-0.173	0.139	-0.03
5	Impossible Child "Yes" Possible Judgments						-0.217	.361*
6	Impossible Child Informative Explanations for "no" Judgments							0.243
7	Impossible Child Informative Explanations for "yes" Judgments							

***$p < .001$, **$p < .01$, *$p < .05$, $t<.09$

Table 6.15

Bivariate Correlations between Mothers' Talk and Children's Judgments and Explanations for Impossible Events in Low-income

		Low-income						
	Variables	1	2	3	4	5	6	7
1	Impossible Mother Factual Explanation		.562**	0.23	.462**	-0.183	0.267	0.019
2	Impossible Mother Hypothetical Explanation			.454**	.497**	-0.054	0.057	-0.017
3	Impossible Mother Fact-seeking Q				.593**	-0.122	-0.089	-0.112
4	Impossible Mother Explanation-seeking Q					0.058	-0.21	-0.063
5	Impossible Child "Yes" Possible Judgments						-.408*	0.136
6	Impossible Child Informative Explanations for "no" Judgments							0.281
7	Impossible Child Informative Explanations for "yes" Judgments							

***$p < .001$, **$p < .01$, *$p < .05$, $t<.09$

Contrary to my prior expectations, there was no relation between mothers' fact-seeking questions and children's "yes" judgments for improbable events in middle class sample: fact-seeking: $r(70) = -.268$, $p = .12$, explanation-seeking: $r(70) = -.214$, $p = .22$. However, mothers' explanation-seeking questions was marginally and negatively associated with children's "yes" judgments for improbable events in the low-income sample, $r(70) = -.33$, $p = .053$. This finding suggested that mothers from low-income families who asked more "how" and "why" questions to their children had children who judged improbable events as impossible.

I also expected to find a positive relation between mothers' hypothetical explanations and children's "yes" judgments and explanations for improbable events. There was no such association in the middle-class sample. However, the hypothetical explanations of mothers' from low-income families was negatively associated with children's "yes" judgments for improbable events $r(70) = -340$, $p < .05$, suggesting that mothers who provided more hypothetical explanations about how or why not an event could occur have children who judge improbable events as less possible, again similar to middle-class children's judgments about improbable events. Finally, mothers' hypothetical explanations were positively associated with children's informative explanations for "no" judgments in the low-income sample, $r(70) = 377$, $p < .05$.

Taken together, the surprising finding about the negative association between explanation-seeking questions and hypothetical explanations of mothers and children's possibility judgments in the low-income sample suggests that mothers who questioned the possibility of improbable events more and provide hypothetical explanations about how or why not an event could occur might have more skeptical children who were more likely to reject the possibility of improbable events.

6.5. Summary and Discussion

The purpose of this study was to examine whether mother-child interactions and discussions about improbable and impossible events were related to children's judgments and explanations about similar events. For this purpose, I examined the frequencies and the types of questions and explanations mothers used when discussing such events with their 3-, 4- and 5-year-olds. I found that mothers asked information-seeking questions more frequently than non-information seeking questions for both improbable and impossible events. I also found that mothers gave more informative explanations when discussing improbable events than impossible events. However, non-informative explanations were as prevalent as informative explanations for impossible events. These findings suggested that mothers guided children in learning and reasoning about the possibility of improbable and impossible events by asking questions and providing explanations, their talk about such events were not always informative.

I also examined children's possibility judgments and explanations about similar events in a task where they participated with the experimenter. The findings from this task showed that 3-, 4- and 5-year-old Turkish children did not differentiate between improbable and impossible events and tended to judge both improbable and impossible events as impossible. Contrary to my hypothesis, these possibility judgments did not vary by age. Children from all age groups judged improbable and impossible events similarly. But there were some SES-related differences. Children from low-income families were more inclined to judge improbable and impossible events as possible by saying "yes" than children from middle-class families. This could either indicate discrepancies in children's conceptual knowledge states or different cultural values across two SES groups. When children's explanations for their "yes" and "no" judgments were examined, it was also found that children from low-income families provided more non-informative explanations for

their judgments than children from middle-class families. This strongly suggests that "yes" judgments of children from low-income families were not based on knowledgeable guesses.

What could have made children from low-income families more credulous in the task than children from middle-class families? Could mother-child conversations and explanations about such events account for these differences between children from two SES groups? The next question I explored was whether mother's questions and explanations about improbable and impossible events were associated with children's own judgments and about such events. In the low-income sample, I found a surprising negative association between mothers' explanations-seeking questions and hypothetical explanations and children's possibility judgments while I did not find such an association in the middle-class sample. This finding could imply that within the low-income sample, mothers who question and provide more explanations make their children tend to be more skeptical about the possibility of such events even when they were discussing these events with an unfamiliar adult/the experimenter.

CHAPTER 7

General Discussion

Across three studies presented in this paper, I attempted to provide evidence for whether or not Turkish preschoolers from middle-class and low-income backgrounds use questions as a tool of acquiring information from more knowledgeable others. I also explored the role of SES and maternal education as two interrelated factors that might influence children's question-asking behavior. Study 1 examined the frequency and function of questions asked by mothers and children in a storybook reading activity to see whether mothers' questions were related to children's questions. Study 2 examined the frequency and function of questions asked by children from middle-class and low-income backgrounds in an experimental question elicitation task controlling for the quality of answers children received from the experimenter. Finally, Study 3 took a different approach and investigated mothers' explanations as well as questions about improbable and impossible events to see whether children learned from them and displayed it when they were asked to reason about similar events independently with the experimenter.

In the following sections of this chapter, I first present the specific findings emerging from these studies and discuss them in relation to my broader research questions about children's question-asking behavior, as well as to the findings in the literature. Then I conclude by discussing the potential limitations of the current research and directions for future research.

7.1. Mothers' Questions as a Model for Children's Questions

In Study 1, I examined 3-, 4- and 5-year-old Turkish children's questions cross-sectionally in a storybook reading activity at home. The content of the storybook was successful prompting mother-child dyads to engage in question-answer exchanges, and particularly mothers asked many

questions while reading the book their children. Also, mothers from both middle-class and low-income backgrounds asked similar number of questions to their children in this activity.

The major finding emerging from this study was that mothers who asked more questions had children who asked more questions as well, suggesting that children could be imitating their parents' question-asking style in their conversations with adults and might be acquiring an exploratory stance through engaging in question-answer exchanges with their parents (Harris, 2012; Tizard & Hughes, 1984). However, this finding appeared to be bound by the context. That is, contrary to my expectations, I did not find an association between mothers' questions as displayed in the storybook reading activity and children's questions in question elicitation task (Study 2). One reason for this dissociation in findings in Study 1 and Study 2 could be related to the different demands and characteristics of the activities children engaged in. Comparison of the frequency of questions children asked in storybook reading activity and question elicitation task showed that children asked more fact-seeking questions in the question elicitation task than in the storybook reading activity but the amount of explanation-seeking questions were similar. This is not a surprising finding since the question elicitation task invited children to ask questions in a more structured context. Also, I observed SES differences in the question elicitation task indicating that children from middle-class backgrounds asked more fact-seeking and explanation-seeking questions than children from low-income backgrounds though I did not observe SES differences either in the frequency of mothers' questions or in the frequency of children's questions in the storybook reading activity. Thus, these two activities appear to have operated differently in eliciting questions from children and have led to differences in children's question-asking behavior due to task familiarity, comfort level in interacting with the experimenter and nature of the task in prompting more questions on the part of the child.

Considering these findings and the intriguing questions they brought on, in future research, it is important to explore both mothers and children's questions in multiple contexts (e.g., daily conversations during routine activities, different book reading contexts, free play, and problem solving activities) to see whether and how mothers' question-asking behavior relates to children's question-asking behavior.

7.2. Children's Questions in The Question Elicitation Task.

In Study 2, I contributed to existing research on children's questions by offering a new methodology that elicited both fact-seeking and explanation-seeking questions from children. The findings from this study revealed that children asked both fact-seeking and explanation-seeking questions to acquire information about novel animals and objects from the experimenter. Children also asked more questions when they received informative answers than non-informative answers in response to their questions. Based on these findings, it could be argued that receiving informative answers encouraged children to ask more questions so that they can learn more about novel animals and objects, while receiving non-informative answers discouraged them and lead them to ask fewer questions. These findings were consistent with earlier findings in the literature showing that children listened to the answers they received from others and either agreed or asked a follow-up question when they received adequate answers; whereas, if they received inadequate answers, they repeated the question or came up with their own explanations (Chouinard, 2007; Frazier et al., 2009; Kurkul & Corriveau, 2017).

My additional analysis on children's initial versus subsequent questions across informative and non-informative answer conditions also indicated that children asked fewer subsequent questions in the non-informative answer condition than informative answer condition, and

decrease in the frequency of questions was higher for middle-class sample than low-income sample. In other words, children from middle-class families seemed to be more influenced by the quality of the answers they received from the experimenter than children from low-income families. These findings could be explained with respect to the quality of the answers children usually receive at home when interacting with their parents. As mentioned earlier, Kurkul and Corriveau (2017) found that children from middle-class backgrounds received more explanatory answers to their questions than children from low-income backgrounds in everyday parent-child conversations. Arguably, such exposure could lead children from middle-class backgrounds to expect more informative answers to their questions and feel more frustrated when they did not get informative answers.

An analysis on children's specific reactions aside from their questions (e.g., agreeing, providing own explanation) following informative versus non-informative answers was beyond the scope of this study, but anecdotally, I could tell that some children were very frustrated when they did not receive answers to their questions and showed their frustration explicitly. Here is one except from a child from middle-class sample who showed his frustration for not receiving informative answers:

Example 7.1 (Middle-class 5;9)

<u>Novel object French fry cutter (Patkes)</u>

Child: What is this?

Experimenter: This is called patkes.

Child: What is it doing?

Experimenter: What is it doing? I don't know.

Child: You don't know anything about the objects and you don't know anything about the animals!

Experimenter: Yeah I don't.

Child: What are they doing here? Are they slicing dough? Is this carrot?

Experimenter: Hmm I don't know.

Child: Let's look at the next one.

Novel animal Meerkat (Mirket)

Experimenter: This is called market.

Child: Mirket? What is it?

Experimenter: An animal.

Child: What does it do? Does it bite?

Experimenter: Does it bite? I don't know.

Child: Does it fight?

Experimenter: Does it fight?

Child: Isn't it written on your papers somewhere?

Experimenter: Hmm no I don't know.

In the light of these observations, in future research, I plan to investigate children's reactions to the quality of the answers they received from adults by focusing on not only on their questions but also by focusing on the type and quality of the answers they receive from adults and how they react to these answers.

Moreover, contrary to my expectations, there were not age-related differences in the frequencies of children's explanation-seeking questions in either Study 1 or Study 2. Children asked "why" and "how" questions as early as 3 years of age to seek for explanations from others even though they used single word questions. These findings were consistent with the findings from previous studies on children's questions (Callanan & Oakes, 1992; Chouinard, 2007) and

suggested that the spike in children explanation-seeking questions could be taking place a little earlier or around age 3.

This study focused only on the frequency and types (fact-seeking and explanation-seeking) of children's questions. There could be age related differences in the syntactic form and complexity of children's expressions when asking questions depending on their language use abilities. For instance, 3-year-olds could use "why" and "how" questions by only using single word questions and mainly to follow up on the information provided by the adult. On the other hand, 4- and 5-year-olds could formulate and express a fully-fledged "why" and "how" questions to target a specific information they are curious about. Yet, such possible age related differences do not reduce the importance of single word "why" and "how" questions 3-year-olds asked as these questions also serve as a tool of acquiring information from others.

Besides syntactic form, the content of children's questions and the complexity level of the information they request from adults could change by age. For instance, Callanan and Oakes (1992) found that younger children's questions were mainly concerned with people's motivations and behavior (3-year-olds: 38.1%, 4-year-olds: 26.9%, 5-year-olds: 24.8%) and physical mechanism (3-year-olds: 21.1%, 4-year-olds: 26.3%, 5-year-olds: 11.5%), while older children asked more about biological phenomena (3-year-olds: 8.6%, 4-year-olds: 22.3%, 5-year-olds: 23.7%). Such differences in the content of children's questions at different ages could reveal their current knowledge states in specific domains. Therefore, in future research, it is important to investigate the content of children's questions to detect possible age related differences in the information they seek from others, and get a glimpse of their current knowledge states about a given phenomenon.

