SOURCE VS. STANCE?

ON THE INTERPRETATION AND USE OF EVIDENTIAL UTTERANCES

BY TURKISH- VS. ENGLISH-SPEAKING ADULTS

A Dissertation

by

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ABSTRACT

This research empirically examined the relationship between evidentiality and modality in sentence interpretation by Turkish vs. English speakers and the influence of different forms of evidential marking on the establishment of discourse coherence. Evidentiality, a property, commonly refers to the linguistic marking (in the grammar or the lexicon) of source of knowledge about an asserted event. What is unclear is whether this property also conveys epistemic value (or stance information). This research examined this issue by speakers of Turkish (in which evidentiality is marked in the grammar) and English (in which evidentiality is marked in the lexicon).

In Experiment 1 participants were presented with identical sentences differing only in whether evidential or modal markers were inserted. For each sentence they were asked to make judgments about the source of evidence and about their relative confidence about whether the asserted event had actually occurred. The results demonstrated that both Turkish and English speakers found that there was enough information to judge the source and degree of certainty of various evidential and modal expressions. The results support the view that there is a close relationship between evidentiality and modality. Further, it was found that the linguistic level of evidentiality indication affected the source and epistemic value interpretations. Evidential expressions were interpreted in more varied ways by Turkish speakers, while modal expressions were interpreted in more varied ways by English speakers.

The second experiment used a discourse completion task in which participants read two sentences containing different evidential expressions that resulted in somewhat contradictory information. Participants were asked to supply a third sentence that would make sense of the first two. Along with the evidentiality manipulation, two other variables were manipulated: whether the evidential information was presented first or second and whether the asserted facts were general or particular. The results suggested that evidentiality marking affected speakers' sense-making process but was not the only factor influencing their response, since presentation order and the type of information (general vs. particular) also mattered. Interestingly, Turkish speakers appeared to place more emphasis on the nature of the fact in arriving at their response, whereas English speakers were more influenced by the order of presentation of the information.

Taken together, the findings suggest that evidentiality conveys epistemic value of the reported event along with source of knowledge. Further, evidentiality – in interaction with contextual factors -- influences speakers' attempts at establishing discourse coherence.

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INTRODUCTION

Evidentiality is a property found in many languages whereby the source of knowledge of an asserted event is linguistically marked (e.g. Aikhenvald, 2004; Aksu-Koc & Slobin, 1986; Chafe, 1986; Plungian, 2001). Scholarly investigations of evidentiality have examined the type of evidence conveyed in different languages that mark evidentiality (e.g. Palmer, 1986), the possible origin of evidentials in relation to the grammaticalization process (e.g. Willett, 1988), and the relationship between evidentiality and modality (e.g. de Haan, 1999). Evidentiality has been investigated in individual languages as well as comparatively, across groups of languages. This dissertation takes a cross-linguistic approach to the question of the relationship between evidentiality and modality by empirically examining how speakers of two different languages, one in which evidentiality is marked in the grammar (Turkish) and another in which it is marked in the lexicon (English), interpret evidential and modal expressions in their language.

In this chapter I will first discuss how evidentiality has been defined by various scholars, an issue that becomes important given the range of opinion about the scope of evidentials. Following this I will discuss the different ways in which evidentiality may be conveyed within and across languages, including the level of the grammar, the level of the lexicon and the level of pragmatics. Next, I will discuss the particular encoding of evidentiality in the languages under investigation in this study, namely, Turkish and

English. I will conclude by discussing the long-standing debate on the relationship between evidentiality and modality and present differing proposed views on this issue.

Definitions of Evidentiality

As will become apparent below, evidentiality has been defined by different linguists in different ways. Despite the differences, there is a general consensus that evidentiality is a linguistic property that indicates the source of knowledge of an asserted proposition. Where scholars differ is in what else evidentiality may also encode. For a number of scholars, evidentiality marks other properties, such as truth or certainty, or a speaker's attitude towards the reliability of the source of knowledge. For example, Lyons (1977) argues that evidentiality is part of a social domain whereby speakers express their commitment to the truth of a proposition. Lyons actually uses the term "modality" instead of "evidentiality," noting that "the speaker is committed by the utterance of an objectively modalized utterance to the factuality of the information that he is giving to the addressee…. Subjectively modalized statements (indeed they can be properly called statements) are statements of opinion, or hearsay, or tentative inference rather than statements of facts" (Lyons, 1977, p. 799). Similarly, Palmer (1986) classifies evidentiality as a type of epistemic modal, noting that evidentiality like other modals "show[s] the status of the speaker's understanding or knowledge; this clearly includes both his own judgments and the kind of warrant he has for what he says" (p. 51). Chafe (1986) proposed a broad and a narrow definition of evidentiality. In the broad sense, he noted that evidentiality marks the speaker's attitude towards the reliability of

knowledge, whereas in the narrow sense he suggested that it marks the source of the knowledge.

In addition to the properties noted above, another feature ascribed to evidentiality is mirativity, which refers to the sense of something as surprising or unexpected. Thus, DeLancey (2001: 369-70), describes mirativity as "the linguistic marking of an utterance as conveying information which is new or unexpected to the speaker". In other words, in addition to conveying source of knowledge, evidentiality markers may also convey speakers' stances with respect to the evidence, specifically, something that is surprising to the speaker (Plungian, 2001). Similarly, Slobin and Aksu (1982) further remark that evidentiality conveys a psychological distance between a speaker and an event; Lazard (2001) similarly notes that it conveys a distance between the speaker and his/her own discourse.

In contrast to the authors mentioned thus far, Willett (1988) regards evidentiality as primarily marking information source in the grammar. Faller (2002) similarly defines evidentiality in terms of "grammatical encoding of the speaker's grounds for marking a speech act" (p. 2). Instead of rejecting the potential intersection of evidentiality and epistemic modality completely, de Haan (1999) contends that evidentiality primarily conveys source of knowledge whereas a speaker's attitude towards the proposition is "secondary in nature" (p. 87). In a central discussion of evidentiality, Aikhenvald (2004) defines it as "a linguistic category whose primary meaning is source of information" (p. 3). Both Aikenvald and de Haan further claim that every language

allows its speakers to indicate source of knowledge; some do this through the grammar, whereas some convey source through lexical means.

In summary, linguistic scholars of evidentiality all agree that evidentiality encodes source of knowledge. Where they differ is in 1) whether evidentiality is regarded as a subcategory of epistemic modality or as a distinct linguistic category, and 2) whether evidentiality can be said to exist only in languages in which it is marked in the grammar. Before turning to these two issues I would first like to review the types of sources of knowledge that may be conveyed through evidential markers in different languages.

Sources of Knowledge across Languages

In this section I define the evidential sources which have been identified by various scholars. Then I will discuss how these scholars place the sources in their typological structure. The range of evidential sources that have been identified so far include visual, auditory, other sensory, inference/results, reasoning/assumptions, hearsay, and quotative.

Sensory evidence

Sensory sources refer to sources of information acquired via the senses. These are typically subdivided into visual, auditory, and other sensory.

Visual. A visual source comprises information acquired by sight. Some languages combine the visual source with other sensory information into a single category, while other languages distinguish between visual and other sensory evidence

from hearing, smelling, etc. (Aikhenvald, 2004; Palmer, 2001; Willett, 1988). Tuyuca is an example of the latter type,

(1) *diiga apewi*

'He played soccer (I saw him play)' (Willett, 1988, p. 73)

According to de Haan (2004) the visual evidential source refers to a deictic situation that indicates that the speaker is in viewing distance of the described situation.

Auditory. The auditory evidential source refers to evidence obtained from hearing. In some languages, auditory sources are classified along with other sensory sources in a single marker that represents 'sensory source' (Willett, 1988). Another set of languages combine the auditory source with other sensory sources, with the exception of the visual source. In a third group of languages, the auditory source is coded separately from visual and other sensory sources (Palmer, 2001). Tuyuca, which spoken by indigenous people in the Brazilian Amazon, is one of the languages that distinguishes auditory source from other sensory sources.

(2) *diiga apeti*

'He played soccer (I heard him, but did not see him)' (Willett, 1988, p. 73)

Other sensory. This source refers to other sensory sources such as smell or touch. This source marker includes auditory and other sensory sources in some languages, while in other languages; other sensory sources are coded separately from visual and auditory sources (Palmer, 2001; Willett, 1988). Eastern Pomo, is spoken by Native Americans located at Lake County, California, is an example of the third group of languages.

(3) *bi.ya p^{h}a.be-k^{h}-ink'e*

'I burned my hand (I feel the sensation of burning in my hand)' (Aikhenvald, 2004, p. 53)

Inference evidence

This evidential source refers to sources of information acquired by inferring and/or assuming without witnessing the situation described directly. Two different inference types have been identified, namely, inference from results and inference from reasoning.

Inference from results. This source refers to the source of information, which is inferred from observable or tangible evidence (Aikhenvald, 2004; Willett, 1988) as in the case that one saw the footprints of a mouse but did not see the mouse itself. Tuyuca is one of the languages that marks inference from results separately from the other sources.

(4) *diiga apeyi*

'He played soccer (I see evidence for it)' (Willett, 1988, p. 73)

According to de Haan (2004), this type of evidential is a hybrid that makes reference to direct and indirect sources of evidence. The speaker did not witness the described situation; on the other hand, she directly sees certain outcomes that allow her to infer what happened.

Inference from reasoning/assumption. This source represents the information which is inferred based on results that are not visible but rely on intuition, logical reasoning, previous experience, general knowledge or some other mental construct

(Aikhenvald, 2004; Willett, 1988) as in the case that if one knows that one's father comes home at 7 pm every weekday and it is already past that hour, one can infer that one's father has arrived home without having to see him at home or see any other signs that would indicate that he is at home. Tuyuca is one of the languages that mark this distinction.

(5) *diiga apehiyi*

'He played soccer (it is reasonable to assume so)' (Willett, 1988, p. 73).

Conjecture. This source refers to the information acquired by inferring. Unlike the case of inferring from results or reasoning, in this case the source of conjecture lacks sensory support or generic information (Givon, 1982). Therefore, the inferential gradient of this source remains unidentified. It is also considered as a "weak inference" in the linguistic literature (Anderson, 1986). According to Squartini (2008) Italian makes this distinction:

(6) [Suonano alla porta] Non aspettavo nessuno; *sara`* Gianni.

[The bell rings] 'I was not expecting anybody. It might be G.' (p. 924)

Hearsay/reported evidence

This refers to the source of information, which is acquired from hearing about the described situation from other people. Four different types of hearsay/reported sources have been described, namely second-hand, third-hand, folklore and quotative.

Second-hand hearsay. This source refers to the source of information, which was heard from someone who was a direct witness (Willett, 1988). Tuyuca makes hearsay distinction in its evidentiality system.

(7) *diiga apeyigi*

'He played soccer (someone else who saw it told me)' (Willett, 1988, p. 73).

Third-hand hearsay. This source of knowledge is acquired from hearing the described situation from someone else. The difference between second-hand and third-hand hearsay is that in third-hand hearsay the person who reports the situation was not a direct witness (Willett, 1988). Turkish evidential structure has this kind of hearsay distinction.

(8) *Ahmet gelmişmiş*.

'Ahmet came (Someone heard from someone else and then told me)'.

Folklore. This source refers to the source of knowledge acquired through an established oral tradition (Willett, 1998). However, it need not refer to an oral tradition as such, but simply what is generally believed to be true. Tuyuca is one of the languages which has this evidential distinction.

(9) *ana kiire baka-yigi*

'A snake bit him' (it is part of a legend)' (Palmer, 2001, p. 41).

Quotative. The difference made in some languages between hearsay and the quotative is that, as Aikhenvald (2004) points out, in the case of hearsay the speaker does not quote the source, whereas in the case of the quotative the speaker gives an overt reference to the quoted source of the described situation. Southeastern Tepehuan, which is a Uto-Aztecan language spoken in Chihuahua, Mexico, has the quotative distinction.

(10) *va-ji pir gu-m bi na-p sac tu-jugui-a*

'Your food is already cold. (You said) you were going to eat '. (Aikhenvald, 2004, p. 58)

Developing a universal typology of evidentiality is a rather complex process that requires that evidential systems across several languages be examined and compared to one another. Linguists studying evidentiality have developed various typological structures and possible evidential hierarchies. This issue is discussed in the next section.

Evidential Hierarchies

Three types of evidential hierarchies have been proposed: 1) categorical hierarchies, in which evidentials are subdivided categorically or taxonomically across languages, 2) scalar hierarchies, which are hierarchies of degree of strength or other criteria, and 3) implicational hierarchies, which refer to predictions of the presence or absence of one element in a language depending on another element's presence or absence (Faller, 2002). In this section I focus on scalar hierarchies of evidentiality.

Scalar hierarchies

The aim of typologies using scalar hierarchies is to assess the strength of the sources across languages. Linguists arrive at a scale by investigating any given language speaker's preference when they receive the information through more than one source. For example, if a speaker visually witnessed a situation and heard about it from someone else as well, and prefers to use the visual source morpheme over the hearsay source morpheme to describe the event, then it would be concluded that the visual source is stronger than hearsay and is higher in the scalar hierarchy.

The scalar hierarchy also represents the absence of an available source. Thus, if a speaker reports a situation in a hearsay form, it would demonstrate that she does not have visual evidence of the described situation (Faller, 2002).

Scalar hierarchies have been reported from the earliest investigations of evidentiality in individual languages. For example, based on his observations of Tuyuca, Barnes (1984) proposed the following evidential scale:

(11) visual > non-visual > apparent > secondhand > assumed

Barnes used a soccer game example. In soccer games people usually have both visual and non-visual (auditory) information. When people describe a soccer game, they prefer to use a visual source marker over an auditory source marker. Further, an assumptive source, which corresponds to inference from reasons, is the lowest in the hierarchy. This source is used when no other source of information (e.g., visual, hearsay) is available about the situation and only prior knowledge is used as the information source.

Oswalt (1986) proposed the following scalar hierarchy for the language Kashaya.

(12) performative > factual-visual > auditory > inferential > quotative

In Kashaya, the speaker's own actions, that is, what speakers themselves engage in, constitutes the highest order source in the evidential hierarchy, whereas the information acquired from someone else has the lowest rank. Oswalt further suggested that the hierarchy is possibly universal, even for English, where evidentials are represented through verbs or adverbs.

According to Barnes (1984), the scalar hierarchy represents the degree of certainty of the speaker. Thus, when reporting a visual source the speaker's degree of

certainty is higher than when she reports a situation with an apparent source. On the other hand, Oswalt explicitly notes that all sources, regardless of their position in the scalar hierarchy, are equally certain and true. The difference between Barnes and Oswalt thus lies in the meaning of the hierarchy. However, neither discusses why a speaker would prefer one source to the others.

de Haan (1998) discussed reasons a speaker may prefer one source to another and stated that the key point of the hierarchy is the speaker's involvement in the described situation. Therefore, first-hand and second-hand sources are important factors for determining speaker preference. When the information comes from a firsthand source, the speaker's involvement in the situation is higher than when the information is acquired secondhand. Because inference/apparent source requires visual/perceptual signs related to the situation, the source is higher on the scale than quotative/secondhand and assumptive sources.

Although Oswalt (1986) suggested that his hierarchy applies to all languages with evidentials, he did not actually test his claim by means of cross-linguistic comparisons. By contrast, Willett (1988) and de Haan (1998) studied different languages with the aim of developing a hierarchy of evidentials found across languages. Both proposed their own reasons for a source preference. For Willett, source preferences are based on directness and reliability. Therefore, the most direct and the most reliable source would occupy the highest order in the evidential hierarchy. Willett's hypothesized hierarchy is:

(13) attested > reported > inferred

Whereas reported sources for Willet are more direct and reliable than inferential sources, for de Haan (1999), the hierarchy is based on directedness and speaker's involvement. The more a speaker is involved with the information source, the higher the source is in the hierarchy. de Haan's hypothesized hierarchy is:

(14) visual > auditory > non-visual > inferential > quotative

According to de Haan, inference requires more involvement of the speaker than reported sources. de Haan's hierarchy differs from that of Willett in the order of inference and reported sources. Both authors suggest directedness as one of the reasons for the preference, but they differ in terms of the ordering of reliability of the source and speaker's involvement.

Faller (2002) proposed a new design of evidential hierarchy to address this disagreement of the order of universal evidential hierarchy. Rather than arguing against or in favor of a particular order proposal, he rejected the linear system and proposed a sequential order system. His hierarchy is based on two sequential orders:

(15) a. The personal evidence cline:

performative > visual > auditory > other sensory > inference from results > reasoning > assumption

b. The mediated evidence cline:

direct > secondhand > thirdhand > hearsay/folklore

According to Faller, "a speaker may sometimes prefer to base a statement on inferential evidence, sometimes on reportative and sometimes might not give preference to either. Furthermore, in none of the cases… can the speaker be said to implicate that (s)he does

not have the order type of evidence" (2002, p. 69). Faller gives examples from Tuyuca and Quechua where speakers sometimes prefer reportative sources, and sometimes inference ones, and their preferences do not imply the absence of the other source. Both orders -(15a) and (15b)- are based on directedness. In (15a), directness is measured by the amount of inference engaged in concluding the described situation. In (15b), directness is measured by the number of mediated speakers. Faller also maintained that there is no difference in directness between (15a) and (15b). These systems are unrelated. When a speaker has a choice of direct vs. inference source she uses the (15a) track and when she has a choice of direct vs. reported source, she uses the (15b) track. If a speaker has both inferential and reported sources available, she prefers the strongest adequate evidence in the conversation. Overall, Faller's hierarchy of evidentials seems to resolve the problems identified with Willett's and Oswalt's hierarchies.

Having given an idea of different types of evidential sources, on which there is general agreement, I next address differences among scholars in definitions of evidentiality. As mentioned above, there are two basic distinctions in definitions of evidentiality. These are the level at where evidentiality is coded, and the relationship between evidentiality and modality. The following section addresses the former issue.

Evidentiality and Grammaticalization

Evidentiality has been discussed as operating on three possible levels: 1) the level of grammar, 2) the lexical/semantic level, and 3) the pragmatic level (Lazard, 2001). Those authors who define evidentiality as a purely grammaticalized phenomenon

use the term 'markers' or other linguistic terms (Boye & Harder, 2009). Bybee (1985), Anderson (1986) and Mithun (1986) are examples of authors who define evidentiality strictly as expressed at the level of the grammar:

> "Evidentials may be generally defined as *markers*[1] that indicate something about the source of information in the proposition" (Bybee, 1985, p. 184)
>
> "[Evidentials are] *markers* [which] qualify the reliability of information" (Mithun, 1986, p. 89).
>
> "*Morphologically*, evidentials are *inflections*, *clitics*, or other free *syntactic elements* (not compounds or derivational forms)" (Anderson, 1986, p. 275).

