LANGUAGE AND SUGGESTIBILITY:

CROSS-LINGUISTIC EVIDENCE ON CHILDREN'S ASSESSMENT OF

SOURCE KNOWLEDGE

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Cagla Aydin

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LANGUAGE AND SUGGESTIBILITY: CROSS-LINGUISTIC EVIDENCE ON

ASSESSMENT OF SOURCE KNOWLEDGE

Cagla Aydin, Ph.D.

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Not much of what we know comes from direct experience but rather from others'
testimony or input. Therefore, distinguishing trustworthy sources from those are not is
an important skill both adults and children should posses in order not to be misled.
One way to identify the credibility or reliability of the information is to focus on the
source of the information, such as perceptual access or communication (hearsay). The
present series of studies focus on the scope of children's evaluation of source
information in verbal messages. While some languages, such as English, encode the
source information by lexical means; i.e., *I saw that he left*, other languages such as
Turkish or Bulgarian code that information by grammatical means; i.e, evidentiality
markers. The cross-linguistic design (Turkish vs. English) in the present studies allows
for exploring the interaction of language (evidential vs. non-evidential) with children's
source reasoning and resistance to misinformation by others. Specifically, the studies
explore whether children growing up in a language in which source cues are marked
grammatically would be more alert to others' informational states compared to
children growing up in a language which needs additional words to code the source
distinctions. In a modified misinformation paradigm, the findings revealed that 4-, 6-
and 8-year old Turkish-speaking children were sensitive to whether the
misinformation comes from perception and or communication. That is , Turkish
children were more resistant to new information if it came from a communication
(hearsay) source as opposed to a direct perception source. English-speaking children
did not take the source into account until 8 years-of-age. Moreover, Turkish-speaking
4-year-olds were more resistant to misinformation when it came from a hearsay source
when compared to their English-speaking peers. These findings reveal an influence of

language in children's developing understanding of source information and evaluation of information by others. The results raise curious questions about the effect of language on children's non-verbal conceptual development for future directions.

BIOGRAPHICAL SKETCH

Çağla Aydın was born in Istanbul, Turkey. She attended Koç University and Boğaziçi University, where she completed a Bachelor's degree in Psychology and a Master's degree in Cognitive Psychology, respectively. Her graduate work focused on development of social cognition, memory and language.

To my family, and to Ayhan Aksu-Koç

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CHAPTER 1

INTRODUCTION

To what extent conceptual development in a particular domain is independent

of the way it is mapped linguistically has been a curious question for psychologists

(Bowerman & Levinson, 2001; Gentner & Goldin-Meadow, 2003; Astington & Baird,

2005, see also Ayhan Aksu-Koc, 2000). Recent research has started to focus on the

guiding role of language in conceptual growth as originally proposed by Vygotsky or

Whorf, and experienced a move away from the Piagetian assumption that language

maps onto cognitive content built independently to investigations showing the guiding

role of language in conceptual growth in lines suggested by Vygotsky/Whorf. Diverse

domains such as gender (Boroditsky, Schmidt, & Phillips, 2003) or space (Choi,

McDonough, Bowerman, & Mandler, 1999) provide evidence for this view.

Recent research in the domain of children's learning has also experienced a

departure from the Piagetian view. In contrast to the conception of cognitive

development which emphasizes one's own direct experience, recent research puts an

emphasis on how children and adults learn tremendously through others' experience

and conclusions. Communication is a mechanism of learning about the world. It is

only natural to rely on other people's knowledge because there is a limit to things that

we can experience ourselves.

However relying on others in order to gain knowledge brings its own

problems. Not everything we learn from others can be relied upon because they can be

full of errors and mistakes, either intentional or unintentional. Therefore, in order to

avoid being duped, it is a crucial skill in communication that children critically assess the verbally transmitted information. Recent research has started to investigate the ways in which young children evaluate input by other people during acquisition of knowledge.

The present work attempts to bring these two ideas together, and look into the guiding role of language in the area of children's evaluation of information from others. This is an interesting connection because, most of the time, language is the means that children acquire information from others.

Recent research shows that children take into account a variety of factors to be able to evaluate the reliability of the input by others. One of the reliability factors, which the present research deals with, is the evaluation of the evidential bases or source-of-knowledge of the informant. The sources-of-knowledge of a speaker can range from perceptual access (e.g., seeing) to hearsay and imagination, and young children are reported to competently handle these sources of information when they are presented in non-linguistic ways (Robinson, Haigh, & Pendle, 2008; Robinson, Haigh, & Nurmsoo, 2008). In the present study, I attempt to investigate the issue, focusing on how young children can make us of *linguistic* clues to assess a speaker's epistemic –knowledge- stance.

This issue has important implications for children's suggestibility, where information –or misinformation- is gained through verbal accounts of people. When a child notices a mismatch between her memory for an event and the interviewer's account of it, among the variables that may resolve the mismatch is the source evaluation. In fact, studies show that children who are better at identifying the origin

of the information are less susceptible to suggestibility (Warren, Huls-Trotter, &

Tubbs, 1991). Children's conception of source reliability has a direct connection to

suggestibility. For example, if children consider a knowledge source as dependable, it

may affect directly what they believe. This connection has received little attention by

the researchers.

There is an intriguing language phenomenon that has a straightforward

connection to these ideas. English speakers have the option of omitting information

about the source of their knowledge either by intentionally misleading the listener or

by unintentionally failing to mention it. For example, they do not have to say "He

closed the door…*and I know this because I saw it with my own eyes."* In other

languages, such as Turkish, speakers do not have the liberty to drop the evidence-

based information. The language forces the speakers to choose among the range of

sources of evidence by including an aspectual feature of past-tense, a category called

evidentiality (Aikenvald, 2004). They need to choose between "He closed the door, *I*

saw him" or "He closed the door, *I was told."* Given young children's difficulties in

resisting misinformation, it is of interest to investigate the relations between

suggestibility and acquisition of evidential language. Despite the relevance of this

connection, it has not received empirical attention in the area of children's

suggestibility.

Therefore the present work deals with children's developing skills in handling

social input in the form of verbal communication. The experimental efforts will first

focus on children's understanding of the relative reliability of sources-of-knowledge.

Turkish-and English-speaking children's use of verbal indications of the source of

knowledge in their reliability judgments are of interest. Next, my aim is to examine whether acquisition of linguistic marking of source in Turkish influence children's proneness to suggestions. The series of studies covered here will include cross-linguistic comparisons of an evidential language –Turkish- and a non-evidential language –English- in a source evaluation task and a misinformation paradigm, respectively.

The organization of the rest of the chapter is as follows: I will first briefly introduce evidentiality in language as a grammatical category, and then move on to how the Turkish language deals with evidentiality by providing some acquisition data by Turkish speaking children. Then, I move on to conceptual understanding of sources of knowledge. This is a rather bulky section as it deals with the developmental trends for understanding of each of the information sources; such as perception or testimony. A brief summary of recent research findings is provided at the end of this section. Next, research on children's evaluation of the sources of knowledge will be briefly covered. A logical flow from this last section is a review of very limited research on evidentiality in various languages and source reliability. Finally, I draw on the links between source reliability/credibility and suggestibility and propose the study on the links between evidentiality and suggestibility.

Evidentiality in Language: Linguistic indication of source

Every language around the world has a way to indicate the various sources of information. An interesting distinction here is that in some languages, such as Western European languages (e.g. English, German), the source of knowledge can only be encoded by lexical means, such as "*I saw*" or "*apparently, reportedly*". Other

languages (e.g. Turkish, Bulgarian, Japanese, Korean), however, grammaticalize source-of-knowledge by means of verbal affixes or particles (Aikenwald & Dixon, 2001), which will be called *evidentiality markers* from here on.

Languages vary substantially in the way they systemize evidentiality. For instance, in Turkish and Bulgarian, evidentials are obligatory in the sense that a particular set of sentences has to contain an evidential. In Turkish, for example, every sentence that conveys information about past events is marked with an evidential source. Speakers of the language need to take this into account and pick the relevant source of knowledge to include in their utterances. This point will be clearer with examples in the following section. On the other hand, languages like Japanese, evidential particles are used only during conversational exchanges and are not obligatory.

Given this variability among existing evidential languages, -after surveying 32 languages -the basic categories of evidentiality are found to be: (Willett, 1988, see also Papafragou et al, 2007)

(1) Direct Access/perception

(2) Indirect access; e.g., report of others and inference.

Within this opposition, the types of information sources that the evidential languages grammaticalize are: vision, non-visual senses (e.g. smell, touching), inference, assumption, hearsay, and quotation (Aikhenvald, 2004; also see, Matsui & Fitneva, 2009).

Evidentiality in Turkish

Turkish evidential markers are multifunctional tense-aspect-modality inflections that also mark information source, or the degree of certainty on some cases. They are obligatory, and unlike mental verbs they have no semantic content, and do not involve embedding.

Pioneering work of Aksu-Koc (1988) has outlined the obligatory source distinctions observed in Turkish evidentiality in four forms with respect to the mode of information access/source of information. Since Turkish is a Subject-Object-Verb (SOV) language, and the evidentiality markers are attached to the verbs (suffixes), and thus, they are at the end of the sentences.

Specifically, the evidential distinctions in Turkish are between (*a*) direct perception or direct experience, encoded by the suffix *–DI; (b)* hearsay or access through linguistic report, i.e., "I was told that he wrote the letter", encoded by the suffix–*ImIş*, (*c*) inference based on the end results; i.e., "Based on the handwriting I infer that he wrote the letter", encoded by the suffix–*mIş,* and (d) opinion or judgment deduced from the speaker's already assimilated knowledge, i.e, "Based on what I know about him, he must have written the letter", encoded by the suffix *-DIr*. (Aksu-Koç et al., 2009). In Table 1 below, the mode of acquisition of these evidentiality markers and examples are depicted.

Table 1. Turkish evidentiality markers and their mode of access with examples

Linguistic Form	Information Access	Example
-DI	Direct experience	*Mektubu yaz-dI.* (I saw him writing the letter.)
-ImIş	Linguistic report	*Mektubu yaz-mIş.* (I was told that he wrote the letter.)
-mIş	Inference from results	*Mektubu yaz-mIş.* (He wrote it, based on the end results.)
-DIr	Deduction from experience	*Mektubu yaz-mIştIr.* (He must have written the letter.)

Acquisition of Evidentiality in Turkish

Aksu-Koc (1988; 1998) provides evidence both from naturalistic data and production studies regarding the course of acquisition of Turkish evidentials. The acquisition of evidentials by Turkish children is an early accomplishment (Aksu-Koc, 1988; 1998). Longitudinal studies (spontaneous speech data) demonstrates that the direct experience marker (*-dI*) emerges as the first marker in speech around one and a half to two years of age to talk about directly experienced past events. The second marker (*-mIş*) appears around 2 years of age and is used in storytelling contexts. Between ages 2 and 3, utterances marked with *–dIr* (in "*–mIşdIr*" form) are used to convey meanings of assumptions or predictions based on habitual events or routine ("Oyuncağimi abim kır- *mIş-dIr*" [My big brother must have broken the toy]). Around the same time, children master the appropriate use of the reportative/hearsay form of *– mIş*; based on other people's verbal reports ("Arkadasim annaannesiyle kal- mIş." [I am told that my friend stayed with her grandma.]).

The production data revealed that when children were told to describe events that happened to the acted out puppets children were able to successfully control the

use of the direct perception marker and the reportative/hearsay marker by 4 years of age (Aksu-Koc, 1988). These developments show that Turkish children mark distinctions between different indicators of informational perspectives quite early in development.

Conceptual Correlates of Turkish Evidentiality

Evidentiality as an area of study can be considered a good candidate to investigate the links between language and cognition. The abilities or domains that evidential distinctions may help develop fall under the general rubric of "mental state understanding" or "theory of mind" (Fitneva & Aydin, in press; Aksu-Koc, 2009; Papafragou et al., 2007).

Within the domain of theory of mind, the development of children's representational understanding is relevant for evidentiality in language. Since evidentiality markers convey information about the speakers' mental sate (e.g., "How they know what they know" or "How certain they are about the assertion'), they might map onto the ability to represent another's mind and understanding other people have other beliefs, ideas and false beliefs (Flavell, 1999; Astington & Gopnik, 1991; Perner, 1991)

Another possible domain is the understanding of the origins of one's own and others' knowledge; i.e. source memory, which is also considered as a part of children's developing theory of mind (Welch-Ross, 2000). Evidential forms, by way of carrying different informational access meanings, might help children's keeping track of or encoding/retrieval of source information in general. This ability is considered as crucial for evaluating the truth-value of knowledge by assessing the

reliability of the source (Harris & Koening, 2004; O'Neill & Gopnik, 1991; Taylor, Esbensen, & Bennet, 1994).

It turns out the same two domains of mental state understanding are reported to be strong moderating factors in children's developing skills in resisting suggestibility. The discussion about this link between evidentiality and suggestibility will be saved to be covered in Chapter Five.

Children's Conceptual Understanding of Sources of Knowledge

Our knowledge about the world and ourselves come from various sources, such as perception, communication or inference. Recent research on children's understanding of source information has focused on whether children understand the circumstances under which these sources give rise to knowledge and whether children actually encode the source of their knowledge. The following review will cover that research focusing on the developmental trends where necessary for easy links with the timing of acquisition of evidentials.

The following is a rather bulky review of how children deal with different knowledge/belief sources developmentally. The overarching critical question is "When do children competently assess the evidential quality of the information they are exposed to?". Many of the studies reviewed here use tasks that mimic the ones used in the theory-of-mind tradition. I intentionally kept information about the procedure details of individual studies to highlight what exactly is asked of children in these tasks.

Perception

Understanding that seeing (or perception) leads to knowledge is suggested as a prerequisite to a representational mind (Pillow, 1989, 1993; Pratt & Bryant, 1990). Studies demonstrate mixed findings regarding at what age this ability develops. In Wimmer, Hogrefe, & Perner (1988), 3-, 4- and 5-year-olds were presented with different boxes that had different objects in them. After the experimented has looked inside one of the boxes in front of the children, they were asked whether or not the experimenter knew what was inside the box ("Does she know or does she not know?") and whether or not the child her/himself knew the content of the box ("Do you know what is in the box or don't you know that?") . While most of the 3-year-olds and some of the 4-year-olds had difficulty in understanding the relationship between visual access and knowledge acquisition, almost all 5-year-olds correctly answered the questions. Wimmer et al. (1988) concluded that understanding perception as a source of knowledge fully develops between 4 and 5 years of age.

Other studies reported earlier age ranges for this kind of development with a slight change in the question being directed to the children. For example, when Pratt and Bryant (1990) simplified the question by getting rid of the double direction of Wimmer et al.'s, to ("Does [x] know what is in the box?") and ("Do you know what is in the box?"), 3-year-old children were able to answer correctly. Similarly, Pillow (1989) reported that 3-year-olds were good at understanding the connection by examining children's monitoring of visual access. Three- and 4-year-old were presented with a bag containing toy dinosaurs of different colors. On each trial, the experimenter took one dinosaur from the bag and put it into a container without letting

the child see the dinosaur's color. Then, the child or a puppet looked inside the container. Children in both age groups could identify correctly who had visual access to the dinosaur and who knew the dinosaur's color. Moreover, 3-year-old children were able to identify which one of two puppets could tell the color of the dinosaur in the container when only one of them had visual access to this information.

 Overall the findings suggest that children as young as 3-years-old, but definitely by 4-years old, understand perception as a source of knowledge by way of monitoring who had visual access to the contents of a container. It should be noted here that a closer look at the findings show that the younger children are having difficulties only when they are required to *report* the sources of knowledge. Reporting the source might not be the only requirement to qualify as understanding the source; a topic that I will discuss later.

Inference

Another important source for knowledge is inference. Even though development of understanding of inference has not been studied as extensively, there is some evidence that children understand it as a separate source of knowledge.