7.3. Mother-Child Conversations about Improbable and Impossible Events

7.3.1. Mother-child booklet task. Study 3 examined the relationship between mothers' explanations as well as questions and children's judgments and explanations about improbable and impossible events in two SES groups. Findings in the mother-child booklet task revealed that mothers from middle-class families and mothers from low-income families did not differ with regards to the frequency of their explanation-seeking questions and factual or hypothetical explanations about improbable and impossible events.

Though unexpected, this finding was not totally inconsistent with the previous findings in the literature. For instance, in comparing Mexican descent mothers' talk with their children to European American mothers' talk, Callanan, Perez-Granados, Barajas and Goldberg (1996) (as cited in Callanan & Jipson, 2001) used the same diary method in Callanan and Oakes' study with Mexican descent mothers living in the United States and asked them to record their children's questions for 2 weeks. They found that Mexican mothers, including mothers with lower education levels, provided explanatory answers to their children's questions (56% of the time) just like European American mothers did for their children. Also, Mexican descent mothers reported that they enjoyed answering their children's questions and saw them as part of children's learning process.

Likewise, Tenenbaum, Callanan, Alba-Speyer and Sandoval (2002) investigated parent-child conversations in 24 Mexican descent families with children whose ages range between 4 to 6;6 years. Parents in half of these families had higher levels of education (years of education: M = 13.58, SD = 1.68), while the parents in the other half had lower levels of education (years of education: M = 7.67, SD = 3.71). Researchers examined parent-child conversations both during an activity in the children's museum and also after a family science workshop at home. The first

examination in the children's museum was based on observation of parent-child conversations during a time-lapse photography exhibit (e.g. a photograph showing a plant growing), a transparent case showing a beehive and a video microscope enlarging the objects ten times of their size. This examination showed that parents' with higher schooling spent more time with their children in the museum; however, when the duration of the parent-child interactions were accounted for, parents with higher and lower schooling provided similar amount of explanations to their children. The second examination was a diary study at home following parents' participation in a family science workshop about garden plants. Parents were asked to record their children's questions and their responses for these questions after the workshop. The results again showed no difference between parents with higher schooling and lower schooling with respect to the explanations they provided for their children.

The discrepancy of the findings in the literature regarding SES differences in mothers' explanatory talk and questions in their conversations with children requires consideration of several possible explanations. The first possible explanation is related to mothers' familiarity with the tasks. Parents from low-income families might not always be accustomed to engaging in the activities requested by the researchers. and as a result might have interacted less with their children within these contexts.

In the context of our study, the second possible explanation could be related to extraordinary events presented to mother-child dyads in both Study 1 and Study 3. In these activities, mothers also expressed surprise regarding the extraordinary events suggesting to the child that she would not have an explanatory answer for the events. Thus, these activities might have erased potential differences in mothers' explanatory talk by minimizing the need for background knowledge and prior experiences in two SES groups.

The third possible explanation could be related to schooling background of the mothers. Although the mean years of education differed across middle-class and low-income groups, all mothers had some school education in both groups. I had only 2 illiterate mothers in the low-income sample. As Rogoff (2003) has argued, even a few years of exposure to formal school environment could enable parents to become familiar with "school like" or "teacher like" conversational styles, and the structured book reading activities in both Study 1 and Study 3 might have given rise to mothers' use of such conversational styles with their children.

7.3.2. Child judgment task. The findings in the child judgment task replicated and extended previous studies by demonstrating that children in both SES groups could not differentiate between improbable and impossible events and middle-class sample's possibility judgments were very similar to the possibility judgments in Western samples. However, children in the low-income sample gave more "yes" judgments concerning the possibility of improbable and impossible events than children in the middle-class sample during the child judgment task. But why did we observe such SES differences?

As I mentioned earlier, Shtulman and Carey (2009) proposed that children might fail to accept the possibility of improbable events not because they violate physical laws, but because they cannot think of a way that these events could occur. In this regard, it might be a failure of imagination and children might be rejecting the possibility of events that they were not able imagine within the constraints of regularities they accepted in their conception of the world. Although this strategy offers an appealing explanation for why children fail to differentiate between improbable and impossible events, in the present study, an additional explanation is needed to explain the SES differences in children's possibility judgments in the child judgment task. If children from low-income backgrounds had given "yes" judgments only for improbable

events by correctly acknowledging their possibility; I could have argued that children in the low-income sample might have less background knowledge about these events, and thus, they might speculate more freely about these events than middle-class children.

However, if children had speculated more and that was why they gave more "yes" judgments about improbable and impossible events, then one would expect that children from low-income families would provide more hypothetical explanations for their "yes" judgments than children from middle-class families. However, this was not the case either. Children from low-income families provided more non-informative explanations following their "yes" judgments than informative explanations for both improbable and impossible events. Thus, the higher frequency of "yes" judgments for improbable and impossible events could arise both from children's lack of knowledge, or perhaps, lack of an explanatory framework to think about these events in a realistic fashion. Thus, more research is needed to examine whether and to what extent parents discuss improbable events as possible in their everyday conversations with children, and how children develop an explanatory framework to reason about such events independently.

Finally, another possible explanation for more "yes" judgments in the low-income sample could be related to comfort level of children when interacting with the experimenter. Children from low-income families might have tended to say "yes" to the experimenter's questions because they were in a situation where a teacher like person asked them the questions by showing pictures, which could indicate partial evidence that these events could occur. As a result, they might have felt less confident to express their ideas and tried to pick a response that they thought the experimenter expected from them. Overall, as it has been argued in previous research as well, children from low-income families might be more reluctant to engage in conversations with other people by perceiving such social interactions as intimidating (Tizard & Hughes, 1984).

7.3.3. Relationship between mothers' questions and explanations and children's beliefs and explanations. Study 3 revealed an interesting relationship between mothers' explanation-seeking questions and explanations for improbable events and children's judgments for improbable events in the low-income sample. Mothers who questioned and speculated more about improbable events had children who judged improbable events as less possible in the low-income sample. This interesting relationship could be interpreted with regards to one of the following explanations. First of all, mothers who questioned and speculated more in the low-income sample might have adopted more realistic point of views and appeared to be less inclined to accept the possibility of improbable events. Consequently, they might have modeled a more skeptical point of view for their children; that is, less willingness to accept the possibility of the improbable events.

Second possible explanation for why mothers' questioning and explanations could influence children's judgments about improbable events negatively in the low-income sample could be related to children's feeling of comfort with uncertainty or with their lack of knowledge and how they cope with it in their interactions with adults (Jirout & Klahr, 2012). For instance, it could be argued that children from middle-class families might feel more at ease with uncertain or unfamiliar situations, and could prefer rejecting the possibility of the events that do not exactly match with their existing knowledge repertoire of what is possible and what is not possible. On the other hand, children from low-income families could feel less at ease with their lack of knowledge in similar uncertain situations and might try to hide it by complying with the experimenter's questions, rather than declaring an opinion and becoming vulnerable to going into conflicts by denying the possibility of the events. Then, if some mothers from low-income families had given

more opportunities for their children to think, question and participate in conversations about such events, their children could have approached similar events with a more skeptical point of view.

7.4. Revisiting the Question: Is the Curious Child Universal?

In the question elicitation task (Study 2), children from middle-class and low-income backgrounds asked similar amount of fact-seeking questions and the proportion of fact-seeking questions in the Turkish sample was comparable to the proportion of fact-seeking questions in everyday conversations of Western samples. However, explanation-seeking questions appeared to be less frequent in the Turkish sample's information-seeking questions (22 % middle-class and 10% low-income) in comparison to previous studies with Western samples (26-30% middle-class, Chouinard, 2007), this was particularly so in the low-income sample. Strictly speaking, the findings with Turkish children in this study were comparable to the findings with Western children, and showed a particularly similar pattern to Tizard and Hughes' (1984) study with children from middle-class and working class families. It is also important to point out that although a little lower than the percentages in Western samples, explanation-seeking questions in Turkish sample was not as low as it was found in small scale traditional cultures in Gauvain et al. (2013) study.

However, there was still a big difference between middle-class and low-income sample within Turkish sociocultural context with respect to the frequency of explanation-seeking questions in the question elicitation task. Considering demographics and background characteristics of these two groups, it has been observed that when asked to select independence versus respect for elders as a value they wanted to instill in their children, 56.4 % of the mothers in the middle-class sample selected independence while only 26 % of the mothers in the low-income sample. Similarly, in the HOME Inventory, middle-class families have got significantly higher

scores in providing children with experience variety, learning materials and language stimulation. These factors arising from SES differences could reflect differences in the ways parents interact with their children during everyday activities and encourage their children to take initiative and ask questions in different contexts.

Taken together, the findings from the present study demonstrated that question asking is not an activity that is only characteristic of Western cultures and but part of general human activity with minor variations in a non-Western cultural context. The variations could be due to parents' education level, adoption of Western child rearing attitudes and variable access to resources in the culture due to socioeconomic differences. More research in different cultures is definitely needed to further examine children's question-asking behavior and its importance for children's learning and development.

7.5. Limitations

There were several limitations of this study that should be acknowledged. First of all, the present study offered an exploration of two SES groups within a single non-Western culture; a Western comparison sample is needed to draw any cross-cultural conclusions based on the results. Besides, there should be more studies in other cultural contexts to examine the universal and socioculturally variable aspects of this phenomenon.

Second, about 50-60 % of children in the low-income sample who participated in the question elicitation task were not attending preschools. Preschool attendance was not correlated with children's questions in the Study 1 and Study 2, it was strongly correlated with vocabulary and SES. Although it might not have a direct influence on children's question-asking behavior, children who do not attend preschools could be less familiar with game-like activities I presented to them and also be less comfortable with interacting with a teacher-like figure.

Third, it should be noted that I have only examined the number of conversational turns as a gross measure of the length of mothers' talk in Study 1. Although this examination provided a glimpse of how often mothers and children took turns during the conversation, it did not provide information on the total number of utterances children heard from their mothers and the proportion of questions within these utterances. Previous research on mothers' talk across middle-class and low-income backgrounds suggested that mothers from low-income backgrounds may also engage in linguistically rich conversations with their children; however, the frequency and duration of such talk could be different (e.g., Hart & Risley, 1992; 1995; Hoff, Laursen & Tardiff, 2002). In other words, mothers from low-income backgrounds might feel less need or take less time to engage in explanatory talk with their children and use more directives in their daily interactions. As a result, children might receive less input in such talk and it might influence their language use and question-asking behavior. Therefore, a deeper analysis on mother's utterances and proportion of questions within utterances could provide more insight on possible interactional differences in middle-class and low-income homes that could influence question-asking behavior.

Finally, a more in-depth analysis of question-answer exchanges between mothers and children in naturalistic longitudinal conversations could enable us to understand what might be the differences in daily experiences of these children, which could result in SES differences in their beliefs and explanations about phenomena in the world. For instance, in this study, I parsed children's and mothers' explanations about improbable and impossible events as factual and hypothetical explanations based on Shtulman and Carey (2007). But perhaps a more detailed examination of mothers' explanations by focusing on causality (as Nolan-Reyes et al. did) or on elaborateness could reveal nuances in the ways mothers from middle-class and low-income families discuss improbable and impossible events with their children.

7.6. Final Thoughts and Future Directions

Despite these limitations, the findings of the present study are important because they points out several promising directions for future research. Research with preschoolers growing up in Western cultures underlined the importance of young children's questions as a tool for learning; but there is little evidence about the universality of or the variations within this phenomenon in non-Western cultures. The present study offers the initial evidence that children from middle-class and low-income backgrounds in a non-Western cultural context also use questions as a tool of learning from others.

Future research should explore why children from low-income families asked fewer questions in the experimental task and what might be the outcomes of question-asking behavior. What happens when children ask fewer questions? How questions and answers children receive could lead to conceptual change in different areas such as scientific knowledge, abstract and metaphysical knowledge, or knowledge about the social world such as other people and their motivations (e.g. theory of mind).

Also, additional work is needed to examine age-related changes in children's question-asking behavior both cross-sectionally and longitudinally. This study did not show any differences across 3, 4 and 5 years of age but future research should explore the developmental trajectory of explanation-seeking questions in both older and younger age groups. It could also be particularly important to examine whether and how question-asking changes after age 5. As children get older, they might become better able to verbalize their questions, and also possibly figure out explanations for the questionable phenomena around them on their own.

In conclusion, this research has important implications for developmental psychology and education. It has contributed to the scarce research in other cultural contexts in this area by

investigating how cultural change and the expansion of schooling—specifically in Turkey, but with possible implications for other cultures—might influence children's question-asking interactions with adults in ways that could help promote children's learning and cognitive development.