Some authors hold an intermediate position with regard to whether evidentiality must occur at the level of the grammar alone. Aikhenvald (2004) and de Haan (2001) are examples of this position. These authors agree that evidentiality involves grammaticalized marking, but concede that there are also optional ways of specification of information source in every language. Further, Aikhenvald (2003, 2004) considers languages with grammaticalized evidentials as 'strong' and 'systematic' and those with lexical marking of evidentials as 'weak' and 'strategic'.

Whereas some linguists have defined evidentiality largely in terms of whether it is marked in the grammar, others, such as Chafe (1986) and Crystal (1991) have focused on semantic aspects of evidentiality:

> "I am using the term 'evidentiality' in its broadest sense, not restricting it to expression of 'evidence' per se. I will be discussing a range of epistemological

[1] The terms in the text were emphasized by the author, herself.

consideration that are linguistically *coded* in spoken and written English" (Chafe, 1986, p. 262).

"Evidentiality: A term used in *semantics* for a type of epistemic modality where propositions are asserted that are open to challenge by the hearer, and require justification" (Crystal, 1991, p. 127).

A third kind of definition emphasizes the pragmatic dimension of evidentiality. This represents a broader conception than the previous two definitions of the phenomenon. The pragmatic definition emphasizes communicative intent. Grammatical and lexical/semantic coding of evidentiality are seen as subcategories of the communicative focus of evidentiality (Boye & Harder, 2009). Ifantidou (2001), one of the scholars who defined evidentiality as a pragmatic phenomenon, notes:

"It has hardly ever been pointed out that the source of knowledge or the speaker's degree of certainty can be pragmatically inferred" (Ifantidou, 2001, p. 15).

Definitions of evidentiality that emphasize the semantic component assume that evidentiality is primarily conveyed in the lexicon but it includes evidential expressions in the grammar as well, whereas definitions of evidentiality that emphasize the pragmatic aspect refer to evidentiality both at the level of the grammar and lexicon. However, there are two main differences between lexical/semantic and grammaticalized evidential languages. First, lexical/semantic evidential languages allow speaker to express more sources than grammaticalized languages. The highest number of sources that can be identified in grammaticalized languages is five, including the first-hand

source. On the other hand, in lexical evidential languages there are more specific ways to state source of knowledge, as explained above. Second, lexical evidential language speakers do not have to express the source of information in their utterances, whereas grammaticalized language speakers have to state from where they received the information about the described situation.

However, even though we know that lexical evidential language speakers have options about whether they would state their source of knowledge, we do not yet know how frequently or regularly they indicate their source of information in their utterances. Thus, it is essential to investigate to what extent grammaticalized and lexical evidential language speakers differ in cognitive processing.

The influence of grammaticalized evidentiality on cognitive processing

Only a few studies have directly compared users of lexical vs. grammaticalized evidential languages. The focus of these studies was possible differences in source monitoring ability. That is, does marking the source of knowledge obligatorily enhance speakers' source monitoring ability compared to marking the source of knowledge optionally?

In order to answer this question, Aksu-Koc, Ögel-Balaban and Alp (2009) compared the source monitoring findings of Ögel (2007) with those of Drummey and Newcombe's (2002) similar investigation on English-speaking children to test whether having grammaticalized evidentiality in Turkish influenced non-linguistic source monitoring. They found that four-year-old Turkish speaking children's source monitoring performance was superior to that of four-year-old English-speaking

children's performance, which was the same level as three-year-old Turkish speaking children's performance. However, the difference in source monitoring performance disappeared by the age of five.

One problem with this finding is that the comparison between the grammaticalized and lexical evidential languages is across separate studies. Therefore, there is an urgent need for cross-linguistic investigations that are conducted within the same study. Further, there is a need for investigations with adult participants.

Tosun, Vaid, and Geraci (2013) conducted a cross-linguistic investigation with adults. They tested source-monitoring accuracy in Turkish (obligatorily encoded evidentials) and English (optionally encoded evidentials). Participants were asked to read statements which were presented either in first-hand form or non first-hand form. Then they were given a surprise memory test, in which they were to recognize the source of knowledge of each statement. Tosun et al. found that Turkish speakers were more accurate in recognizing first-hand formed statements than non first-hand formed statements, while English-speaking participants did not demonstrate any difference in recognizing first-hand and non first-hand formed statements. Tosun et al. further tested Turkish-English bilingual speakers to examine a possible carryover effect in source monitoring accuracy from Turkish to English. Late bilinguals, that is, those who learned English after the age of twelve, treated English non first-hand forms statements in the same way that they treated Turkish non first-hand statements, recognizing them less accurately than first-hand statements.

It is clear that the level of at which evidentiality is indicated in a language leads speakers to code and recognize information somewhat differently. Coding the source of information on a regular basis in the grammar leads Turkish speakers to make distinctions between the direct and indirect evidential sources and treat them differently. On the other hand, coding the evidential sources on an optional basis leads speakers of English to treat the different sources equally.

The findings reviewed above only address one particular task: source monitoring. There are various other cognitive processes, such as sense-making or decision-making, that may be differentially affected by the presence of evidential marking and by how it is encoded in the language. Further, coding evidentiality at different levels probably leads speakers to interpret evidential sources differently due to their use in discourse. Therefore, in this study I examined languages which encode evidentiality in grammar and those which encode evidentiality in the lexicon. Specifically, I investigated Turkish, as a language with grammaticalized evidentiality and English, as a language with lexical evidentiality. The next two sections summarize what is known about the encoding of evidentiality in these languages.

Evidentiality in Turkish

The Turkish evidentiality system is among the earliest described. The distinction between witnessed and unwitnessed narrated events is found in Mahmud al-Kasgari's 11th century compendium, *Diwan lugat at-Turk* (Freidman, 2003).

In Turkish evidentiality is grammaticalized. This means that expressing the source of knowledge is obligatory in Turkish grammar. According to Aikhenvald's (2004) categorization, Turkish is an example of two-choice evidential languages. That is, it makes a distinction between first-hand and non first-hand sources of knowledge. Aksi-Koc and Slobin (1982, 1986) referred to the two as 'direct' vs. 'indirect' sources of knowledge.

First-hand source expression

The first-hand source marker *–di* (realized as *–di, -dı, -dü, -du, -ti. –tı, -tü, -tu*)[2] conveys directly experienced source of knowledge (Slobin & Aksu, 1982). Directly experienced sources refer only to visual sensory sources of evidence. If the source of information is auditory, olfactory, or gustatory, the corresponding proposition is marked using the non first-hand source marker (Aikhenvald, 2004).

(16) *Handan okula gitti*. 'Handan went to school, I saw.'

In (16), the speaker saw when Handan was leaving home to go to school. According to Aksu-Koc and Slobin (1986), first-hand source markers are also used to express knowledge that is expected or unsurprising.

(17) *Köprü tadilatı trafiği alt üst etti*. 'Construction of the bridge disturbed the traffic.'

In example (17), the speaker uses the first-hand marker even though she has not witnessed the traffic jam, because it would not be surprising at all that there would be a traffic jam when the bridge is under construction.

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[2] The variations in the suffixes are due to vocal harmony.

The first-hand form is not a default of the unmarked version of the past tense in Turkish. On the contrary, it is one of the two options to indicate the source of knowledge. Thus, choosing the first-hand marker shows that the speaker intends to indicate that she witnessed the event and convey her certainty (Aksu-Koc, 2000; Kornfilt, 1997).

Non first-hand source expression

Non first-hand sources are marked with the suffix *–miş* (realized as *–miş, -mış, -müş, -muş*) on the past tense of the verb. This marker is derived from the resultative and stative suffix *–miş* (Slobin & Aksu, 1982). It covers three different information sources: reportive, inferential, and perceptive/mirative (Johanson, 2000, 2003).

In the reportative source, the information is acquired from someone else.

(18) *Handan okula gitmiş*. 'Handan reportedly went to school.'

In example (18), the speaker heard from someone else that Handan went to school, as she herself did not see Handan leaving home to go to school. English equivalents of reportative source include *reportedly, allegedly, as they say/said,* and all of the reported speech versions. In Turkish it is possible to use reportive evidentials even in the first person.

(19) *Geçen gece çok hızlı araba kullanmışım.* 'Last night I drove too fast, reportedly'.

In example (19) the speaker reports information about herself, which she heard from someone else. While she was driving she did not realize that she was fast. However, later her friend in the car told her that she was driving fast.

The basis of the inferential source is reflection and reasoning arising from inference from results and from reasoning per se.

(20) *Handan okula gitmiş*. 'Handan apparently went to school.'

In the example (20) the speaker inferred that Handan went to school. She could not find Handan and her school bag at home or she knew that Handan had a class at the time, thus she inferred that Handan went to school without seeing personally when this happened. English equivalents of inferential *–miş* include *apparently, presumably, as far as ... understand/understood* etc. (Johanson, 2003). Again, in Turkish, the inferential evidential can be used in the first person.

(21) *Ders çalışırken uyumuşum*. 'I apparently slept while I was studying.'

In the example above, the speaker said that after she just woke up. This shows that the speaker was unconscious when she did the action and she inferred what must have happened.

The basis of perceptive source is first-hand knowledge, meaning direct sensory perception other than visual sensory knowledge such as smelling, or hearing, or else it is unexpected information (Johanson, 2003).

(22) *Handan okula gitmiş*. 'Handan went to school, I was surprised to hear'

In example (22) the speaker heard when Handan closed the door and left home or she saw Handan in the school but she also knew that Handan was sick and not expected to be on campus on that day. According to Johanson (2003), English equivalents of the perceptive source include *it appears/appeared that, it turns/turned out that, as….can/could see that, hear* etc. In Turkish the perceptive evidential is also possible in the first person.

(23) *Farketmeden ayağına basmışım.* 'I stepped on your foot accidentally.'

In the example above, the speaker, herself, did the action but she realized it only later. In this case, the speaker was conscious and awake but she stepped on the other person's foot accidentally. According to Johanson (2000) and Aksu-Koc and Slobin (1986), perceptive use of the evidential is also interpreted in terms of relative novelty, sudden discovery, and new knowledge with an unprepared mind.

The suffix *–miş* is also used with other tenses to convey the source of information of the tense time.

(24) a. *Handan okula gidiyormuş.* 'Handan reportedly is/was going to school.'

b. *Handan okula gidecekmiş.* 'Handan reportedly will/would go to school.'

c. *Handan okula gidermiş.* 'Handan reportedly goes to school.'

d. *Handan okula gitmişmiş.* 'Handan reportedly has/had gone to school.'

e. *Handan okula gitmiştir.* 'Handan presumably went to school.'

In the example (24) the suffix *–miş* refers to a compound tense structure. The sentence already has its own tense. The suffix *–miş* is attached after the primary tense suffix and conveys that the source is non first-hand without giving any past tense implication. In (24a) the non first-hand marker is attached to the continuous tense, which gives the meaning that the described situation is happening at the moment but the source is not first-hand. In (24b) the described situation will happen in the future and the source is non-first-hand. This compound structure is used only for reportative sources because the event has not happened yet; thus, it is impossible to infer or perceive it. Example (24c) describes an event that happens regularly as in the present tense, but the source is non first-hand. Example (24d) represents a situation that already happened in the past with a

non first-hand source and it is also reported (Johanson, 2003). Thus, it is a third-hand evidential. This type is mostly used sarcastically. In the last example (24e), the suffix –*dir* is attached after the non first-hand suffix and represents inference from reasoning, previous knowledge and knowledge about habitual events (Aksu-Koc, 2009, Aksu-Koc & Alici, 2000).

In a pilot corpus study, Öztürk (2008) examined six different 30-minute Youtube videos of television dramas. She found that the first-hand marker was used six times more often than the non first-hand marker in Turkish. Moreover, most of the first-hand markers were used in the first person singular, whereas most of the non first-hand markers were used in the third person singular. Although this finding allows us to make some inference about the usage of evidentials in natural conversations, more data need to be collected and extended over other domains besides television dramas.

The next section discusses evidentiality in English.

Evidentiality in English

Evidentiality is not grammaticalized in English. It is possible, however, to express evidentiality in such languages. Aikhenvald (2004) notes that expressing evidentiality in English is like expressing gender in genderless languages. Speakers do not have to indicate the source of information, but they can if they want to. Various ways are identified to express evidentiality in English. Sensory verbs (e.g., *see*), cognitive verbs (e.g., *think*), adjectives (e.g., *supposed*), adverbs (e.g., *apparently*) and modal

auxiliaries (e.g., *must*) are used to state source of knowledge (Aikhenvald, 2004; Chafe, 1986; Nuyts, 2001b, Whitt, 2010, 2011).

Sensory evidence

Sensory evidence indicates first-hand knowledge and usually is expressed by sense verbs in English. Chafe (1986) and Whitt (2010, 2011) give detailed examples of English sensory verbs and their evidential usage. Sensory verbs like *see, look, hear, sound, taste, smell, feel* are basic evidential verbs which are used to express first-hand sources, as in (16b). However, these verbs do not always indicate the source of knowledge, as in (16a). According to Whitt (2010), since evidentials are in a deictic structure these verbs need to have a deictic component following them.

(25) a. I see the ship.

b. I see the ship sinking. (Whitt, 2011)

In this example (25b) indicates a visual evidential source. However, the verb *see* is a polysemic verb whose meaning extends, as in the example (26).

(26) I see your pain is growing.

In this example the meaning of 'see' extends to 'understand' and does not express an evidential source (Whitt, 2010).

Another sensory verb is 'to hear,' which is used to state auditory and hearsay sources. Aikhenvald (2004) gives an example to demonstrate the difference between auditory and hearsay source.

(27) a. I heard France beating Brazil.

b. I heard that France beat Brazil.

In (27a) the speaker express an auditory source, which means that she heard the situation while it was happening but she did not have visual evidence. On the other hand in (27b) the speaker expresses hearsay information, which means that she heard the described situation from someone else.

The other senses such as olfactory, as in (28), gustatory, as in (29) and tactile, as in (30), are expressed through verbs like *smell, taste* and *feel*.

(28) I can smell that you are wearing a nice perfume.

(29) I can tell by tasting that the food is delicious.

(30) I feel the carpet is soft.

A deictic component is also required besides these sensory verbs to get the evidential meaning. Object oriented sensory verb uses without a deictic component indicate a perceptual judgment rather evidential assessment (e.g., I *see* a black cat). On the other hand, some of the verbs do not require a deictic component overtly. Those verbs are mostly object-oriented verbs, as in (31).

(31) The sculpture looked damaged. (Whitt, 2011, p. 349)

Sensory verbs do not always state sensory evidence. Some of the verbs such as *look, sound, feel* express inferential meaning (Whitt, 2010).

(32) She looks like she is sleeping.

(33) He sounds like he is mad.

(34) It feels like the door is open. (Chafe, 1986, p. 267)

According to Chafe these verbs are less reliable than other sensory verbs in indicating source of evidence.

Hearsay evidence

The verbs, adverbs, and adjectives for hearsay expression in English are not clear-cut. Some of the verbs and adverbs are clear in indicating hearsay, such as reported speech expressions, while some other verbs and adverbs might carry hearsay meaning depending on the context, such as the verb *seem*. According to Babel (2009) and Clift (2006), the English reported speech stance is definitely a demonstrated hearsay source and evidence for grammaticalization of evidentiality in English. Chafe (1986) also identified many reported speech phrases used in English conversations and writings: *people say, they say, I have been told*, and more specifically *Sarah told me, Harry said* (p. 268).

(35) I was told that all beauty must die.

In example (35) it is clear that the speaker acquired the described situation from someone else through language. Another clear demonstration of hearsay comes from the adverbs 'reportedly' and 'allegedly' (Aikhenvald, 2004; Mushin, 2001). These adverbs openly indicate that the source of knowledge is second-hand, as in (36) and (37).

(36) Thomas was reportedly fired from his job.

(37) Jenny allegedly killed her husband.

On the other hand, some verbs do not clearly state a hearsay meaning. The meaning emerges instead from their syntax and/or from semantic cues. In example (27), the verb 'hear' could mean either auditory source or hearsay. The difference between (27a) and (27b) is the syntax which makes (27b) hearsay evidence. Another example is the verb

'seem' which might mean either inferential or hearsay evidence. Chafe (1986) gives an example:

(38) Well Schaeffer it seems had just found the latest article from the Smithsonian. (p. 268)

In this case the same sentence might mean inference or hearsay; the central point to distinguish the two sources is the context of the sentence. According to Chafe, the sentence in (38) is an example of hearsay evidence because the context provides clues that the information is obtained through language.

Inference from results

According to Chafe (1986) the most common marker that expresses inference from results is *must*. It states an inference with a high degree of reliability. Many of the authors who discuss evidentiality and modality distinction indicate that the epistemic necessity marker *must* also expresses evidential inference from results (e.g. Faller, 2002; Matthewson, 2010).

(39) It *must* have been a kid. (Chafe, 1986, p. 266)

In (39) the sentence describes that the speaker saw some visible signs around (for example some small footprints) although she did not witness the situation (she did not see the child) and reached a conclusion by inferring from those signs, that there was one.

In addition to the modal auxiliary, some adjectives and adverbs are also used to state inference from results.

(40) It was *obvious* that she fed the cat too much.

(41) She *apparently* fed the cat too much.

In both examples (40) and (41), the speaker did not see someone feeding the cat but saw that the cat was too heavy for its age and concluded that the cat was being fed too much. The adverb *apparently* is stated as inference by Gisborne and Holmes (2007), Izvorski (1997), and Mortensen (2006), although other scholars argue that it also carries meaning of hearsay (e.g., Chafe, 1986; Mushin, 2001). According to Chafe (1986), *evidently* is another adverb indicating inference; its certainty, however, is less than that of other inferential adverbs. *Seem* is a verb indicating less certainty than inferential evidence as well (Mithun, 1986).

(42) She seemed to feed the cat too much.

According to Aijmer (2009) *seem to* is the most grammaticalized form of evidential marker, which is similar to modal auxiliaries.

Inference from reasons

According to Chafe (1986) the typical inference from reason markers are *should* and *presumably*. In the examples (43) and (44), it is possible to understand that the speaker inferred the described situation from her previous knowledge acquired before the situation.