In one study, 4- and 6-year-olds were presented with a container including balls of one or two colors. On each trial of the experiment, one ball was taken from the container and put into a bag. On some trials, children had visual access to this transfer whereas on other trials, an experimenter had seen it. The children were then asked to indicate who knew the color of the ball (Sodian & Wimmer, 1987). Neither 4-year-olds not 6-year-olds had problems responding to questions about their own knowledge, however the younger group of children were not able to understand

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somebody else's knowledge derived from inference when the other participant did not have visual access to the information. In a similar study conducted by Sodian and Wimmer (1987) in which they used a toy puppet instead of an experimenter, similar results were obtained. Half of the 4-year-old children and most of the 5- and 6-year-old children could state correctly whether they knew the content of the bag regardless of whether they observed the change of location or not. However, most 4-year-olds and few 5-year-olds were not able to take the toy puppet's perspective with regards to what it knew. When both age groups were asked about whether they themselves neded to guess or not, most of them correctly stated that they had to guess the content of the bag. These results, the authors concluded, demonstrates that it is not until 6-years-of-age children were able to comprehend how knowledge can be derived through inference (Sodian & Wimmer, 1987).

With limited research in this area, the current pattern of findings show that while 4-year-old children use inference to construct knowledge, their understanding of inference as leading to knowledge is still developing. This latter type of seem to emerge around the fifth year of life and develops further in the sixth year. Moreover, understanding the relationship between inference and the resulting knowledge state seem to be easier for self than for another person (O'Neill & Gopnik, 1991; Wimmer et al., 1988a). Whether or not this self-other pattern holds is an interesting question for further research.

Testimony (Communication)

Another source of information, especially crucial for our purposes here, is testimony; that is, being told can lead to knowing. Verbal testimony –communication-

provides a lot of information to children especially after language is acquired, approximately after age 2 (Wimmer et al., 1988). However, understanding the relationship between linguistic report and knowledge acquisition develops in time (Wimmer et al., 1988).

A series of studies show that children are able to judge the knowledge of others and provide and modify the necessary contents of the verbal information they give to others. For instance, Perner and Leekam (1986) found that 3-year-old children can inform another individual verbally about the details of a situation when they realize that this individual does not know the details. When portraying children's folk epistemology, Montgomery (1992) claims that the ability to adjust verbal information on the basis of other's knowledge state reflects an implicit understanding of testimony as a source of knowledge (Montgomery, 1992).

A relatively conscious (explicit) understanding of testimony has scarcely been assessed with several experimental paradigms which are similar in logic to the inference paradigms. Wimmer et al. (1988) assessed 3-, 4-, and 5-year-old children's understanding of hearsay as a source. Children were again presented with containers with different objects inside them. The experimenter looked inside of the box and tells the collaborator child what was inside. The participant children are then asked to indicate whether or not the collaborator child knew what was inside the box and they themselves knew the content of the box (Wimmer et al., 1988). The youngest group of children, the 3-year-olds, were not able to understand the relationship between the testimony and the knowledge state however 4- and 5-year-olds knew the collaborator knew the contents because he/she was told by the experimenter.

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It seems from the above review that children's understanding of seeing, utterances and inference as sources of knowledge develops throughout preschool and elementary school years, and they begin to differentiate between sources as young as 4-years-old. The overall developmental progression looks like perception is associated with knowledge before inference and communication as sources of knowledge, and the level of explicitness of understanding of all of the sources continue to develop throughout early childhood (e.g., Miller, Hardin, & Montgomery 2003; Taylor 1988; Pillow 2002; Beck & Robinson, 2001).

Tracking the origins of knowledge

Being aware of the fact that different sources lead to knowledge (O'Neill & Gopnik, 1991) is not sufficient for monitoring them. Monitoring, or keeping track of sources of knowledge, requires the ability to identify which one among the potential sources results in knowledge acquisition and belief formation (Beck & Robinson, 2001).

In the previous section on different types of information sources, people have concentrated on the basic origins-of-knowledge paradigm -following the theory of mind methodology tradition- where the child's task is to judge whether someone does or does not know a target fact following some form of informational access. Other researchers have tried to look at the development of source identification ability with paradigms that offer *comparisons* of perception, communication, and inference. Comparisons of different sources require an ability track the origin of the information.

For example, in O'Neill et al. (1992), 3-, 4- and 5-year-old children were presented with pairs of objects in two different conditions. In the feel condition, the

objects in the pairs differed from each other in characteristics that can be only perceived through touching while in the see condition they differed from each other in characteristics that can be perceived only through visual perception. 3- and 4- year-olds performed worse than 5-year-olds; they had difficulty in finding out which modality of sensory experience is required for acquisition of a particular kind of information. In another experiment the participants were asked to evaluate knowledge state of two puppets' about objects that differed in certain characteristics; i.e., color and softness. Children needed to by considering these puppets' visual experiences such as looking into the tunnel to see the object or tactile experiences such as putting the hand into the tunnel to touch the object or putting the hand on the tunnel. It was found that although 3-year-olds understand the relationship between visual sensory experience and knowledge acquisition, they cannot understand feeling as a source of knowledge. However, 4- and 5 ½ -year-old children were able to understand that putting the hand on the tunnel did not provide any information about the object in the tunnel whereas putting the hand into the tunnel gave tactile information. However, when they had to choose between looking into the tunnel and putting the hand into the tunnel as the source of tactile information they were found to prefer erroneously seeing over feeling.

In Gopnik and Graf (1988), the task was not to judge whether knowledge has been formed but to *indicate* whether a learned fact was acquired through perception, communication and inference. 3, 4- and 5-year-old children were presented with a set of six drawers containing different objects. In each of the six trials, children gained information about the content of one of the drawers, but in different ways. In two trials

they were allowed to directly see what was in the drawers whereas the experimenter told the content of the drawers in the other two trials. In the remaining two trials, children were presented with a perceptual clue related to the object in the drawers and asked to infer their contents. For example, an egg carton or a crayon box was presented to the children and they were told that what belonged to these boxes was in the particular drawer. At the end of each trial, after the children were asked to state the content of the particular drawer, they were expected to identify the source of their knowledge by answering the question of whether they saw the content of the drawer, figured it out from the clue or were told about it. Unlike older children, 3-year-olds who have just found out what is in a drawer and remember that content, have much greater difficulty in reporting whether they have seen the content, were told about it, or just guessed (Gopnik & Graf 1988; O'Neill & Gopnik 1991).

In a similar vein, Bruell & Wooley (1996) were interested in 3-, 4- and 5-year-old children's ability to distinguish between an internal source, namely *imagination*, from two external sources, namely *visual perception* and *hearsay*. On a general level, 3-year-olds performed worse than 5-year-olds whereas 4-year-olds did not differ from the other age groups. Moreover, children could identify visual perception as a source more successfully than linguistic report whereas identification of imagination as a source did not differ from identification of the other source types. Besides, 3-year-old children's performance in recognizing hearsay as a source was very low.

Finally, O'Neill and Gopnik (1991) compared sources including visual perception, language, tactile perception and inference as possible sources for information. 3- and 4-year-old children were exposed to only two sources among four

possible ones. The children's performance was found to be influenced by the source type in such a way that children in see-infer condition performed worse than those in the feel-infer condition while children in the feel-infer condition performed worse than those in the non-inference groups, namely see-feel, see-tell and feel-tell groups. These findings suggest that identifying inference as a source of knowledge is more difficult than identifying other types of sources (O'Neill & Gopnik, 1991). This finding supports the idea that source monitoring ability depends on the type of source (O'Neill & Gopnik, 1991) where perception and utterance did not differ in difficulty; although it differs from Gopnik and Graf's (1988) results which show that identifying *linguistic report* as a source is more difficult than identifying other sources.

Overall what the above type of research reveals about the developmental progression of understanding sources is as follows: Understanding visual access as source of knowledge starts to develop around 3 years of age. Three-year-old children an experimenter who only has partial visual access to an object will not be informative in finding out what the object is (Pratt & Bryant, 1990). Understanding that some sources (i.e., vision and touch) will be more informative than others in certain situations develops only around age 4 (O'Neill & Chong, 2001). Sodian & Wimmer (1987) demonstrates that understanding inference as a source of knowledge develops a couple more years late, around 6-years-of age. Another important observation from this line of research is that even though three- and four- year olds children show understanding of sources through behavioral paradigms, they have difficulties in reporting their source of information verbally (Gopnik & Graf, 1988; O'Neill & Chong, 2001).

Assessing the Reliability of the Sources of Knowledge

In this section, the research that will be reviewed deals with children's evaluations of different sources of knowledge. Even though the previous section outlined that 3-year-old children experience difficulties in reporting their source knowledge and memory for sources, they seem to use source of knowledge in their evaluation of reliability based on recent research. Mitchell, Robinson, Nye & Isaacs (1997) reported that 3-year olds could tell a person who has seen an object has more reliable information about the object than a person who was told about the object or just inferring it. Similarly, Pillow, Hill Boyce and Stein (2000) showed that by 5 years of age, children showed some realization that information obtained from perception or inference was more certain than a response based on guessing. Findings from these studies reveal that, at least in certain situations that ask for comparison of sources, children prioritize different sources based on their evidential access.

More recent studies also supported the evidence on children's early understanding of reliable speakers. Various cues or strategies they use to decide on the reliability status of the sources include checking the plausibility of content of utterances, checking previous accuracy of the speaker, and accessibility to evidence. Studies using "word-learning from others" paradigms showed that children even as young as 3-years-old are sensitive to a speaker's accuracy history and to speaker's assertion of her own ignorance when they decide whether or not to believe that speaker's naming of a new unfamiliar object. (e.g., Koening, Clement, & Harris, 2004; Koening & Harris, 2005; Jaswal & Neely, 2006; Birch, Vauthier & Bloom, 2007).

Another strategy for evaluating source reliability is to look at speakers'

individual record of reliability in the past. In these studies, children typically observe a video in which two adult speakers (or dolls or pictured adults) name familiar objects. To build a history of accuracy, one speaker consistently names the objects correctly (e.g. "it's a doll") while the other speaker repeatedly names them incorrectly (e.g. "it's a cat"). When tested, children hear the two speakers giving conflicting information (novel labels) for objects that are not familiar, or give the same novel label to two different novel objects. Both 3- and 4-year-olds showed sensitivity to ignorance level of the speaker and chose the label from a speaker who has a history of past accuracy over the speaker who claimed ignorance about the labels of the objects ("I like to play with it. I don't know what it is called"). Even though 3 year olds were not very systematic, 4-year-olds consistently preferred tha label provided by the speaker with accurate naming history. (Sabbagh & Baldwin, 2001; Koening & Harris, 2005). In Pasquini, Corriveua, Koenig & Harris (2007) showed that using the same methodology, children were exposed to the varying rates of accuracy by more or less accurate informants (100% vs 0% accuracy rate, 100% vs 25%, 75% vs 0%, 75% vs 25%,. The results suggested that 3 year olds mistrust informants who make a single error, whereas 4-year olds track the relative frequency of errors when deciding whom to trust.

Other studies have shown that children evaluate sources of knowledge based on accessibility to evidence. With a modification of O'Neill, Astington and Flavell's (1992) procedure, Robinson, Mitchell, and Nye (1995) had young children guess the content of a box from the picture on its exterior (a toy boat, in this case). Then the experimenter looked inside and told the child that the box contained only a ball. When

the children had to inform another person or a doll what the box contained, they were less significantly likely to say "ball", as they had been told, than in a control condition in which they saw for themselves that the box contained a ball. This shows that when in contradiction with their own experience, children can assign a "doubtful" status to hearsay/utterance but accept it when they have no other way of checking it. Childdren were less "blinded" by the reality and resist to it when the information was presented verbally. They trust to a testimony, or judge when to trust a testimony.

In Robinson & Whitcombe (2003) and Whitcombe and Robinson (2000) children were asked to guess the color of the toy which was hidden after only felt it, and then the speaker provided them with a contradicting color. Both 3- and 4- year-olds believed this contradicting suggestion when the speaker had seen the toy (better informed than themselves were) but did not buy the suggestion when the experimenter both themselves s and the experimenter had the same kind of perceptual experience (e.g. tactile). This is evidence to children's sensitivity to a speaker's perceptual access when they decided whether or not to believe the speaker's assertion.

All together these studies show that children who are 3-to 4-years-old are sensitive to a speaker's current perceptual access as well as his/her past history, when deciding whether to believe what they are told. This is a rather unexpected finding given the same age children's difficulties in reporting the sources of their knowledge. A question that follows is that would the children who are able to assess other's source of knowledge non-linguistically be able to make use of linguistic source cues; such as evidentiality markers? The following section will summarize the limited research on children's use of evidentiality markers in their source reliability judgments.

Source Reliability and Evidentiality

To our knowledge there are no systematical cross-linguistic comparisons of children's developing skills in decoding linguistic source cues across evidential and non-evidential languages. The existing studies deal with only one evidential language group, and compare the findings with what is reported on English-speaking children's source reasoning. The common research paradigm consists of asking children which one of the conflicting sentences -marked with different evidential markers- provides correct information ("*The box behind the curtain is blue -I saw*". vs. "*The box behind the curtain is pink -I heard that*."). Generally, children are provided with verbal cues only, that is, they do not witness any behavioral occurrences of the informational relations; such as somebody putting the box behind the curtain (see also, Matsui & Fitneva, 2009).

The findings regarding the age ranges are mixed. For example, for Japanese three- and four-year olds, evaluating the grammatical source expressions was harder than the non-linguistic ones (Matsui et al, 2006). Similarly, Korean-speaking three- and four- year olds performed at chance in distinguishing utterances marked by *–e* (direct experience interpretation) from information marked by *–tay* (hearsay interpretation) (Papafragou et al., 2007). Finally, Fitneva (2008) reported that full comprehension of Bulgarian evidential markers was not observed until nine years of age. Matsui and Fitneva (2009) concludes that these findings indicate that children's ability to use evidentials to assess the reliability of communicated information develops later than their utilization of non-linguistic cues/heuristic described in the previous section (see also Fitneva, 2008).

The lack of systematical comparisons of different age groups across languages prevents us to make adequate interpretations on the interaction of language and source reasoning. However, cross-linguistic evidence on other epistemic meanings, such as certainty, leads us to expect differences between speakers of different languages. For example, Matsui, Rakozcy, Miura, & Tomasello (2009) found that Japanese children as young as 3-years old outperformed their German speaking peers on standard false belief tasks when certainty was grammatically coded in the Japanese utterances in a similar fashion to the evidentiality markers. Also, the research reviewed in the previous sections demonstrated that children's nonlinguistic understanding of knowledge sources presents the same sequence of development on the basis of linguistic data (naturalistic and production studies of Turkish evidentiality).

Given this backdrop, the present study investigates whether language interacts with children's understanding of others' informational access by presenting cross-linguistic data. In many studies, children's acquisition and growing mastery language has been connected with their mental state understanding (e.g., deVilliers & deVilliers, 2000, Astington & Baird, 2005, Ruffman, Slade & Crowe, 2002). Also, the early competence the Turkish children show with evidentials in spontaneous speech might in the encoding of experience into memory in terms of the evidential categories that make source information readily accessible at the time of retrival. Thus, in the present study, we tested whether there are developmental differences across linguistic communities in the ability to identify speaker reliability from linguistic source expressions. More specifically, we wanted to see whether Turkish-speaking children would benefit from the grammaticized indication of source information in their native

language when there is conflicting information by different informants. We tested this possibility by comparing Turkish-speaking children with their English-speaking peers. It was expected that if grammatical means to express informational relations does sensitize Turkish children to those distinctions, they will be able to "read" the linguistic source cues better, i.e., they will prefer direct perceptual access over the other sources at an earlier age than their English speaking peers. To reiterate, the main question of the current study is whether there are any developmental differences across linguistic environments in the ability to identify speaker reliability from linguistic cues.

CHAPTER 2

METHOD STUDY 1

This study explored children's source reliability judgments. Specifically, it tested whether children raised in languages that are imbued with informational relations would be more attentive to linguistic source reliability compared to their English speaking peers whose language do not code the source information obligatorily. The participants were presented with a story of a protagonist whose ultimate aim was to find a treasure. The story consisted of 12 items – 3 warm-up- each of which presented a problem about finding out the treasure, and the clues to the solution of the problem were offered by three informants, who had varying information access to the content they provided; namely, direct perception, inference, and hearsay. The children and adult participants were asked to pick between the contrastive trios.

Participants

Turkish Sample

Thirty-nine 4-year-olds (M= 4;6, range = 4; 0 to 5;0), 40 6-year-olds (M= 6;4, range = 5; 11 to 6; 10), 40 8-year-olds (M= 8;6, range = 8;2 to 9; 0) and 40 adults (M= 24; 4, range = 19;8 to 27;6) participated for baseline purposes. The Turkish adult sample consisted of a mix of college undergraduates and graduates, and they volunteered to participate.