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APPENDIX A

Demographics Questionnaire and HOME Inventory

Demographics Questionnaire and HOME Inventory in English

Demographics Questions			
1	When is your birth date? (If the date is not known) How old are you?	Day……..…. Month……..…Year……. Age:_____	
2	Where were you born? City center, town or village?	1> Metropolitan city (İstanbul, Ankara, İzmir, Bursa, Adana) 2> City (center) 3> Town 4> Village 5> Abroad (write here)..... ……	
3	Where have you lived the longest so far?	_____ 1> Metropolitan city (İstanbul, Ankara, İzmir, Bursa, Adana) 2> City (center) 3> Town 4> Village 5> Abroad (write here)..... ……	
4	Have long have you been living in this city?	.....YEARS	
5	Do you speak any other language with your child at home?	If yes, which language? 1> No → Go to question 9 2> Kurdish 6> French 3> Arabic 7> Other _____ 4> English 5> German	
6	Which language do you speak most with your child?	(ONE RESPONSE) 1> Turkish 2> Kurdish 6> French 3> Arabic 7> Other _____ 4> English 5> German	
7	Who speaks other languages with your child?	1>Farther 2>Brother 3>Grandparents 4> Other _____	

8	Do you think to what extent your child will learn this language?	1> Better than Turkish 2> As much as Turkish 3> Less than Turkish	
9	Are mother and father together?	1> Yes 2>No If yes; How long you have been married? YEARS	
10	I will ask you a few questions about your children. How many children do you have?	(Write here)	

11	What is your education level, the latest degree you received?	(Write here).....	
12	What is your spouse's education level, the latest degree he/she received?	(Write here).....	
13	How many people live in your household including children?	(Write here).....	
14	Do you have anyone living in your house besides your spouse and children? (including nanny)	1>Yes 2>No → Go to section 4	
15	What is the relation of this person to the child?	1> Uncle 2> Aunt 3> Grandparents 4> Nanny 5>Other_____	

Child Care Section					
16	The person/center that takes care of the child	The period in which the person/center takes care of the child	If person;	**Where is the location?**	
	1>Person 2>Center	From which age to which age? _____ Total time: Years ……	1>What is the relation? _____ 2>Nanny	1> At the child's house 2>At his/her own house 3>Other_____	

	Months….			
17	Does your child go to a preschool or childcare center at the moment?	1>Yes 2>No → Go to next section.		
18	How many days in a week does your child go to a preschool or childcare center?	_____ days		
19	How long does your child stay in the preschool or childcare center?	1> Full day 2> Halfday 3> 1-2 Hours 4> Other_____		
20	How many children are there in your child's classroom?	1> 5 or less 5> 21 or more 2> 6-10 6> I am not sure / I don't know 3> 11-15 4> 16-20		

Family Socioeconomic Status Section			
21	Do you work and earn money?	1>Yes 2>No → go to 3rd question	
22	What is your job?	(Write here) .... Go to 4th question	
23	Which one of the following best fits your situation?	1>Retired 2>Housewife 3>Student 4>Looking for a job 5>Works voluntarily	
24	Does your spouse work?	>Yes 2>No → go to 6th question	
25	What does he/she do?	(Write here)	
26	How many people (including you) work in your household to earn money?	(Write here) _____	
27	Do you own the house you live in?	1>Yes → go to 10th question 2>No	
28	Do you pay rent?	1>Yes 2>No	
29	Do you live in public housing?	1>Yes 2>No	

30		Yes, we have	No, we don't have	
	1. Television	1	2	
	2. Video player	1	2	
	3. Credit Card	1	2	
	4. Computer	1	2	
	5. Internet connection	1	2	

	6. Car	1	2	
	7. Fridge	1	2	
	8. Washer	1	2	
	9. Dish washer	1	2	
	10. LCD/Plasma TV	1	2	
	11. Microwave oven	1	2	
	12. Domestic or international vacation opportunity	1	2	
	13. Summer house	1	2	
	What are the monthly expenses of the people living in your household (e.g. rent, gas, electricity, doctor, transportation, school expenses, grocery and so on) (To the Interviewer: If the person does not say anything, read the options) 1> 650 TL or less 2> 650 TL-1200 TL 3>1200-3000 TL 4> 3000-5000 TL 5> 5000 TL or more	…… Turkish Liras		

- What do you think is more important for a child to have? (please choose ONE option)
  - Independence OR Respect for Elders
- What do you think is more important for a child to have? (please choose ONE option)
  - Obedience OR Self-Reliance
- What do you think is more important for a child to have? (please choose ONE option)
  - Curiosity OR Good Manners
- What do you think is more important for a child to have? (please choose ONE option)
  - Being Considerate OR Well Behaved

****Please read each item carefully and rate the extent to which you agree or disagree with the item by circling a number on the scale that appears below it****

HOME Inventory

The activities that you engage in with ……..(CHILD'S NAME) and the rules that you set up at home are very important for the mother and the child interaction. Now I would like to ask you a few questions about these activities and rules.
(INTERVIEWER: Each of the answer choices will be read.)

Experience Variety			
1	Does your child eat at least a meal each day with his/her dad, you, and his/her siblings, if any?	1>Yes 2>No	*C48*
2	Do you buy a newspaper or a magazine at least once a week and read it at home?	1>Yes we do and I read it. 2>Yes we do but I don't read it. 3>No we don't. 4>Illiterate.	*C49*
3	How often do you or another member of the family read a book yo your child?	1>We read every day 2>We read couple of times every week 3>We read once a week 4>We read rarely (less than once a week) 5>We never read 6>Illiterate	*C50*
4	How many hours on average does your child spend watching TV every day?	_____ hours	*C51*
5	Did you visit another place (a village, town, summer camp or city) with you child for vacation last year?	1>Yes, several times 2>Yes, once 3>No	*C52*
6	Did you take your child to any show/entertainment (zoo, circus, museum, theater for children, puppet show etc.) last year?	1>Yes, several times 2>Yes, once 3>No	*C53*

7	Children can sometimes test our patience. If such an occasion happened last week, how many times did you use physical punishment such as spanking, slapping, hitting or pinching?	1>Such an occasion didn't happen. 2>Such an occasion happened but I didn't give physical punishment. 3>I gave physical punishment once. 4>I gave physical punishment two or more times.	*C54*
8	What do you do when your child gets angry or aggressive?	1>I don't do anything, I wait for him/her to calm down. 2> I try to entertain or distract him/her with something else. 3> I send him to somewhere where he/she could be alone. 4>I forbid him/her from doing something he/she loves (chocolate, sleeping late, TV etc.) 5>I physically punish him/her (hitting, spanking, pinching etc.) 6> I talk to him/her and try to understand and solve the problem first. 7>I yell and express my anger with my words. 8>Other (please specify) _____	*C55*
9	What do you do if your child hits you in a moment of madness or anger?	1>I don't do anything, I wait for him/her to calm down. 2> I try to entertain or distract him/her with something else. 3> I send him to somewhere where he/she could be alone. 4>I forbid him/her from doing something he/she loves (chocolate, sleeping late, TV etc.) 5>I physically punish him/her (hitting, spanking, pinching etc.) 6> I talk to him/her and try to understand and solve the problem first. 7>I yell and express my anger with my words. 8>Other (please specify) _____	*C56*
Academic Stimulation			
10	Do you help your child to learn a song, poem or rhyme?	1>Yes, always 2>Yes, occasionally 3>Not yet	*C57*

11	Do you teach your child the terms such as under, on, next to, behind, bigger, smaller so that he/she could describe things?	1>Yes, always 2>Yes, occasionally 3>Not yet	*C58*
12	Do you help your child learn colors?	1>Yes, always 2>Yes, occasionally 3>Not yet	*C59*
13	Do you help your child learn numbers?	1>Yes, always 2>Yes, occasionally 3>Not yet	*C60*
14	Do you help your child learn letters in the alphabet? (e.g. how to write his/her name, or answering his/her questions about letters).	1>Yes, always 2>Yes, occasionally 3>Not yet	*C61*
15	Do you help your child learn shapes such as square, triangle, circle etc?	1>Yes, always 2>Yes, occasionally 3>Not yet	*C62*

HOME ITEMS BASED ON OBSERVATION

Learning Materials			
	Materials available for the child		
1	The child has toys with different color contrasts, sizes and shapes.	1>Yes 2>No	
2	The child has at least one puzzle.	1>Yes 2>No	
3	The child has at least two music CDs at home to play music that is appropriate for his/her age.	1>Yes 2>No	
4	The child has toys such as blocks, legos, play doughs) which will support his/her creativity.	1>Yes 2>No	

5	The child has games and toys which will support his/her handicraft (lacing beads, legos, clothes for dolls etc.).	1>Yes 2>No	
6	The child has toys or games that will help him/her learn the numbers.	1>Yes 2>No	
7	The child has at least three storybooks for children.	1>Yes 2>No	
8	There are at least 10 visible books that could be read by everyone at home.	1>Yes 2>No	
9	There are materials like paint, chalk or pencil for the child to use.	1>Yes 2>No	
Language stimulation			
10	The child has toys which will help him/her learn the names of the animals.	1>Yes 2>No	
11	The mother has taught or is teaching child polite phrases like please, thank you and I am sorry.	1>Yes 2>No	
12	The mother listens to the child and encourages him/her to talk.	1>Yes 2>No	
13	The child talks about his/her desires (e.g. I want to eat jam and bread for breakfast).	1>Yes 2>No	
14	The mother uses correct grammar and pronunciation when she talks with the child.	1>Yes 2>No	
15	The mother talks with the child using a positive tone (warm and caring).	1>Yes 2>No	
16	The mother talks with the child as if she talks with an adults (in terms of content).	1>Yes 2>No	
17	The mother completes the child's unfinished statements.	1>Yes 2>No	
Physical environment			
18	The place they live appears to be safe.	1>Yes 2>No	
19	There is a playground outside and appears to be safe.	1>Yes 2>No	
20	The place is dark or gloomy.	1>Yes 2>No	
21	The environment looks aesthetically nice.	1>Yes 2>No	
22	There is at least 10 m2 space per person in	1>Yes	

	the house.	2>No	
23	The rooms are overcrowded with furniture.	1>Yes 2>No	
24	The house is clean enough.	1>Yes 2>No	
25	The house is not messy (there are no unwashed dishes, leftover food and piles of clothes around).	1>Yes 2>No	
	Warmth and acceptance		
26	The mother held the child close to herself for at least 5 minutes during the visit.	1>Yes 2>No	
27	The mother talked to the child at least twice during the visit.	1>Yes 2>No	
28	The mother responded to child questions and requests verbally.	1>Yes 2>No	
29	The mother responded to the child's talk verbally.	1>Yes 2>No	
30	The mother praised the child at least two times (“well done,” “good job” etc.) during the visit.	1>Yes 2>No	
31	The mother hugged, kissed or showed affection to the child at least once during the visit.	1>Yes 2>No	
32	The mother supported a skill of the child's (e.g. eating on his/her own) or an activity he/she likes to do.	1>Yes 2>No	
33	The mother introduced the visitor to the child.	1>Yes 2>No	
34	The drawings, paintings or art projects made by child are shown in the house.	1>Yes 2>No	
	Harsh discipline		
35	The mother spoke harshly, scolded or humiliated the child.	1>Yes 2>No	
36	The mother physically restricted the child (holding his/her arms, tugging his/her arm etc.) during the visit.	1>Yes 2>No	

37	The mother punished the child physically (hitting, spanking, pulling his/her ear etc.)	1>Yes 2>No	

Demogprahics Questionnaire and HOME Inventory in Turkish

Soru	BÖLÜM 03-DEMOGRAFİK SORULAR		
1	Doğum tarihinizi öğrenebilir miyim? (Doğum tarihi bilinmiyor ise yaşı) Kaç yaşındasınız?	Gün…….…. Ay…….……Yıl……. Yaş:_____	*C4*
2	Nerede doğdunuz? Merkez il mi, ilçesi veya köyü mü?	1> Metropol, büyük şehir merkezi (İstanbul, Ankara, İzmir, Bursa, Adana) 2> Şehir (merkez) 3> Kasaba 4> Köy 5> Yurtdışı (**yazınız**)	*C5*
3	Bugüne kadar en uzun yaşadığınız yer? _____	1> Metropol, büyük şehir merkezi (İstanbul, Ankara, İzmir, Bursa, Adana) 2> Şehir 3> Kasaba 4> Köy 5> Yurtdışı (**yazınız**)	*C6*
4	Şu an oturduğunuz şehirde kaç yıldır yaşıyorsunuz?	.....YIL	*C7*
5	Evde _____ [ÇOCUĞUN İSMİ] ile Türkçeden başka bir dil kullanılıyor mu? Evet ise "hangi dil? "	1> Hayır → 9. soruya geçiniz 5> Almanca 2> Kürtçe 6> Fransızca 3> Arapça 7> Diğer _____ 4> İngilizce	*C8*