(43) They *should* have given her money back.

(44) They *presumably* gave her money back.

Matthewson (2010) also analyzes *should* and concludes that it represents inference from reasons and is treated as the inference-from-reasons/assumption markers in grammaticalized evidential languages.

Chafe (1986) also indicates that other modal auxiliaries, *can*, *could*, and *would*, also express inference from reasons. Their degree of reliability, however, is less than *should* and *presumably*.

Chafe (1986) counts beliefs as evidential sources. He states that they represent the source of information. *I think*, *I guess* and *I suppose* are examples of beliefs he uses to demonstrate their evidential value.

(45) I think she likes me.

(46) I guess she helps her grandmother.

(47) She is my new roommate, I suppose.

According to Chafe *suppose* is a mode of knowing based on downgraded evidence, although the use of *supposed to* conveys the source of hearsay. Fetzer (2008) indicates that verbs like *guess* and *think* convey a cognitive load. Even though beliefs are not categorized as one of the evidential sources in grammaticalized languages, they can be considered under inference from reasons because the conclusions in (45), (46) and (47) seem to be based on previous knowledge with an unknown source indication.

In summary, even though there has not been explicit grammatical structure to indicate evidentiality in English, it is possible to state the source of knowledge. There are two differences between English and grammaticalized evidential languages. First English, as a non-grammaticalized evidentiality language, allows its speaker to express more sources than grammaticalized languages. The highest number of sources that can be identified through grammatical means is five, including first-hand source. On the other hand, in English there are more specific ways to state source of knowledge, as

explained above. Second, English speakers do not have to express the source of information in their utterances, whereas grammaticalized language speakers have to state from where they received the information about the described situation. However, even though we know that English speakers have options about whether they would state their source of knowledge, we do not yet know how frequently they indicate their source of information in their utterances. Thus, there is a need to investigate to what extent English speakers tend to use evidential verbs, adverbs, and adjectives.

Further, there is a need to clearly understand how language speakers interpret evidential expressions and to what extent they attribute a particular meaning to them. In terms of interpreting the source of evidential expressions, it can be expected that Turkish speakers' interpretation have greater variation from one evidential expression to another, because each source is defined by the grammar with a specific evidential meaning. On the other hand, English speakers' interpretation may result in less variation from one evidential expression to another, because those expressions are not defined firmly, and English speakers interpret the source of an evidential expression from their daily practices. For example it has been discussed that the adverb *apparently* might mean inference or hearsay (Chafe, 1986), and the adverb *reportedly* means hearsay as well (Aikhenvald, 2004).

In addition to source of knowledge, evidentiality has been discussed as conveying epistemic value. The meanings attributed to evidentiality are examined empirically in Section 5 in terms of the relationship between evidentiality and epistemic

modality. In the following section I review different possible relationships proposed by various scholars.

EVIDENTIALITY AND EPISTEMIC MODALITY

As with evidentiality, epistemic modality has been defined in various ways in the literature. Lyons (1977), one of the first scholars to study epistemic modality, defines it as the utterance in which the speaker qualifies his/her commitment to the truth of the proposition expressed in two extremes -- from necessarily true to necessarily false. There are levels in between the two extremes, such as 'possibly true/false', 'probably true/false'. Givon (1982), as an epistemologist, defines modality as a probability of the proposition on a scale between *necessary* (which has a probability of 1.0) and *impossible* (which has a probability of 0.0), where *probable* and *possible* are in the middle (with a probability of 0.5). Aijmer (1980) adds a new aspect to the epistemic modal definition by defining evidentiality as a subgroup of modals as "expressions, which say something about the speaker's evidence and, degree of certainty" (p. 11). Further Palmer (1986) defines the term 'epistemic' as applying "not simply to modal systems that basically involve the notions of possibility and necessity, but to any modal system that indicates the degree of commitment by the speaker to what he says" (p. 51). According to Chafe (1986), it is coding the speaker's attitude toward his/her knowledge of a situation. Later, van der Auwera and Plungian (1998) define epistemic modality as "the judgment of the speaker: a proposition is judged to be uncertain or probable relative to some judgement(s)" (p. 81). According to Nuyts (2001a), epistemic category is "evaluation of the chances that a certain hypothetical state of affairs under consideration (or some aspect of it) will occur, is occurring or has occurred in a possible world" (p. 21).

In summary, epistemic modality has been defined as attitude, judgment or commitment of the speaker towards how likely the situation described is to occur in a possible or actual world.

The relationship between evidentiality and epistemic modality differs depending on how evidentiality is defined. Four different views have been argued in the literature: 1) complete disjointment 2) inclusion 3) overlap 4) identity. In the next sub-sections I discuss these four positions.

Complete Disjointment

Those authors who claim complete disjointment of evidentiality and epistemic modality (Aikhenvald, 2004; de Haan, 1999, 2004; Lazard, 2001; Oswalt, 1986) argue that the two structures convey different kinds and nature of information. Epistemic modality refers to the judgment of truth or probability of the statement, while evidentiality refers to the source of information. All types of evidential sources are equally likely to be true and none of the sources are superior to the others in terms of the statements' probability (see Figure 1).

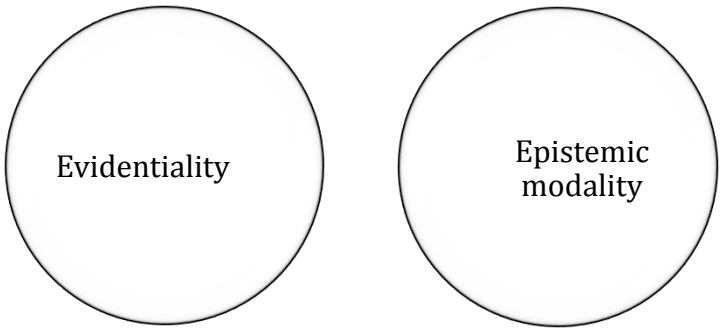

Figure 1. The complete disjointment view of relationship between evidentiality and epistemic modality.

Three arguments have been raised to support a complete disjointment view. First, languages with evidential markers may have epistemic modals as well. These two markers can be combined in one sentence. For instance, in Western Tarahumara, an Uto-Aztecan language, reportative suffix *–ra* can be combined with suffixes that conveys truth or doubt:

(48) a. *alue hu-ra*

'They say it is he.'

b. *raha-ra-guru*

'They say he burned it and it is probably true.' (Aikhenvald, 2004)

Linguists who support disjointment argue that if evidentiality conveys epistemic meaning as well, languages with evidentiality would not need epistemic modals to convey their degree of certainty or their judgment and commitment. Further, it is also possible to see a weak source of knowledge (e.g. hearsay as second-hand) combined with the strongest epistemic modal (e.g. 'must' as epistemic necessity) (De Villiers, Girard, Gernet-Garfield, Roeper, & Speas, 2009).

Second, people who speak languages with evidential markers keep using second-hand markers even though they are positively sure about the information they talk about, if the source of information is second-hand. The most common example is given by Givon (1982) as in the case of a Lama who talks about the *Life of the Buddha* using the hearsay suffix. Although Buddhists consider the story as the truest of all stories, because they have not personally witnessed Buddha's life, they need to use the hearsay evidence

marker while narrating it. It is concluded that evidentiality conveys only the source of knowledge, not epistemic judgment of the narrative.

Third, another argument of complete disjointment is negation. The relation between negation and modals is ambiguous, while between evidentiality and negation there is a clear relation (Matsui & Fitneva, 2009; De Villiers et al., 2009). The ambiguity occurs when negating a sentence with an epistemic modal:

(49) - Mr. Smith must be the doctor.

- No, it is not true!

In (49) the 'no' might mean two things. First, 'no' might negate the modal as in: 'No, he may be.' Second, 'no' might negate the described situation as in: 'No, he must not be the doctor.' However, negating an evidential sentence means only to negate the described situation, not the evidence indicated.

(50) – Mr. Smith was reportedly the doctor.

- No, it is not true.

In (50) the 'no' means only negating the fact that Mr. Smith was the doctor. The 'no' does not interpreted as 'no, the source was not hearsay'. Thus, according to the complete disjointment view, epistemic modals and evidentiality are totally different structures of languages.

In contrast to the above, there are other views suggesting that there is a relation between modals and evidentials. One of the views is inclusion.

Inclusion

The inclusion view argues that one of the categories is analyzed as a subtype of the other (Dendale & Tasmowski, 2001). This view may be subdivided as follows: 1) Epistemic modality is a subtype of evidentiality, and 2) Evidentiality is a subtype of epistemic modality.

Epistemic modality as a subtype of evidentiality

Chafe (1986) and Matlock (1989) argue that epistemic modality is a subtype of evidentiality. Chafe defines evidentiality as the speaker's attitude towards the described situation in a broad sense, and as a source of knowledge in a narrow sense. Thus, some portion of evidentiality, besides the source of knowledge, also indicates speakers' attitude (see Figure 2). Matlock clearly defines evidentiality as a larger category including epistemic modals. "Evidentials, linguistic units comprising part of epistemic modality, code a speaker's source of information, and some degree of certainty about that information" (p. 215). In this case it is possible to say that all epistemic modals are evidentials; however, not all evidentials are epistemic modals.

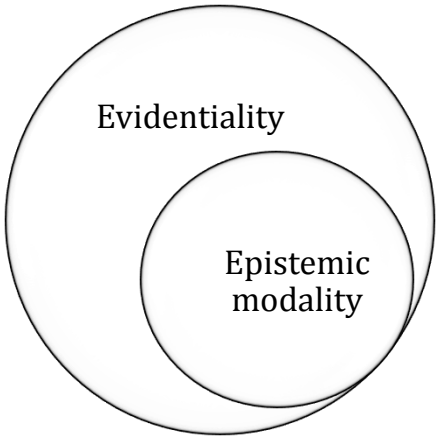

Figure 2. Epistemic modality as a subtype of evidentiality.

Von Fintel and Gillies (2010) argues that all 'ordinary' epistemic modals carry evidential meaning, so that their effect is weakened, as in example (50).

(51) a. It is raining.

b. It must be raining.

Although (51b) represents the strongest epistemic modal, which is epistemic necessity, it is perceived as weaker than (51a) which has no epistemic marker. Von Fintel and Gillies (2010) concluded that it is because *must* as an epistemic modal carries an *evidential signal,* in particular it signals that the speaker has reached her conclusion via an indirect inference" (p. 3). Because (51a) does not have any epistemic and/or evidential marker it reveals the direct source, which is always more credible than secondary sources. The main problem with this view is the difficulty of demonstrating that all epistemic modals are evidentials. The authors suggest that even the strongest modal is weakened by an indirect source; other modals can be assumed to be already weakened. However, this logic is not sufficient to argue that all epistemic modals are evidentials. Finding only one epistemic modal without an evidential meaning is enough to falsify this view.

Evidentiality as a subtype of epistemic modality

A number of scholars argue that evidentiality is a subtype of epistemic modality (Bybee, 1985; Mithun, 1999; Palmer, 1986, Willett, 1988). Palmer stated his view overtly saying: "the term 'epistemic' should apply not simply to modal systems that basically involve the notions of possibility and necessity, but to any modal system that indicates the degree of commitment by the speaker to what he says. In particular, it should include evidentials such as 'hearsay', or 'report' (the quotative) or the evidence

of senses" (p. 51). Thus, according to this view, all evidentials are epistemic modals, but not all epistemic modals are evidentials (Plungian, 2001) (see Figure 3).

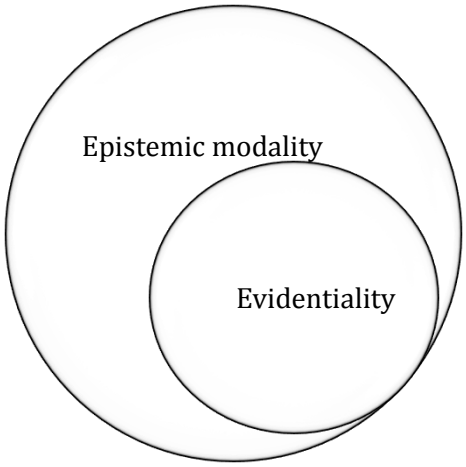

Figure 3. Evidentiality as a subtype of epistemic modality.

This view argues that all of the evidential sources imply some degrees of certainty about the described situation. Mithun (1986) indicates that evidential markers moderate the reliability of information in four ways: degree of precision, probability, expectations about the probability and source of knowledge. She gives some examples from Northern Iroquoian where the markers not only convey the source of information but also 'precision', 'probability', and 'expectation'. The mirativity function is also seen as another form of evidence for the view that all evidentials have an epistemic role. Mirativity demonstrates the expectation of the speaker and how prepared, psychologically the speaker is. According to Aksu-Koc and Slobin (1986), Turkish indirect evidentials represent the unprepared mind of the speaker and lack of expectations that the described situation would occur. On the other hand, the same

criticism as directed to the other inclusion view is made to support this opinion, which is the difficulty of demonstrating that all of the evidentials have epistemic value. As in Givon's (1982) Buddhist monks example, even though the speakers are completely positive about the truthfulness of what happened in the past, they need to use second-hand (hearsay) marker because the source of information is not their personal experience. Thus, in this example a second-hand source (hearsay) is epistemically valued the same as a first-hand source, which demonstrates that not all evidential sources have their own epistemic values.

Overlap

According to the overlap view, there are pure evidentials and pure modals, but also ambiguous markers, which can be both (DeLancey, 2001; Faller, 2002; van der Auwera & Plungian, 1998) (see Figure 4). Faller discusses in his dissertation that there are pure modals, which do not convey any evidential meaning at all, such as English 'may'. When a person says, "*Jo may be the thief"*, the speaker just talks about the possibility of the propositions without indicating the source of information. Similarly, there are pure evidentials, which do not convey any epistemic value as in Givon's (1982) example of the *Life of the Buddha*. Even though Buddhists are completely sure that the story happened as it was told, they still tell the story in the indirect (hearsay) version because they themselves did not witness the situation described in the story. According to Faller, there are also ambiguous markers, which state both epistemic value and evidential value, such as inferential markers.

The German verb *sollen* is an example of an ambiguous marker. This verb can convey both epistemic and evidential meaning.

(52) a. *Der Film sollte gut sein.*

'The movie should be good.' (epistemic possibility)

b. *Der Film soll gut sein.*

'The movie is said to be good' (evidential, reportative) (Faller, 2002, p. 87)

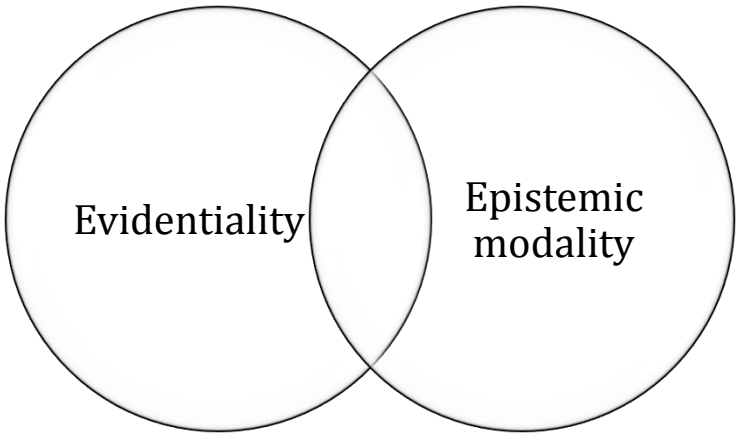

Figure 4. Overlap of evidentility and modality.

Faller (2002) and van der Auwera and Plungian (1998) indicate that English epistemic necessity *must* also express inferential evidentiality. Moreover, Faller even classifies English as a grammaticalized evidential language with two choices, 'inference' and 'everything else'. According to Izvorski, (1997) a grammatical form encoding epistemic necessity generally indicates that the information source is inferential; equally, information inferred from the other signs conveys the necessary truth judgment. Even though some of the authors find this view convincing (e.g., Gerner, 2009), some

question the difference between inferring from results and inferring from reasoning (e.g., Cornillie, 2009). Inferring from direct evidence is considered to express a strong epistemic commitment, whereas inferring from generic knowledge/reasoning is considered to suggest a weak epistemic assessment. Therefore, inference from reasons conveys different epistemic evaluation from inference from evidence; however, they are marked the same evidentially.

In addition to English *must* and German *sollen*, one can add an example of evidentiality and modality overlap from Turkish, namely, third-hand evidential markers. Although this marker has not yet been examined systematically by linguists, grammatically it is supposed to convey hearsay information in which the source of the hearsay also was not the first person witnessing the described situation. Besides marking third-hand source, the marker *-mismis* expresses almost sarcastically that the situation is not reliable at all. Thus, the third-hand source marker conveys an epistemic value as well. However, this marker needs to be investigated more systematically. All in all, because the overlap view contends that there are pure epistemic modals and pure evidentials besides some ambiguous markers, it solves the criticisms addressed in the inclusion view.

Identity

Matthewson (2010) proposed that all evidentials are epistemic modals and all modals are evidentials (see Figure 5). She examined English *must* and *should* and Quechua *–mi* and Korean *–te* to demonstrate that English epistemic modals (*must* and

should in this case) work in the same way as the evidential markers of other languages (-*mi* and –*te*).

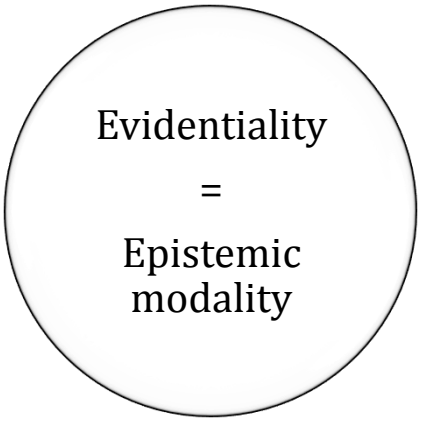

Figure 5. Identity of evidentiality and epistemic modality.

Quechua –*mi* represents direct sources, whereas Korean –*te* represents inference from reasoning. According to Matthewson's analysis English *must* and Quechua –*mi* represents the trustworthiness distinction in a reverse way. Quechua –*mi* requires trustworthy evidence, which is directly acquired, while *must* disallows trustworthy evidence, which is directly acquired. English *must* is considered as inference from results in her analysis, and therefore requires direct evidence of signs. However, because the information is inferred, it disallows the speaker from having witnessed the described situation, which makes the evidence weaker than the directly witnessed information.