American Sample

Forty 4-year-olds (M= 4; 4, range = 4;0 to 4; 9), 39 6-year-olds (M= 6; 6, range = 5;

11 to 6;9), 41 8-year-olds (M= 8;3 month, range = 8;1 to 9;0) and 40 adults. The adult

participants were college undergraduates were recruited from research laboratories at

the psychology department and they participated on a voluntary basis. Four-, 6- and 8-

years old children in both language groups were tested individually in a quiet room or

in an isolated space at their local schools. The participants were mostly English

monolinguals (97%) except for a total of 3% who knew some Spanish and Asian

Americans who knew some Chinese. Since these languages do not involve

grammatical evidentiality and the children were not fluent in these languages, they

were kept in the experimental sample. Table 2 below summarizes the demographic

information for both samples.

Participants from all age groups were predominantly from middle SES

families. Sixty percent of the participants in the Turkish sample and 65% percent of

the participants in the American sample were girls.

Table 2. Demographic characteristics of the sample

Age	Language	N	Mean Age	Age Range	Number of girls
4	Turkish	39	4;6	4;0-5;0	26
	English	40	4;4	4;0-4;9	22
6	Turkish	40	6;4	5;11-6;10	27
	English	38	6;6	5;11-6;9	23
8	Turkish	40	8;6	8;2-9;0	19
	English	41	8;3	8;1-9;0	27
Adult	Turkish	39	24;4	19;8-27;6	20
	English	40	20;8	18;4-20;3	26

Materials and Design

To avoid intonations or gestures that would introduce linguistic bias effects, animated characters and prerecorded voice-overs were used. Animated clips featuring three cartoon-character informants wearing different colors (green, red, blue) were used in each trial for both linguistic groups.

An adult native speaker interviewed each child individually in a quiet corner or room in their local school. Children received neutral feedback for their answers. At the beginning of each session, experimenter played with the child, introduced them to the computer and the clicker to control until the child felt comfortable. Then, each child participated in a warm-up session to accustom them to the task, test trials, and a verbal ability measure. The order of the verbal ability measure and the source task was counterbalanced across participants.

Source Reliability Task

To introduce the task, the experimenter pointed to a still frame of the three informants and asked about each color in turn, and made sure they understand the colors and what they would be doing (" Do you see these three people? Which one is wearing green/blue/red? They are going to give us clues to help Alf –the protagonist-about where to look for things. You should listen to them carefully as they speak, ok? You can ask to listen to them again."). Then, a story plot in which a protagonist is set out to find a treasure was presented to the children (see Appendix). By outlining a coherent storyline –presented as a game to help the protagonist- the demands of processing multiple events and linguistic markers are thought to be decreased. Each trial began with a narrator's voice, explaining the protagonist's task to the children

(e.g. "Here,Alf is trying to find the keys to the treasure chest. It could be in any of these locations.") Then, alternative locations in a still frame are presented (e.g. Let's listen to the clues people will give us, and decide where he needs to look, ok?") With separate mouse clicks, the three informants, using one of the three evidential relations, (perception, hearsay, inference) provided children with conflicting information about the whereabouts of the objects. After they were done listening to the informants, the experimenter asked which informant the child should believe in order to find the keys. Examples of the three evidential relations that were manipulated in the conflicting utterances by the informants are described in Table 3 below. Finally, a still frame including the three informants and the three locations they referred to was presented to the children (see Figure 1). The trios were arranged so that each source was heard first an equal number of times by each subject. The order of the utterances depended on the participants' preference for getting an answer first from the character on the right, on the left or in the middle. They were asked which one of the speakers should the protagonist listen to in order to reach his goal. The positioning of the informants and their informational access varied systematically across trials. There were a total of 12 trials, three of which were warm-up items.

Table 3. Operationalization of source. (Responses to "Where are the keys?")

Contrastive Trios	Turkish	English
Perception	Kedi kaçır -*DI*.	The cat took them, *I saw*.
Communication	Köpek kaçır-MIŞ.	The dog took them, *I was told*.
Inference	Tavşan kaçır-MIŞTIR.	The rabbit took them, *I think.*
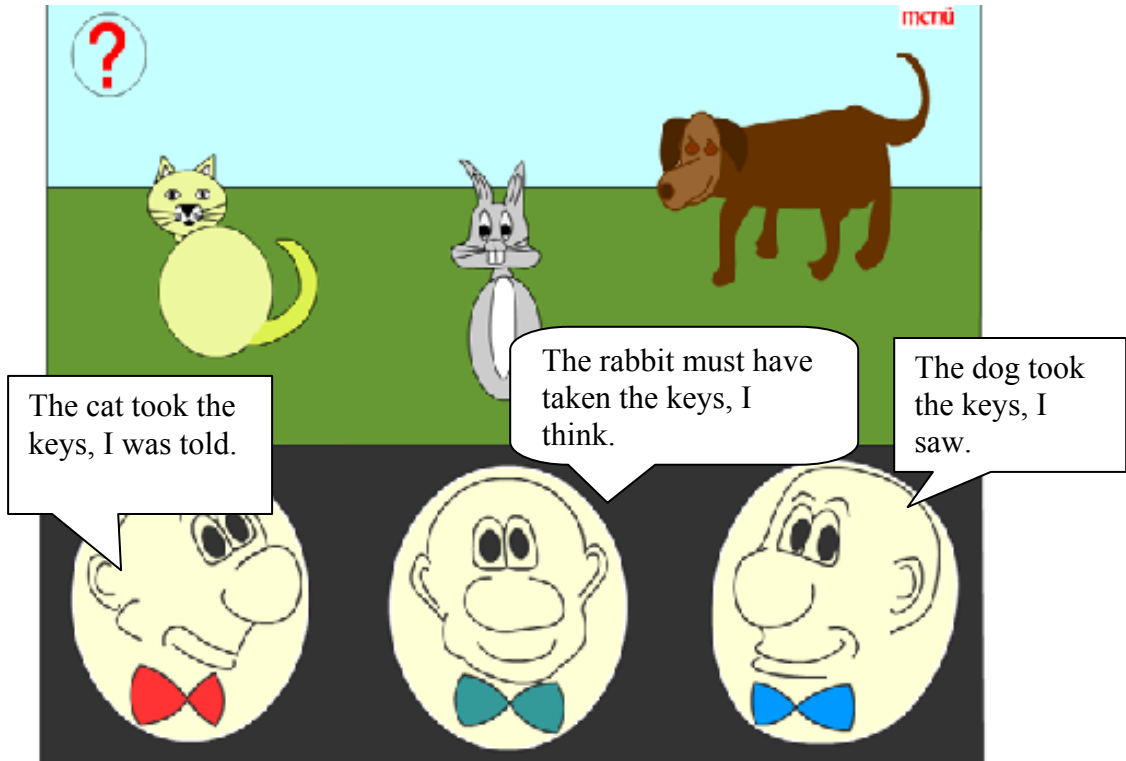
Figure 1. Source Reliability Task- A Still screen from the animated story. *The callouts were added for demonstration purposes.*

Verbal Ability Measure

An important issue here is to control for verbal ability in general when looking at this effect. I suggest to control for general language/verbal skills because it is not only a more valid index of development and also associated with theory of mind performance –as indexed by false belief tasks- (Sparrevohn &Howie, 1995). Here, the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981) is used, which is a measure of general receptive linguistic competence. The Turkish standardization of the task has been done during the 1980s, so it might not be the most reliable measure but it is the only published standard test we could use for the study's purposes. Children were classified as low language skill (PPVT < 1 SD from mean), average language skill

(PPVT within 1 SD of mean), and high language skill (PPVT > 1 SD from mean). The

general language variable was entered into the analyses as a covariate.

CHAPTER 3

RESULTS STUDY 1

The two central questions of the study were whether children assess utterances on the basis of verbal expressions of source, and prefer direct perception –a direct source of information- over indirect sources, such as hearsay or inference, and, secondly, whether Turkish children would come to reach this understanding – preferring direct perception over the other sources- earlier than their English speaking peers due to the salient grammaticalization of these source distinctions in their language. I will adopt a developmental approach while examining these effects.

To reiterate, in the current study, children's task was to decide which one of the three characters would provide a relatively reliable answer to the question at hand. Each one of the informants had differential access to the information –perception, hearsay, inference- which they indicated in their utterances. The order of the utterances depended on the child's preference for hearing an answer first from the character on the left, on the right or in the middle.

First I will begin by checking the role of item content on children's preferences in the task. I will proceed to an overall presentation of the children's preferences of sources-of-knowledge. I will particularly focus on the developmental trends and the linguistic group differences in the data.

Trials on which children could not reach a decision (after a prompt for guessing) were excluded from the analyses as were the trials on which noise interfered with a child's attention. Less than 1.5 % of the data were excluded for these reasons.

Item analyses

To check whether the content of the item episodes (e.g. somebody stealing the keys, or somebody hiding somewhere), rather than the manipulation of the source affected children's choices, preliminary analyses were conducted on each item. Such a bias could reflect children's own knowledge, motivation or familiarity with the content/ideas in the utterances. Multinomial tests on the proportion with which one content was chosen over the others did not identify biases ($\alpha = .05$), except for one content. This was expected because previous pilot analyses with the items were planned for that purpose; special attention was given when items were prepared. Any conventional associations or affordances regarding the content of the items had been avoided. Other preliminary analyses showed no effect of utterance content, utterance order and source-of-knowledge (evidentials) order on children's decisions. Thus, these variables were not considered further.

Source Preferences (Source Reliability)

Children's preferences for one source over the others, specifically, direct perception over indirect sources were analyzed in terms of age and language group. To see whether there is a general relationship between the preference of the sources and the combination of language and age variables, the data was modeled using generalized estimation equations (GEE, multinomial logistic regression). The GEE method provides parameter estimates and tests of the effects of the variables in the model through their generalized scores.

Gender did not have a significant effect on the variables of interest therefore was not included in the model. The final model at hand will focus on variables

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including language group and age, and their interaction (In the model, both age and language were treated as categorical variables). General verbal ability was entered as a co-variate and was also treated as categorical (e.g., scores > 1SE) due to mismatches of standardization of the test across countries. Turkish PPVT was standardized during 1989s and the standardized raw scores were not meaningful by themselves.

The dependent variable Source Reliability was defined as the proportion of choosing one source over the others derived from the eight items, and assessed through constructing 95% confidence intervals around the estimates. The analyses tested whether the proportion of times children preferred perceptual access over hearsay or inference was different from the chance level of 33 %. The data were submitted into a multivariate analysis of variance to assess the significance of any developmental trends.

To establish a baseline response pattern to the specific stimuli, contrasting sentences were first tested with adults. Adult samples uniformly chose to rely on the direct perception source over the other sources in both Turkish and American groups; 98.7% and 99 % of the time respectively. This is the first study to date that reports adult data with Turkish evidentials, and the findings confirm non-linguistic adult intuition and evidence from eyewitness testimony studies that perceptual access to the knowledge trumps indirect sources of information such as reported speech, imagination or inference.

Our model in the current study supported an existence of a relationship between the dependent variable Source Reliability and the independent variables; language and age, and general verbal ability as a covariate (χ^2 (6, N = 236) =18.39, *p*

< .05). The criterion for classification accuracy was also satisfied (accuracy rate = 60%).

The multinomial logistic regression makes further contrasts taking direct perception source as the reference variable and comparing communication and inference sources, respectively. Further results revealed that *language* group turned out to be significantly distinguishing preferences of children in favor of direct perception over communication and inference respectively (χ^2 *(1, N = 238) =4.913, p < .05; χ^2 (1, N = 236) =7.298, p < .05*).

As Figure 2 and Figure 3 depicts, overall Turkish children at each age preferred perception as reliable source of information 61% of the time (*SD =0.17*) which was significantly different from chance (*t* (119)= 4.25, *p* = .04). English-speaking children, overall, preferred communication 51% of the time. (*t* (118) = 3.64, *p* = .02).

Figure 2, shows that with age, for Turkish children, the value of perception to the other sources significantly increased. 8-year old children preferred perception as a reliable source 78% of the time, whereas 4-and-6 year olds preference rates were around 45% (*F* (2, 119)= 11.42, p < .01, η^2_p = 0.2).
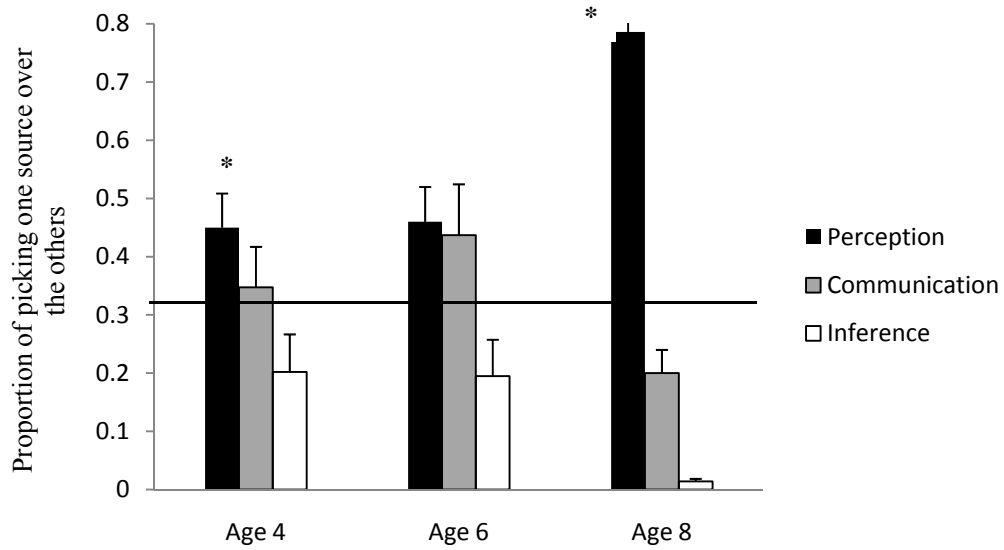
Figure 2. Mean proportion of source preference of Turkish-speaking children. Error bars show standard error of means. Asterisks indicate selection of one source more often than expected by chance (.33) (p < .05)
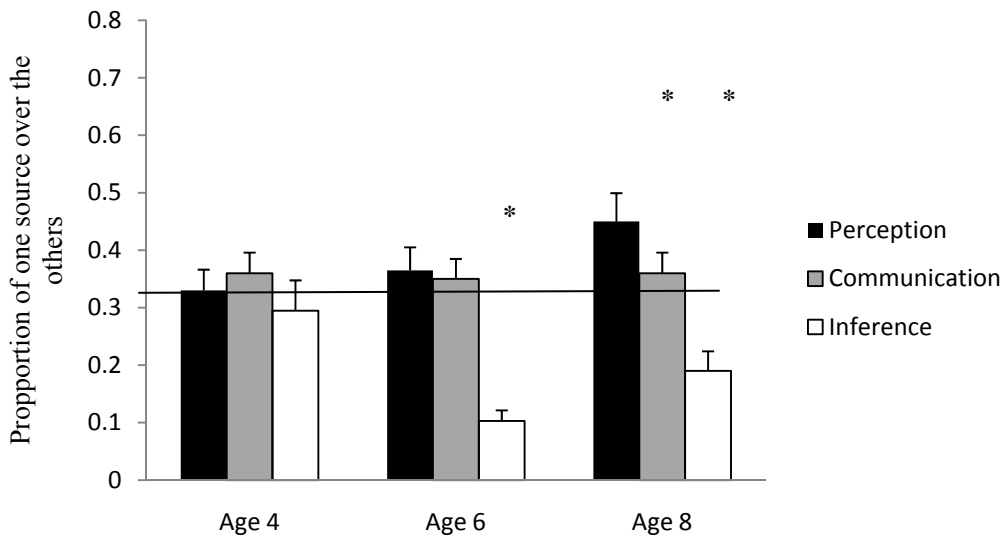
Figure 3.Mean proportion of source preferences of English-speaking children. Error bars show standard error of means. Asterisks indicate selection of one source more often than expected by chance (.33) (p < .05)

The main interest of the study was to see whether language affects children's preferences of direct perception whether there are timing differences with regards to preferring direct perception as a reliable source of information across language groups.