6	Siz çocuğunuzla en çok hangi dilde konuşuyorsunuz? **(TEK CEVAP)**	1>Türkçe 2> Kürtçe 3> Arapça 4> İngilizce 5>Almanca 6>Fransızca 7>Diğer _____	*C9*
7	Kim çocuğunuzla Türkçeden başka dilleri konuşuyor?	1>Baba 2>Kardeş 3>Anneanne, babaanne 4> Diğer _____	*C10*
8	Çocuğunuzun bu dili ne kadar öğreneceğini düşünüyorsunuz? (ANKETÖR: Şıkları okuyun)	1> Türkçeden daha iyi 2> Türkçe kadar 3> Türkçeden daha az	*C11*
9	Anne baba birlikte mi?	1> Evet 2>Hayır Cevap **Evet** ise; Kaç yıldır evlisiniz ? Yıl	*C12* *C13*
10	Şimdi size çocuklarınız hakkında birkaç soru soracağım. Toplam kaç tane çocuğunuz var?	(**Yazınız**)	*C14*

11	**(ANKETÖR: Lütfen en büyük çocuktan başlayarak aşağıdaki tabloyu doldurun)**						
		İsim	**Doğum tarihi Gün/Ay/Yıl veya**	**Cinsiyet**	**Okula gidiyor mu?**	**Kaçıncı sınıfa devam**	**Şu an sizinle mi yaşıyor?**
	1. çocuk	_____ **Yazınız**	___/___/___ _____ *C15a*	1> Kız 2> Erkek *C15b*	1>Evet 2>Hayır *C15c*	_____ **Yazınız** *C15d*	1>Evet 2>Hayır *C15e*
	2. çocuk	_____ **Yazınız**	___/___/___ _____ *C16a*	1> Kız 2> Erkek *C16b*	1>Evet 2>Hayır *C16c*	_____ **Yazınız** *C16d*	1>Evet 2>Hayır *C16e*
	3. çocuk	_____ **Yazınız**	___/___/___ _____ *C17a*	1> Kız 2> Erkek *C17b*	1>Evet 2>Hayır *C17c*	_____ **Yazınız** *C17d*	1>Evet 2>Hayır *C17e*

	4. çocuk	_____ **Yazınız**	___/___/___ _____ *C18a*	1> Kız 2> Erkek *C18b*	1>Evet 2>Hayır *C18c*	_____ **Yazınız** *C18d*	1>Evet 2>Hayır *C18e*
	5. çocuk	_____ **Yazınız**	___/___/___ _____ *C19a*	1> Kız 2> Erkek *C19b*	1>Evet 2>Hayır *C19c*	_____ **Yazınız** *C19d*	1>Evet 2>Hayır *C19e*
	6. çocuk	_____ **Yazınız**	___/___/___ _____ *C20a*	1> Kız 2> Erkek *C20b*	1>Evet 2>Hayır *C20c*	_____ **Yazınız** *C20d*	1>Evet 2>Hayır *C20e*
	7. çocuk	_____ **Yazınız**	___/___/___ _____ *C21a*	1> Kız 2> Erkek *C21b*	1>Evet 2>Hayır *C21c*	_____ **Yazınız** *C21d*	1>Evet 2>Hayır *C21e*
	8. çocuk	_____ **Yazınız**	___/___/___ _____ *C22a*	1> Kız 2> Erkek *C22b*	1>Evet 2>Hayır *C22c*	_____ **Yazınız** *C22d*	1>Evet 2>Hayır *C22e*
	9. çocuk	_____ **Yazınız**	___/___/___ _____ *C23a*	1> Kız 2> Erkek *C23b*	1>Evet 2>Hayır *C23c*	_____ **Yazınız** *C23d*	1>Evet 2>Hayır *C23e*
	10. çocuk	_____ **Yazınız**	___/___/___ _____ *C24a*	1> Kız 2> Erkek *C24b*	1>Evet 2>Hayır *C24c*	_____ **Yazınız** *C24d*	1>Evet 2>Hayır *C24e*

12	Eğitim durumunuz, yani en son bitirdiğiniz sınıf nedir?	**(Yazınız)**	*C25*
13	Eşinizin eğitim durumu, yani en son bitirdiği sınıf nedir?	**(Yazınız)**	*C26*
14	Evinizde tüm çocuklar dahil kaç kişi yaşıyor?	**(Yazınız)**	*C27*
15	Evinizde siz, eşiniz ve çocuklarınız dışında başka bireyler var mı? (Bakıcı dahil)	1>Evet 2>Hayır → **Bölüm 04'e geçiniz.**	*C28*
16	Bu kişinin/kişilerin çocuğa göre akrabalık ilişkisi nedir?	1> Dayı 5>Anneanne/babaanne 2> Teyze 6>Dede 3> Amca 7>Bakıcı 4> Hala 8>Diğer_____	*C29*

Soru	BÖLÜM 06- ÇOCUK BAKIMI BÖLÜMÜ		
	Bazı anneler iş, okul, kurs ya da başka sebeplerle çocukları ile sürekli olarak beraber olamazlar. Bu durumda çocuklara anneleri dışında düzenli bir şekilde bakan başka birisi ya da birileri vardır. Bazı çocuklar da düzenli bir şekilde yuvaya ya da kreşe giderler. Şimdi soracağım sorular _____ [ÇOCUĞUN İSMİ] nin siz yokken birlikte vakit geçirdiği kişiler ve yerler hakkında.		
1	Doğduğundan beri çocuğunuza sizden başka bakmış olan kişileri düşünün. Çocuğunuza en az birkaç ay boyunca **düzenli olarak** (yani birkaç ay boyunca en az haftada birkaç gün ve günde 2 saatten fazla) bakan kimse oldu mu?	*1>Evet* *2>Hayır* → **Soru 3 e geçin.**	C38

	Şimdi çocuğunuza düzenli olarak bakmış olan kişiler ya da gittiği yuvalar hakkında birkaç şey öğrenmek istiyorum. Çocuğunuza doğduğundan bugüne kadar bakmış olan kişileri sırası ile düşünüp bu soruyu ona göre cevaplamanızı istiyorum. Eğer çocuğunuza aynı anda birden fazla kişi baktıysa, lütfen çocuğunuz en çok kiminle vakit geçirdiyse onu belirtin.					
2		**Çocuğunuza Bakım Sağlayan Kişi/ Yuva**	**Bu kişinin/ yuvanın bakma süresi**	**Kişi ise**	**Bu kişinin bakma yeri**	
	1	1>Kişi 2>Yuva *C39a*	Kaç aylıktan kaç aylığa baktı? _____ Toplam süre: Yıl …… Ay ……. *C39b*	1>Akraba (Yakınlık derecesini yazınız) _____ 2>Bakıcı *C39c*	1>Çocuğun evinde 2>Bakan kişinin evinde 3>Diğer_____ *C39d*	
	2	1>Kişi 2>Yuva *C40a*	Kaç aylıktan kaç aylığa baktı? _____ Toplam süre: Yıl ……. Ay…….. *C40b*	1>Akraba (Yakınlık derecesini yazınız) _____ 2>Bakıcı *C40c*	1>Çocuğun evinde 2>Bakan kişinin evinde 3>Diğer_____ *C40d*	
	3	1>Kişi 2>Yuva	Kaç aylıktan kaç aylığa baktı? _____ Toplam süre: Yıl ……. Ay……..	1>Akraba (Yakınlık derecesini yazınız) _____ 2>Bakıcı	1>Çocuğun evinde 2>Bakan kişinin evinde 3>Diğer_____	

		C41a	C41b	C41c	C41d	
	4	1>Kişi 2>Yuva C42a	Kaç aylıktan kaç aylığa baktı? _____ Toplam süre: Yıl ……. Ay…….. C42b	1>Akraba (Yakınlık derecesini yazımız) _____ 2>Bakıcı C42c	1>Çocuğun evinde 2>Bakan kişinin evinde 3>Diğer_____ C42d	
	5	1>Kişi 2>Yuva C43a	Kaç aylıktan kaç aylığa baktı? _____ Toplam süre: Yıl ……. Ay…….. C43b	1>Akraba (Yakınlık derecesini yazımız) _____ 2>Bakıcı C43c	1>Çocuğun evinde 2>Bakan kişinin evinde 3>Diğer_____ C43d	
3	Çocuğunuz şu anda kreşe veya yuvaya gidiyor mu?			1>Evet 2>Hayır → **Bölüm 07'ye geçin.**		C44
4	Çocuğunuz şu anda kreşe ya da yuvaya haftada kaç gün gidiyor?			_____ GÜN		C45
5	Çocuğunuz kreşte veya yuvada ne kadar süre kalıyor?			1> Tam gün 2> Yarım gün 3> 1-2 Saat 4> Diğer_____		C46
6	Çocuğunuzun sınıfında aşağı yukarı kaç çocuk var?			1> 5 veya daha az 2> 6-10 3> 11-15 4> 16-20 5> 21 veya daha fazla 6> Emin değilim / bilmiyorum		C47

- Sizce bir çocukta aşağıdaki özelliklerden hangisinin olması daha önemli? (lütfen aşağıdaki seçeneklerden BİRİNİ işaretleyiniz.)

  Bağımsızlık YA DA Büyüklere saygı

- Sizce bir çocukta aşağıdaki özelliklerden hangisinin olması daha önemli? (lütfen aşağıdaki seçeneklerden BİRİNİ işaretleyiniz.)

  İtaat YA DA Kendine güven

- Sizce bir çocukta aşağıdaki özelliklerden hangisinin olması daha önemli? (lütfen aşağıdaki seçeneklerden BİRİNİ işaretleyiniz.)

  Merak YA DA İyi huyluluk

- Sizce biz çocukta aşağıdaki özelliklerden hangisinin olması daha önemli? (lütfen aşağıdaki seçeneklerden BİRİNİ işaretleyiniz.)

  Düşünceli olmak YA DA Uslu olmak

****Lütfen aşağıdaki cümlelerin her birini dikkatlice okuyunuz ve cümleye ne kadar katılıp katılmadığınızı aşağıdaki rakamlardan size en uygun geleni işaretleyerek belirtiniz. ****

Soru	BÖLÜM 07a- HOME MÜLAKATI		
	Sizin _____ [ÇOCUĞUN İSMİ] ile birlikte yaptığınız şeyler ve evde koyduğunuz kurallar anne-çocuk ilişkisini oluşturan önemli şeylerdir. Şimdi bunlar hakkında size birkaç soru sormak istiyorum. **(ANKETÖR: Cevap şıklarından her birisi okunacaktır.)**		
1	**Çocuğunuz günde en az bir öğün yemeği babası, siz ve varsa kardeşleriyle birlikte yiyor mu?**	**1>Evet** **2>Hayır**	*C48*
2	**Evinize en az haftada bir kere gazete ya da dergi alıp siz okuyor musunuz?**	**1>Evet alıyoruz ve okuyorum** **2>Evet alıyoruz ama ben okumuyorum** **3>Hayır almıyoruz** **4>Okuma-yazma bilmiyor.**	*C49*
3	**Evde siz ya da aileden başka birisi çocuğunuza ne sıklıkta kitap okur?**	**1>Her gün mutlaka okunur.** **2>Haftada bir kaç kere okunur.** **3>Haftada bir kere okunur** **4>Nadiren (haftada bir kereden daha az) okunur** **5>Hiç okunmaz** **6>Okuma-yazma bilinmiyor.**	*C50*
4	**Çocuğunuz günde yaklaşık kaç saat televizyon karşısında geçirir?**	**_____ saat**	*C51*
5	**Geçtiğimiz bir yıl içinde çocuğunuzla birlikte, başka bir yere (köy, kasaba, yayla ya da başka bir şehir) gezmeye gittiniz mi?**	**1>Evet, birkaç kere** **2>Evet, bir kere** **3>Hayır**	*C52*
6	**Geçtiğimiz bir yıl içinde çocuğunuzu herhangi bir gösteriye (hayvanat bahçesi, sirk, müze, çocuk tiyatrosu, kukla gösterisi gibi) götürdünüz mü?**	**1>Evet, birkaç kere** **2>Evet, bir kere** **3>Hayır**	*C53*
7	**Çocuklar bazen insanın sabrını çok zorlayabilir. Geçtiğimiz hafta içinde böyle bir durum olduğunda kaç kere çocuğunuza vurmak, şaplak atmak, sarsmak veya çimdiklemek gibi fiziksel bir ceza verdiniz?**	**1>Böyle bir durum olmadı** **2>Böyle durumlar oldu ama fiziksel ceza vermedim** **3>Bir kere fiziksel ceza verdim** **4>İki veya daha fazla kere fiziksel ceza verdim**	*C54*
8	**Çocuğunuz bir şeye kızdığında ya da öfkelendiğinde ne yaparsınız?**	**1>Hiçbir şey yapmam, sakinleşmesini beklerim** **2> Onu oyalamaya veya dikkatini başka bir şeye çekmeye çalışırım** **3>Onu yalnız kalabileceği bir yere yollarım** **4>O gün için sevdiği bir şeyi (çikolata, geç yatma, televizyon seyretme v.b.) yasaklarım.** **5>Onu fiziksel olarak cezalandırırım (örneğin, vururum, sarsarım, çimdik atarım, kulağını çekerim).** **6>Onunla konuşur, sorunu anlamaya ve çözmeye çalışırım.** **7>Bağırır, kızdığımı sözlerimle ifade ederim.** **8>Diğer (yazınız) _____** **_____**	*C55*