On the other hand, English *should* is even weaker than *must* in terms of its epistemic value and commitment, but it does not simply mean that *should* is a weaker

version of epistemic necessity. Matthewson compares English *should* with Korean *–te*. According to her analysis, *should* reasons forward from the earlier events while *must* reasons backwards from current evidence. *Should* always requires that the time of acquisition of the evidence is earlier in time than the described situation. In this case, *should* represents inference from reasons and it functions in the same way as Korean *–te* which represents the source of inference from reasons. Thus, Matthewson concludes that every modal has evidential value and every evidential has epistemic value. Because this view is the most recent one, it needs to be examined more especially in terms of the pure evidential and pure epistemic modal views.

In conclusion, four different views apply different values for evidentiality and epistemic modality: that the two are the same, or completely different, or that evidentiality is a subtype of modality, or that modality is a subtype of evidentiality. In each view, the epistemic value of evidentiality differs. However, the epistemic value is not always determined by the grammatical marker used to identify the evidential sources. As de Haan (2004) indicates, any epistemic value comes from the contextual interaction with the hearer/reader although this is totally different than epistemic value in grammar.

When reviewing these various proposals about the relation between evidentiality and epistemic modality, it is clear that they are based on linguists' own intuitions or those of native speakers of the languages in question, as well as reliance on logical argument as the primary method of investigation. For the present purposes, the value of these proposals is largely heuristic: they offer claims about the possible relationship between evidentiality and epistemic modality that can be tested empirically, whether

through corpus analyses or experimental studies of speakers' interpretations or judgments. Experimental investigations would allow us to answer the relation/difference between evidentiality and modality by manipulating those variables and controlling confound variables. They would also allow us to assess measurable behavioral changes in, for example, trust, decision-making, or memory of people toward statements with different evidential sources and epistemic modals.

Aside from its theoretical significance, examining the relationship between evidentiality and epistemic modality also has a practical significance. Language is a primary means of communication and people give meanings to events through language. Therefore, individuals' interpretations of what is said actually reflect how they perceive the world. If one interprets an evidential source as how likely it was that the described situation happened or if one interprets an indication of possibility of the described situation's occurrence as the speaker's source of information, the meaning of the described situation is definitely changed and influences the hearer's reaction to it.

For example, if in a presidential debate, one of the candidates says: "The announced inflation rate *reportedly* decreased during my presidential term," the audience may interpret what he/she said as inflation rate decrease happened but he/she heard it from the company who conducted research on it. In this case, the audience interprets the evidential marker (*reportedly*) as the source of knowledge only. Thus, they may appreciate the candidate due to his/her honesty because he/she indicates his/her source of knowledge. On the other hand, they may also interpret his/her report as suggesting that the inflation rate decrease was not likely to have happened. This interpretation gives

epistemic value to an evidential source (hearsay in the example) and would definitely influence what the audience thinks about the candidate (e.g., that the candidate did not successfully manage the economy of the country during his/her term). There is also a stance interpretation here – e.g., the speaker could be using an ironic tone. Thus, it is crucial for the candidate to know the relation between evidentiality and epistemic modality so as not to lose the election. The example can be extended to any other daily setting to understand the very real way in which the debate about the relative interpretation of evidentiality and epistemic modality could play out.

As mentioned above, to more fully examine the relationship between evidentiality and epistemic modality and the effect of epistemic value on evidentiality we need to look at how actual speakers interpret evidential and modal expressions within and across grammaticalized and lexical evidential languages. Further we need to examine the social or pragmatic aspects of language and evidentiality usage. That is, we need to investigate evidentiality empirically in context and discourse. Before turning to the present research, a review of previous studies bearing on these issues is provided.

Empirical Investigations of Evidentiality and Modality

The commitment and reliability/certainty judgment investigations have focused on which source is perceived as more reliable than (the) others. Because perceptual and first-hand sources are always listed at the top of the evidential sources scale/hierarchy (15), it is expected that first-hand sources will be judged more reliable and certain, and will be higher in degree of commitment. The studies are conducted with child

participants mostly to examine the developmental aspect of the process specifically comprehension of evidentiality. The comprehension measurement already begins with the assumption that evidential markers have epistemic value, in which non first-hand evidential sources have less epistemic value than first-hand source markers. Therefore it has been considered that if a child comprehends evidentiality, then she needs to rely more on the information with first-hand source marker than with non first-hand source marker. Because it is an indirect measurement for comprehension, the findings may not be representing the actual evidential comprehension development. However, they measure reliability judgments and the epistemic value of evidentiality directly and demonstrate that in various languages with grammatical evidential markers, evidentiality is related to epistemic modality. First-hand source markers make the information more likely to happen, while non first-hand source markers are found less likely and less reliable for children. Therefore, it is possible to indicate that evidential systems influence people's reliability judgments, which leads us to think about their influence on other cognitive processes such as decision-making.

Aksu-Koc and Alici (2000) measured three- to six-year-old Turkish speaking children's certainty judgments to different evidential sources. In their task, children see a dialog between a Teddy bear and the experimenter. The experimenter asks: *Ayıcık annen nerede?* 'Teddy, where is your mother?' Teddy answers: *Banyoya girmiştir*. 'She must have entered the bath'. Then children are asked if they think that Teddy is certain about this or not. Aksu-Koc and Alici found that as children's age increased they think that Teddy is not certain about what he said. They concluded that evidential source markers

influence Turkish-speaking children's certainty judgments, where non first-hand source markers are perceived as less certain than first-hand source markers.

Öztürk and Papafragou (2005) tested the effect of evidential morphemes on five- to seven-year-old Turkish-speaking children's reliability judgments. They used the hidden object task. Children see two puppets talking about what is in a closed box. One says there is an airplane in the box; the other says there is a helicopter in the box. One of the puppets uses the first-hand source marker while the other puppet uses the non first-hand source marker. Then the children are asked what they think is in the box. The authors found that, in all age groups, children rely on the first-hand source marker and indicate the object was what the puppet who uses first-hand source marker. Further, as the age of the children increased their reliance on the first-hand marker increases. This finding is very similar to Aksu-Koc and Alici's (2000) even though they compared first-hand sources and inference from reasoning.

Similar to other experiments in Turkish, Fitneva (2001, 2008, 2009) investigated trustworthiness loading of evidential markers in Bulgarian. She tested six- to nine-year-old Bulgarian-speaking children. Children were asked to listen to a story about four people in which Person A is looking for what and where Person D is doing and asks Person B and C about Person D. Persons B and C answer her question in two different ways using different source markers. Then the children are asked what they think about where and what Person D is doing. Fitneva found that children prefer to rely on the first-hand source marker over the non first-hand source marker.

Matsui, Yamamoto and McCagg (2006) used the hidden object task to test three- to 7-year-old Japanese speaking children. They compared the effect of source particles (e.g. 'I think') and source morphemes (e.g. *–tte*, as non first-hand source marker) and found that separating the particle from other particles and relying on perceptual particles (as a first-hand source) develops at the age of four in Japanese children, while differentiating the evidential morphemes and relying on the first-hand marker develops by the age of six. In summary, even though it develops later, the first-hand source marker is judged more reliable than non first-hand source marker. Further, Japanese adult speakers also demonstrate the same effect of evidential markers on their reliability judgments. They rely on the first-hand source marker more than the non first-hand source marker (Matsui & Fitneva, 2009; Matsui & Miura, 2009). Likewise, Tibetan-speaking children and adults demonstrate a similar effect. After the age of five, they demonstrate a preference for the first-hand marker in the reliability judgment over the non first-hand source marker in a hidden object task (De Villiers et al., 2009; De Villiers & Garfield, 2009). The authors also state that Tibetan adult speakers prefer to rely on first-hand sources than on non first-hand sources. Moreover, when they are very certain about the described statement, they tend to use first-hand markers in their speech. On the other hand, Papafragou and her colleagues (2007) tested Korean-speaking children and did not find a difference in reliability judgments between first-hand and non first-hand sources. This inconsistent finding disappears with adult participants, who prefer to rely on first-hand markers over non first-hand markers. Therefore, considering that previous studies point to the age of comprehension of evidentiality as six years, the inconsistent

finding of Korean children might be explained by the fact that the oldest child group was four years old.

Taken together, there is a consistent finding on the relationship between certainty and evidentiality: evidential source markers influence people's reliability and certainty judgments. First-hand sources are considered more reliable and trustworthy than non first-hand sources.

In addition to investigations of languages with grammaticalized evidential markers, languages that lexically encode evidentiality have been examined. Moore, Bryant and Furrow (1990) examined English-speaking children's comprehension and attention to mental verbs using the hidden object task. The hidden object's location is described in different ways: '*I know it's in the red box*' vs. '*I think it's in the blue box*'. Moore et al. (1990) found that children after the age of four start using the mental verb cues to answer the question '*Where is the object?*'. In a similar task Moore, Pure and Furrow (1990) manipulated modal verbs and found that by the age of five children rely on *must* statements, '*the candy must be in the red box*', more than *might* statements, '*the candy might be in the blue box*'.

Based on a corpus study, Biber and Finegan (1989) conclude that evidentiality is a type of stance, indicating certainty and doubt. Some adjectives (e.g. *obvious, true*), verbs (e.g. *conclude*), adverbs (e.g. *assuredly*), emphatics (e.g. *for sure*) and predictive modals (e.g. *will*) refer to certainty, while some adjectives (e.g. *alleged*), verbs (e.g. *assume*), adverbs (e.g. *supposedly*), hedges (e.g. *maybe*), possibility modals (e.g. *might*), and necessity modals (e.g. *should*) refer to doubt.

Considering modal auxiliaries as forms of evidentiality in English, Francis and Wales (1994) investigated modal auxiliaries and their certainty and obligation ratings. They asked participants to listen to sentences with various modal auxiliaries (e.g. *must, can*) and to rate the sentences in terms of certainty and obligation. They found that the modal auxiliary *must* was rated the most certain modal and received the highest obligation ratings. In certainty ratings, *can, would, should* follow *must*, respectively. In obligation ratings, the order differs a bit from certainty. *Should* follows *must* in obligation ratings whereas *would* and *can* receive almost equal rating points. The modal *might* receives the lowest rating points from both certainty and obligation ratings.

In a recent study, Tosun and Vaid (2012) investigated the influence of English adverbs referring to evidential sources on reasoning and decision-making processes. Participants were asked to read a short biography about a hypothetical politician. In this biography the key point is the part that mentions that he took hush money. All of the participants received the same biography with one difference on the key point statement's adverbs: *Edward apparently took hush money*. The adverbs were changed from direct (no adverb), to *apparently, allegedly, presumably, reportedly* and one modal*, must have*. After reading the biography participants were asked the question, *How much do you think Edward took as hush money*? The results showed that participants who received the biography in the direct version guessed the highest amount of money, those who received *reportedly, presumably* and *must have* versions guessed a significantly smaller amount of money.

In summary, even though English does not have a grammaticalized evidential structure, lexically encoded evidential sources appear to influence people's certainty judgment and their reasoning and decision-making process. However, more such investigations, using more fine-grained manipulations, are needed to arrive at a clearer understanding of the nature of this influence. Further, direct comparative studies are needed to examine the effect of how evidentiality is marked across different languages on users' judgments of reliability and certainty.

The findings from both grammaticalized and non-grammaticalized evidential languages' investigations demonstrate that evidential markers carry epistemic values as well. However, there are two missing elements in existing studies examining the relationship between evidentiality and epistemic modality. First, the investigations demonstrate the relation only from the perspective of evidentiality. In order to fully understand the relation, we need to look into the epistemic modals and whether they carry evidential information as well. For example, is the situation described by, "John *must* have washed his hands" interpreted as expressing that John most probably washed his hands or as expressing the speaker's inference that John *apparently* washed his hands. By simultaneously examining how modals are interpreted and how evidentials are interpreted – in the same sentence frame – one can more directly address the hypothesized claims about the relation between evidentiality and epistemic modality.

Secondly, almost all of the investigations about grammaticalized evidentiality test the difference between first-hand and non first-hand source of evidence. However, there are other sources of information defined and marked in different languages.

Moreover, in languages, which lexically indicate evidentiality, different source of knowledge can be easily conveyed with various adverbs and adjectives (e.g. “apparently” for inference from results, “reportedly” for hearsay, “presumably” for inference from reasons, and so on). Thus, further investigations need to examine the influence of different evidential markers, their epistemic value, and whether their epistemic values correspond to the hierarchies of evidences, as noted in Section 1.

The Present Research: An Overview

One goal of this research is to shed light on what evidentiality means as a theoretical construct by examining how evidential expressions in two distinct languages are interpreted. From a theoretical view, it is important to clarify the status of evidentiality in terms of the linguistic classification, specifically, whether it is an independent linguistic category (as argued most forcefully by Aikenvald, 2004) or is better understood as a type of epistemic modality. From a practical viewpoint, it is important to clarify how people use and understand evidential utterances, that is, whether they load more values (e.g., epistemic) other than source of information and whether they trust a particular source more than other sources. Most of the discussions on evidentiality have been undertaken at a theoretical and linguistic level. Another goal of the research is to understand how evidential expressions are interpreted explicitly and implicitly.

With these goals in mind, two studies were conducted. The first investigation used an experimental approach to examine how people interpret sentences when they are

presented in the form of evidential or modal sentences. For each presented version, participants were asked to explicitly judge whether source of knowledge is coded in the sentence and their degree of confidence that the asserted event actually occurred. The aim of the study was to examine whether only source information comes to mind when the sentence is presented in an evidential form and whether only certainty information comes to mind when the sentence is presented in a modal form, or whether both types of information are activated in each presented form.

This study is the first systematic attempt to directly investigate the relationship between evidentiality and modality using speaker judgments. It was expected that in both languages evidentiality would convey epistemic value of the given information along with the source of information, and modality conveys source of information along with the epistemic value of the reported event, although the speakers of the two languages under investigation may weight the different kinds of information differently. It is expected that Turkish speakers interpret the source and epistemic value of evidential expressions in more variation, because each evidential expression is defined in the grammar in terms of the source of knowledge. Assuming that each source conveys different degree of epistemic value, Turkish speakers may interpret the epistemic value of evidential expressions in more variety. On the other hand, English speakers are expected to show less variety across the expressions in interpreting evidential expressions, because those expressions are not defined in the grammar and the linguistic scholars have not reached a consensus on the interpretations of evidential adverbial expressions. There are some unclear areas in the meaning of these expressions, where

different evidential expressions may be interpreted as the same source of evidence. Thus, they may be interpreted as conveying the same degree of epistemic value.

The second investigation also used an experimental approach. This study examined to what extent individuals trust different sources of knowledge presented in discourse context. In addition to its theoretical relevance, the aim of this study was to observe whether speakers' decision-making is actually affected by how they interpret different evidential terms. Unlike Study 1, Study 2 did not solicit explicit judgments. Instead, the study examined implicit processing of source or confidence. Participants in Study 2 were asked to read two sentences with differing and even contradictory source markers and to generate a third sentence that completes (makes sense of) the preceding context. It was expected that in both languages, the influence of degree of certainty would vary by the type of evidential marking and influence individuals' decisions to resolve the dissonance in the discourse. If the evidential marking of a given sentence is judged a greater degree of certainty than the evidential marking of the following sentence, then it is expected that the third sentence is completed by reliance on the fact of the first sentence.

Taken together, these two studies allow insights into the scope of evidential marker use in Turkish and English. Specifically, Study 1 examines how speakers explicitly judge source of evidence information for sentences containing evidential markers vs. the same sentences containing modals, and also how confident they are that the asserted event actually occurred (when the sentences are described using evidentials vs. modals). Study 2 examines speakers' judgments about source and confidence

indirectly (implicitly) by studying the relative salience of different factors in affecting language users' judgments. Further, the first study allows us to provide an explanation to a long-standing theoretical debate on the status of evidentiality, and the second study examines how evidential expressions inform language users' judgments. Together, the studies aim to contribute to a better understanding of how evidential expressions are used and influence behavior.

STUDY 1: INTERPRETATION OF EVIDENTIALITY AND MODALITY

This experiment was designed to address the nature of the relationship between evidentiality and modality, using a sentence interpretation task in which participants were asked to make judgments of source and confidence for sentences containing either modal or evidential markers.

Although no previous empirical study has directly examined this issue, there is some indirect evidence from developmental studies. These studies tested comprehension of source of information beginning with the assumption that first-hand sources would be perceived as more trustworthy than second-hand sources. The studies were designed to test how children regard various sources of information in terms of their degree of confidence and trust. The main findings were that children ascribed different degrees of certainty to different sources (e.g., Aksu-Koc & Alici, 2000; Fitneva, 2001; Matsui & Miura, 2009; Öztürk & Papafragou, 2005). First-hand sources were trusted more than second-hand sources.

Based on a corpus study of English, Biber and Finegan (1989) stated that some evidential adjectives (e.g. *alleged*), verbs (e.g. *assume*), adverbs (e.g. *supposedly*), as well as modals of possibility (e.g. *might*), and necessity (e.g. *should*) refer to doubt. This study, together with the developmental findings, would suggest that evidentiality is not an independent linguistic property conveying only source of knowledge.

Investigating certainty ratings for different modal auxiliaries, Francis and Wales (1994) found that *must* was rated as the modal with the highest degree of certainty,

followed by *can, would, should* and *might.* Some linguists have argued that at least some modals also convey source of information. Faller (2002), von Fintel and Gillies (2010) and van der Auwera and Plungian (1998) noted that the modal *must* indicates an inferential source. However, there is no empirical investigation of whether modality markers convey information other than the epistemic value or degree of certainty of the reported event.

The present study is the first that directly investigates both the source and degree of confidence interpretations of both evidential and modal sentences in speakers of two different languages, Turkish and English. Participants were given evidential sentences (e.g., *Apparently Jennifer forgot to feed the cat*) and modal sentences (e.g., *Jack must have passed the math test*) and were asked to judge both the source of the proposition of a given sentence and their confidence in terms of whether the reported event actually happened. The findings will inform the debate on the four proposed views of the relationship between evidentials and modals, namely, the complete disjointment, inclusion, partial overlap or identity accounts.