Separate 3 (Age: 4-, 6-, 8-year-olds) X 2 (Language: Turkish, English) ANOVAs were conducted for each source-of-knowledge. As Figure 4 below shows, an analysis of variance on the proportion of reliability judgments favoring direct perception confirmed a main effect for language group (F (1,235)=11.07, $p < .001$) . More Turkish 4-year olds and 8-year olds than English-speaking 4-year olds and 8-year olds selected direct perception as a reliable source of knowledge. Even though, the trend was there the differences between Turkish- and English speaking 6-year-olds did not turn out to be significant.
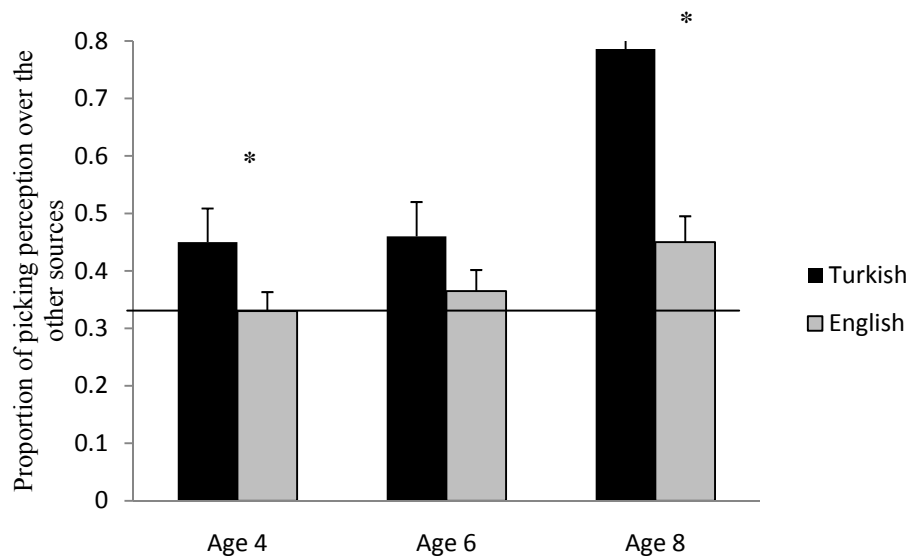
Figure 4. Mean proportion of source preference favoring direct perception over indirect sources. Error bars represent +-1SE. Asterisks indicate selection of one source more often than expected by chance (.33) (p < .05)

Similarly, another ANOVA was conducted to see whether two language groups behave differently in preferring communication over the other sources. As Figure 5 below, shows English 8-year olds (36%) preferred communication significantly more than the Turkish 8-year olds (20%).
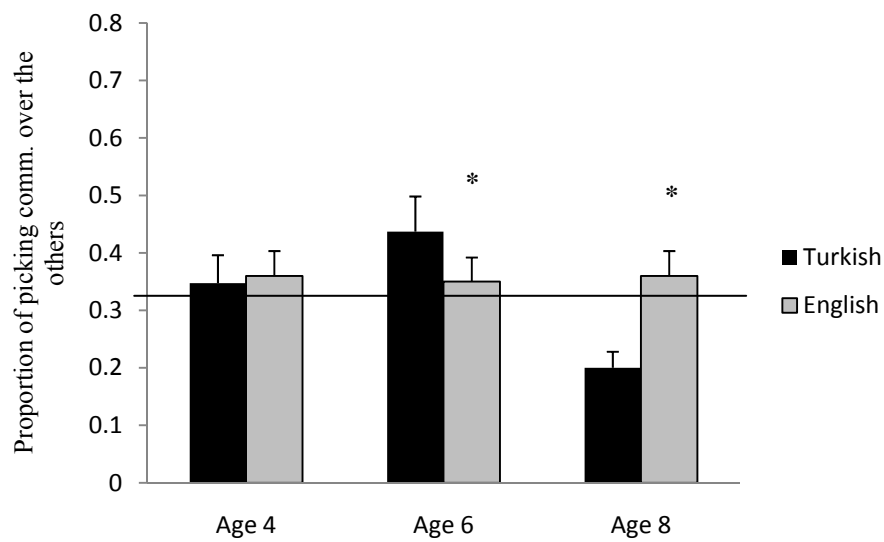
Figure 5. Mean proportion of source preference favoring communication over other sources. Error bars represent +-1SE. Asterisks indicate selection of one source more often than expected by chance (.33) (p < .05)
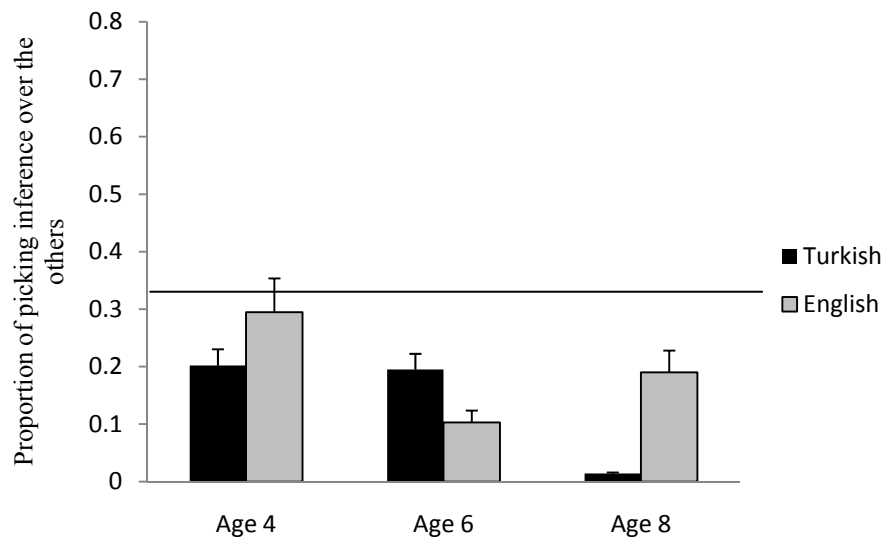
Figure. 6. Mean proportion of source preference favoring **i**nference over other sources. Error bars represent +-1SE. Asterisks indicate selection of one source more often than expected by chance (.33) (p < .05)

All together these analyses support the present study's main prediction that age and grammatical evidentiality in language are predictors in children's developing reliability judgments. A summary of the findings, discussion and the implications of these findings will be presented in the next chapter.

CHAPTER 4

STUDY 1 DISCUSSION

This study explored whether children rely on source cues presented linguistically in the utterances. The findings of the current study provides initial evidence that the source information carried by the Turkish evidentials influences source preferences of Turkish speaking monolingual children as young as 4-years old. Following adult intuition and the data on non-verbal source knowledge tasks with children, Turkish speaking children's preferences are in favor of direct perception evidentials when there is contradictory information from different sources. The data also revealed that English speaking monolingual children do not start to use verbal source distinctions as a speaker reliability cue until 8 years of age.

In this chapter, I will discuss how the present findings fit in within the previous research on source knowledge and mental state understanding. Next, I will elaborate on possible reasons for the differences between two language groups. I will also briefly discuss the relevance of the current findings for the Sapir-Whorf hypothesis; a rather detailed discussion is presented in the final chapter. The brevity of the discussion in the present chapter will be compensated in the general discussion and conclusions chapter at the end.

Children's Mental State Understanding and Evidentiality

Exploring how children start successfully determining the reliability of their informants has been considered a crucial area under the general rubric of mental state understanding or what it means to have a theory of mind. Understanding whether an

informant is reliable requires understanding others' epistemic states; specifically, whether or not they are certain/uncertain, or the evidential bases of their argument (the source of their knowledge). In fact, theorists suggest that success in standard theory of mind tasks reflects a growth in understanding that knowledge is dependent on informational access (e.g. Wimmer, Hogrefe, & Sodian, 1988; Perner, 1991).

Previous studies show that children are pretty competent in understanding source knowledge. By 4 -or 5-years of age, they are able to appreciate that another's knowledge may be derived from perception, or mental inferences (O'Neill, Astington, & Flavell, 1992; Sodian and Wimmer, 1987). Other studies, however, also suggest that children's ability to verbally report sources of information may develop more slowly (Gopnik & Graf, 1988; O'Neill & Gopnik, 1991). As reviewed in the introduction, however, young children are pretty good at evaluating speakers on the basis of their reliability, certainty or previous accuracy history by utilizing non-verbal cues (e.g., Koenig & Harris, 2005). Matsui et al. (2006) asserts that this might suggest that some -possibly implicit- understanding of speaker's epistemic states develops before a fully developed understanding of mind; or theory of mind. Note that the use of the term "implicit" here does not have any theoretical implications but imply a nonconscious use of the knowledge. Similarly, Haigh & Robinson (2003) also suggested that children who succeed in the reliability judgments tasks might not have reflective awareness of sources, but a "working understanding of knowledge sources".

The findings of the present study provides initial evidence that this non-linguistic implicit understanding also extends to children's utilization of linguistic source cues in speakers of evidential languages, at least in Turkish speaking children.

Studies on Turkish evidentials show that children start to use evidentials in appropriate contexts from very early on (by 36 months all evidentials forms are appropriately used in naturalistic and experimental contexts) (Aksu-Koc 1988), however when asked to reflect on the meaning of the evidentials in comprehension studies (responses to "how do you know?" questions, they are not able to do so until 5- or 6-years-of-age (Aksu-Koc & Alici, 2000). Since the source reliability judgment task does not require any metalinguistic understanding or reflection of the markers, it is my opinion that an implicit knowledge of the evidential meanings is sufficient to guide the children through the items in the present study. The ease with the markers are used in language within the relevant contexts (a situation that calls for the use of them as cues) may sensitize speakers, without any conscious awareness, to the source distinctions as cues.

What might be the other possible reasons responsible for differences across languages in the source reliability task? As reviewed above, Turkish language encodes evidential relations through sentence-final morphemes (i.e., closed-class items). In the linguistics literature -and as identified also by Matsui et al. (2006)-, closed-class items are considered to have a somewhat distinct function from that of verbs and nouns (Wilson & Sperber, 1993; Talmy, 2001). Typically, they are considered to encode procedural information, and thus, are not accessible to consciousness. Even though they are not accessed consciously, closed-class items have an influence on conceptual understanding. It is hard to test this hypothesis empirically; however, there is supporting evidence, across evidential languages, that young children make use of information encoded in the sentence-final evidential particles earlier than information encoded in verbs (Matsui et al., 2006). This could contribute to our understanding of

the linguistic group differences that were found in the present study. In line with the previous research, English-speaking children, in our study, did not differentiate between sources as indicated by lexical information (such as verbs, *I saw).* Other studies in English also point to a developmental lag in children's ability to assess information based on verbal cues. For instance, children only start to reliably use mental verbs, such as *know* or *guess* around age 7 (Moore et al., 1990), even though in the studies reviewed in the Introduction shoe that by sever years of age, children already possess a conceptual understanding for both know and guess.

Language and Cognition: Whorf revisited

The present study provides the only cross-linguistic data comparing an evidential and a non-evidential language in children's reliability judgments. The present findings suggest that the presence of the evidentiality markers influences the timing children evaluate the nature of evidence. This is an interesting developmental finding pointing to a possibility that growing up in a language with its grammar imbued with evidential relations divert attention resources to the source cues as opposed to growing up in a non-evidential language.

This possibility is a version of the Sapir-Whorf hypothesis (Whorf, 1957) which has been a fascinating hypothesis for researchers over the course of years. There is both supporting and non-supporting evidence for the hypothesis in the domain of children's source understanding. For example, Papafragou el al. (2007) looked at Korean speaking children and suggests that the understanding of non-linguistic information sources develops earlier than the comprehension of evidentials which indicates the possibility that the comprehension of evidentials, maps onto an

existing conceptual framework not vice versa. However, converging evidence from other studies in Turkish suggests that Turkish-speaking children are better able to retain non-linguistic source information than are same age English-speaking children (Aksu-Koc, Ogel, & Alp, 2009) There is also supporting evidence for cross-linguistic differences from other epistemic meanings. For instance, Japanese preschoolers were much better than their German peers in standard false belief tasks when a grammatical form of certainty was used in Japanese during the tasks (Matsui et al., 2009).

However, the present study is just an initial support for the cross-cultural differences with evidentiality markers. It is too early to draw broad conclusions about the relationship between language and thought in respect to evidentiality. More sophisticated methods such as non-correlational designs (Fitneva & Aydin, in press) are needed. An interesting extension to the present research would be to look at cross-language differences in standard tasks, such as non-verbal source memory tasks. A logical assumption based on the findings of the current study is that linguistic encoding of source would influence non-linguistic source monitoring abilities of Turkish children. The existence of the forms in the language might help encoding of experience into memory in terms of the evidential categories that makes source information accessible at the time of retrieval.

Also, another extension would be to look at the whether or not Turkish-speaking children would extend this pattern in preferring to learn from a direct perception source to other relevant contexts, such as misinformation contexts. Suggestibility is an interesting arena to study how children learn from other people. Given children's suggestibility is highly influenced by other sources' credibility and

their use of languages, in the next section I turn to explore the links between

evidentiality and children's suggestibility.

CHAPTER 5

INTRODUCTION- STUDY 2

Children's ability to evaluate verbally/linguistically presented information has

important implications for research on suggestibility. Suggestibility refers to change of

belief and memory resulting from inaccurate information, which is mostly verbally

presented. Recent proposals argue that suggestibility is directly linked to source errors;

i.e., people inaccurately attribute the source of the information they report to their own

experience instead of someone else's report (Zaragoza & Lane, 1994). If young

children cannot identify where they learned the information, this leaves the possibility

open that they may absorb information regardless of the credibility of different sources

to which they are exposed. Here, children's understanding of source reliability gains

greater importance. It might directly influence what children believe.

In the present research (and for the remainder of this chapter), I entertain this

link between children's understanding of source reliability and their resistance to

suggestibility. It will be followed by the considerations of the link between

evidentiality to suggestibility. The following review will also briefly review some of

the relevant research findings covered in the above sections for the purposes of the

flow of the argument.

Suggestibility and Understanding of the mind

Children's developing understanding of the mind is critical in their evaluations

of others. This understanding includes the realization that other people can have

different intentions when they demonstrate knowledge, they can posses a different

perspective on the same information, and they can be simply wrong or less certain. In the following section, I review how different aspects of understanding of the mind could be implicated in young children's resistance to false information by others.

Representational Understanding and Suggestibility

Suggestibility of children's memory has been best demonstrated in research as the post-event misinformation effect (e.g. Loftus, 1979). The standard paradigm consists of three parts. First the participants experience an event, and then they are exposed to misleading information about the event. Finally, they are tested on their memory for the original event. This effect has been delineated with multiple test conditions, such as free recall, standard recognition, forced-choice recognition, and cued recall (Bruck & Ceci, 1999).

Research has demonstrated that younger children's memory is more vulnerable to misleading information compared to older children's (but see Brainerd, Reyna & Ceci, 2008). At around ages between 3 and 5 years, children show an increase in resisting false suggestions (Ceci & Bruck, 1993). In order to explain the mechanisms that are responsible for young children's suggestibility, two hypotheses have been proposed. The memory alteration hypothesis argues that report accuracy is damaged by a false suggestion overwriting the representation for the original event (Tousignant, Hall, & Loftus, 1986). The original event representation gets permanently altered and updated by the post-event information. Memory alteration hypothesis asserts a cognitive mechanism that points to underlying memory impairment. According to a rather socially-driven hypothesis, the original event representation is preserved in memory but the post-event false suggestion coexists with it; hence it is referred to as

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the co-existence hypothesis (Zaragoza & McCloskey, 1989). Later, the child may reject the original information in lieu of the post-event suggestion because the latter is perceived as more reliable, trustworthy, etc. For example, the child may reason that although she recalls the original event, an adult suggested an alternative and adults are more knowledgeable than children, so it is best to report what the adult suggested even if it runs counter to their memory. In this situation, the child needs to keep track of each of the information sources--original and post-event--and assess their likely truth value in order to benefit fully from others' testimony or to avoid being deceived. A recent proposal to these two accounts is an opponent-processes account of suggestibility (Brainerd and Reyna, 2005). The key idea is here is that since the meaning-content of the original event phase and the misinformation phase is similar, when "correct meaning –gist" but false detail is presented to the child, the gist (meaning based) memories from the earlier phase are also strengthened. Thus, this account predicts that the source of the information would not have an influence on suggestibility as long as it is measured right away (so verbatim memory is perfect) or sources are very distinct from each other.