Soru	BÖLÜM 07a- HOME MÜLAKATI		
	Sizin _____ [ÇOCUĞUN İSMİ] ile birlikte yaptığınız şeyler ve evde koyduğunuz kurallar anne-çocuk ilişkisini oluşturan önemli şeylerdir. Şimdi bunlar hakkında size birkaç soru sormak istiyorum. **(ANKETÖR: Cevap şıklarından her birisi okunacaktır.)**		
1	**Çocuğunuz günde en az bir öğün yemeği babası, siz ve varsa kardeşleriyle birlikte yiyor mu?**	**1>Evet** **2>Hayır**	*C48*
2	**Evinize en az haftada bir kere gazete ya da dergi alıp siz okuyor musunuz?**	**1>Evet alıyoruz ve okuyorum** **2>Evet alıyoruz ama ben okumuyorum** **3>Hayır almıyoruz** **4>Okuma-yazma bilmiyor.**	*C49*
3	**Evde siz ya da aileden başka birisi çocuğunuza ne sıklıkta kitap okur?**	**1>Her gün mutlaka okunur.** **2>Haftada bir kaç kere okunur.** **3>Haftada bir kere okunur** **4>Nadiren (haftada bir kereden daha az) okunur** **5>Hiç okunmaz** **6>Okuma-yazma bilinmiyor.**	*C50*
4	**Çocuğunuz günde yaklaşık kaç saat televizyon karşısında geçirir?**	**_____ saat**	*C51*
5	**Geçtiğimiz bir yıl içinde çocuğunuzla birlikte, başka bir yere (köy, kasaba, yayla ya da başka bir şehir) gezmeye gittiniz mi?**	**1>Evet, birkaç kere** **2>Evet, bir kere** **3>Hayır**	*C52*
6	**Geçtiğimiz bir yıl içinde çocuğunuzu herhangi bir gösteriye (hayvanat bahçesi, sirk, müze, çocuk tiyatrosu, kukla gösterisi gibi) götürdünüz mü?**	**1>Evet, birkaç kere** **2>Evet, bir kere** **3>Hayır**	*C53*
7	**Çocuklar bazen insanın sabrını çok zorlayabilir. Geçtiğimiz hafta içinde böyle bir durum olduğunda kaç kere çocuğunuza vurmak, şaplak atmak, sarsmak veya çimdiklemek gibi fiziksel bir ceza verdiniz?**	**1>Böyle bir durum olmadı** **2>Böyle durumlar oldu ama fiziksel ceza vermedim** **3>Bir kere fiziksel ceza verdim** **4>İki veya daha fazla kere fiziksel ceza verdim**	*C54*
8	**Çocuğunuz bir şeye kızdığında ya da öfkelendiğinde ne yaparsınız?**	**1>Hiçbir şey yapmam, sakinleşmesini beklerim** **2> Onu oyalamaya veya dikkatini başka bir şeye çekmeye çalışırım** **3>Onu yalnız kalabileceği bir yere yollarım** **4>O gün için sevdiği bir şeyi (çikolata, geç yatma, televizyon seyretme v.b.) yasaklarım.** **5>Onu fiziksel olarak cezalandırırım (örneğin, vururum, sarsarım, çimdik atarım, kulağını çekerim).** **6>Onunla konuşur, sorunu anlamaya ve çözmeye çalışırım.** **7>Bağırır, kızdığımı sözlerimle ifade ederim.** **8>Diğer (yazınız) _____** **_____**	*C55*

9	Çocuğunuz eğer kızgınlıkla ve o anki öfkesiyle size vurursa, ne yaparsınız?	1>Hiçbir şey yapmam, sakinleşmesini beklerim 2>Onu oyalamaya veya dikkatini başka bir şeye çekmeye çalışırım 3>Onu odasına veya bir köşeye yollarım 4>O gün için sevdiği bir şeyi (çikolata, geç yatma, televizyon seyretme v.b.) yasaklarım. 5>Onu fiziksel olarak cezalandırırım (örneğin, vururum, sarsarım, çimdik atarım, kulağını çekerim). 6>Onunla konuşur, sorunu anlamaya ve çözmeye çalışırım. 7> Bağırır, kızdığımı sözlerimle ifade ederim. 8>Diğer (**yazınız**) _____	*C56*
10	Çocuğunuza şarkı, şiir veya tekerleme öğrenmesi için yardımcı oluyor musunuz?	1>Evet, her fırsatta 2>Evet, arada sırada 3>Henüz Değil	*C57*
11	Çocuğunuza bir yeri ya da bir şeyi tarif edebilmesi için altında, üstünde, yanında, arkasında, daha büyük, daha küçük gibi terimleri öğretiyor musunuz?	1>Evet, her fırsatta 2>Evet, arada sırada 3>Henüz değil	*C58*
12	Çocuğunuza renkleri öğrenmesi için yardımcı oluyor musunuz?	1>Evet, her fırsatta 2>Evet, arada sırada 3>Henüz değil	*C59*
13	Çocuğunuza sayıları öğrenmesi için yardımcı oluyor musunuz?	1>Evet, her fırsatta 2>Evet, arada sırada 3>Henüz değil	*C60*
14	Harfleri öğrenmesi için çocuğunuza yardımcı oluyor musunuz? (Örneğin, adını nasıl yazacağını göstermek ya da harflerle ilgili bir soru sorduğunda cevaplamak ve göstermek vb.)	1>Evet, her fırsatta 2>Evet, arada sırada 3>Henüz değil	*C61*
15	Çocuğunuza kare, üçgen, yuvarlak vb. gibi basit şekillerin isimlerini öğrenmesi için yardımcı oluyor musunuz?	1>Evet, her fırsatta 2>Evet, arada sırada 3>Henüz değil	*C62*

Soru	BÖLÜM 07b- HOME GÖZLEME DAYANAN MADDELER		
	Çocuğa yönelik materyaller		
1	Çocuğun değişik renkleri (renk kontrastları) olan, farklı büyüklükleri ve şekilleri ayrıştıran oyuncakları var.	1>Evet 2>Hayır	*C63*
2	Çocuğun en az bir tane yapbozu var.	1>Evet 2>Hayır	*C64*
3	Evde çocuğun yaşına uygun müzik çalabilmek için en az iki tane kaset ya da CD si (SİDİ si) var.	1>Evet 2>Hayır	*C65*
4	Çocuğun yaratıcılığını destekleyecek (bloklar, legolar, oyun hamuru gibi) oyuncakları var.	1>Evet 2>Hayır	*C66*
5	Çocuğun el becerilerini destekleyen oyunları veya oyuncakları var (ipe dizmek için boncuk, küçük bloklar, oyuncak bebeğe giydirmek için giysiler, vb.).	1>Evet 2>Hayır	*C67*
6	Çocuğun, sayıları öğrenmesine yardımcı olan oyuncakları veya oyunları var.	1>Evet 2>Hayır	*C68*
7	Çocuğun en az üç tane çocuk kitabı var.	1>Evet 2>Hayır	*C69*
8	Evdeki herkesin okuyabileceği en az on kitap görünür şekilde duruyor.	1>Evet 2>Hayır	*C70*
9	Çocuğun kullanabileceği boya, tebeşir veya kalem gibi malzemeleri var.	1>Evet 2>Hayır	*C71*
	Dil için uyarma		
10	Çocuğun, hayvanların isimlerini öğrenmesine yardımcı olan oyuncakları var.	1>Evet 2>Hayır	*C72*
11	Anne çocuğa lütfen, teşekkür ederim, özür dilerim gibi basit nezaket cümlelerini öğretiyor/öğretmiş.	1>Evet 2>Hayır	*C73*
12	Anne, çocuğun anlattıklarını dinliyor ve onu konuşması için teşvik ediyor.	1>Evet 2>Hayır	*C74*
13	Çocuk kendi isteklerini (örneğin kahvaltıda reçel-ekmek yemek istiyorum gibi) ifade ediyor.	1>Evet 2>Hayır	*C75*
14	Anne çocukla konuşurken doğru bir dilbilgisi ve telaffuz kullanıyor.	1>Evet 2>Hayır	*C76*
15	Annenin ses tonu, çocuğa olumlu duygular (sıcaklık, şefkat, sevgi vb) taşıyor.	1>Evet 2>Hayır	*C77*
16	Anne (içerik açısından) çocukla yetişkinle konuşur gibi konuşuyor.	1>Evet 2>Hayır	*C78*
17	Anne çocuğun ifadesinde eksik kalan yerleri tamamlıyor .	1>Evet 2>Hayır	*C79*

	Fiziksel Çevre		
18	Yaşanan ev güvenli görünüyor.	1>Evet 2>Hayır	*C80*
19	Dışarıdaki oyun alanı güvenli görünüyor.	1>Evet 2>Hayır	*C81*
20	Dairenin içi karanlık ya da boğucu (sıkıcı).	1>Evet 2>Hayır	*C82*
21	Çevre estetik olarak güzel gözüküyor.	1>Evet 2>Hayır	*C83*
22	Evde, kişi başına en az 10 m^2 alan düşüyor. (3 metre x 3 metre veya daha fazla)	1>Evet 2>Hayır	*C84*
23	Odalar, mobilyalarla aşırı derecede dolu.	1>Evet 2>Hayır	*C85*
24	Ev, makul düzeyde temiz.	1>Evet 2>Hayır	*C86*
25	Ev, asgari düzeyde dağınık (bulaşık, kalmış yiyecek, kaldırılmamış kıyafet yığınları yok).	1>Evet 2>Hayır	*C87*
	Sıcaklık ve kabul		
26	Anne, çocuğu ziyaret sırasında en az 5 dakika kadar kendine yakın olacak şekilde tuttu.	1>Evet 2>Hayır	*C88*
27	Anne, çocukla ziyaret sırasında en az iki kere sohbet etti.	1>Evet 2>Hayır	*C89*
28	Anne, çocuğun sorularını ve isteklerini sözel olarak cevaplandırdı.	1>Evet 2>Hayır	*C90*
29	Anne, genellikle çocuğun konuşmalarına sözel olarak cevap verdi.	1>Evet 2>Hayır	*C91*
30	Anne, çocuğu ziyaret sırasında en az iki kere kendiliğinden övdü ("aferin," "güzel yaptın," vb.).	1>Evet 2>Hayır	*C92*
31	Anne, ziyaret sırasında çocuğu en az bir kere okşadı, öptü, sevdi veya kucakladı.	1>Evet 2>Hayır	*C93*
32	Anne, ziyaret sırasında çocuğun bir becerisini (örneğin, yemeğini kendi yiyebilmesi) ya da sevdiği bir şeyi gösterebilmesi için çocuğa destek oldu.	1>Evet 2>Hayır	*C94*
33	Anne, ziyaretçiyi çocuğa tanıttı.	1>Evet 2>Hayır	*C95*
34	Çocuğun yaptığı resim, boyama, yapıştırma ya da proje gibi faaliyetler evde bir yerde sergilenmiş.	1>Evet 2>Hayır	*C96*

	Çocuğa katı disiplin uygulamak		
35	Anne, çocuğa karşı ziyaret sırasında bir kereden fazla sert konuştu, onu azarladı veya aşağıladı.	1>Evet 2>Hayır	*C97*
36	Anne, ziyaret sırasında çocuğu fiziksel olarak kısıtladı (kollarını tutarak hareketini engellemek, istemediği halde kucağa alarak uzaklaştırmak, kolundan çekmek, vb.)	1>Evet 2>Hayır	*C98*
37	Anne, ziyaret sırasında çocuğu fiziksel olarak cezalandırdı (vurmak, kulak çekmek, çimdiklemek, vb.).	1>Evet 2>Hayır	*C99*

Soru	BÖLÜM 08 – HANE GELİR-GİDER ANKETİ		
	Son olarak size evinizin geçimi ile ilgili birkaç sorum olacak.		
1	Şu anda para kazanmak amacıyla herhangi bir şey yapıyor musunuz?	1>Evet 2>Hayır → **soru 3'e geçin**	*C100*
2	Ne iş yapıyorsunuz?	(**Yazınız**) .... **Soru 4'e geçin**	*C101*
3	Şimdi sayacaklarımdan hangisi size en uygun olandır?	1>Emekli 2>Ev kadını 3>Öğrenci veya kursa gidiyor 4>İş arıyor, bulsa çalışmak istiyor 5>Gönüllü çalışıyor	*C102*
4	Şu anda eşiniz çalışıyor mu?	1>Evet 2>Hayır → **soru 6'ya geçin**	*C103*
5	Ne iş yapıyor?	(**Yazınız**)	*C104*
6	Evinizde para kazanmak için çalışan kişi sayısı (siz dahil) nedir?	(**Yazınız**) _____	*C105*
7	Oturduğunuz ev size mi ait?	1>Evet → **soru 10'a geçin** 2>Hayır	*C106*
8	Oturduğunuz eve kira ödüyor musunuz?	1>Evet 2>Hayır	*C107*
9	Oturduğunuz ev lojman mı?	1>Evet 2>Hayır	*C108*

Şimdi size bazı şeyler sayacağım. Bunlara evde sizinle yaşayan kişilerden kimin sahip olduğu önemli değildir.