It is hypothesized that participants (Turkish and English speakers alike) will find enough information to make both types of judgments (source and certainty) for both evidential and modal sentences. If this is found to be the case, it would show that language speakers can derive source information from modal sentences and epistemic value from evidential sentences. This in turn would provide support for the position that there is a close relationship between evidentiality and modality. Of the four views, only the *complete disjointment* view claims zero relationship between evidentiality and

modality. It is expected that this view will be disproved, as participants indicate that there is enough information to interpret the source of a modal expressions and to interpret the certainty of an evidential expression. Further, participants' rate of finding enough information to interpret source of modal expressions and to interpret certainty of evidential expressions would demonstrate the nature of the relationship.

Further, studying the performance of speakers of two different languages will allow us to examine whether the pattern of response is influenced by how evidentials are marked in the language. It is hypothesized that Turkish speakers' source and confidence judgments of evidential sentences will show more variation across the different evidential expressions. That is, because evidentiality is defined by the grammar rules, certain markers are assigned for certain sources of knowledge. Turkish speakers will interpret the sources of each evidential expression how they are defined in the grammar. Similarly, if each source may conveys different degrees of certainty, then Turkish speakers will also interpret the degree of certainty of evidence expressions at various levels. Modal expressions in Turkish, however, have not been studied empirically or claimed to have clearly specified degrees of certainty. Kerimoglu (2010) examined the modal indication in Turkish including suffixes, morphosyntactic structures and lexicons, but did not mention Turkish speakers interpretations of modal expressions. Therefore, there is no basis to predict how Turkish speakers will interpret modal expressions.

On the other hand, English speakers will show a comparable pattern for modal expressions. That is, modal expressions in English are defined more meticulously and it was already demonstrated that there is a variation in conveying degree of certainty

across modal expressions (Francis & Wales, 1994). It is expected that English speakers will interpret the source of modal expressions at various levels as they interpret their degree of certainty. Further, because evidentiality is not defined by the grammar of English, the meaning or the source of evidential expressions will be interpreted according to how speakers use them. In the evidentiality literature, some adverbial evidential expressions are claimed to convey various source indications whereas some evidential expressions are claimed to include the same source indication. For example *apparently* is considered as inference by some scholars (e.g. Gisborne & Holmes, 2007; Izvorski, 1997), and as hearsay by other scholars (e.g., Chafe, 1986; Mushin, 2001) while the adverb *reportedly* is also considered as hearsay (Aikhenvald, 2004). Thus, it is expected that English speakers will demonstrate less variety in the interpretation across evidential expressions.

In addition to the theoretical motivation underlying the analysis, the study allows us to test previously untested intuitions about how specific evidential expressions in English are typically interpreted. The expressions used in the study (*reportedly, apparently, presumably and supposedly*) were selected according to linguistic scholars' predictions (e.g., Aikhenvald, 2004; Chafe, 1986; Gisborne & Holmes, 2007; Izvorski, 1997; Mushin, 2001). Although there is a consensus on the source of evidence of some adverbs, such as *reportedly* as hearsay and *presumably* as assumption, there are some adverbs over which linguistic scholars have not reached an agreement yet, as in the above example of *apparently*. Similarly, *supposedly* is considered as conjecture in some contexts and as hearsay within a different context (Chafe, 1986). The present study will

shed light on this issue by bringing empirical observations to bear on whether the predictions of these linguists correspond to language speakers' actual interpretations.

Method

Participants

A total of 50 Turkish-speaking participants (45 females, and 5 males) and 60 English-speaking participants (40 females, and 20 males) were recruited from a university in the U.S. (College Station, TX) and in Turkey (Istanbul). Turkish speakers' ages ranged from 19 to 27, with a mean age of 22.6. Participants from Turkey used Turkish as their first and primary language. Although most of these participants had also studied English and/or Arabic, they considered themselves as monolingual because their knowledge of these other languages was at the beginner level. English speakers' ages ranged from 17 to 20 with a mean age of 18.55. They were also essentially monolingual speakers.

Material and design

A total of 80 declarative sentences were prepared. Each sentence was in the active voice, third person singular form and contained a verb in the past tense. The sentences were presented in two formats: Evidential and Modal. Within each format there were four types. For the evidential condition, the types were Hearsay ('reportedly'), Inference ('apparently'), Assumption ('presumably'), and Conjecture ('supposedly'). For the modal condition the types were 'must', 'should', 'could', and 'might'. A sample set of stimuli is given below:

Evidential samples

Hearsay: *Reportedly* the girl worked out for an hour yesterday.

Duyduğuma göre kız dün bir saat spor yap*mış*.

Inference: *Apparently* the girl worked out for an hour yesterday.

Görünüşe göre kız dün bir saat spor yap*mış*.

Assumption: *Presumably* the girl worked out for an hour yesterday.

Kız dün bir saat spor yap*mıştır*.

Conjecture: *Supposedly* the girl worked out for an hour yesterday.

Kız dün bir saat spor yap*mışmış*.

Modal samples

Must: The girl *must have* worked out for an hour yesterday.

Kız dün bir saat spor yap*mış olmalı*.

Should: The girl *should have* worked out for an hour yesterday.

Kız dün bir saat spor yap*malıydı*.

Could: The girl *could have* worked out for an hour yesterday.

Kız dün bir saat spor yap*mış olabilir*.

Might: The girl *might have* worked out for an hour yesterday.

Kız dün bir saat spor yap*mış olabilir*.

The Form variable (Evidential vs. Modal) was manipulated within subjects. The total of 80 sentences were arranged in such a way that 10 sentence blocks were presented in each of the 8 types (four types per form condition). The sentences were presented in a fixed random order.

Two dependent variables were examined, namely, source judgments and epistemic value (confidence) judgments. For source judgments, participants were instructed to decide the source of information of each sentence based on 4 options: Hearsay, Inference, Assumption, and Conjecture. They were also able to choose the option of "not enough information for this decision". For confidence judgments, participants were instructed to decide how confident they were that the event referred to in the sentence actually happened: Extremely, Quite, Somewhat, or Not at all confident. They also had an option of choosing "not enough information for this decision" (see Appendix A for a copy of the instructions). The two tasks were conducted 1 or 2 days apart and the order of the task was counterbalanced. The experiment was paper-pencil based. Participants were tested only in their primary language (Turkish or English).

Procedure

The experiment was administered in groups. Participants received a booklet containing 80 sentences with instructions to make either source or confidence judgment (see Appendix B). One or two days after they completed the first task they received the other task. The sentence order of the second task was the same as that in the first task. At the end of the experiment participants were asked to complete a language background questionnaire to determine the extent of their knowledge of any other language besides their primary language.

Data coding and analysis

The data from the two tasks (source judgments and confidence judgments) were analyzed separately.

An initial analysis was conducted of the relative proportion of the 'not enough information' (NEI) response option selected for each of the form types. For example, the proportion of NEI responses to the hearsay sentence form was computed for the 10 sentences with the adverb 'reportedly'. The same computation was done for all other sentence forms. Further, the same NEI computation was followed for the confidence judgment analysis. After that, an overall mean NEI proportion was computed for evidential sentences, which included four evidential sentence forms and for modal sentences, which included four modal sentence forms. A 2 (Sentence form: Evidential vs. Modal) x 2 (Language: Turkish vs. English) ANOVA was conducted.

A second set of analyses were then performed on the source judgments per form type by comparing the relative proportion of each source option selection out of the total source judgments made for each evidential and modal sentence form, excluding the NEI option. For example, for hearsay sentences (with the adverb 'reportedly' for English) the relative proportion of hearsay judgments was examined based on the total number of source judgments. The same computation was done for each source response for each sentence form. This detailed coding made it easier to see the pattern of choices for each evidential source and modal.

A third set of analyses examined confidence judgments per sentence form type. These were computed by weighting the judgments. 'Extremely confident' responses were weighted by 3, 'quite confident' were weighted by 2 and 'somewhat confident' were weighted as 1; 'not at all confident' responses were weighted as 0. The total points

were standardized as percentages so that the highest confidence level would be 100% and the lowest confidence level would be 0%.

To summarize, three analyses were conducted. The first compared Turkish and English speaking participants' relative use of the response option, 'not enough information' for both source and confidence judgments. The second analysis was conducted to compare English and Turkish speakers' responses on source judgments. The first part of the second analysis compared source judgments of English and Turkish speakers within each sentence form. With this analysis the distribution of source interpretations for a given sentence form was examined. The second part of the second analysis was conducted to compare a given source judgment (e.g., hearsay) between sentence forms for Turkish and English speakers. With this analysis which sentence form was interpreted as a given source type was tested. Finally the third analysis examined the confidence judgments of sentence forms for Turkish and English speakers.

For all analyses, significance was set at $p < .05$ and partial eta η_p^2 is reported as the measure of effect size.

Results

Analysis of 'not enough information' response option by sentence form and language

A 2 (Sentence form: Evidential vs Modal Sentence) x 2 (Language: Turkish v. English) repeated measures ANOVA was conducted separately on "not enough information" (NEI) responses for both source and confidence judgments. For the

purpose of this analysis, the four types within each sentence form were averaged. Overall descriptive statistics are summarized in Table 1.

Table 1

Turkish and English Speaking Participants' Mean Percent NEI Responses on Source and Confidence Judgments to Evidential and Modal Sentence Forms

Sentence Form		Turkish (n=50)	English (n=60)
Source Judgment	Evidential	8.32 (9.61)	.46 (1.34)
	Modal	11.18 (12.08)	3.34 (8.23)
Confidence Judgment	Evidential	8.83 (12.99)	1.21 (4.73)
	Modal	8.55 (9.88)	3.17 (7.13)

Note. Standard deviations are indicated in parenthesis.

Source judgments. A significant sentence form main effect was found, F (1, 94) = 7.29, $p < .01$, $\eta_p^2 = .07$. Participants responded with NEI more frequently to modal than evidential sentences. The language main effect was also found significant, F (1, 94) = 34.3, $p < .001$, $\eta_p^2 = .27$. Turkish speakers gave significantly more NEI responses than English speakers. A Sentence Form by Language interaction, however, did not emerge, F (1, 94) = .002, $p = .97$.

Confidence judgments. A significant Language main effect was found, F (1, 93) = 18.68, $p < .001$, $\eta_p^2 = .17$. Turkish speakers showed a higher number of 'not enough information' responses than English speakers when asked to judge how confident they

were that the asserted event had actually occurred. There was no main effect of Sentence form, F (1, 93) = .72, p = .4. Further, the Sentence form by Language interaction was not significant, F (1, 93) = 1.26, p = .26.

Analyses of source judgment responses excluding NEI response option

In this analysis, source judgments to each of the four evidential sentence forms and each of the four modal sentence forms were examined as a function of four source judgments types and by group. A 4 (Judgment Type: Hearsay v. Inference v. Assumption v. Conjecture) x 2 (Language: Turkish v. English)[3] repeated measures ANOVA was conducted for each sentence form separately. The results are displayed in Figure 6 for evidential sentence forms and in Figure 7 for modal sentence forms (see Appendix C for the summary table of the source judgment analyses).

Hearsay sentence form. The analysis of sentences containing the hearsay form (e.g. *Reportedly Jack passed the math test*) revealed a significant Judgment Response main effect, F (3, 324) = 64.16, $p < .001$, $\eta_p^2 = .37$. When asked to judge the source of sentences with the hearsay sentence form, participants chose "Hearsay" significantly more frequently than "Inference" (t (109) = 10.09, $p < .001$), "Assumption" (t (109) = 11.06, $p < .001$) or "Conjecture" (t (109) = 6.11, $p < .001$). Conjecture responses were in turn chosen significantly more frequently than Inference (t (109) = 2.65, p = .01) or Assumption (t (109) = 3.34, $p < .001$). Participants' Inference and Assumption responses did not differ from each other.

[3] A Language main effect was not expected in any sentence form analyses because for both Turkish and English speakers total percentages of the response options added up to100%.

There was no main effect of language, but a Judgment Response by Language interaction was significant, F (3, 324) = 25.61, $p < .001$, $\eta_p^2 = .19$. Turkish speakers chose "Hearsay" more frequently than "Inference" (t (49) = 3.47, $p < .001$) and "Assumption" (t (49) = 3.9, $p < .001$), but were as likely to choose "Conjecture" as "Hearsay". On the other hand, for English speakers, Hearsay was the most frequent response and it was chosen significantly more frequently than Inference (t (59) = 12.94, $p < .001$), Assumption (t (59) = 14.41, $p < .001$) and Conjecture (t (59) = 12.85, $p < .001$). The other responses did not differ from one another.

Inference sentence form. The analysis of the Inference sentence form (e.g. *Apparently Jack passed the math test*) demonstrated a significant Judgment Response main effect, F (3, 324) = 35.78, $p < .001$, $\eta_p^2 = .25$. Overall, Inference responses were chosen significantly more frequently than Assumption (t (109) = 6.6, $p < .001$) and Conjecture (t (109) = 8.13, $p < .001$), but equally frequently as Hearsay responses (t (109) = .55, $p = .58$). Moreover, Hearsay responses were chosen more frequently than Assumption (t (109) = 5.49, $p < .001$) and Conjecture (t (109) = 7.05, $p < .001$). Finally, Assumption responses were chosen more frequently than Conjecture (t (109) = 2.09, $p < .05$).

Further, a Judgment Response by Language interaction emerged as well, F (3, 324) = 27.7, $p < .001$, $\eta_p^2 = .20$. Turkish speakers' judgments of Inference sentences as Inference were more frequent than Hearsay (t (49) = 5.62, $p < .001$), Assumption (t (49) = 6.98, $p < .001$) and Conjecture (t (49) = 8.46, $p < .001$). There was no difference between Hearsay and Assumption responses (t (49) = 1.02, $p = .31$); however, Hearsay

responses were more frequent than Conjecture (t (49) = 2.32, p = .025) responses. On the other hand, for English speakers, Hearsay responses were the most frequent response to Inference sentence form and they were significantly higher than Inference (t (59) = 3.85, p < .001), Assumption (t (59) = 6.31, p < .001) and Conjecture (t (59) = 7.57, p < .001). The second common answer was Inference and it was significantly more frequent than Assumption (t (59) = 2.68, p < .01) and Conjecture (t (59) = 3.84, p < .001). There was no difference between Assumption and Conjecture (t (59) = 1.28, p = .2) responses.

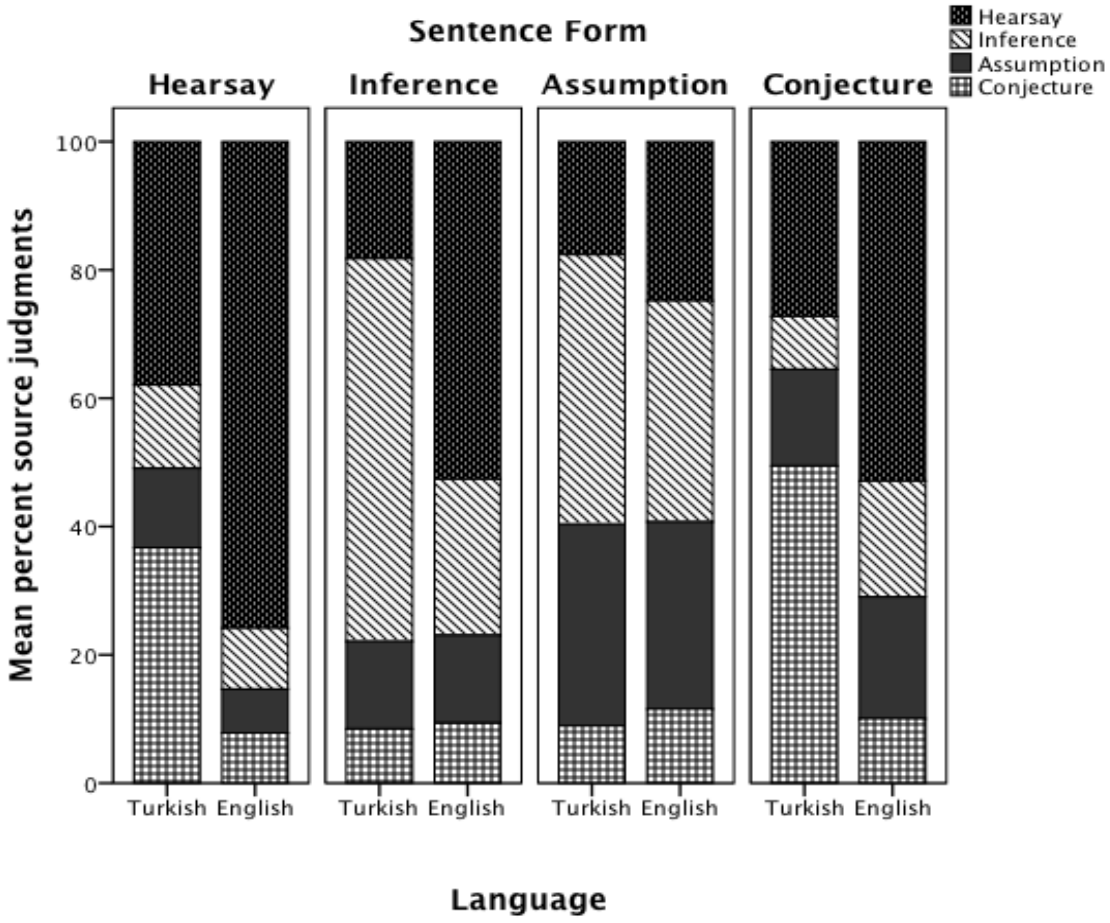

Figure 6. Mean percent source judgment responses to evidential sentence forms of Turkish and English speakers.

Assumption sentence form. The results of the assumption sentence forms (e.g. *Presumably Jack passed the math test*) demonstrated a significant Judgment Response main effect, F (3, 321) = 19.49, $p < .001$, $\eta_p^2 = .15$. The most frequent source judgment for the assumption sentence form was Inference and that response was significantly more common than Hearsay (t (108) = 3.82, $p < .001$), and Conjecture (t (108) = 8.46, $p < .001$). The second common response was Assumption and it was significantly more frequent than Hearsay (t (108) = 1.98, $p = .051$) and Conjecture (t (108) = 5.83, $p < .001$). However Inference and Assumption responses did not differ (t (108) = 1.72, $p = .09$). A Judgment Response by Language interaction did not emerge, F (3, 321) = 1.35, $p = .26$. Turkish and English speakers exhibited similar source judgment patterns to Assumption sentences.