These hypotheses seem to differ in the mechanism they propose of how post-event communication reduces the child's accuracy. However, all of them deal with how many representations children can hold in memory, and they implicitly assume that representations are the basis for beliefs about events. Representational abilities are considered as integral to children's understanding of the mind (Wellman, 1993; Perner, 1991). Understanding that other's mental states can be different from one's own and from the previous states is referred to as "theory of mind" in the literature

(Wellman, Phillips & Rodriguez, 2000; Perner, 1991). Researchers have proposed that resistance to misinformation effect requires certain theory-of-mind (ToM) abilities that may be missing in younger children (e.g., Bright-Paul, Jarrold, & Wright, 2008). Improvements in resistance to misinformation coincide with the age children pass the benchmark tests for theory of mind, between 3 and 5 years (Ceci & Bruck, 1993; Gopnik & Astington, 1998).

The first distinct component of ToM that might have an influence on children's suggestibility is the ability to handle different mental representations of reality (Welch-Ross, 2000). ToM development requires simultaneously considering multiple contradictory representations. This is an important skill in legal settings where children need to provide accounts of what they originally knew about the event, without confusing it with post-event information from other sources. Studies have shown that understanding false belief makes children more resistant to misinformation. For example, children of 5 years and older who also passed a standard false belief task had more accurate memories of a video segment than did younger group who failed the task (Templeton & Wilcox, 2000). Other studies that looked at representational change ability showed that 3-to-5 year olds' performance on appearance –reality tasks predicted their tendency to yield to new misleading information (Welch-Ross, Diecidue, & Miller, 1997). Interestingly, Thomsen & Berntsen (2005) demonstrates that the representational change question (change in their own belief) was a better predictor than other's change of belief questions for yielding to false information after seeing a staged event. Although the exact mechanism responsible for this pattern is unclear, it seems likely that younger

children's belief that the world can be represented in only one way may prohibit them from simultaneously reasoning about their original representation and the one derived from the suggestions. In contrast, older children who realize that the same event can be represented differently by different people may be better able to correctly resolve the contradiction created by suggestions.

Source-of-Knowledge and Suggestibility

The second component of ToM development proposed by Welch-Ross (2000) that might have an influence on suggestibility is the emergence in understanding of the connection between origins of experience and knowledge. This requires growth in two skills: (1) identification of information sources and (2) evaluation of sources. In a misinformation context, even though the content of the event and misinformation phases are well-remembered, the origins of these memories may be confused, resulting in suggestibility (Ackil & Zaragoza, 1995; Poole & Lindsay, 2002).

Understanding that knowledge is dependent on informational access grows with age. Research has shown that 3-to-4-year-old children are able to associate seeing with knowledge (Pillow, 1989). However explicit understanding that different knowledge states are results of different sources does not appear until 4-years of age (O'Neill, Astington, & Flavell, 1992). Children have difficulties in verbally reporting the evidential bases of their knowledge; e.g. seeing the contents of a box for themselves, or being told by the experimenter (O'Neill & Gopnik, 1991). Again, around 5-years-old, children can distinguish those speakers who are engaging in story-telling or fictional language (Harris, 2002). Thus, even young children are able to reason about the sort of evidence that lead people to believe something. This skill is

crucial in suggestibility paradigms where children's believes need to be updated based on available evidence; that is children should be more likely to change their original account if they attribute a more valid status to the interviewers' accounts.

The developmental progression of identification of sources show us that direct perception as a source of information appears first, then hearsay information, and finally inference. Does this progression mean that there is a succession in the reliability values that children attach to those sources and *prioritize* some over the others based on evidential access?

In suggestibility studies, there are two contradictory pieces of evidence; one from the original event information, and one from the post-event information. If the child retains a memory of both of these conflicting sources, her task is to judge beliefs that follow from different kinds of evidence. Findings from a growing number of studies show that in cases of contradiction young preschoolers can judge which source is more likely to be reliable. For example, they rely on their own direct perception more than conflicting verbal reports of others, and rely on others' direct perception that people who were told about or just inferred the information and they are more likely to believe what they are told by an adult who has had visual evidence over one who has not (e.g., Robinson, Champion, & Mitchell, 1998; Robinson, Mitchell, & Nye, 1995).

More recent studies show how children deal with other's testimony with paradigms closer in design to suggestibility paradigms. Robinson & Whitcombe (2003) and Whitcombe and Robinson (2000) asked children to guess the color of the toy which was hidden after they had only felt it, and then the speaker provided them

with a contradictory color. Both 3- and 4-year-olds believed this contradictory

suggestion when the speaker had seen the toy (i.e., better informed than themselves)

but did not believe the suggestion when both themselves and the speaker had the same

kind of perceptual experience (e.g., felt).

It seems that young children have some intuitive or implicit understanding that

hearsay evidence is less reliable than direct perceptual evidence. Even 3-year-old

children who have difficulty in providing verbal accounts of the origins of their belief

make use of accessibility to evidence cues when they are faced with contradictory

information. Matsui,Yamamoto & McCagg (2006) suggests that this finding points to

development of "possibly implicit understanding of speaker's epistemic states" before

an explicit understanding of the mind (p.159). Children evaluate the utterance as less

reliable if it conflicts with direct evidence but tend to accept it when there is no such

basis. To be speculative, one could argue that the contradictive nature of the presented

information might be pushing children to evaluate the possible cues, and emphasizing

the sensitivity to informational access. What is not explicit verbally may get evaluated

on a more automatic level during a misinformation context.

In fact, the representational accounts of children's cognitive development state

that when the representations are verbally expressed, they are fully accessible to

consciousness, hence explicit (Karmiloff-Smith, 1992). In other instances, although

representations cannot be verbalized, some implicit level of understanding is present

and can guide thought in nonpropositional –nonlinguistic- procedures: thus resulting

in success in handling the origins of beliefs among very young children.

Other data also show that children are critical of different sources that vary in reliability when they are faced with conflicting information in eyewitness paradigms. Preschool children engage in social evaluation of sources and are more likely to incorporate the false suggestions of adults than the identical false suggestions of peers (Ceci et al., 1987). Moreover, they distinguish between credible or non-credible adults. Children's memory reports were impaired only when misinformation was presented by a credible adult as opposed to a discredited adult or a child communicator (Lampinen and Smith, 1995). However, these results need to be cautiously interpreted because delayed susceptibility to misinformation was not measured. It is possible that after a delay the credibility status of the sources might fade out, and thus children would be equally suggestible by both sources. Such a trend would be explained by a fuzzy-trace account (FTT, Brainerd and Reyna, 2005) such that children might reject misinformation in an immediate test due to good verbatim memory, however, it can morph into a memory later on, resulting in similar levels of suggestion by both credible and not credible sources. This effect is called a sleeper effect and has been shown in other misinformation effect and source credibility studies (e.g. Underwood & Pezdek, 1998).

Children's ability to evaluate and track the sources of beliefs has been associated to reductions in suggestibility levels. Monitoring the origins of beliefs – *source monitoring*- is considered as part of theory of mind because it builds on the understanding that other people can entertain different beliefs based on their informational relation to the world (Drummey & Newcombe, 2002). Overall, studies looking directly at this association have some version of "intervention" paradigms; i.e.

alerting children to sources of their knowledge prior to post-event communication, putting contextual cues in retrieval questions, explicitly warning about post-event misinformation (Giles, Gopnik, & Heyman, 2002; Thierry et al., 2001, Bright, Paul-Jarrold, & Wright, 2005; Holliday & Haynes, 2002). The findings revealed that some warning or training on the existence of source information helps even 3-to-4- year olds to resist suggestibility. Then, it is reasonable to assume that grammatically salient source cues would act similarly as the explicit source cues. Evidentiality markers, as linguistic cues that tag source distinctions, might help children to be alert to sources during a misinformation paradigm causing reductions in suggestibility levels.

Suggestibility and Source Credibility

Studies looking at social psychology of suggestibility show that suggestibility levels are reduced when subjects know the post-event communication was produced by a less credible source.

Smith and Ellsworth (1987) showed that adult participants took speaker reliability into consideration when post-event communication was from a credible course; i.e. questioner who had seen the events, then a naïve source who had not seen the events. Similarly, subjects were less likely to be misled by a witness of the original event than by the innocent bystander (Dodd & Bradshaw, 1980).

There are a limited number of studies that looked at children's sensitivity to source reliability in suggestibility paradigms. Ceci, Ross, & Toglia (1987) found that preschool children were misled to a greater extent when the misleading information was presented by an adult interviewer rather than a specially trained 7-year old interviewer; suggesting that preschool children were sensitive to speaker reliability –

age, in this case- and discounted the information by the less credible source. Finally, Lampinen and Smith (1995) found that children's memory reports were impaired only when misinformation was presented by a credible adult as opposed to a discredited adult or a child communicator.

Even though, these results do not speak for whether or not children make a distinction between source knowledgeability or trustworthiness, they suggest that children are influenced by source credibility cues when faced with conflicting information in eyewitness paradigms.

Evidentiality in Language and Suggestibility: An Empirical Question

So far, the evidence seems to point to a causal relationship between children's emergent understanding of mind -conflicting representation and origins of knowledge- and their ability to resist contradictory suggestions. It seems reasonable to assume that comprehension of evidentials, fostered more in some languages than others, is a mediating force in the association of understanding of mental states and the ability to resist contradictory suggestions.

The association between evidentiality and suggestibility offers a good testing ground for investigating the relationship between language and conceptual systems. Below, I review why the relationship between evidentiality and suggestibility is an important one, and why the misinformation paradigm is a suitable testing ground for this association.

Language's effects on children's resistance to suggestibility have been long known. The verbal nature of the instructions and questions in children's suggestibility

studies point to a strong association between language and suggestibility. Studies

looking directly at this relationship focus on general effects of language ability on

children's proness to misinformation. It has been demonstrated that legal interviews

with children often are conducted in a language that exceeds the cognitive ability of

the interviewed children. Typical examples include use of long and complex sentences

as well as use of unclear references to persons and situations etc. (e.g., Davies &

Seymour, 1998, Brennan & Brennan, 1988; Zajac & Hayne, 2003) On the other hand,

using age-appropriate levels of language reduces children's suggestibility levels (e.g.,

Korkman, et al., 2008). Imhoff & Baker-Ward (1999) interviewed three- and four-

year-old children about a personally experienced event with different protocols with

regards to the degree of interviewer support and language appropriateness. The results

indicated that young preschoolers' resistance to suggestibility increased when a

language that is easily comprehensible to young children was used, whereas language

appropriateness was not as important for the older children.

Treated as an individual difference variable, narrative ability is found to make

significant contributions to the individual differences in children's susceptibility to

suggestions (Roebers, & Schneider, 2005; Kulkofsky et al., 2007). In a recent meta-

analysis of individual differences in children's suggestibility, Bruck and Melnyk

(2006) found that among the cognitive factors that predict children's suggestibility,

language ability and creativity were fairly consistent across many studies and

measures. In a similar vein, Kulkofsky et al. (2007) found that children's level of

narrative production skills influenced their ability to resist suggestions (Kulkofsky et

al., 2007).

Another feature of language that has been proposed to influence children's suggestibility levels is their pragmatic language ability, such as understanding the intended meaning vs. literal meaning (Beal & Belgrad, 1990). Young children questioned by adults may sometimes attempt to make their answers consistent with what they perceive to be the intent of the interviewer rather than what is consistent with their memory of the event. Newcombe and Dour (2001) employed a pragmatic competence scale to examine the relationship between children's conversational understanding and age-related differences in suggestibility. They found that suggestibility levels were moderated by the children's scores on the pragmatic task.

All these findings point to the fact that general language ability –narrative or pragmatic abilities- has a mediating role in children's ability to resist verbal information from other sources. However, there is none, or limited, research on specific components of language and suggestibility. Linguistic structures, such as evidentiality, could have a guiding role in storing and organizing information we learn from others. As Johnson et al (1993) noted, "…in many of the cases of receiving information about the event through people, news reports, or personal narratives, the verbal cues alone provide the information". Being among those verbal cues, evidential markers have a potential to be alerting children to individual perspectives and making them be more cautious in assigning trust to individual interviewers.

Earlier in the Introduction, it was reviewed that emergent understanding of the mind has been suggested as a mediator in reductions in suggestibility. At the "evidentiality" section the two components of theory-of-mind -understanding the origins of knowledge and representational change- have been offered as cognitive

correlates of evidentiality in language. It seems reasonable to assume that comprehension of evidentials, fostered more in some languages than others, is a mediating force in the association of understanding of mental states and the ability to resist contradictory suggestions. Welch-Ross (2000) suggests that ToM understanding aids to resist suggestion by decreasing the likelihood of overwriting the original event trace with misinformation. Once children start simultaneously considering contrading representations, they yield less to suggestions. Evidential language could provide listeners with salient grammatical tags so that they could differentiate between original and post-event information, and have less difficulty simultaneously holding them in mind. For example, if the original event story in a misinformation paradigm is from an "direct witness" perspective (utilizing –*dı* marker in Turkish) and the post communication is from a "hearsay" perspective (utilizing – *mış* marker), one would expect that Turkish speaking children would be less prone to misinformation.

Bright-Paul, Jarrold, and Wright (2008) suggest that growth in understanding origins of knowledge results in better source-monitoring. Previous review demonsrates that source-monitoring skills are highly associated with resistance to suggestibility. If training children in source-monitoring, or warning them about the source cues help them avoid being deceived by misinformation, one would expect evidentiality in language to act the same way. Evidential bases of the information is attached to the utterance obligatorily, and possibly saliently, therefore act as alerts for tracking the source information. Also, evidentials vary by the reliability of the relevant informational sources; i.e. direct perception being considered as more reliable than hearsay. In a misinformation context, children go through the effort to decipher these

grammatical evidential markers to evaluate the informational stance of the post-event communicator. Thus, children acquiring an evidential language would be expected to be more alert to the trustworthiness of the reporter.

Children's representational limitations in both linguistic and non-linguistic tasks have been a frequent theme in our discussion. In non-linguistic tasks of source assessment, children are required to indicate their responses *verbally*. This requires an explicit representation and monitoring of sources, and evaluation of the end product. In daily such assessments are made on a procedural level because we hardly need to indicate our reliability judgment. Robinson (2008) mentions that focusing on a "working understanding of trust in speaker knowledge" instead of explicit demonstrations of such knowledge.

I suggest misinformation paradigm as an implicit measure to look at children's trust in different information sources. In this sense it follows a long tradition of distinguishing between performance and competence disjunctions (Flavell, 1970), as children may have the cognitive competence to appreciate epistemic markers long before they can demonstrate it in their explicit verbal performance. Similarly, in evidential –linguistic- studies, Matsui et al. (2006) points to the problem of asking children about their understanding of the sentences with evidential markers and looking for verbal judgments from them. It suggests that researchers should simply look for a rather spontaneous way to tap that kind of knowledge. The misinformation paradigm seems to be a good candidate in which we can see how children's sensitivity to linguistic clues in assessing the comparative informedness of the speakers. It seems reasonable to assume that comprehension of evidentials, fostered more in some

languages than others, is a mediating force in the association of understanding of mental states and the ability to resist contradictory suggestions.

Suggestibility and Evidentiality

In the experimental paradigm described below, I investigate whether differences in the grammatical explicitness with which languages express source distinctions might influence children's resistance to suggestibility. Previously, children's suggestibility by testimony of others has been studied either by word-learning tasks or origins of knowledge tasks. Since misinformation protocols provide children with opportunities to deal with extended and complex events, children might pay special attention to the reliability cues. I adopt a developmental perspective because I think this will provide us with not only a description of language's effects on suggestibility but also how acquisition of evidentiality might influence children's resistance to misinformation. Our specific questions are: First, does having an explicit form of evidentiality in one's language improve resistance to misinformation? Given the age shifts in suggestibility, learning a language which grammatically marks information source contrasts might help speakers reason about the connection between beliefs and the sort of evidence. Second, how might grammatically explicit forms for evidentiality help? If they help by focusing the children on informational access, children should be less suggested by sources that do not have first-hand knowledge, i.e., hearsay. Similarly, they should be more prone to misinformation if they think the source has more reliable information than themselves.

The present study is designed to see children's assignment of trust when the misinformation is provided from an informational perspective different than the

original perspective. The children are randomly assigned to two informational conditions -direct witness and hearsay- that they are going to receive the event details. The informational perspective is switched during the post-event communication phase; i.e., the group who learned about the event from a hearsay perspective hears the post-event information from a direct witness perspective. If children are sensitive to linguistic cues, they will assign more reliability to direct witness perspective; therefore, post-event information would overwrite the original event information, resulting in higher suggestibility levels.