Evinizde bu gerecin olup olmadığı önemli bizim için. Her biri için "sahibiz", "sahip değiliz" seçeneklerinden birini söyleyiniz.

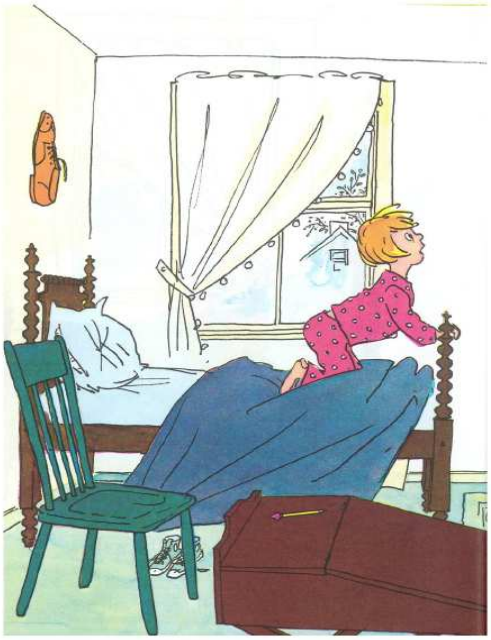
		Sahibiz	Sahip Değiliz	
10	1. Televizyon	1	2	*C109*
	2. Video/VCD Oynatıcı	1	2	*C110*
	3. Kredi Kartı	1	2	*C111*
	4. Bilgisayar	1	2	*C112*
	5. İnternet bağlantısı	1	2	*C113*
	6. Araba	1	2	*C114*
	7. Buzdolabı	1	2	*C115*
	8. Çamaşır makinesi	1	2	*C116*
	9. Bulaşık makinesi	1	2	*C117*
	10. LCD/Plazma televizyon	1	2	*C118*
	11. Mikro dalga fırın	1	2	*C119*
	12. Yurt içi ve/veya yurtdışında tatil imkanı	1	2	*C120*
	13. Yazlık ev	1	2	*C121*
11	Evinizde yaşayan tüm kişilerin, yiyecek-içecek, kira, gaz, elektrik, ulaşım, okul, taksitler, doktor veya ilaç gibi pek çok masrafları olabilir. Bunların hepsini toplayacak olursak, evinizde yaşayan kişilerin aylık toplam masrafları ne kadardır? (ANKETÖRE: Eğer kendisi söylemezse şıkları okuyun.) 1> 650 TL'den az 2> 650 TL-1200 TL arası 3>1200-3000 TL arası 4> 3000-5000 TL arası 5> 5000 TL'den fazla	..... YTL		*C122*

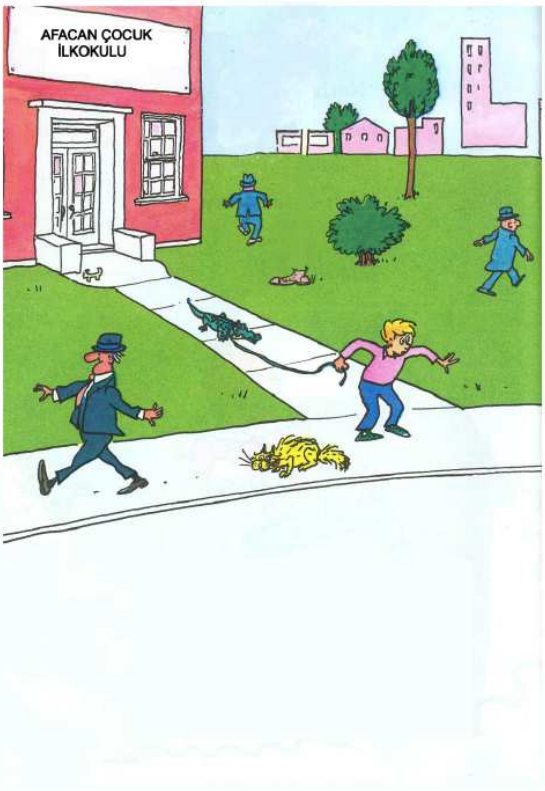
ANKETÖRE:

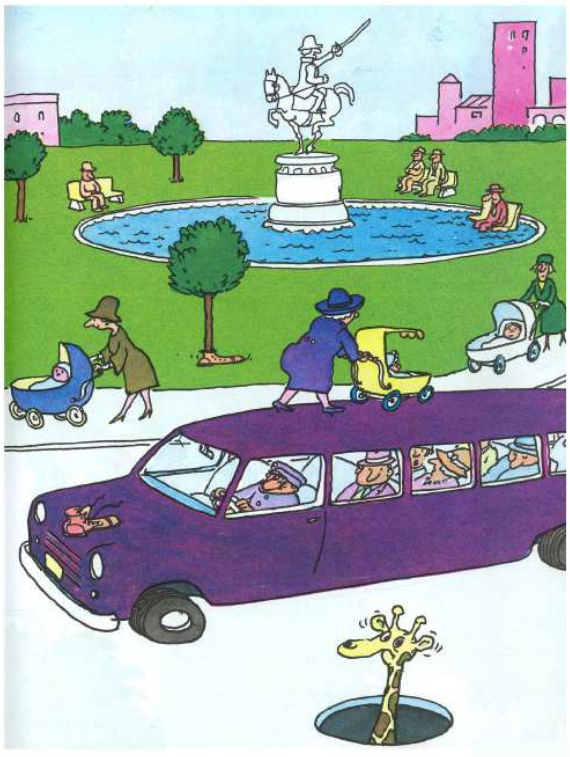
BÖLÜM 09-ANKETÖRÜN ANNEYE DAİR GÖZLEMLERİ

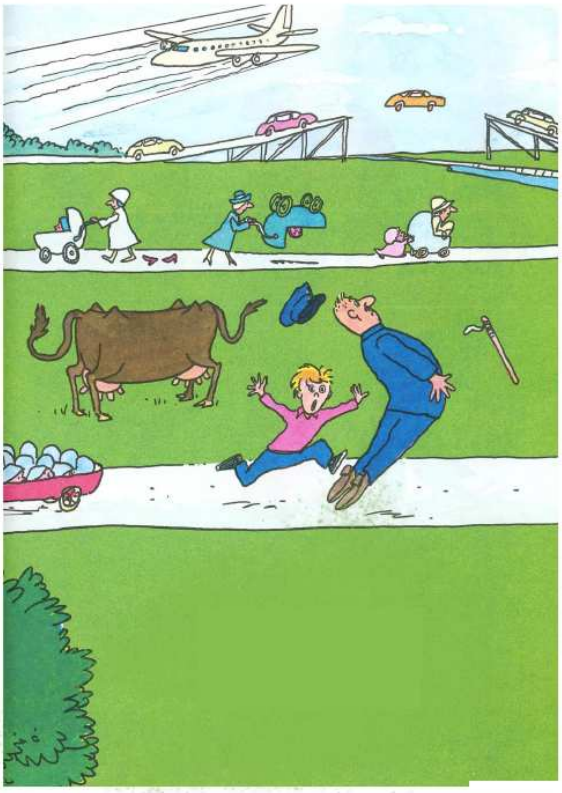
	Lütfen bu soruları annenin görüşme sırasındaki tutum ve davranışlarını göz önüne alarak doldurunuz..		
1	Katılımcının görüşmeye olan ilgisini nasıl değerlendirirsiniz?	5> Çok ilgiliydi 4> İlgiliydi 3> Biraz ilgiliydi 2> İlgili değildi 1> Çok ilgisizdi	*C123*
2	Katılımcı soruları ne derece anladı?	5> Tümünü anladı 4> Çoğunu anladı 3>Bazı soruları anlamadı 2> Çoğunu anlamadı 1> Hiçbirini anlamadı	*C124*
3	Katılımcı soruları cevaplarken ne derece dikkat gösterdi?	5> Çok dikkatliydi 4> Dikkatliydi 3>Bazen dikkatli değildi 2> Dikkatsizdi 1> Çok dikkatsizdi	*C125*
4	Katılımcı soruları cevaplarken ne kadar içten (samimi) cevaplar verdi?	3> Çoğunlukla içten (samimi) cevaplar verdi 2> Ara sıra içten (samimi) cevaplar verdi 1> İçten (samimi) cevaplar vermedi	*C126*
5	Katılımcı görüşme sırasında herhangi bir soruya/bölüme kayda değer bir tepkide bulundu mu?	1>Evet 2> Hayır → **8'e geçiniz**	*C127*
6	Hangi soruya / sorulara?	.....	*C128*
7	Ne gibi tepkiler? (kısaca yazınız)	.....	*C129*
8	Anketteki herhangi bir bölümü yarıda kesmek zorunda kaldınız mı?	1>Evet 2> Hayır → **Anket bitti**	*C130*
9	Hangi bölümü/ bölümleri?	.....	*C131*
10	*Neden?*	.....	*C132*

APPENDIX B
Sample Pictures from Wacky Wednesday




AFACAN ÇOCUK
İLKOKULU





APPENDIX C

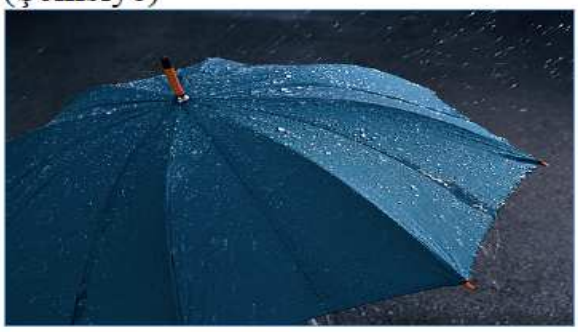
Pictures of Novel Animals and Objects Used in Study 2

Familiar Animals and Objects

Polar Bear (Kutup ayısı)

Leopard (Leopar)

Umbrella (Şemsiye)



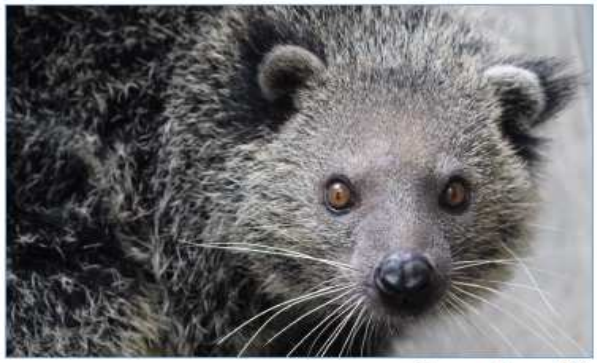
Citrus Juicer (Portakal sıkacağı)

Novel Animals

Mexican axolotl (Meksika semenderi)

Pangolin (Karıncayiyen)

Binturong (Ayı kedisi)



Sea otter (Su samuru)

Meerkat (Mirket)

Saiga (Sayga)