Conjecture sentence form. The conjecture sentence form (e.g. *Supposedly Jack passed the math test*) analysis revealed a significant Judgment Response main effect, F (3, 324) = 16.75, $p < .001$, $\eta_p^2 = .13$. Post hoc analyses revealed that the most frequent two responses were Hearsay and Conjecture. Hearsay responses were significantly more frequent than Inference (t (109) = 6.01, $p < .001$), Assumption (t (109) = 4.93, $p < .001$) and Conjecture (t (109) = 2.16, $p = .033$). Conjecture responses were also more frequent than Inference (t (109) = 3.44, $p < .001$) and Assumption (t (109) = 2.39, $p = .018$). Further, there was no difference between Inference and Assumption, (t (109) = 1.34, $p = .18$).

Further, a Judgment Response by Language interaction was significant, F (3, 324) = 21.47, $p < .001$, $\eta_p^2 = .17$. The source judgment pattern of Turkish and English

speakers was significantly different. Turkish speakers judged conjecture sentences as Conjecture more frequently than Hearsay (t (49) = 2.19, p = .022), Inference (t (49) = 6.34, p < .001) and Assumption (t (49) = 4.62, p < .001). On the other hand, English speakers judged conjecture sentences as Hearsay more frequently than Inference (t (59) = 5.06, p < .001), Assumption (t (59) = 4.82, p < .001) and Conjecture (t (59) = 7.38, p < .001).

I now turn to the analysis of the four modal sentence forms.

'Must' sentence form. The analysis 'must' sentences (e.g. *Jack must have passed the math test*) demonstrated a significant Judgment Response main effect, F (3, 321) = 56.89, p < .001, η_p^2 = .35. The most common judgment responses to 'must' sentences were Inference and Assumption. Both responses were significantly more frequent than Hearsay [Inference v. Hearsay: t (108) = 11.18, p < .001; Assumption v. Hearsay: (t (108) = 10.29, p < .001] and Conjecture [Inference v. Conjecture: t (108) = 8.56, p < .001; Assumption v. Conjecture: t (108) = 8.66, p < .001]. The difference between Assumption and Inference was not significant, t (108) = .45, p = .65.

Further, a Judgment Response by Language interaction was also significant, F (3, 321) = 3.85, p < .01, η_p^2 = .035. Turkish and English speakers were equally likely to judge 'must' sentences as Inference, t (107) = 1.55, p = .12. However, English speakers selected Assumption more than Turkish speakers, (t (107) = 2.14, p < .05). Turkish speakers made more Hearsay judgments than English speakers, t (107) = 2.99, p < .01. There was no difference between Turkish and English speakers' frequency of selection of Conjecture responses, t (107) = 1.58, p = .12.

'Should' sentence form. The results of 'should' sentences (e.g. *Jack should have passed the math test*) showed that there was a significant Judgment Response main effect, F (3, 297) = 12.4, $p < .001$, $\eta_p^2 = .11$. Inference was the most common response and significantly more frequent than Hearsay (t (100) = 7.12, $p < .001$) and Conjecture (t (100) = 2.05, $p < .05$). Although Assumption was significantly more frequent than Hearsay (t (100) = 5.03, $p < .001$), it was equally frequent as Inference (t (100) = 1.32, $p = .19$) and Conjecture (t (100) = .8, $p = .42$).

Further, a Judgment Response by Language interaction emerged, F (3, 297) = 3.86, $p < .01$, $\eta_p^2 = .04$. The pattern of English and Turkish speakers' source judgments were different. For Turkish speakers the most frequent response was Inference and it was a significantly more common response than Hearsay (t (40) = 4.78, $p < .001$), Assumption (t (40) = 2.37, $p < .05$) and Conjecture (t (40) = 3.62, $p < .001$). Assumption was the second most frequent answer and it was more common than Hearsay (t (40) = 2.41, $p = .02$). On the other hand, English speakers' judgments were equally distributed for Inference, Assumption, and Conjecture [Inference v. Assumption: t (59) = .19, $p = .85$; Inference v. Conjecture: t (59) = -.18, $p = .85$; Assumption v. Conjecture: t (59) = -.01, $p = .99$]. Hearsay judgment was the least frequent response [Hearsay v. Inference: t (59) = -5.36, $p < .001$; Hearsay v. Assumption: t (59) = -4.5, $p < .001$; Hearsay v. Conjecture: t (59) = -4.35, $p < .001$].

'Could' sentence form. The analysis of 'could' sentences (e.g. *Jack could have passed the math test)* revealed a significant Judgment Response main effect, F (3, 303) = 24.7, $p < .001$, $\eta_p^2 = .2$. The most frequent source responses to 'could' sentences were

Inference and Assumption. They were significantly more common than Hearsay and Conjecture [Inference v. Hearsay: t (102) = 6.75, $p < .001$; Inference v. Conjecture: t (102) = 3.68, $p < .001$; Assumption v. Hearsay: t (102) = 7.68, $p < .001$; Assumption v. Conjecture: t (102) = 4.89, $p < .001$]. Inference and Assumption response frequency did not differ from each other, t (102) = 1.19, $p = .24$. Finally Conjecture responses were more frequent than Hearsay, t (102) = 2.53, $p < .05$.

In addition, a Judgment Response by Language interaction was significant, F (3, 303) = 3.81, $p < .01$, $\eta_p^2 = .04$. The response pattern of English speakers was different from Turkish speakers. Turkish speakers judged *could* sentences as Inference and Assumption more frequently than Hearsay and Conjecture [Inference v. Hearsay: t (42) = 4.59, $p < .001$; Inference v. Conjecture: t (42) = 5.07, $p < .001$; Assumption v. Hearsay: t (42) = 4.49, $p < .001$; Assumption v. Conjecture: t (42) = 4.85, $p < .001$]. No difference was found between Inference and Assumption, t (42) = .2, $p = .84$; and between Hearsay and Conjecture, t (42) = .46, $p = .64$. On the other hand, English speakers judged *could* sentences as Assumption more frequently [Assumption v. Hearsay: t (59) = 6.23, $p < .001$; Assumption v. Conjecture: t (59) = 2.54, $p = .014$; Assumption v. Inference: t (59) = 1.92, $p = .059$] followed by Inference and Conjecture. The Inference response was more frequent than Hearsay, t (59) = 4.97, $p < .001$; however, it was as frequent as Conjecture, t (59) = .86, $p = .39$. Finally Conjecture responses were more common than Hearsay responses, t (59) = 3.36, $p < .001$.

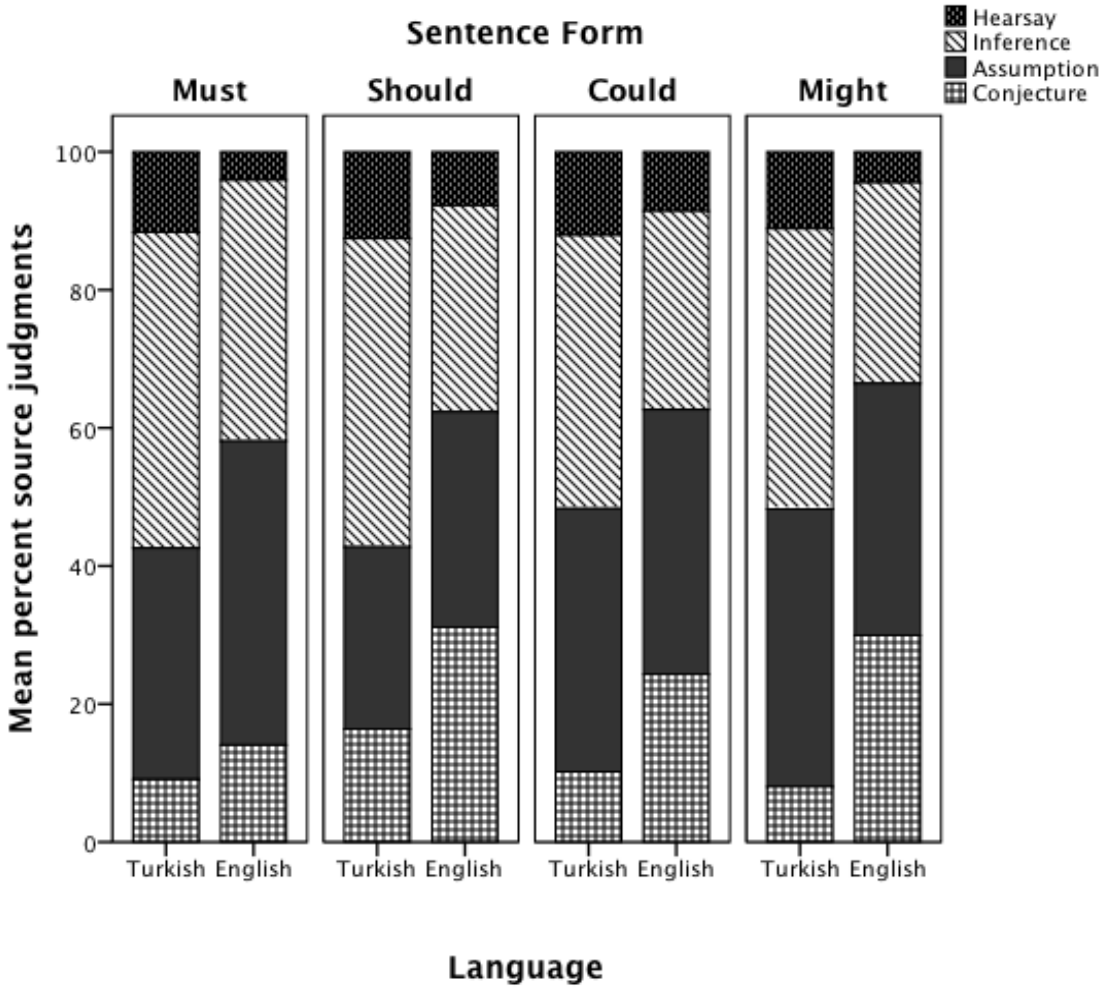

Figure 7. Mean percent source judgment responses to modal sentence forms of Turkish and English speakers.

'Might' sentence form. The analysis of 'might' sentences (e.g. *Jack might have passed the math test*) demonstrated that there was a significant Judgment Response main effect, F (3, 324) = 31.19, $p < .001$, $\eta_p^2 = .22$. Similar to the 'could' sentence form results, participants judged 'might' sentences more often as Inference and Assumption than Hearsay and Conjecture [Inference v. Hearsay: t (109) = 8.79, $p < .001$; Inference v. Conjecture: t (109) = 3.47, $p < .001$; Assumption v. Hearsay: t (109) = 9.42, $p < .001$;

and Assumption v. Conjecture: t (109) = 4.46, $p < .001$]. There was no difference between Inference and Assumption, t (109) = .87, $p = .39$. Finally Conjecture was chosen more often than Hearsay, t (109) = 4.15, $p < .001$.

Further, a Judgment Response by Language interaction emerged, F (3, 324) = 8.61, $p < .001$, $\eta_p^2 = .07$. The source judgment pattern of 'might' sentences differed among Turkish and English speakers, similar to the other modal sentence forms. English speakers judged 'might' sentences equally frequently as Inference, Assumption and Conjecture [Inference v. Assumption: t (59) = -1.41, $p = .16$; Inference v. Conjecture: t (59) = -.15, $p = .88$; Assumption v. Conjecture: t (59) = 1.11, $p = .27$]. Further all of the three sources were significantly more frequently selected than Hearsay [Inference v. Hearsay: t (59) = 7.3, $p < .001$; Assumption v. Hearsay: t (59) = 9.52, $p < .001$; Conjecture v. Hearsay: t (59) = 6.35, $p < .001$]. On the other hand, Turkish speakers selected Inference and Assumption sources as the most common and these sources were more frequent than Hearsay and Conjecture [Inference v. Hearsay: t (49) = 5.56, $p < .001$; Inference v. Conjecture: t (49) = 6.54, $p < .001$; Assumption v. Hearsay: t (49) = 4.88, $p < .001$; and Assumption v. Conjecture: t (49) = 6.58, $p < .001$]. Further, Inference and Assumption (t (49) = .05, $p = .96$) did not differ from each; neither did Hearsay and Conjecture (t (49) = .89, $p = .37$). Overall results of the source judgment analysis are summarized in Table 2.

Table 2

A Summary of Source Judgment Analysis

Sentence Form	**Turkish Speakers' Source Judgments**	**English Speakers' Source Judgments**
Hearsay	H = C >I = A	H >I = A = C
Inference	I > H =A > C	H > I > A = C
Assumption	I ≥ A >H > C	I ≥ A >H > C
Conjecture	C > H > I = A	H > I = A = C
Must	I > A > H = C	A = I > C > H
Should	I > A > H = C	C = I = A > H
Could	I = A > H = C	A ≥ I = C > H
Might	I =A > H = C	A = I = C > H

Note. H = Hearsay, I = Inference, A = Assumption, and C = Conjecture

Analysis of confidence judgments excluding the not enough information response option

Participants' total confidence judgment scores for each sentence form were analyzed in a 4 (Sentence Form: Hearsay v. Inference v. Assumption v. Conjecture) x 2 (Language: Turkish v. English) repeated measures ANOVA for evidential sentence forms. A separate 4 (Sentence Form: Must v. Should v. Could v. Might) x 2 (Language: Turkish v. English) repeated measures ANOVA was conducted for modal sentence forms (see Appendix D for the summary table of the confidence judgment analysis).

Evidential sentences. The evidential sentence form analysis revealed a significant Sentence Form main effect, F (3, 324) = 35.02, $p < .001$, $\eta_p^2 = .25$. Hearsay and Inference sentences received the highest confidence scores. The scores of the two source types did not differ from each other (t (109) = .63, $p = .53$), while they were significantly greater than other sentence forms [Hearsay v. Assumption: t (109) = 2.14, $p = .03$; Hearsay v. Conjecture: t (109) = 8.03, $p < .001$; Inference v. Assumption: t (109) = 3.42, $p < .001$; Inference v. Conjecture: t (109) = 7.57, $p < .001$]. Conjecture was judged the lowest in confidence level and significantly less than Assumption (t (109) = 5.47, $p < .001$). The Language effect was significant as well, F (1, 108) = 13.05, $p < .001$, $\eta_p^2 = .11$. Overall English speakers' confidence scores were significantly greater than Turkish speakers.

Further, a Sentence Form by Language interaction emerged, F (3, 324) = 23.56, $p < .001$, $\eta_p^2 = .18$. Confidence judgment patterns of evidential sentence forms differ for Turkish speakers and English speakers (see Figure 8). Turkish speakers demonstrated more variation in their confidence judgments of evidential sources. For Turkish speakers, the most confident source was Inference, and it was significantly greater than other sources (Hearsay: t (49) = 4.89, $p < .001$; Assumption: t (49) = 2.48, $p = .02$; Conjecture: t (49) = 7.56, $p < .001$). The second confident source was Assumption and it was significantly greater than Hearsay (t (49) = 2.1, $p < .05$) and Conjecture (t (49) = 6.14, $p < .001$) sources. The third confident source was Hearsay and it was judged more confident than Conjecture, so that conjecture had the lowest confidence score (t (49) = 4.35, $p < .001$).

On the other hand, English speakers showed less variation in their confidence judgments of evidential sentences. Hearsay was the most confident source for English speakers and it was significantly greater than other sources (Inference: t (59) = 4.18, p < .001; Assumption: t (59) = 6.89, p < .001; and Conjecture: t (59) = 7.25, p < .001). Inference was the second most confident source and was significantly greater than Assumption (t (59) = 2.42, p = .02) and Conjecture (t (59) = 4.19, p < .001). However, there was no difference between the sources of Assumption and Conjecture (t (59) = 1.44, p = .17). Further, English speakers' confidence scores for Hearsay and Conjecture sources were significantly higher than those for Turkish speakers [Hearsay: t (109) = 5.76, p < .001; and Conjecture: t (108) = 5.81, p < .001] while the confidence scores of Inference and Assumption did not differ between Turkish and English speakers [Inference: t (108) = 1.6, p = .11; Assumption: t (108) = .46, p = .64].

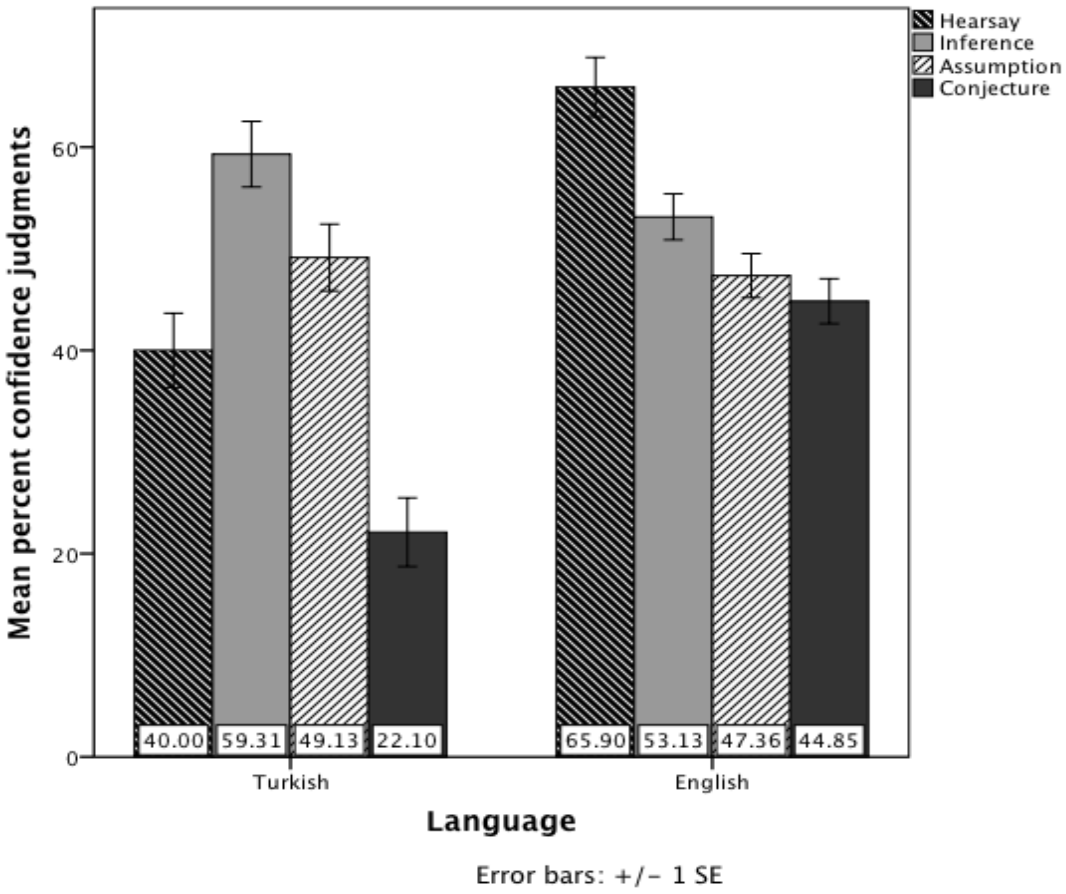

Figure 8. Mean percent confidence judgment of evidential sentences by sentence type and group.