Such a design call for cross-linguistic comparisons among languages with different evidential systems; i.e., grammaticalized vs. non-grammaticalized. Turkish evidentiality is very well suited for examining reported events in a suggestibility context. As discussed above, the primary use of evidentials in Turkish is through talk about past events. There are two perspectives when talking about past events in Turkish; the direct and indirect access to information. They are represented as: (1) direct perception, encoded by the suffix *–dI*, (2) hearsay encoded by the suffix *–mIş*.

The paradigm follows the tradition of standard misinformation tasks (e.g. Ceci et al., 1987, Lampinen et al., 1995). Children are presented with a surprise-birthday-party-themed story narrated by a previously videotaped adult. Half the children hear the unfolding of events from a "direct witness/ *I saw*" perspective (utilizing the marker *–dI* in Turkish), and half the children hear it from a "hearsay/ *I was told*" perspective (utilizing the marker *– mIş*). Then the participants listen to children's music for a 10 minute filler period. In stage 2, children see another videotape of a different adult telling the same story from a different informational stance this time;

i.e. originally hearsay perspective now becomes a direct perception perspective or vice verca. The experimenter shows the child either the version with misleading details or the version without any contradictory information involved. During the final stage, children are presented a two-alternative forced choice test in which they will be asked to choose between the original still image in the story and an alternative picture containing the suggested detail. The actual and the suggested pictures will be identical in all other respects so that the only difference is the erroneous information that had been suggested to the children.

CHAPTER 6

STUDY 2 METHOD

In the experimental paradigm described below, we investigate whether differences in the grammatical explicitness with which languages express source distinctions might influence children's resistance to suggestibility. Previously, children's suggestibility by testimony of others has been studied either by word-learning tasks or origins of knowledge tasks. Since misinformation protocols provide children with opportunities to deal with extended and complex events/actions, the reliability cues might be more apparent to the children. We adopt a developmental perspective because we think this will provide us with not only a description of language's effects on suggestibility but also how acquisition of evidentiality might influence children's resistance to misinformation.

Our specific questions are: First, does having an explicit form of evidentiality in one's language improve resistance to misinformation? Given the age shifts in suggestibility, learning a language which grammatically marks information source contrasts might help speakers reason about the connection between beliefs and the sort of evidence. Second, how might grammatically explicit forms for evidentiality help? If they help by focusing the children on informational access, children should be less suggested by sources that do not have first-hand knowledge, i.e., hearsay. Similarly, they should be more prone to misinformation if they think the source has more reliable information than themselves; e.g. perceptual access.

The present study is designed to see children's assignment of trust when the

misinformation is provided from an informational perspective different than the original perspective. The children are randomly assigned to two informational conditions -direct witness and hearsay- that they are going to receive the event details. The informational perspective is switched during the post-event communication phase; i.e., the group who learned about the event from a hearsay perspective hears the post-event information from a direct witness perspective. If children are sensitive to linguistic cues, they will assign more reliability to direct witness perspective; therefore, post-event information would overwrite the original event information, resulting in higher suggestibility levels.

Turkish evidentiality is very well suited for examining reported events in a suggestibility context. As discussed above, the primary use of evidentials in Turkish is through talk about past events. There are two perspectives when talking about past events in Turkish; the direct and indirect access to information. They are represented as: (1) direct perception, encoded by the suffix –*dI*, (2) hearsay encoded by the suffix–*mIş*.

Participants

Turkish Sample

Ninety-eight 4-year-olds (M= 4 years 2 months, range = 3; 9 to 5;3), 96 6-year-olds (M= 6 years 4 months, range = 6; 1 to 7;1), 98 8-year-olds (M= 8; 6, range = 8;0 to 8;10) participated in the study.

American Sample

A hundred 4-year-old (M= 4; 3, range = 4;0 to 5; 3), 98 6-year-old (M= 6; 4, range = 6; 0-6;11), and 100 8 year old (M = 8; 3, range =7;8-8;11) participated in the study.

Four-, 6- and 8- year-old children in both language groups were tested individually in a quiet room or in an isolated space at their local schools. Table 4 below summarizes the demographic information for both samples.

Participants from all age groups were predominantly from middle SES families. Sixty seven percent of the participants in the Turkish sample and sixth-five percent of the participants in the American sample were girls. Written consent and verbal assent were obtained from all participating parents and children, respectively. Demographic characteristics of the sample are summarized in Table 4 below.

Table 4. Demographic characteristics of the sample-Study 2

Age	Group	N	Mean Age	Age Range	Number of girls
4	Turkish	98	4;2	3;9-5;3	60
	English	96	4;3	4;0-5;3	58
6	Turkish	96	6;4	6;1-7;1	55
	English	98	6;4	6;0-6;11	56
8	Turkish	97	8;6	8;0-8;10	73
	English	96	8;3	7;8-8;11	54

Procedure

The paradigm follows the general logic of standard misinformation tasks (e.g. Ceci et al., 1987, Lampinen et al., 1995). Children participated individually in a quiet

room or corner in their preschool. Trained female researchers served as the interviewers in each school. Prior to the testing days, the researchers visited the children's classroom to establish familiarity.

Children sat in front of a 17" screen-notebook computer. When necessary, they could put headphones on. They were presented with a "surprise birthday party" themed story narrated by a previously videotaped adult. There were no other distractions on the video; just an adult narrating an unfolding of events on a day when a person was surprised by a party by their friends.

In Stage 1, half of the participating children heard about the events from a "direct witness" perspective (utilizing the marker –dI in Turkish); that is the adult on the tape told the story as if he/she was there and had seen the events. The other half the children heard the same story, with the exact details from a "hearsay/reportative" perspective (utilizing the marker –mIs); that is as is they were told about the events by somebody else (see Appendix for the items/events in the story). 12 target items, most of them embedded within an action, were included in the story (e.g., *She spilled orange juice all over her new shirt*). All targets were nouns typically acquired before age three, according to objective age-of-acquisition norms (Morrison, Chappel, & Ellis, 1997) to minimize variations in linguistic competency influencing performance. The story took approximately 3 minutes to be told to the children. After the video, the participants listened to children's music for a 10-minute filler period.

In stage 2, children saw another videotape of a different adult being asked questions about the same surprise party event. The interviewer was not seen or heard on the tape; the children just saw the interviewed adult giving answers to the questions

about the surprise party from the opposite informational stance this time; i.e. originally hearsay perspective in Stage 1 now becomes a direct perception perspective. (Note: The reason why children did not hear the interviewer asking questions is that, in Turkish, one cannot avoid using the evidentiality markers in asking questions, which would end up cueing Turkish speaking children differently from their English speaking peers). The story that was told by the interviewee was structurally identical to the original story, except that 6 of the 12 items were changed. For example, the character spilled orange juice in the original story but was described as spilling apple juice in the post-information interview.

Depending on the condition, the experimenter showed the child either the version of the interview with misleading details or the version without any contradictory information (contradictions to the target items) involved. The materials and procedure for the not misinformed group were identical to those for the misinformed group, except for the following modifications. First, at the post-event interview, children did not receive contradictory information but listened to a neutral, unrelated story. Second, at test they only received original and new items because none of the targets were presented to them at the post-event information. The conditions in the study are depicted in Table 5 below.

During the final stage, children were presented a two-alternative forced choice test in which they were asked to choose between two still images. A still image of an item from the original story was paired either an alternative picture containing the suggested detail (from Stage 2) or some control pictures that were never presented nor suggested. Ordering of alternatives was counterbalanced.

The actual and the suggested pictures were identical in all other respects so that the only difference is the erroneous information that had been suggested to the children (for a schematic representation of the design see Figure 7.)
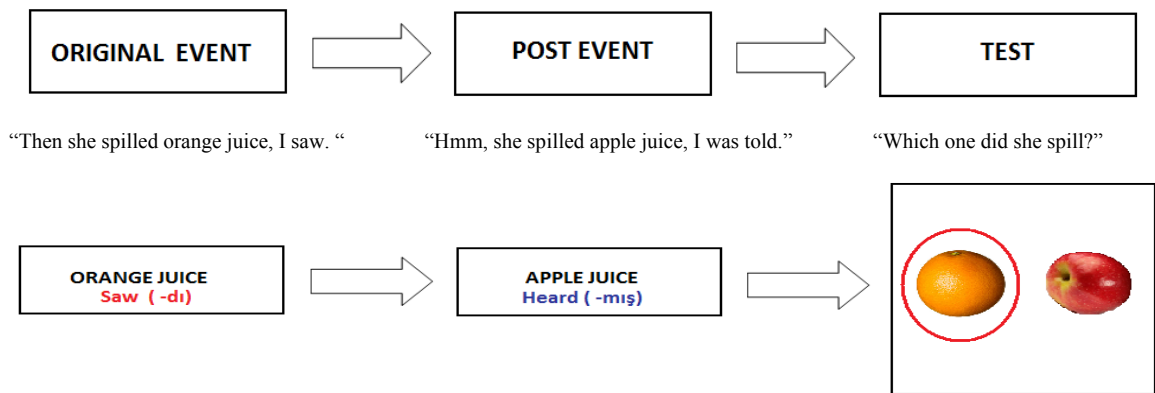
Figure 7. Experimental Design – Misinformation paradigm with a source credibility switch (Sample item)

Table 5. Experimental Conditions (Information Source Switches)

Event Information	Post-event Info	Test
Bias Conditions		
1. "Saw" Source	"Heard"	Pictures
2. "Heard" Source	"Saw"	Pictures
3. "Saw" Source	"Saw"	Pictures
4. "Heard"	"Heard"	Pictures
No Bias Conditions		
5. "Saw" Source	"Saw"	Pictures
6. "Heard" Source	"Heard"	Pictures
7. "Saw" Source	"Heard"	Pictures
8. "Heard" Source	"Saw"	Pictures

CHAPTER 7

STUDY 2 RESULTS

The two central questions of the study were whether children keep track of the reliability cues in the utterances in resisting contradictory information from others and whether being raised in a language community that grammaticalizes the source distinctions would sensitize children for understanding source reliability –when compared to children speaking languages that do not.

Specifically, we predicted that children's accuracy would be significantly low when the source of the misleading information was a reliable one. In other words, we expected that children's accuracy will be lower when the misleading source was more reliable –perceptual access- when the original source was relatively less reliable – hearsay- and vice versa.

We also predicted that these effects would be stronger in Turkish children when compared to their English-speaking peers. For instance, Turkish-speaking children will be less suggestible by a hearsay source during post-event information if the original event source was perception; and they will be more suggestible than the English-speaking children when the post-event sources was perception if they received the original event information from a hearsay source.

I will begin by looking at English-speaking children's performances in different conditions and see whether they can keep track of the sources-of-knowledge. Next, I will examine the role of language in children's performance, and look more into the developmental differences across language groups.

To test these hypotheses, children's accuracy on target items was combined into a single score representing total accuracy and converted into percentages. Recall that in the accuracy levels (reporting the information from the original event) are expected to be higher in the (Saw-Heard) condition because the original story is by a more reliable source and post-event is from a less reliable source. Also, the accuracy levels are expected to be lower in (Heard-Saw) because in this condition the post-event source perspective would be considered more reliable than the original event perspective. Table 6 below shows the mean accuracy percentage in each condition developmentally, and across language groups.

Table 6. Mean percentages of accuracy and SDs across conditions as a function of age and language group

		Source Condition							
		Saw Heard		Heard Saw		Saw Saw		Heard Heard	
Age	Language	M	SD	M	SD	M	SD	M	SD
Age 4	Turkish	66	22	48	22	56	25	56	24
	English	47	39	49	21	48	31	50	21
Age 6	Turkish	70	19	55	22	67	21	68	19
	English	62	38	63	20	62	24	64	23
Age 8	Turkish	85	21	70	19	83	22	82	36
	English	83	26	78	27	82	15	82	25

A crucial distinction in the design of the present study was whether children would pick up on the informational perspective switches between the original event and the post-event information stages. Recall that children were randomly assigned to 2 informational conditions at Stage 1: "Saw" or "Heard" perspectives, and at Stage 2 the perspectives were switched and counter-balanced.

Figures 8, 9, and 10 summarize the findings. A 4 (*Source Credibility*: Saw-Heard vs. Heard-Saw vs. Heard-Heard vs. Saw-Saw) X 2 (*Language*: Turkish vs. English) X 3 (*Age*: 4- 6- 8-year-olds) ANOVA was conducted with Credibility, Age and Language as between subject variables. Again, the dependent variable was the accuracy level (reporting the original account event at test). This is converted to percentages for ease of interpretation.

The omnibus ANOVA revealed a main effect of condition, (F (3, 298) = 19.43, $p < .01, f = .45$, qualified by a condition x language interaction (F (1, 298) = 15.65, $p < .01, f = .41$. Two language groups were similar in their performances in the no-source-switch conditions but Turkish children's accuracy levels were higher than English-speaking children in the Saw-Heard condition, but lower in the Heard-Saw condition. Figure 11, depicts the age trends across conditions. Overall, there was a main effect of age; F (2, 298) = 19.43, $p < .001$, older children were more accurate in general than the younger children.

Separate ANOVA's 4 (Source Credibility) X 2 (Language) for age groups were conducted. As Figure 7 depicts, for 4 year olds, a main effect of language (F (1, 96) = 13.73, $p < .01, f = .42$ was qualified by a Language X Source Credibility Interaction ($F(3,96) = 4.54$, p $< .01, f = .40$. Planned comparisons revealed that only the Turkish group performed significantly better (more accurate) on the Saw-Heard condition than the Heard-Saw condition (t (42) = 4.92, $p < .01$, $n_p^2 = .51$). In other words, Turkish 4-year olds were more accurate than English-speaking 4-year olds in the Saw-Heard condition. The difference between Turkish children's performances Turkish children's performances Saw-Heard ($M = 66, SD = 22$) vs. Heard-Saw ($M =$

48, *SD*=22) conditions was also significant, which indicates the source-switch

conditions were effective. Furthermore, overall, there was no effect of experimental

condition on the accuracy rate of 4-year-old English-speaking children.

Figure 8. 4-year-olds' mean accuracy percentage across conditions. Error bars indicate standard error of the mean. Asterisks indicate significance at p < .01 level.

Figure 9. 6-year-olds' mean accuracy percentage across conditions. Error bars indicate standard error of the mean. Asterisks indicate significance at p < .01 level.