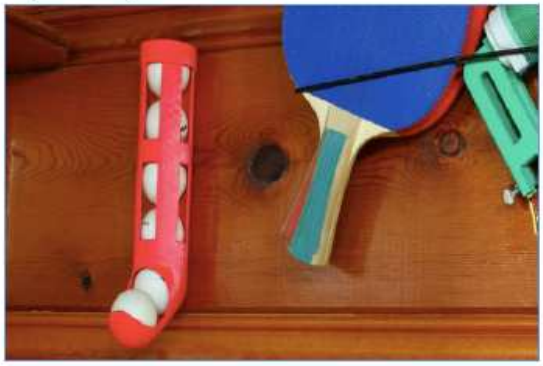
Crokuta Crokuta (Krokuta krokuta)

Chipmunk (Çipmunk)

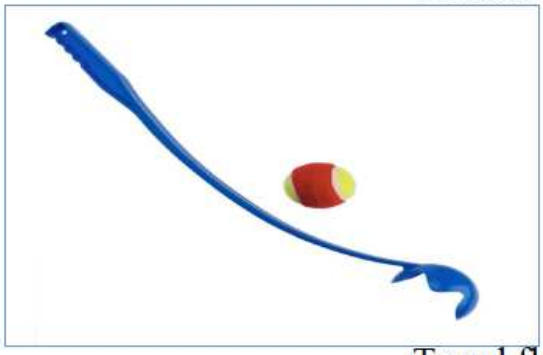
Novel Objects

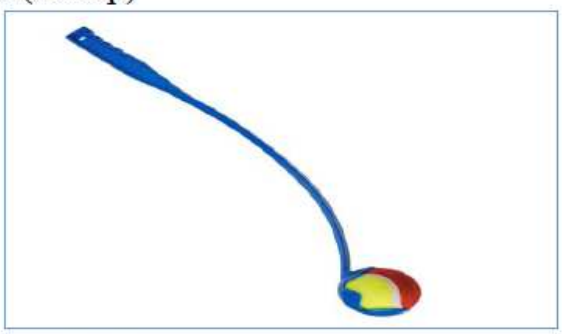
Meatball maker (Toparlak)

Ball dispenser (Beket)



Ball launcher (Filsap)

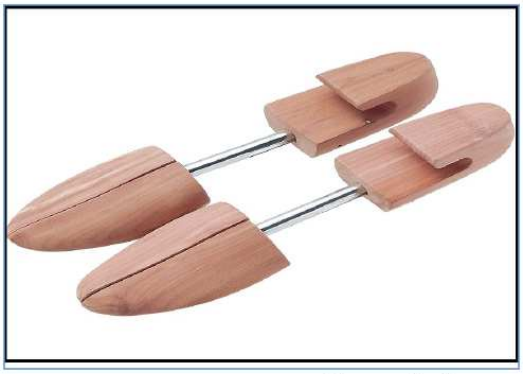




Towel flattener (Garfo)

Olive pitter (Raypa)

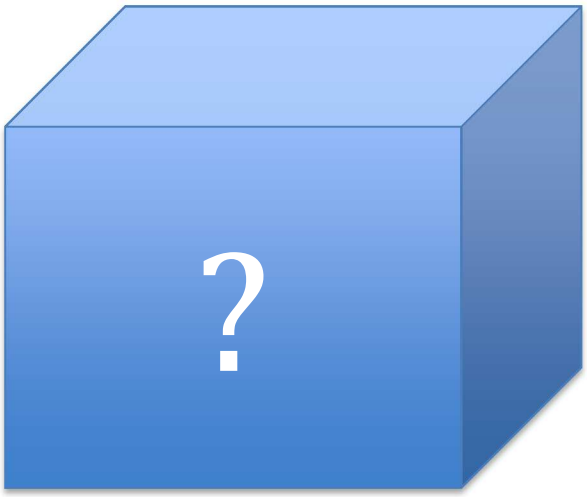
Shoe stretcher (Tayfel)



French fry cutter (Patkes)

Carpet sweeper (Gırgır)

The Presentation of the Task.



APPENDIX D
Knowledge Repertoire of Facts and Explanations Provided in the Informative Answer Condition in Study 2

***Training**: Animals.*

1.Polar bear **What?** They live along shores and on sea ice. They can swim very well. They have a very thick fur, which protects them against cold. They have highly developed sense of smell. **Why?** They swim very well because they move very fast under water and hunt for fish.
2. Leopard **What?** They can climb trees easily. They can run very fast. They sleep during the mornings and wander around during nights. Their babies live with their mothers for about 2 years. **Why?** They eat and sleep on the trees because they protect not only themselves but also their food from other animals.

***Testing**: Animals*

1. Sea otter **What?** They live in the water. They have webbed feet, water-repellent fur to keep them dry and warm. They close their nostrils and ears in the water. They float on their backs at the surface of the water and sleep like that. **Why?** They hold hands with other sea otters so that they don't drift and get lost while floating on the water.
2. Meerkat **What?** They dig burrows and live in them. They only go outside during the daytime.

They use their keen sense of smell to locate their favorite foods,
They eat small reptiles, birds, eggs, fruit, and plants.

Why?
They live in groups as large as 40, and everyone in the mob participates in gathering food, keeping a look out for predators, and taking care of the babies.

3. Mexican axolotl
What?
They only live in a lake in Mexico City.
They spend their whole lives underwater
It breathes through its feathery external gills.
You can keep it as a pet.

Why?
They have the ability to regenerate their body parts so they do not get old.

4. Pangolin
What?
They don't have teeth.
They have a very long tongue and they grind food with their tongue.
Their eyes are very small and they have poor eyesight.
They climb trees with the help of their tails.

Why?
When pangolins feel threatened, they curl up into a tight, almost impenetrable ball to protect their tender undersides.

5. Saiga
What?
Its fur gets a lighter color in winter.
They are very timid animals and they quickly run away when feel threatened.
They cannot hear very well but they have a very keen eyesight.
They run very fast.
Why?
They migrate to warm places in winter. They have very strong legs and they can swim in rivers.

6. Chipmunk
What?
They hide their food under bushes, rocks and tree logs.
They hibernate in cold weather but they wake up occasionally to eat.
They live in North America.
One chipmunk can gather up to 165 acorns in a day.

Why?

They typically hoard much more food than necessary because they like to eat a lot.
7. Crocuta crocuta **What?** They have very strong chins and teeth. They sound like they giggle when they find food and this is how they invite their friends to eat as well. They live in large groups called clans, which can include up to 80 crocuta crocutas. They like having mud baths. **Why?** They meet at a large den in the middle of their territory with their friends.
8. Binturong **What?** They live in rain forests. They use their tails like their hands and can climb trees by using their tails. They smell like popcorn. They can swim very well. **Why?** They spend most of their time hanging out in the treetops.

Training: Objects.

1.Citrus juicer **What?** Its upper part is made of plastic while the lower part is made of glass. You place the lemon on upper part after slicing it into two. You can take the plastic part of after squeezing the lemon. You can pour the lemon juice into salads or meals afterwards. **Why?** It helps you to squeeze lemon juice easily by keeping its stones on the upper plastic part.
2. Umbrella **What?** It is made out of waterproof fabric. You can open it up and close it when not in use. It can have different colors. You can carry it anywhere you go. **Why?**

You use it not to get wet when it rains.

Testing: Objects.

1. Beckett (Ball dispenser: Beket) **What?** It is made out of plastic. It looks like a long pipe. It has a plastic curve underneath. You can hang it on a wall. **Why?** It helps you keep your ping pong ball in order so that you do not lose them.
2. Crullet (Meatball maker: Toparlak) **What?** It is made out of metal. It looks like scissors but has a pair of tongs. You can hold it as scissors and use it as pincers. It is first used for making meatballs. **Why?** You can also use crullet to make balls out of play dough.
3. Garflom (Flattens towels: Garfo) **What?** It is spongy and soft. It has two spined ball attached to it. It could be in different colors. You can warm it up and then use it. **Why?** It flattens the towels when you roll it on them and make them look like ironed.
4. Hartup (Carpet Sweeper: Gırgır) **What?** It has a rolling brush underneath. When you press the button on it, it opens up. It is made out of plastic. It is being used manually. **Why?** It is used to sweep breadcrumbs and similar dirt on the carpet.
5. Taiffel (Stretches out shoes: Tayfel)

What? It is made out of wood and metal. You can adjust the metal part according to the size of your shoes. It is shaped like shoes and sold in pairs. **Why?** It stretches out tight shoes when you don't wear them.
6. French fry cutter (Patkes) **What?** It works when you turn the handle on its back. It is used in the kitchen. It is made out of stainless steel. It has big and small holes to cut the potatoes. **Why?** It is used to cut potatoes easily and quickly before you fry them.
7. Riapank (Seeder: Raypa) **What?** It is made of plastic and metal. When you press its upper part, it helps you pitting the olive. The metal part is long but its tip is round. **Why?** It is used for pitting olives so that we can enjoy eating them seedless.
8. Filsap (Ball launcher: Filsap) **What?** It has a round part for holding the ball. It has a long shaft and it is elastic. It is made out of plastic. **Why?** It is used for launching a ball and make it go long distance.

APPENDIX E

Examples from Transcripts in Question Elicitation Task (Study 2)

Example 1

(Middle-class 5;11 in Informative Answer Condition)
Novel Object Shoe Stretcher (Tayfel)
Child: What is that?
Experimenter: It is called Tayfel.
Child: What Tayfels are for?
Experimenter: We place this into a shoe.
Child: Then what happens?
Experimenter: For instance if you have tight shoes that you can no longer wear, you can stretch them out using Tayfel. Then you can fit in your shoes.
Child: But what if the leather of the shoes will become thinner?
Experimenter: Yeah the leather might become thinner as it stretches out the shoes.
Child: Thinner… Very nice.

Example 2
(Middle-class 3;11 in Informative Answer Condition)
Novel Object Olive pitter (Raypa)
Child: I don't know this (he is trying to press the button).
Experimenter: Wait, wait. This is called Raypa.
Child: What is it doing?
Experimenter: Look there is a metal part but its tip is round. When you press the upper part, it helps you pitting the olive.
Child: Wow where does the olive seed go?
Experimenter: It goes underneath and then we can eat the olive seedless.
Child: How are we eating it?
Experimenter: We can enjoy eating them seedless.
Child: Do we eat it with a fork?
Experimenter: Yes we can.

Example 3
(Low-income 5;11 in Non-informative Answer Condition)
Novel Object French fry cutter (Patkes)
Child: What is this?
Experimenter: This is called patkes.
Child: Patkes. Potatoes potatoes.
Experimenter: Hıhı. Wow!

Child: It came out of box again.
Experimenter: Yes.
Child: You mash the potatoes with this.
Experimenter: You mash potatoes with this.
Child: …
Experimenter: Okay what else do you know about what is happening here?
Child: …
Experimenter: Okay let's open the box and see what we have.

Example 4
(Low-income, 3;1 in Non-informative Answer Condition)
<u>Novel Animal Binturong (Ayi kedisi)</u>
Child: What is this?
Experimenter: This is called Ayi kedisi.
Child: Ayı kedisi.
Experimenter: So what do you want to know about this?
Child: I spilled soup on myself.
Experimenter: You spilled soup. Okay so is there anything you want to know about binturong?
Child: Yes.
Experimenter: What is it?
Child: It has spikes like this and it has a mouth like this.
Experimenter: A mouth like this. Okay what else?
Child: But this is its nose, these are its eyes. And these are its ears. That is all.
Experimenter: Okay you can press the button. So what do you want to know about what is happening here?
Child: What is this?
Experimenter: This is also ayi kedisi. What else do you want to know?
Child: Can I press the button?
Experimenter: Okay let's see what we are going to see in the next box.

APPENDIX F

Sample Pictures and Scripts from Booklets with Improbable and Impossible Events

Improbable Events

The person in the next picture finds an alligator under her bed.

Could a person find an alligator under her bed in real life?

The person in the next picture has lion as a pet.

Could a person have lion as a pet in real life?

Impossible Events

The person in the next picture walks on the water.

Could a person walk on the water in real life?

The person in the next picture makes a car disappear.

Could a person make a car disappear in real life?

CURRICULUM VITAE BURCU UNLUTABAK

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EDUCATION

Lehigh University (Ph.D., January 2017) *Bethlehem, PA*

Department of Psychology
Social and Cognitive Development
Dissertation: *"Is the curious child universal? On examining the frequency and types of questions asked by middle-class and low-income Turkish preschoolers"*
Committee: Dr. Ageliki Nicolopoulou (Advisor), Dr. Amanda Brandone, Dr. Christopher Burke, Dr. Ayhan Aksu-Koc.