Modal sentences. Modal sentences' confidence judgment analysis demonstrated a significant Sentence Form main effect, F (3, 282) = 11.9, $p < .001$, $\eta_p^2 = .11$. The modal 'Must' was judged as the most confident modal and its confidence level was significantly higher than that of the other modals [Should: t (102) = 3.01, $p = .003$; Could: t (102) = 4.84, $p < .001$; Might, t (109) = 6.93, $p < .001$]. Should and Could sentence confidence levels did not differ from each other (t (95) = 1.76, $p = .08$), but were significantly higher than Might sentences [Should v. Might: t (102) = 2.89, p

= .005; Could v. Might: t (102) = 2.28, p = .03]. The Language main effect was not significant, F (1, 94) = 2.92, p = .09.

A Sentence Form by Language interaction was significant, F (3, 282) = 3.94, p < .01, η_p^2 = .04. Turkish speakers and English speakers demonstrated different confidence patterns for modal sentences (see Figure 9). Turkish speakers judged all modal sentences similarly in terms of the confidence level that they convey. The only difference was between Must and Might sentences, (t (49) = 3.07, p = .004), where Must sentences were judged more confident than Might sentences. The other modal sentence forms did not differ from one another [Must v. Should: t (42) = .15, p = .88; Must v. Could: t (42) = 1.61, p = .12; Should v. Could: t (35) = 1.21, p = .23; Should v. Might: t (42) = 1.69, p = .1; Could v. Might: t (42) = 1.08, p = .28].

On the other hand, English speakers exhibited more variation and a strong confidence order among modal forms. The modal Must was judged as the most confident form and its confidence level was significantly higher than other modal forms [Should: t (59) = 3.49, p < .001; Could: t (59) = 4.81, p < .001; Might: t (59) = 6.7, p < .001]. Should and Could sentences did not reveal a significant difference in their confidence level, t (59) = 1.27, p = .21; while their confidence scores were significantly greater than Might sentences [Should v. Might: t (59) = 2.35, p = .02; and Could v. Might: t (59) = 2.02, p < .05].

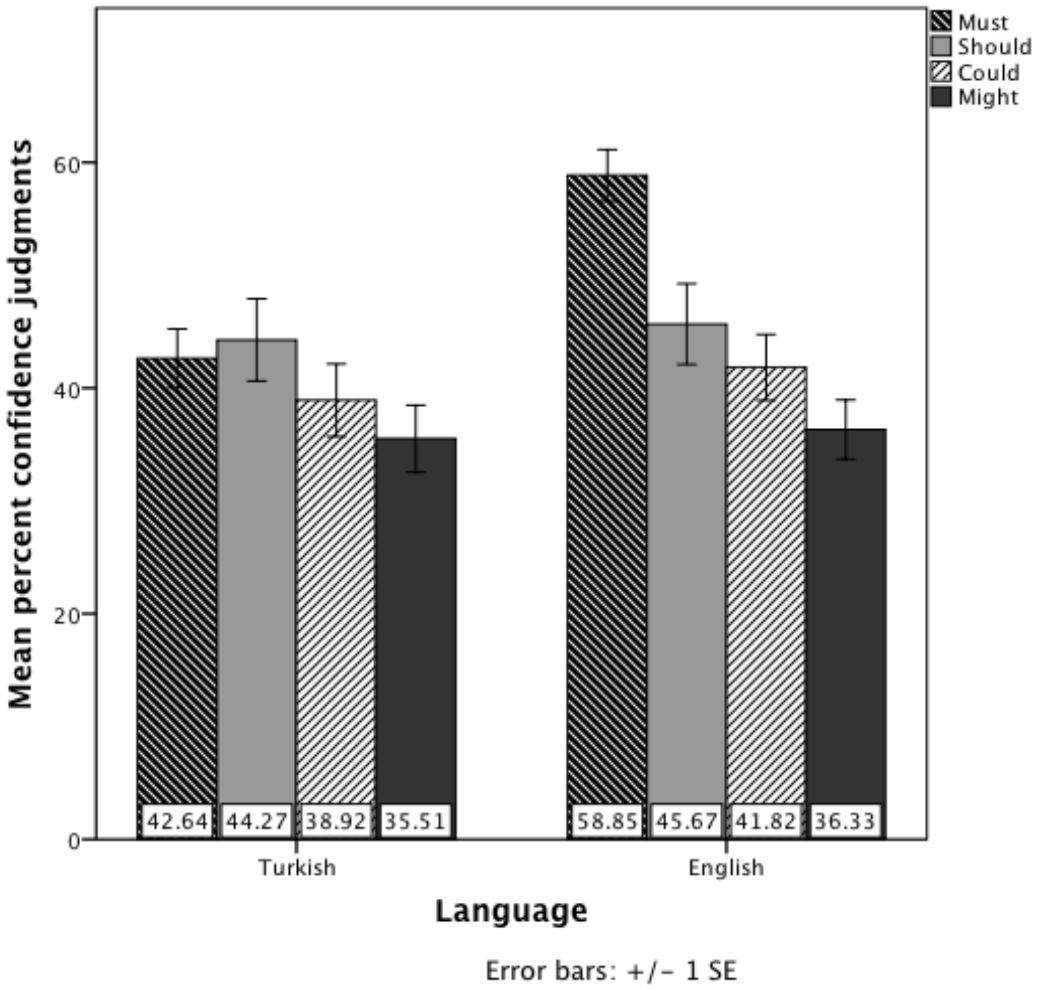

Figure 9. Mean percent confidence judgment of modal sentences.

Discussion

This experiment investigated how speakers of Turkish and of English interpret evidential and modal expressions with respect to source and their relative confidence in their judgments. The main focus of the experiment was to examine the relationship between evidentiality and modality and to bring empirical data to bear on various hypothesized views about the relationship. A second aim was to investigate whether the

level at which evidentiality is expressed (in grammar or in the lexicon) would differentially influence speakers' source and confidence judgments.

I will proceed by first discussing the findings for the 'not enough information' analysis followed by the source judgment results and finally the confidence judgment results.

'Not enough information' (NEI) responses

Participants were provided NEI option along with four other source and confidence options. The main purpose of providing this option was so that they would not feel forced to select one of the sources or confidence levels but would have the option of deciding whether they had enough information to make either of those judgments. Thus, it was possible to examine whether participants would make source judgments for modal sentences and confidence judgments for evidential sentences, which was the theoretically critical point of the experiment. If participants find enough information from an evidential sentence to interpret the epistemic value of the proposition, it tells us that an evidential expression includes an epistemic value. Similarly, if participants consider that a modal sentence reveals enough information to interpret the source of information, this tells us that modal expressions also indicate the source of information of the proposition.

The findings demonstrated that for both source and confidence judgments, and for both Turkish and English speakers, NEI responses were chosen far less often than would be expected based on chance (20%).

Source judgments for evidential forms. The mean frequency of NEI responses to the source judgment task for evidential sentence forms (8.04% for Turkish, 0.45% for English speakers) was lower than that to modal sentence forms (11.18% for Turkish, 3.4% for English speakers) in both Turkish and English speakers. It was therefore more likely for speakers of both languages to find enough information to interpret the source of information from an evidential expression than from a modal expression, even though modal expressions convey enough information to interpret the source of information.

Source judgments for modal forms. The results of source judgments for modal sentence forms are especially interesting. Evidential sentence forms with four different evidential expressions were expected to be responded as their corresponding source, or at least as one of the four source options. However, it was not clear how participants would interpret modal sentences, and whether they would attribute source information to particular modal expressions. The results demonstrated that the modal sentence forms conveyed source of information along with the other meanings, so that listeners could decide how this information was gathered by the speaker at a very high rate (88.82% Turkish speakers, 96.6% English speakers).

Confidence judgments. Similar to the source judgment task, in the confidence judgment task participants demonstrated a higher rate of ability to make decisions about the epistemic value of the presented propositions. Turkish speakers responded 9.25% of the time with 'not enough information' for evidential sentences, and 8.55% of the time with 'not enough information' for modal sentences. In the confidence judgment task, the difference of NEI response rate between evidential and modal expressions disappeared.

Participants found equally enough information to judge the epistemic value of the propositions from evidential and modal expressions.

The results of the evidential sentences were also meaningful from a theoretical perspective. They showed that participants found there to be enough information in an evidential sentence to figure out how confident they were about whether the reported proposition actually occurred. Put differently, people interpreted evidential expressions as conveying epistemic value along with the other meanings at the same rate as they did for modal expressions.

Differences between Turkish and English speakers. Another theoretically interesting aspect of the findings from the NEI analyses was the difference between Turkish and English speakers. English speakers showed almost no hesitation in making both source and confidence judgments of evidential sentences, with only a small percent stating that they did not have enough information to make source or confidence judgments of modal or evidential sentences. On the other hand, Turkish speakers were significantly more likely to find the information given was not enough to make the required judgments. Most surprisingly, Turkish speakers' source judgments of evidential sentences revealed more NEI responses than English speakers did for the same judgment and the same sentence type, even though one would have expected that Turkish speakers would show a greater certainty in ascertaining source, given that evidentiality is marked in their grammar. This finding is discussed further below.

One possible reason for the difference obtained between Turkish and English speakers could be cultural. According to Matthew and Busemeyer (2011), Western and

Eastern societies demonstrate different procedures and processes while making judgments and decisions. Westerners are more likely to notice salient changes and to believe in a single correct answer, and even search for the slightest differences that makes one option better than the others. On the other hand, Easterners focus on more conciliatory answers, and they are comfortable with there being more than one correct answer. Extending this line of argument to the present results, it could be the case that in making their decision, Turkish speakers were focused on the overall meaning, whereas English speakers were searching for a single correct answer and trying to build a rule for that by detecting slight changes in the sentences. As was evident in the results, English speakers almost never tended to select the NEI option, while Turkish speakers behaved more cautiously in their decisions.

As mentioned above, it is theoretically important for the rate of NEI responses to be measured below the chance level (20%). In order to discuss the theoretical outcome of the NEI response finding, the results of the source judgments of modal sentences and confidence judgments of evidential sentences are crucial. Our results demonstrated that people judge there to be enough information to determine both the source of information of modal expressions and the epistemic value of evidential expressions. This finding in itself would lead one to reject the complete disjointment view proposed by Aikhenvald (2004), de Haan (1999), Lazard (2001) and Oswalt (1986), where the two linguistic properties are considered completely independent from each other. Although evidentiality has been described as an indication of source of knowledge, it also conveys the epistemic value of the reported proposition. Along the same lines, modality has been

defined as the expressions to indicate degree of certainty and confidence about whether the reported proposition actually happened; however, it also indicates the source of knowledge of the proposition.

The low incidence of NEI responses in our findings showed that both modals and evidentials can be interpreted similarly. English speakers could interpret the epistemic value of 98.2% of evidential sentences and the source of information for 96.6% of modal sentences. Turkish speakers could judge the source of modal sentences at 88.82% level and epistemic value of evidential sentences at 90.75% level. Another way of stating the pattern of findings is that for English speakers, evidentiality and modality sets appear to be perceived as more overlapping than for Turkish speakers.

Overall, the results of NEI analyses demonstrate that modality and evidentiality are neither completely disjointed properties nor are they completely the same. They display as two sets, which intersect to a great extent. The degree of intersection of evidentiality and modality appears to be different for Turkish and English. English speakers interpreted evidentiality almost as a subset of modality, while Turkish speakers allowed for a space for interpreting evidentials purely in terms of source and modals as purely in terms of epistemic value.

A further question asked in the present study was how the intersecting/overlapping areas of evidentiality and modality sets are shaped by specific response types, and whether any evidential and modal forms were interpreted and utilized interchangeably. The additional analyses conducted of the source and confidence judgments (excluding the NEI responses) are of relevance here.

Interpretation of source judgments

The source judgment task was designed to examine speakers' interpretation of the source of an asserted event based on sentences containing evidential expressions or modal expressions. Although based on considerations of grammar alone, one would expect speakers of a grammaticalized evidential language (e.g., Turkish) to differentiate first-hand and non first-hand sources of information, other factors may also enter into source judgments for these speakers, leading them to use a particular type of source marker to convey something other than just source of information (e.g., surprise, accidental actions). Therefore, the purpose of the source judgment of evidential expressions in Turkish was to clarify how Turkish speakers actually interpret evidential expressions.

Further, for languages in which evidentiality is expressed at a lexical level (e.g., English), there are theoretical presumptions about the evidential meanings of certain adverbs. Chafe (1986) argued that *presumably* indicates assumption, *supposedly* beliefs or conjecture and *reportedly* and *apparently* hearsay. On the other hand, Gisborne and Holmes (2007), Izvorski (1997) and Mortensen (2006) argue that *apparently* conveys inference. However, these claims have never empirically tested. Therefore the purpose of the source judgments task of English evidential expressions was to elucidate how English speakers interpret the different evidential adverbs.

The source judgment task for modal sentences was designed to address the question of the nature of the relationship between evidentiality and modality. As mentioned in Section 5, there are three views that argue that some, if not all, modal

expressions also designate the source of information of the reported proposition. In the literature on modality and evidentiality in English, Chafe (1986), Faller (2002), von Fintel and Gillies (2010), and van der Auwera and Plungian (1998) have noted that *must* is the most common modal to be used for conveying the source of inference. Chafe also stated that modal auxiliaries *should* and *could* convey the source of assumption. The various forms of modal expressions in Turkish were discussed by Kerimoglu (2010), who noted a close relationship between Turkish evidentiality and modality. The morpho-syntactic markers of modality *(-miş olmalı*, *-miş olabilir*) were specifically proposed to convey the source of inference and assumption. Kerimoglu (2010) and Kornfilt (2001) further suggested that the suffix *–dır* is a modal expression, whereas it was mentioned as source of assumption by Aksu-Koc (2009). Therefore, the purpose of the source judgment task with modal expressions was designed to clarify whether speakers could find enough information to make source judgments, and if so, whether their judgments would correspond to theoretical presumptions proposed by linguistics scholars.

The results of the source judgments task demonstrated that Turkish and English speakers interpret evidential and modal expressions differently. Turkish speakers judged source for hearsay sentences as hearsay and conjecture. The reason for this tendency was probably that Turkish speakers considered the source of conjecture as providing third-hand information, which exists in Turkish grammar, when the source of conjecture is not first-hand and the actual source of information is not identified. Hence, Turkish speakers could easily mix hearsay and conjecture, as the latter is considered as third-hand source information. Inference sentences were judged as inference 60% of the time, which

demonstrated that Turkish speakers were mostly consistent about the source of inference. Conjecture sentences were judged as conjecture at the rate of 49%. However, for assumption sentences Turkish speakers made more inference than assumption judgments. This suggests that the assumption source marker in Turkish is perceived as conveying inference (the source of information obtained from results) and assumption (the source of information obtained from reasoning) interchangeably.

English speakers' source judgments of evidential sentences demonstrated less variability than those of Turkish speakers. English speakers judged all evidential expressions, but particularly assumption expressions (*presumably*), as hearsay. The adverb *reportedly* was judged 76% of the time as hearsay, which indicates that English speakers have a clear understanding of the source interpretation of *reportedly*. This rate was even higher than that for Turkish speakers' hearsay judgments of hearsay sentences. This finding is consistent with linguists' presumptions of the adverb *reportedly* (Aikhenvald, 2004; Chafe, 1986; Mortensen, 2006). However, English speakers rated *apparently* (as inference) and *supposedly* (as conjecture) as hearsay about half of the time (53%). These results support Chafe's presumptions and are inconsistent with the presumptions of Gisborne and Holmes (2007), Izvorski (1997) and Mortensen (2006). Further, the three evidential adverbs (*reportedly*, *apparently*, *supposedly*) were interpreted as the same in terms of other less frequent source judgments. All follow the order hearsay, inference, assumption and conjecture. Thus, we can conclude that these adverbs were interpreted the same and are used interchangeably. In contrast, *presumably* (used as assumption) was judged as a mix of inference and assumption. This finding is

somewhat consistent with Chafe's presumption on *presumably* (see Table 3). Further, English speakers' interpretation of *presumably* is very similar to Turkish speakers' interpretation of the assumption marker *–dır*.

The results of source judgments of modal sentences also demonstrated a significant difference between Turkish and English speakers. Turkish speakers interpreted all of the modal forms as the same. This was expected for the *could* and *might* sentence forms because both have the same morpho-syntactic marker. However, the other two modal forms have different markers than *could/might*. Yet, Turkish speakers show no distinction between the three modal types and interpret them as a combination of inference and assumption. As with the source judgments, these modals correspond to the source judgment of assumption for Turkish speakers, consistent with what was claimed by Kerimoglu (2010) and Kornfilt (2001).

English speakers, on the other hand, demonstrated more variation in the source judgments of modal sentences. The modal *must* was interpreted as both inference (37.83%) and assumption (44.01%). This finding partly supported the presumption of Chafe (1986), Faller (2002), von Fintel and Gillies (2010) and van der Auwera and Plungian (1998). Contrary to Chafe, however, *should* sentences were not interpreted distinctively as assumption; rather they were equally judged as conjecture (31.14%), inference (29.91%) and assumption (31.18%). *Could* and *might* sentences were interpreted similarly as assumption, followed by inference and conjecture. English speakers' source interpretation of modal sentences, overall, shows a combination of inference, assumption and conjecture at different rates. However, none of the modal

interpretations directly correspond to an evidential form's interpretation, which serves as evidence against the identity view.