As Figure 9 depicts, for 6-year-olds, a main effect of condition (F (3, 96) = 9.23, p < .01, was observed. The Language X Source Condition was marginally significant. The figure above speaks to this trend. Similarly, there was no effect of source condition on the accuracy rate of 6-year-old English-speaking children. Eight-year old Turkish- and English speaking children demonstrated a similar pattern; with the Saw-Heard condition being significantly different from the Heard-Saw condition for the Turkish group, as depicted in Figure 10. Surprisingly, even 8-year-old English-speaking children did not pick up on the source switches across conditions.
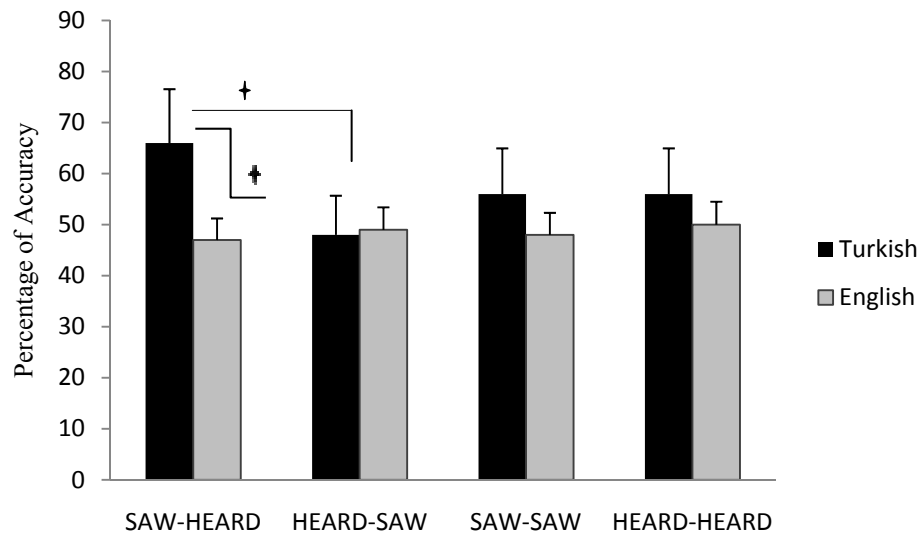
Figure 10. 8-year olds' mean accuracy percentage across conditions. Error bars indicate standard error of the mean. Asterisks indicate significance at p < .01 level.
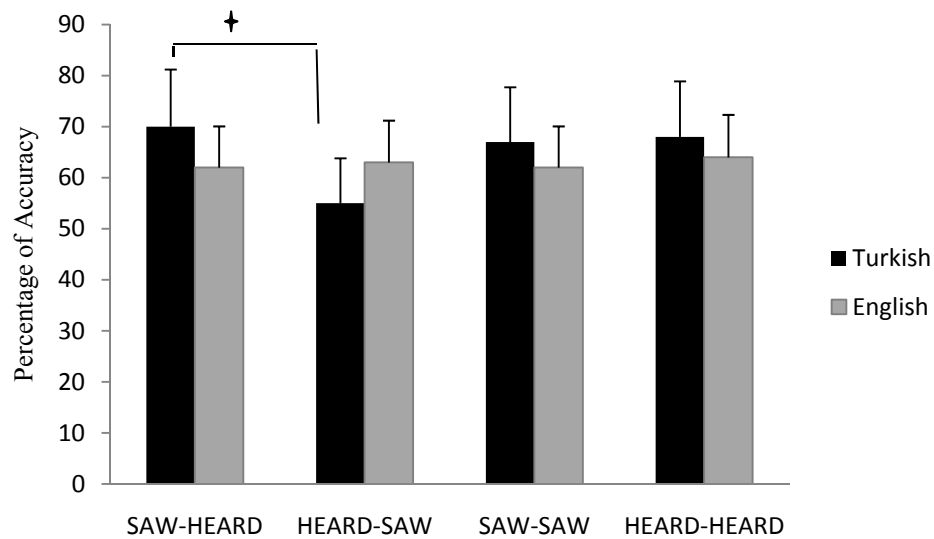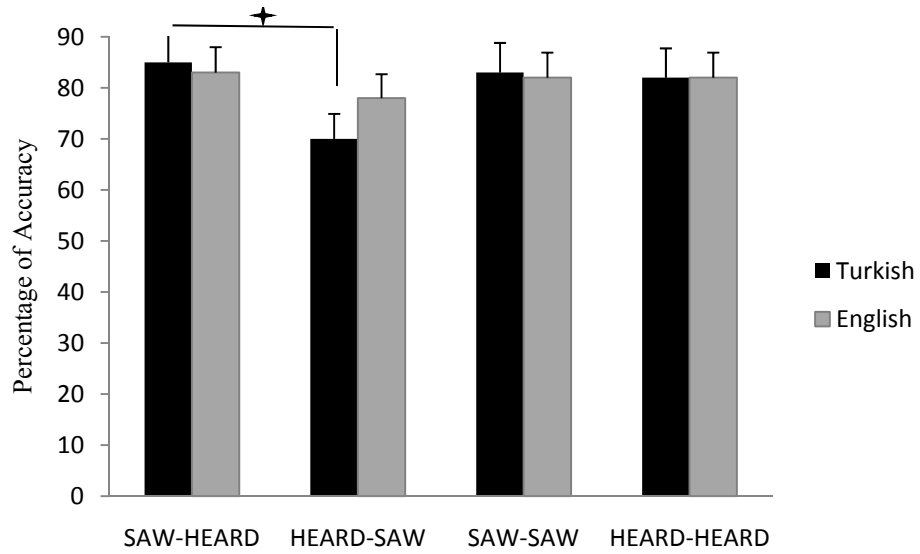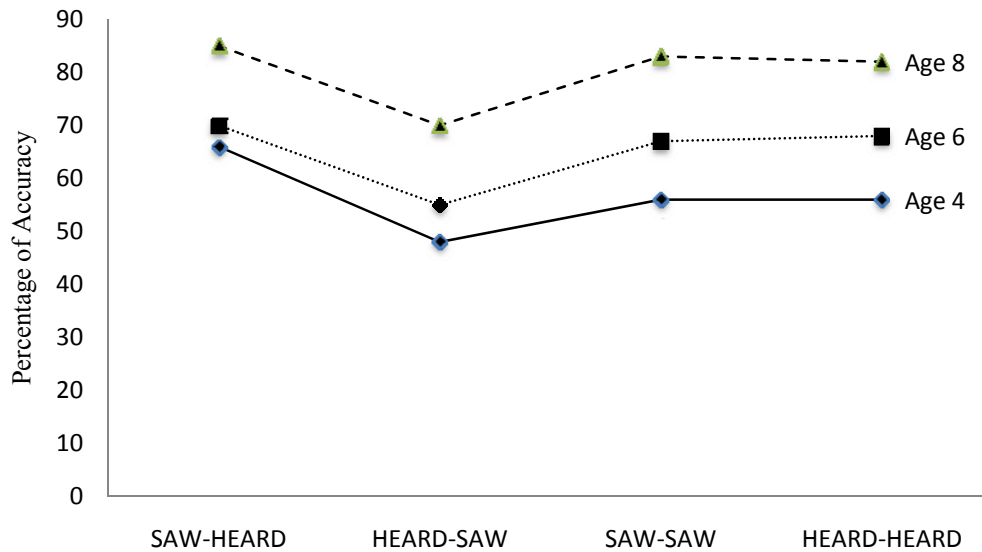

Figure 11. Age trends for mean accuracy percentage across conditions for Turkish-speaking children.
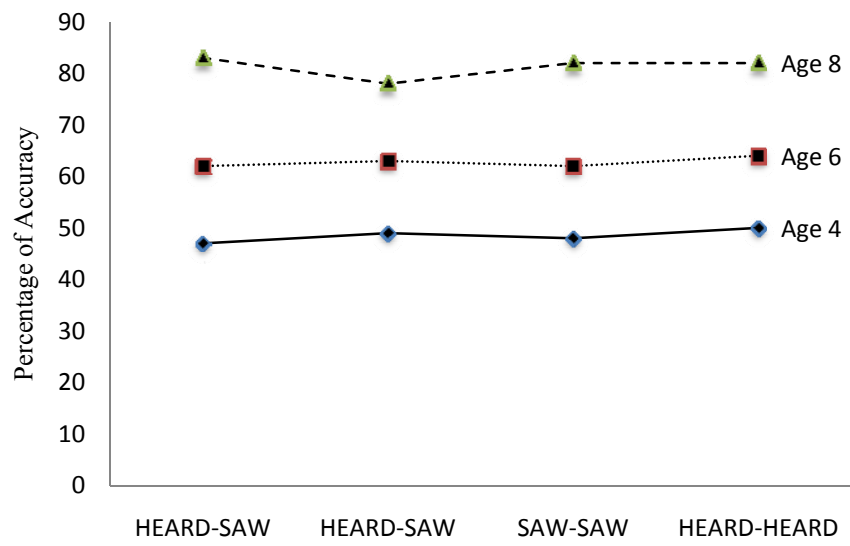
Figure 12. Age trends for mean accuracy percentage across conditions for English-speaking children.

CHAPTER 8

GENERAL DISCUSSION

The current study presented a relatively novel question about the relationship between exposure to grammatical evidentiality and awareness of knowledge sources operationalized by a misinformation paradigm. The prediction was that children with access to a language with evidentials, in this case, Turkish, will be relatively protected against suggestibility (or contradictory information) compared with children whose language has no grammatical markers of source, e.g., English.

Briefly put, the critical feature of the task capitalized on the informational perspective switches between the original event perspective and the post-event information perspective. In a typical suggestibility –misinformation- task, the participant witnesses an original event and is given a post-event conflicting account and finally recalls/recognizes the original event. Here, the children were randomly assigned to two informational conditions, the unfolding of the events being narrated from either an "I saw" perspective or an "I am told" perspective. The informational perspective was switched during the post-event communication phase: the group that heard the story from an "I am told" perspective received the conflicting account from a perception perspective, and vice versa. If the children were sensitive to linguistic clues, they would assign a higher reliability/credibility status to the "I saw" account – be it in the original event or post-event communication-; and thus resulting in higher or lower suggestibility levels.

The findings were interesting in the sense that Turkish children as young as 4-year-olds were attentive to the perspective changes indicated by the evidentials. They were more resistant to contradictory information when it was presented through a hearsay perspective compared to their English-speaking peers. However, they yielded to the contradictory information when it was through a perception source. The cross-linguistic comparisons were not significant in the latter point, however.

English-speaking monolingual kids, on the other, hand did not seem to pay attention to the linguistic source cues in the accounts. Their suggestibility levels were pretty much the same across conditions, and followed a developmental trend in line with the reported suggestibility data in the literature regardless of the source switch conditions (Ceci & Bruck, 1993).

In this chapter, I will discuss the implications of the findings with respect to previous research on children's suggestibility and their understanding of knowledge sources, and possible interactions of language I will conclude by and language and cognition discussions. I will also suggest future directions where relevant.

Children's suggestibility and understanding indications of source

The main finding of the study which is, compared to English speaking children, Turkish speaking children pay more attention to source credibility cues when receiving contradictory information from different informants is not that surprising considering the previous research in suggestibility. First, children's ability to evaluate and keep track of the sources of beliefs has been associated with reduction in suggestibility levels in the literature. For example, studies looking directly at this association used intervention paradigms that alert children to the sources of their

knowledge prior to post-event communication, putting contextual cues in retrieval questions, and explicitly warning about postevent misinformation (Giles, Gopnik, & Heyman, 2002; Thierry et al., 2001; Bright-Paul, Jarrold, & Wright, 2005; Holliday & Hayes, 2002). The findings document that some warning or training of the existence of source information helps 3-to-4-year olds resist suggestibility. Given this backdrop, children growing up speaking an evidential language that tags source distinctions explicitly and saliently might keep them alert for those distinctions as well.

Moreover, language's effects on suggestibility have long been known. Studies looking at this relationship demonstrated that using age appropriate levels of language reduces children's suggestibility levels (Korkman et al., 2008; Imhoff et al., 1999). Also, narrative ability and pragmatic language skills (understanding literal vs intended meaning) are reported to make significant contributions to the individual differences in children's suggestibility (Roebers & Schneirder, 2002; Kulkofsky, Wang, & Ceci, 2007; Beal & Belgrad, 1990). These findings point to a possibility that language skills plays a moderating role in children's ability to resist verbal information from others. It could be expected, then, linguistic structures such as evidentiality to have a guiding role in organizing and evaluating the communicated information by others. Thus, given the effect of source knowledge training studies and language skills on suggestibility, grammatical evidentiality have a potential to alert children to individual perspectives and make them more cautious in assigning trust to individual interviewers, and in turn, might play a protective role in children's suggestibility.

Recall that the critical differences were only found in the condition in which the source perspective was switched from "I saw" in the original event to "I heard"

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during post-event communication among Turkish children. This specific finding points to the possibility that the hearsay marker has a special role in Turkish evidentiality. It might alert children to the coding of "new information obtained from linguistic report", and the ability to identify the hearsay marker as a distinct form the perception marker might allow children to keep representations/events arising from different sources distinct from one another. In fact, the proportion with which children preferred perception as a source in the source reliability task explained 26 % of the variance in this condition. There is converging evidence from other studies that the hearsay marker might have a special role among evidentials. For example, even though Papafragou et al. (2006) were not able to find differences between non-linguistic source monitoring performances between Korean and English speaking children, what they found was a correlation between production of the reportative marker and the ability to evaluate knowledge of others acquired through linguistic report. The possible special role of the hearsay marker is worth investigating further with source memory and long-term memory tasks.

The present work on the relationship between suggestibility and evidentiality in language could inspire new topics of research for the future. Robinson (2009) proposes that it might also be interesting to design cross-linguistic comparisons with the existing suggestibility tasks that are already used with English-speaking children; such as the rumor mongering studies by Principe, Kanaya, Ceci, & Singh (2006). Their paradigm makes use of the hearsay phenomenon such that children are tested on events they only heard from others (e.g., classmates, teachers) as opposed to directly experiencing them. Younger children seem to be making source errors and falsely

claim that they had actually seen the events. Since a past tense-narrative account in Turkish would have to include the evidential, and would thus be marking the hearsay account, would Turkish children still make those errors?

Further research on general source memory errors would also be a potential area to investigate. Future research should also focus on misinformation paradigms that resemble eyewitness testimony studies where children have actual perceptual access to the original event and the post-event communication comes from others` testimony.

Children's evaluation of information by others

Drawing on the lines of research on speaker reliability/trust and, the first study shows that selective judgments of reliability extends to the situations where the only cues are the linguistic ones. Important question remain to be investigated; such as when there are multiple cues; e.g. both non-verbal and verbal, which one would the children prefer? To what extent the grammatical source cues remain to be effective cues for reliability/credibility?

Previous research on speaker reliability shows that children value their own perception in the face of others' testimony (e.g., Robinson & Whitcombe, 2003; Ganea & Xu, 2009) but they are also able to revise their own belief (derived by partial perceptual access) by other's testimony. An interesting question in this area is: How would speakers of evidential languages behave in these situations?

Other studies of suggestibility and speaker credibility shows that children do not always prefer adults to endorse information but they take into account the adults' knowledgeability status (e.g. Lampinen et al., Ceci et al, 1987). When faced with other

cues, such as age or knowledge status of the speakers, how would linguistic source

cues function in Turkish speakers' decisions about better informants? The contexts in

which there are multiple cues to evaluate, what is the priority give to evidential? Such

questions are curious domains of study for future research.

Why the language differences?

Our findings suggest that young English-speaking children are not as

successful in reliability judgments when the presentation of the sources is only verbal.

It may not be easy for children to attend to source information when it is merged in the

utterances. These findings are corroborated by other research on children's handling of

verbal epistemic meanings. With English-speaking kids, relying on verbal cues begins

later. For example, children do not start using mental verbs such as *know* or *guess*

reliably until 7 years of age (Johnson & Wellman, 1980), and they do not reliably use

expressions of modality, such as *must* or *might* (Moore et al., 1990). On the other

hand, evidence from Korean, Turkish and Japanese, shows that children productively

use the markers of certainty and other epistemic meanings in their spontaneous speech

and experimental settings as early as 3 years old (e.g, Matusi et al., 2006).

Language and Cognition

The present research is also interesting because it has implications for

linguistic relativity discussions. Intuitively, it makes sense that learners of languages

with grammatical markings of source distinctions would find such distinctions to be

more salient than learners of languages that do not grammaticalize source distinctions.

The linguistic relativity hypothesis argues for the role of language in shaping

cognition, a view with a long history (Whorf, 1957), and deals mostly with language

production. A suggestibility paradigm of the sort proposed here could be an initial step to provide us with insights into the conceptual effects of language in the context of reception. It is also well-represented in Slobin's notion of "thinking-for-speaking" which is a process where "cognition plays a dynamic role within the framework of linguistic expression" (Slobin, 2003; p.158). He further puts that "It is quite likely that the language in which information is presented both fictional and documentary- plays a role in the ways in which information is stored and evaluated. However, we still lack cross-linguistic research on such issues as eyewitness testimony, so the question of linguistic relativity in memory for reported events remain open." (Slobin, 2003; p. 171).

Our findings speak to the possibility that Turkish-speaking children might be less susceptible to the influence of conflicting testimony in court. Even though, all the data presented here are correlational, one might speculate that the thinking of a person who habitually uses and hear evidentials differs in some important ways from the thinking of a person who rarely uses or hears source information in language.

However, caution should be given when drawing conclusions about the relationship between language and thought with respect to evidentiality. The reasons for that multifold. First, there is no direct evidence that children who grow up hearing and using evidentials daily remember or show significant sensitivity to source information than children whose native language does not contain evidentials. Such evidence can only be obtained by noncorrelational designs; such as intervention or training studies (see also Fitneva & Aydin, in press). Future studies should definitely include such experimental designs. Also, as mentioned earlier, the differences between

evidential systems (across different languages) can be substantial. Special attention should be paid to the reliability of findings across languages. Cross-linguistic replications are necessary, both with non-evidential languages and other evidential languages in order to confirm the present conclusions.

As a final remark, it would be very interesting to observe that the emerging evidence for a connection between the acquisition of evidentiality and several aspects of cognition, such as source memory, will encourage further research that helps our understanding of the relation between language and thought.