Bogazici University (MA., June 2012) *Istanbul, Turkey*

Graduate School of Social Sciences
Developmental Psychology
MA. Thesis: *"On the developmental relations between preschool children's theory of mind skills and their ability to track referents in narrative discourse"*

Bogazici University (BA., June 2012) *Istanbul, Turkey*

College of Arts and Sciences
B.A. in English Language and Literature: Bogazici University, Istanbul

RESEARCH INTERESTS

My research focuses on language and communicative development of young children in relation to their social and cognitive abilities. I am particularly interested in how young children learn from more knowledgeable others around them (i.e. parents, teachers) and the role of family and cultural factors in children's social and cognitive development.

HONORS AND AWARDS

Lehigh University Doctoral Travel Grant for Global Opportunities (2017)
Lehigh University Strohl Dissertation Completion Fellowship (2016-2017)
Lehigh University Mountaintop Summer Research Fellowship (2015)
The Turkish Fulbright Commission - Fulbright Opportunity Funds Program (2012)
Turkey Higher Education Scholarship (2008-2010)

Reward of Second Degree in Bogazici University (2008)
Bogazici University Achievement Scholarship (2006 - 2008)
Mehmet Zorlu Foundation Scholarship (2004 - 2008)

RESEARCH EXPERINCE

Graduate Research Assistant (June 2015-Sept. 2015)
Lehigh University
Summer Research Project: Using National Datasets to Answer Questions about Early Childhood Development
Principal Investigators: Dr. Ageliki Nicolopoulou, Dr. Amanda Brandone from Psychology Department and Dr. Paticia Manz and Dr. Brook Sawyer from College of Education.

In collaboration with Laura Wallace, a graduate student in the College of Education and with the mentoring of principal investigators, we addressed key questions in early childhood development and education by using large national datasets. As graduate students, we also mentored two undergraduate students to assist us in this project. We did extensive literature searches on the key questions we wanted to investigate and we became familiar with the processes involved in accessing and using the national datasets.

Graduate Research Associate (May 2014)
Lehigh University
Social Science Research Center
Behavioral Health Consultant Program Evaluation: Quantitative Study

I have assisted Dr. Ageliki Nicolopoulou in the statistical analysis of on two clinical measures (CD4 and viral load counts) and one behavioral measure (medication adherence) of patients at the St. Luke's and ECHO clinics. This analysis was conducted to examine whether the addition of a Behavioral Health Consultant (BHC) to the primary medical team at the two clinics had a positive influence on the three measures under consideration.

Graduate Research Assistant (Sept. 2013-August 2014)
RIPPLE: Read, Play and Promote Project
Institute of Educational Sciences (IES)
Principal Investigators: Dr. Ageliki Nicolopoulou from Lehigh University, Dr. Kathy Hirsh-Pasek from Temple University, Dr. Roberta Golinkoff from University of Delaware and Dr. David Dickinson from Vanderbilt University

The goal of the project was twofold: (a) to find the best book reading and play strategies to help low-income children learn new vocabulary words; and (b) to test the effectiveness of book reading and play activities in classroom environments to ensure their applicability. I took part in this project during its third year, and I helped the research team by collecting, entering and coding data. Specifically, I administered self-regulation, narrative comprehension, and narrative retelling tasks to children. Also, together with the

project coordinator, Dr. Tamara Spievak Toub, we worked in developing a coding scheme to measure the fidelity of implementation of the play strategies by the teachers.

Graduate Research Assistant (August 2012-August 2013)
Lehigh University Narrative Development Lab
Principal Investigator: Dr. Ageliki Nicolopoulou

I assisted Prof. Nicolopoulou with various ongoing research projects. We had lab meetings with undergraduate students every week and worked on different research projects together. During the Fall Semester, we investigated book-reading methods to improve narrative comprehension skills of low-income preschoolers. We transcribed videos of preschool children who participated in a book-reading intervention program and worked in creating a coding manual for these transcriptions to analyze children's responses to the intervention. During the Spring Semester, we explored how young children develop inference-making abilities during a book-reading activity and how they are related to memory and theory of mind development. I guided students to transcribe data, create new coding schemes and, then analyze and interpret data in terms of the specific research questions we asked.

Part-time Research Assistant (Nov. 2011- June 2012)
Istanbul Twin Study funded by The Scientific and Technological Research Council of Turkey
Principal Investigator: Dr. Nihan Ketrez from Istanbul Bilgi University

The project investigated the language development of twins compared to singletons longitudinally in their natural learning environments. As the research assistant, I collected data from twins and singletons in their home contexts. I was also responsible for transcribing and segmenting parent-child conversations into different utterances, which can be defined as uninterrupted chain of spoken language in this study. I coded these utterances in the CHAT (Codes for the Human Analysis of Transcripts) files and analyzed them using CLAN (Computerized Language Analysis) program.

Part-time Research Assistant (Nov. 2008-June 2009)
Koç University, Istanbul, Turkey

The project was conducted by Prof. Asli Ozyurek (Max Planck Institute for Psycholinguistics in Nijmegen). My responsibilities included investigating the language development of deaf children, particularly collecting data from home-signer children who have hearing parents and thus not exposed to any systematic form of language.

PUBLICATIONS

Manuscripts in Preparation
Unlutabak, B., Nicolopoulou, A. (in preparation). The role of inference-making abilities and verbal memory in narrative comprehension during preschool years.

Unlutabak, B., Aksu-Koc, A., Nicolopoulou, A. (in preparation). The role of shared knowledge and stimuli complexity in Turkish Preschoolers' use of referential expressions in elicited narratives.

Nicolopoulou, A., **Unlutabak, B.**, Ronfard, S., Lindley, C. (in preparation). Comparing children's grasp of false belief in standard tasks and picture book stories.

Nicolopoulou, A., Hindman, A., Sawyer, B., **Unlutabak, B.** (in preparation). Examination of factors that promote early childhood narrative and vocabulary skills

Book Chapters

Nicolopoulou, A., **Unlutabak, B.** (in press). Storybooks as privileged context for understanding theory of mind concepts? To appear in *Social environment and cognition in language development: Studies in honor of Ayhan Aksu-Koç*, the Trends in Language Acquisition Research (TiLAR) Series with John Benjamins.

Conference Proceedings

Unlutabak, B. & Aksu-Koc, A. (2015) Developmental relations between reference to characters in narratives and theory of mind. In Zeyrek, D., Sağın-Şimşek, Ç. Atas, U., and Rehbein, R. (Eds.) *Ankara Papers in Turkish and Turkic Linguistics*. Harrassowitz Verlag, Weisbaden.

PRESENTATIONS

Poster Presentation (**Unlutabak, B**. Nicolopoulou, A.): "Is the Curious Child Universal? Examining the Frequency and Types of Questions Asked by Turkish Preschoolers from Middle-class and Low-income Families" at the Biennial Meeting of the Cognitive Development Society, Portland, Oregon, October 12-14, 2017.

Poster Presentation (**Unlutabak, B.** Nicolopoulou, A.): "The Examination of Turkish Preschoolers' Possibility Judgments and Explanations about Extraordinary Events" at the Biennial Meeting of the Cognitive Development Society, Portland, Oregon, October 12-14, 2017.

Poster Presentation (Ronfard, S., **Unlutabak, B.** Nicolopoulou, A., Harris, P.L.): "Preschoolers do not test counter-intuitive claims: Evidence from Turkey" at the Biennial Meeting of the Cognitive Development Society, Portland, Oregon, October 12-14, 2017.

Poster Presentation (Nicolopoulou, A., **Unlutabak, B.**, Ronfard, S., Lindley, C.): "Comparing children's grasp of false belief in standard tasks and picture book stories" at the Biennial Meeting of Society for Research in Child Development (SRCD), Austin, Texas, US, April 6-8, 2017

Poster Presentation (Nicolopoulou, A., Hindman, A., Sawyer, B., **Unlutabak, B**.): "Examination of factors that promote early childhood narrative and vocabulary skills" at

Twenty-Third Annual Meeting Society for the Scientific Study of Reading (SSSR), Porto, Portugal, July 13-16, 2016

Poster Presentation (**Unlutabak, B.** & Nicolopoulou, A.) "The role of inference-making abilities and verbal memory in narrative comprehension during preschool years" at the Biennial Meeting of Society for Research in Child Development (SRCD), Philadelphia, US, March 19-21, 2015

Paper Presentation (**Unlutabak, B**. & Nicolopoulou, A.) "Narrative listening comprehension in relation to inference-making abilities and short-term memory in preschool years" at the 44rd Annual Meeting of the Jean Piaget Society (JPS), San Francisco, US, May 29-31, 2014.

Poster Presentation (**Unlutabak, B**., Spearot, L., Nicolopoulou, A., Hough, L.) "Books as meaningful contexts for understanding theory of mind concepts" at the 13th International Congress for the Study of Child Language (IASCL), Amsterdam, The Netherlands, July 14-18, 2014

Paper Presentation (**Unlutabak, B.,** Aksu-Koc, A. & Nicolopoulou, A.) "Developmental relations between Turkish preschool children's theory of mind skills and their ability to track character references in narrative discourse" at the 43rd Annual Meeting of the Jean Piaget Society (JPS), Chicago, US, June 6-8, 2013

Poster Presentation (**Unlutabak, B.** & Aksu-Koc, A.) "Developmental relations between reference to characters in narrative discourse and theory of mind skills" at the Biennial Meeting of Society for Research in Child Development (SRCD), Seattle, US, (April 18-21, 2013).

Paper Presentation (**Unlutabak, B.** & Aksu-Koc, A.) "Developmental relations between reference to characters in narratives and theory of mind" at the 16th International Conference on Turkish Linguistics, Ankara, Turkey, September 18-21, 2012).

Paper Presentation (**Unlutabak, B**. & Aksu-Koc, A.) "*Okul öncesi çocukların anlatılarındaki kişi gönderimlerinin dinleyici açısından anlaşılabilirliği ile işlem belleği ve zihin kuramı arasındaki gelişimsel ilişki* " at the National Congress of Psychology, Bogazici University, Istanbul, Turkey, April 25-28, 2012

TEACHING EXPERIENCE

Adjunct Faculty- Child Development, Lehigh University, College of Arts and Sciences (Department of Psychology, Summer 2017)

As the instructor of this course, I provided students with an overview of the scientific study of child development. We examined the physical, cognitive, social, and emotional development of infants, children, and adolescents, and the various factors (e.g., genes, parenting, peers, school, and culture) that influence development.

Teaching Assistant- Research Methods, Lehigh University, College of Arts and Sciences (Department of Psychology), Supervising Professor: Padraig O'Seaghdha (Fall, 2015 & Spring 2016)

I was responsible for familiarizing psychology students with current research methods in the field and allow them gain hands-on experience in experiment design, data collection, and write-up processes.

Teaching Assistant- Child Development, Lehigh University, College of Arts and Sciences (Department of Psychology), Supervising Professor: Amanda Brandone (Fall, 2014 & Spring 2015)

I was responsible for holding office hours to answer students' questions, assisting the Professor in grading exams and class activities. In addition, I was responsible taught Child Development Recitation, a supplemental course was designed to facilitate student thinking and learning about developmental psychology through active and critical engagement with the course material, and through exposure to real world applications and methods of studying child development. I built the course on ideas covered in Child Development course while providing hands-on experience in a small group setting.

OTHER RELATED WORK EXPERIENCE

Jan. 2010- June 2012: Istanbul	**Bogazici University Alumni Association (BUMED),**
	Writer and editor at Bogazici Magazine
March 2008-June 2012:	**Hurriyet Daily News, Istanbul**
	Translator

UNIVERSITY SERVICES AND ACTIVITIES

Global Union, Lehigh University, Vice President for Club Relations 2015-2016
Graduate Student Life, Lehigh University, Teacher Development Program 2016

LANGUAGES

Turkish (native), English (fluent), German (pre-intermediate better in reading), French (basic)

PROFESSIONAL AFFILIATIONS

Cognitive Development Society

Jean Piaget Society

International Congress for the Study of Child Language

Society of Research in Child Development

REFERENCES

Ageliki Nicolopoulou, Ph.D.; Professor of Psychology and Global Studies, Lehigh University (agn3@lehigh.edu)

Amanda Brandone, Ph.D.; Associate Professor of Psychology, Lehigh University (acb210@lehigh.edu)

Ayhan Aksu-Koc, Ph.D.; Professor of Psychology, Bogazici University (koc@boun.edu.tr)

Christopher Burke, Ph.D.; Associate Professor of Psychology, Lehigh University (ctb208@lehigh.edu)