Final Remarks

Children's suggestibility is related to others' testimony, and therefore, to language. As illustrated in the present paradigm, it is especially about testimonies that inform us about events that happened in the past. Children need to be equipped with the means to evaluate the testimonies in order to avoid being misled. It has been reviewed in the preceding chapters how linguistic cues could act as means for assessing what to believe and what not in certain situations. On this view, understanding how specific elements of language and suggestibility intertwine is critical for the process of cognitive development. Children resist corrections and suggestions offered by adults in areas where they could practice first-hand exploration; i.e., when they observe things. However, we do not yet have developmental accounts to describe how they deal with second-hand information, especially when the information is contradictory. The above paradigm sets a good candidate to answer these questions partly. When children do not have any information about 'what happened' or speaker characteristics, the logical step for them is to rely on other cues

such as informational access. As we have seen, young children suffer from limited reflective understanding of the relation between information access and consequent knowledge state. This has been discussed in both linguistic and non-linguistic literature. It would be worthwhile to continue research on domains with applied implications, such as suggestibility settings.

All in all, linguistic structures such as evidentiality could have a guiding role in storing and organizing information we learn from others. As Johnson et al. (1993) noted "In many cases of receiving information about the events through people, news reports, or personal narratives, the verbal cues alone provide the information:". (p.13). Being among those verbal cues, evidential markers have a potential to alert children to individual perspectives and make them more cautious in assigning trust to others. Adopting a linguistically mediated account of suggestibility also has important practical implications. Such a perspective suggests that age related differences in susggestibility may be a function of how the social situation is perceived as a function of linguistic cues, and possibly as a function of linguistic community. If, in the future, there is accumulated evidence for this, then efforts should be made to develop methods of understanding the types of source reliability cues, including linguistic ones, that children understand and the mechanisms through which they operate.

APPENDIX

STUDY 1

In this study, both children and adult participants selectively preferred the reliability of different modes of access to information (sources of information) in an information-seeking story context. The modes of access in question were verbal indications of (1) direct perception, (2) hearsay (communication), and (3) inferences. These sources were selected because they are grammatically-encoded in Turkish language.

A computerized game was presented to the participants. After a voice-over narrating the overarching theme of the story, the actual items were presented. In an individual item/trial, the participants heard three conflicting statements (by three separate informants) about what happened in the story using one of the informational (evidential) relations. The children do not see the unfolding of the events animated on the screen. Instead, they are provided with a still screen depicting each of the conflicting locations or the animals in the story in order to help with their memory. Note that since Turkish evidential markers are pas-tense markers and obligatorily marked, the introduction of the story was narrated in simple present tense in order not to prime children by using past tense. The participant's task was to indicate which one of the animated characters (informants) one should believe in based on the verbal clues they received. The story and the items/trials are very simple and not embellished on purpose in order not to lose the participants' attention with elaborative details. The contrastive trios of sources and the order were counterbalanced within and between episodes. All the information is auditorily presented to the participants and the order of the items were also randomizes. All data collection activities were conducted in a separate room in the child's school or in a quiet corner of the classroom. Turkish translations follow each item/trial in italics.

Story Introduction –Standard Voice-Over

Alf is an adventurous young boy/girl [The gender of the protagonist is randomized.] who lives in a small town close to the forest. Since the town is pretty small, he does not have many friends. He is bored most of the time. He likes to spend time with their neighbor who is 80 years old because she tells him interesting stories. One day the neighbor tells him about a very big treasure box; hidden somewhere in the forest. Whoever finds the treasure will have so much fun with the contents of it because there are all sorts of story books and very interesting toys. Alf instantly decides to make a trip to the forest in order find it. On his way, he encounters people who guide him to the treasure with clues.

("*Do you see these three people? Which one is wearing green/blue/red? They are going to give us clues to help Alf about where to look for things. You should listen to them carefully as they speak, ok? You can ask to listen to them again.*").

The next morning, Alf gets up early and starts his journey. On his way, he stops and asks his questions to the people with the bow-ties.

Trial 1

Here, Alf is trying to find the map of the forest. It could be in any of these locations. Let's listen to the clues people will give us, and decide where he needs to look, ok?

Alf: Where is the map?

Character 1: The pirate took the map, I saw.

Character 2: The chopper took the map, I was told.

Character 3: The witch must have taken the map, I think.

Which one should Alf believe to find the map?

Turkish translation:

Karakter 1: Haritayı korsan aldı.

Karakter 2: Haritayı ödüncü almış.

Karakter 3: Haritayı cadı almıştır.

Trial 2

Here, Alf finds his sandwich is half-gone. Let's listen to the clues people will give us, and decide who eats it, ok?

Character 1: The bird ate it, I saw.

Character 2: The swan ate it, I was told.

Character 3: The chicken ate it, I think.

Turkish translation:

Karakter 1: Haritayı korsan aldı.

Karakter 2: Haritayı ödüncü almış.

Karakter 3: Haritayı cadı almıştır.

Trial 3

Here, Alf is trying to find a bottle of water because he is thirsty. It could be in any of these locations. Let's listen to the clues people will give us, and decide where he needs to look, ok?

Alf: Where is the bottle?

Character 1: It fell into the river, I saw.

Character 2: It fell in to the hole, I think.

Character 3: It fell into the lake, I was told.

Turkish translation:

Karakter 1: Nehire düştü.

Karakter 2: Yerdeki oyuğa düşmüş.

Karakter 3: Gole düşmüştür.

Trial 4

Here, Alf is trying to find the keys to the treasure chest. It could be in any of these locations. Let's listen to the clues people will give us, and decide where he needs to look, ok?

Alf: Where are the keys?

Character 1: The cat took them. I saw.

Character 2: The dog took them. I was told.

Character 3: The rabbit must have taken them. I think.

Turkish translation:

Karakter 1: Anahtarları kedi aldı.

Karakter 2: Anahtarları köpek almış.

Karakter 3: Anahtarları tavşan almıştır.

Trial 5

Here, Alf is trying to find his sunglasses because they are lost. It could be in any of these locations. Let's listen to the clues people will give us, and decide where he needs to look, ok?

Alf: Where are my glasses?

Character 1: They were under the bench, I think.

Character 2: They were under the box. I was told.

Character 3: They were under the trash bin, I saw.

Turkish translation:

Karakter 1: Sıranın altındadırlar.

Karakter 2: Kutunun altındalarmış.

Karakter 3: Cop kutusunun altındaydılar.

Trial 6

Here, Alf is trying to find an apple tree because he is hungry. It could be in any of these locations. Let's listen to the clues people will give us, and decide where he needs to look, ok?

Alf: Where is the apple tree?

Character 1: It was behind the hill, I saw

Character 2: It was behind the flower field, I was told.

Character 3: It was behind the bridge, I think.

Turkish translation:

Karakter 1: Tepenin arkasındaydı.

Karakter 2: Çiçek tarlasının arkasındaymış.

Karakter 3: Köprünün arkasındadır.

Trial 7

Here, Alf finds a basket full of fruit in the morning when he wakes up. He is trying to see who left it. Let's listen to the clues people will give us, and decide who gives it to him, ok?

Character 1: The lion left it, I was told.

Character 2: The bear left it, I think.

Character 3: The wolf left it, I was told.

Turkish translation:

Karakter 1: Haritayı korsan aldı.

Karakter 2: Haritayı ödüncü almış.

Karakter 3: Haritayı cadı almıştır.

Trial 8

Here, Alf is trying to find the secret passage. It could be in any of these locations.

Let's listen to the clues people will give us, and decide where he needs to look, ok?

Alf: Where is the passage?

Character 1: It was behind the rock, I was told.

Character 2: It was behind the tree, I saw.

Character 3: It was behind the river, I think.

Which one should Alf believe to find the passage?

Turkish translation:

Karakter 1: Büyük kayanın arkasındaymış.

Karakter 2: Ağacın arkasındaydı.

Karakter 3: Nehirin arkasındadır.

Trial 9

Here, Alf sees a fire far away. He wants to learn who is over there.

Let's listen to the clues people will give us, and decide where he needs to look, ok?

Character 1: The grumpy old man lit it, I think.

Character 2: The forest ranger lit it, I saw.

Character 3: The witch lit it, I was told.

Turkish translation:

Karakter 1: Ateşi huysuz yaşlı amca yakmıştır.

Karakter 2: Ateşi orman koruyucusu yaktı.

Karakter 3: Ateşi cadı yakmış.

Trial 10

Here, Alf is trying to find a red rose for his mom. It could be in any of these locations

Let's listen to the clues people will give us, and decide where he needs to look, ok?

Alf: Where is the rose?

Character 1: The lady in red picked it, I saw.

Character 2: The lady in purple picked it, I was told.

Character 3: The lady in green picked it, I think.

Turkish translation:

Karakter 1: Kırmızı paltolu kadın kopardı.

Karakter 2: Mor paltolu kadın koparmış.

Karakter 3: Yeşil paltolu kadın koparmıştır.

Trial 11

Here, Alf is trying to find his glasses. They could be in any of these locations

Let's listen to the clues people will give us, and decide where he needs to look, ok?

Alf: Where are my glasses?

Character 1: The turtle broke them, I think.

Character 2: The pig broke them, I was told.

Character 3: The mouse broke them, I think.

Turkish translation:

Karakter 1: Gözlüğü kaplumbağa kırmıştır.

Karakter 2: Gözlüğü domuz kırmış.

Karakter 3: Gözlüğü fare kırdı.

Trial 12

Here, Alf is trying to a pen to write a letter to his mom. He can't find his pen in his

pocket. Let's listen to the clues people will give us, and decide where he needs to look,

ok?

Alf: Where is the pen?

Character 1: The squirrel took it, I saw.

Character 2: The skunk took it, I was told.

Character 3: The monkey took it, I think.

Turkish translation:

Karakter 1: Kalemi sincap aldı.

Karakter 2: Kalemi kokarca almış.

Karakter 3: Kalemi maymun almıştır.

STUDY 2

Original Event Phase

The following story was presented to the participants either from a "direct perception/witness" perspective or a "hearsay" perspective, depending on the condition. Since everything else in the story is same except for the perspective of the narrator, here only the direct witness perspective is being presented. The story which is about a surprise party setting is being told by a pre-recorded narrator on the screen. The target items are underlined. The Turkish version of the text will follow.

Experimenter:

Now I am going to show you a person who will tell you what happened on Alfie's (or Sue's, randomized) birthday party. Do you want to see him (or her, randomized)?

Let's listen to what he says careful, ok?

Narrator:

There was a surprise party for Alfie, I saw. People brought all sorts of presents, I saw. The gift boxes were all sizes, big and small. Alfie's mom decorated the living room very nicely, I saw. The decorations were very colorful. There were <u>blue balloons</u> all around the room, I saw. The presents were piled up <u>in the cupboard,</u> I saw. Alfie's mom told the guests that Alfie thought he would have a baby-sitter today because his mom needed to be at work until late. People were hiding behind <u>the couch,</u> I saw. They yelled "Surprise!" when Alfie got to the living room, I heard. Alfie was very surprised, then he was smiling, I saw . Alfie's mom brought the cake. It was a <u>chocolate birthday cake,</u> I saw. Alfie blew the candles, and everybody sang happy birthday and clapped, I saw. People started to eat. The guests gave their presents to Alfie. His best friend got him <u>a toy plane,</u> I saw. His mom got him a new shirt, I saw. He wore it immediately because he liked it so much. Alfie spilled <u>orange juice</u> all over his new shirt, I saw. His mom cleaned it with a napkin, I saw. After the snacks, all the guests were watching <u>a children's cartoon</u> show on the TV for a while. Then, they all went out to the garden and started to play hide-and-seek, I saw. Alfie hid behind <u>the tree,</u> I saw. Nobody could find him. The guests saw a <u>baby rabbit</u> near the fences, I saw. They tried to catch it but ran away, I saw. One of the guests got sick and she said she had a <u>stomachache,</u> I saw. Alfie's mom phoned her parents and they came to pick her up. I saw. Then Alfie's dad came home from work, I saw. He kissed Alfie and told him happy birthday. He, then, said he would do a couple of magic tricks for his guests. He put a <u>ketchup bottle</u> inside a box, closed the lid, said "abracadabra!" and when he

opened it again the box was empty, I saw. All the guests clapped. The guests then said

goodbye to Alfie and his parents I saw, thanked them and left, I saw.

Misinformation Phase *(The perspective is switched)*

Experimenter:

Do you remember Alfie's birthday party story? I sometimes forget the details. Let's

listen to it again from another person again, ok? Would you listen with me? This time

I think somebody else is asking questions to the person but the camera did not catch

their questions very well, we will only hear the answers to the questions, ok? Let's

listen to it carefully.

Interviewer: [on tape] -----mumbling

Person [on tape] *There were red balloons as decorations, I was told.*

Interviewer: [on tape] -----mumbling

Person [on tape] *The presents were piled up on the kitchen counter, I was told.*

Interviewer: [on tape] -----mumbling

Person [on tape] *The guests were hiding behind the dining table, I was told.*

Interviewer: [on tape] -----mumbling

Person [on tape] There was a strawberry birthday cake, I was told.

Interviewer: [on tape] -----mumbling

Person [on tape] *Alfie's best friend got him a toy truck, I was told.*

Interviewer: [on tape] -----mumbling

Person [on tape] *Alfie spilled apple juice all over his shirt, I was told.*

Interviewer: [on tape] -----mumbling

Person [on tape] *The guests were watching a children's movie, I was told.*

Interviewer: [on tape] -----mumbling

Person [on tape] *When they were playing hide-and-seek, Alfie hid behind the bench, I was told.*

Interviewer: [on tape] -----mumbling

Person [on tape] *The guests saw a baby squirrel near the fences, I was told.*

Interviewer: [on tape] -----mumbling

Person [on tape] *One of the guests had a headache, I was told.*

Interviewer: [on tape] -----mumbling

Person [on tape] *During the magic show, Alfie's dad put a mustard bottle inside the box, I was told.*

TURKISH TEXT

Alfi için süpriz bir doğumgünü partisi vardı. İnsanlar bir sürü hediye getirmişlerdi. Hediye kutuları çeşitli boylardaydı; hem büyükler hem küçükler vardı. Alfi'nin annesi oturma odasını çok güzel bir biçimde süslemişti. Süslemeler rengarenkti. Odanın içinde <u>mavi balonlar</u> vardı. Hediyeler <u>dolabin içine</u> yığılmıştı. Alfi'nin annesi misafirlere, Alfi'nin partiden haberi olamdığını, eve gelince bebek bakıcısıyla kalacağını sandığını, çünkü annesinin geç vakte kadar çalışması gerektiğini sandığını söyledi. Misafirler <u>koltuğun arkasında</u> saklanıyorlardı. Alfi oturma odasına girince "Supriiz!" diye bağırdılar. Alfi önce çok şaşırdı ama sonra gülümsemeye başladı. Alfi'nin annesi pastayı getirdi. Pasta <u>çikolatalıydı</u>. Alfi mumları üfledi ve herkes "iyi ki dogdun!" şarkısını söyledi ve alkışladı. Misafirler yemek yemeye başladılar. Sonra Alfi'ye hediyelerini verdiler. En yakın arkadaşı Alfi'ye oyuncak bir <u>uçak</u> verdi. Annesi

ise bir tişört hediye etti. Alfi tişörtü çok sevdiği için hemen üstüne giydi ama her tarafına <u>portakal suyu</u> döktü. Annesi bir mendille üstünü temizledi. Bir şeyler atıştırdıktan sonra, misafirler bir süre televizyonda <u>çizgi film</u> izlediler. Sonra, hep birlikte bahçeye çıkıp saklambaç oynadılar. Alfi <u>bir ağacın</u> arkasına saklandı. Onu kimse bulamadı. Misafirler çitlerin orda <u>bir bebek tavşan</u> gördüler; yakalamaya çalıştılar ama o onlardan kaçtı. Misafirlerden biri hasta oldu ve <u>midesinin ağrıdığını</u> söyledi. Alfi'nin annesi çocuğun annesiyle babasını aradı. Onlar da gelip kızlarını aldılar. Sonra Alfi'nin babası işten geldi. Alfi'yi öpüp mutlu yıllar diledi. Daha sonra, misafirler için bir iki sihirbazlık gösterisi yapacağını söyledi. Bir kutunun içine <u>ketçap</u> şişesini koydu. kapağını kapatti. "Abrakadabra!" dedi ve sonra kapağını açtığında ketçap şişesi yoktu. Bütün misafirler alkışladılar. Sonra Alfi ve ailesine teşekkür edip ordan ayrıldılar.

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