Table 3

Theorized Claims about the Interpretation of English Evidential Expressions and Actual Interpretations Made by English Users

Evidential adverb	**Claim**	**Source**	**Results**
Reportedly	Hearsay	Aikhenvald (2004), Chafe (1986), Mushin (2001)	Hearsay, 76%
Apparently	Hearsay Inference	Chafe (1986), Mushin (2001) Gisborne & Holmes (2007), Izvorski (1997), Mortensen (2006)	Hearsay, 53% Inference, 24%
Presumably	Assumption	Chafe (1986), Mortensen (2006)	Inference, 34% Assumption, 29%
Supposedly	Conjecture/ Unknown	Chafe (1986)	Hearsay, 53%

In summary, Turkish and English speakers' source judgments of evidential and modal sentences were found to differ quite noticeably. Turkish speakers judged the

sources most of the times consistently with the grammatical rules of those source markers and they judged modal sentences as conveying the sources of inference and assumption. On the other hand, English speakers' responses for evidential expressions were *not* consistent with linguists' presumptions, while their interpretations of modal sentences *were* partially consistent with them. English speakers interpreted almost all of the evidential expressions as hearsay and demonstrated more variation on source judgments of modal expressions. This finding demonstrated a clear difference between grammaticalized and lexical evidential indication, as discussed in Section 2. Because Turkish speakers have to indicate the source of information basically from childhood, they have more experience in indicating and interpreting the source of a reported proposition than English speakers. It is as if they program their mind to think on the basis of evidentiality (e.g. Tosun et al., 2013). However, English speakers use evidential expressions optionally (when they choose to) and there is no clear consensus on the source representation of each evidential adverb other than scholars' expectations. It appears that English speakers tend to interpret most evidential adverbs as hearsay; they are more consistent in their interpretations of modal expressions. Turkish speakers' source judgment of modal expressions, on the other hand, did not reveal any variation and were all interpreted the same way. This is probably because they already have the grammatical markers to indicate the source of information and do not need any more forms of evidence. Therefore all modal expressions are simply considered as assumption.

The next step was to look at the confidence judgment of these modal and evidential expressions.

Interpretation of confidence judgments

The confidence judgment task was conducted to examine the epistemic value interpretations of modal and evidential expressions. The epistemic value of English modality was previously investigated by Francis and Wales (1994), who found that each modal marker in English was rated at a different certainty level. *Must* was judged as the most certain modal, which represents epistemic necessity. *Can, would, should* and *might* followed after *must* in certainty ratings, in that order. The present study served as a replication of Francis and Wales's study.

Further, epistemic value ratings of Turkish modal expressions were tested as well. Kerimoglu (2010) discussed Turkish modality in detail, although he did not mention the epistemic value of each marker. He focused on the meaning of the markers separately. The marker *–miş olabilir* (*could/might*) has a probability meaning, whereas the marker *–miş olmalı* (*must*) represents deduction and necessity and is used for strong possibilities; finally, the marker *–malı* (*should*) has the meaning of obligation and necessity. Moreover, Kerimoglu stated that most of the time along with the modal markers, the value of certainty is manipulated by lexical markers such as *probably, possibly, usually, absolutely,* and *perhaps*. The present study is the first empirical investigation of how Turkish speakers rate the epistemic value of modal expressions.

The purpose for obtaining confidence judgments for evidential sentences was to address the theoretical issue of the relationship between modality and evidentiality. It was of interest whether speakers could find enough information to judge the epistemic value of evidential expressions and if so, whether different sources of information would

be judged at different levels of certainty. In the evidentiality literature, Willet (1988) and de Haan (1999) have proposed their own answers to this issue. According to Willet, hearsay sources should be more reliable than inference because hearsay conveys information that was directly gathered by whoever first reported the proposition. On the other hand, de Haan argued that inference should be more reliable than hearsay, because the source of inference requires a closer involvement of the speaker herself in the reported event by having to gather proof. Aside from providing empirical data on this issue, another aim of the confidence judgments task was to examine if there would be a difference between Turkish and English speakers in confidence judgments.

The results demonstrated that English and Turkish speakers judged the epistemic value of the modal sentences differently. Consistently with Francis and Wales (1994), English speakers judged the epistemic value of modal expressions in a particular order: the modal *must* was judged as the most certain modal (58.85%) followed by *should* (45.67%) and *could* (41.82%). *Might* elicited the lowest confidence judgments (36.32%) by English speakers. On the other hand, Turkish speakers did not find any certainty difference between the modals. All modal expressions were judged at similar medium confidence levels. The only differentiation they made was for *must* and *might; must* (42.64%) was judged to be more confident than *might* (35.51%).

As Turkish speakers judged the source of all modal sentences equivalently, they similarly judged the confidence level of those modal expressions as equivalent. Thus, we can conclude that for Turkish speakers modals represent one member of the overlapping section of evidentiality and modality sets. On the other hand, just as English speakers

judged the source of modal expressions variously as inference, assumption and conjecture, they also judged their confidence levels for the modals differently. Thus, we can assertively argue that for English speakers, modal expressions are represented as independent members of the intersection of evidentiality and modality sets.

In terms of the confidence judgments of evidential expressions, similar to the modal sentences, Turkish and English speakers showed different results. Turkish speakers gave highest confidence ratings for the inference sentences (59.31%) followed by assumption sentences (49.13%). Hearsay sentences were judged less confident (40%) than inference and assumption and the least confident source of information was conjecture (22.10%). Turkish speakers' confidence judgments were consistent with de Haan's (1999) argument in that inference was judged more reliable than hearsay. On the other hand, English speakers' judgments demonstrated a different ranking. They gave hearsay sources the highest confidence rating (65.9%) followed by inference (53.13%), assumption (47.35%) and conjecture (44.85%), although assumption and conjecture did not differ significantly. English speakers' confidence judgment pattern was consistent with Willet's (1988) argument where hearsay was more reliable than inference. The difference between Turkish and English speakers' confidence judgments of evidential expressions could be related to their source judgments of the same sentences.

Turkish speakers judged each source of evidence as projected in the grammar, and their source judgments varied accordingly. They judged the confidence level of each source consistently with its proximity to the proposition source. In this case, because the speaker is involved in the same environment of the reported event when the source was

inference, they also reported more confidence that the event actually happened. In the hearsay source, because the speaker's involvement is more limited than in the case of inference, they reported less confidence than they did for the inference case. Thus, in Turkish speakers' minds evidential sources appear to be represented as independent sets in the intersection of the evidentiality and modality. On the other hand, as English speakers judged all of the evidential sources, except assumption, as hearsay, the difference between the confidence levels of these evidential expressions demonstrated that even one source type could be varied in terms of its reliability. The confidence level difference between the evidential forms could be not because of the nature of the source (hearsay) but because of the actual source itself (who says it). Thus, in English speakers' mind, the source hearsay is represented at three different levels of certainty. The certainty level of assumption sentences was independent differently from hearsay sources.

Before discussing the theoretical implications of the findings, there are some limitations of the study to be noted. First, the study asked participants to make metalinguistic judgments, i.e., to think about their linguistic knowledge. This is not something that language users typically do. It is possible that how participants respond on tasks requiring explicit metalinguistic judgments may not be consistent with how they actually perform in their regular daily language use. For example, an English speaker might judge *apparently* as hearsay but might actually use it as inference in her daily language practice. A second limitation is that the stimuli were presented out of context. In actual language use, contextual cues are usually available to constrain how discourse

in interpreted. It is quite likely that the sentences presented in this study would have been judged differently if they had been presented within a context. Further work is needed to address how context, including sociopragmatic factors, may interact with particular markers of modality or evidentiality in affecting judgments of source or confidence. A third limitation was that the need to examine the results statistically occasionally resulted in the loss of some of the individual differences that were present in the responses. For example, whereas the majority of participants considered hearsay sentences as hearsay, some considered them as inference.

With these limitations in mind, we turn to the theoretical implications of the findings.

Theoretical implications of overall findings

The theoretical implications were touched on earlier. This section brings them together to present a broader picture of the relationship between evidentiality and modality. As the not-enough-information analyses demonstrated, evidentiality and modality are in a close relationship. People indicated that they could find enough information to make source judgments of modal expressions and epistemic value judgments of evidential expressions. This finding disproves the complete disjointment view by Aikhenvald (2004), de Haan (1999), Lazard (2001) and Oswalt (1986). On the other hand, evidential and modal expressions were not used interchangeably. Both for Turkish and English speakers modal and evidential expressions were used to indicate different sources of evidence and confidence levels. Thus, the identity view (by Matthewson, 2010) was also disproved. In summary, evidentiality and modality are

neither completely independent linguistic property from each other, nor are they the same structures conveying completely the same meaning, although they display a close relationship.

Further, the results demonstrated that Turkish, as a grammatical evidential language, and English, as a lexical evidential language, exhibit different evidentiality-modality relationships. English speakers' epistemic value judgments of evidential expressions were almost 100%, indicating that each and every evidential expression conveys epistemic value, whereas source judgments of modal expressions yielded more "not enough information" responses than evidential sentences. This pattern supports an inclusion set in which evidentiality is considered a subtype of epistemic modality (see Figure 10), as proposed by Bybee (1985), Palmer (1986), Willett (1988), and Mithun (1999). According to this view all evidential expressions convey epistemic value; however, not all modal expressions convey the source of the evidence.

Further, the source and confidence judgments of English speakers displayed how the members of this subset were shaped. According to the analyses, each modal expression (*must, should, could, might*) was judged differently from one another in both source and confidence judgments, which was displayed as independent members in the English evidentiality-modality set structure. Assumption (*presumably*) as an evidential expression was judged distinctively from other sources and from modals in both source and confidence judgment tasks. Thus, it was displayed as another independent member of the subset. Further, other evidential expressions (*hearsay, inference, conjecture*) were judged as the same source (*hearsay*) but at different epistemic value levels (strong,

medium, and weak). Therefore, these sources were displayed as the hearsay subset in the evidentiality subset with three members.

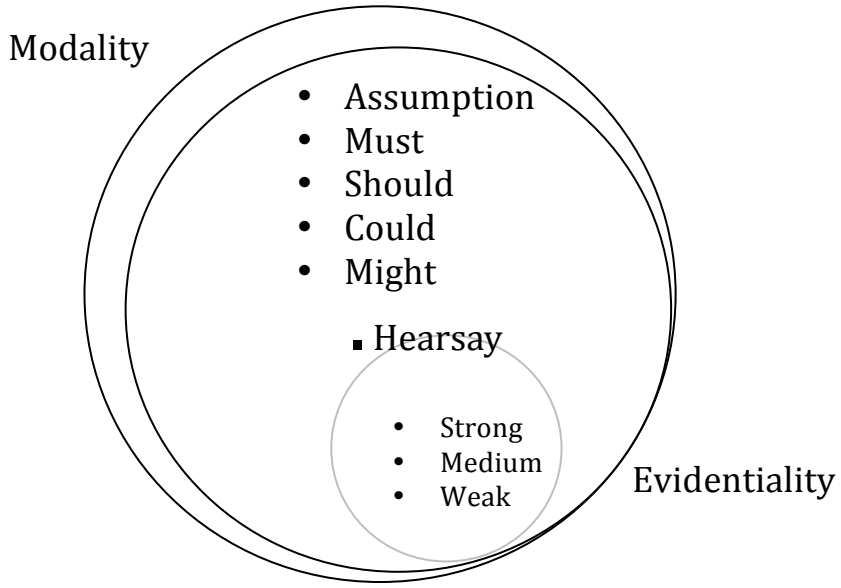

Figure 10. The prototypical Venn diagram of the English evidentiality and modality relationship.

On the other hand, Turkish speakers demonstrated a different relationship between evidentiality and modality. For one thing, Turkish speakers indicated more NEI responses than English speakers. Turkish speakers' evidentiality and modality relationship structure appears to be more of an overlapping structure (see Figure 11). The overlap view argues that not all modals convey the source of information and not all evidentials convey epistemic value, however, there is overlap between them where they convey both source and epistemic value information (DeLancey, 2001; Faller, 2002; van der Auwera & Plungian, 1998). Scholarly discussions of the interpretation of source for modals has focused on the modal *must*. However, our source and confidence judgment

analyses allowed for an examination of several different modals and it was possible to display how the overlapping section of the relationship was contained. Turkish speakers judged each and every evidential expression independently from one another in terms of both the source and confidence tasks. Thus, all evidential expressions were represented as independent members of the overlap set. Further, all of the modal expressions were judged as the same in terms of both the source and confidence judgment tasks. Thus, all modals were displayed as only one member of the overlapped sets.

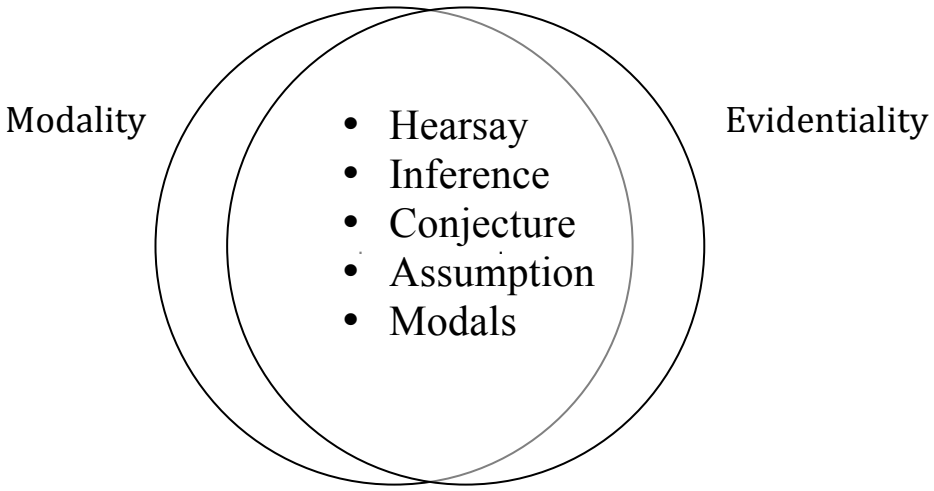

Figure 11. The prototypical Turkish evidentiality and modality relationship.

In summary, the results demonstrate a close relationship between evidentiality and modality although the nature of the relationship depends on the nature of evidentiality and modality indication of the languages.

In this study, judgments of evidential and modal expressions were elicited explicitly. To test the investigated relationship in Study 1 further it will be important to

assess implicit judgments of evidential expressions. Study 2 was, therefore, conducted to examine the implicit effect of the epistemic value of evidentiality at the discourse level.

STUDY 2: IMPLICIT EPISTEMIC VALUE JUDGMENTS OF EVIDENTIALITY EXAMINED THROUGH DISCOURSE COMPLETION

The purpose of this experiment was to examine how individuals' attitude towards the reliability of the source would change for different evidential sources at the discourse level. Previous experimental investigations conducted mostly with child samples tested reliability of evidential sources indirectly and demonstrated that first-hand source markers were treated as more reliable and trustworthy than non first-hand markers, and thus children made their decisions according to the fact that was stated in the first-hand form (e.g., Aksu-Koc & Alici, 2000; Fitneva, 2001; 2008; 2009; Öztürk & Papafragou, 2005). This experiment was designed to replicate findings of these previous studies and extend them to adults as well as to different types of non first-hand sources (hearsay and inference).

It has been argued that the reliability level difference between evidential sources found in the literature is due to the implied stance difference of those evidential sources. The first-hand source marker clearly implies that the speaker was there when the reported event happened. Because the person is close to the reported event in the sense of time and space, people tend to rely more on first-hand information than on non first-hand information (Barnes, 1984). In this case a further question would be how the reliability of information would change when both types of information are non first-hand, but one of the sources implies a closer proximity stance-wise.

As indicated in the first experiment, inference is thought to involve closer proximity to the reported event (de Haan, 1998). For instance, the source of inference indicates the person who reported the event must have been close to the event in the sense of space (but not time). On the other hand, the source of hearsay conveys that the speaker is close neither in the sense of space nor time. Therefore, it is possible to argue that when inference and hearsay sources face off against each other, inference sources would be considered more reliable than hearsay. Moreover, the logic above would also predict that the reliability difference between first-hand and hearsay sources would be larger than the difference between first-hand and inference.

Furthermore, unlike the first experiment, in this experiment reliability of evidential sources attributed by people was measured implicitly rather than by asking them explicitly to provide a confidence rating. Another difference between Study 1 and 2 is the linguistic unit of interest. The present study examined evidentiality at the discourse level. Thus, participants would have more information about the event rather than basing their judgments on a single sentence out of context. As such, the experimental environment more closely approximates real world practices of evidentiality in language.

Along with the influence of evidential expressions on the establishment of discourse coherence, the impact of two other factors was examined. The first factor was order of presenting the information, and in particular, whether the more recently presented information is somehow more salient. Bruine de Bruin (2005) and Bruine de Burin and Keren (2003) investigated the influence of recently presented information on

the affective valence of various decisions, such as selecting a blind date. They found that people tend to have more positive thoughts about recently received information and thus tend to select the most recent option. Although the task in the present experiment is somewhat different (relying on one vs. another type of asserted information in making sense of discourse rather than making an actual selection of one person vs. another), it was nevertheless of interest whether an order of presentation effect would also be observed, either alone or in an interaction with an evidentiality effect.

A second factor that the research design allowed one to examine relates to a so-called attributional bias in decision-making, which occurs when people underutilize general facts and instead prefer particular facts in making their judgments. This is a form of the base rate fallacy (see Kahneman & Tversky, 1973, 1974; Nisbett, Borgida, Crandall & Reed, 1976). Kahneman and Tversky (1973, 1974) argued that people tend to neglect the base rate, or general information, and focus on specific or situational facts when they need to make judgments under uncertainty. Nisbett and his colleagues (1976) further noted that people tend to evaluate information in proportion to its vividness. Particular information is considered more vivid than general information. Thus, people tend to weigh particular information more than it warrants.

In the present experiment, whether the asserted fact involved general or particular information was manipulated along with the evidentiality manipulation. As such, it was possible to observe the influence of the nature of the information alone and in an interaction with the source of evidence. With this purpose, a discourse completion task was used to measure how participants reasoned in arriving at discourse coherence.

Participants received a pair of sentences as test stimuli. One of the sentences stated a general fact about a person (e.g., *Jack was afraid of heights*) and the second sentence stated a particular/situational fact, which contradicted the first sentence (e.g., *He rented an apartment on the 10th floor of a high-rise)*. Participants were asked to think of and write down a third sentence to make sense of the situation described. The evidential source in which each sentence was presentenced was manipulated as first-hand, hearsay and inference. Further the order of the sources (as a measure of the recency effect) and the order of the two sentences (as a measure of attributional bias) were controlled and counterbalanced.

It was expected that participants would complete the third sentence supporting the fact that started with what they perceived as the more reliable evidential source than the other fact. For example, when participants saw a pairing of first-hand and inference sentences, they would be more likely to complete the third sentence based on the information given in the first-hand sentence. When the sentence pairing involved inference and hearsay, then they would more likely base the third sentence on the information contained in the inference sentence. Further, it was expected that participants would complete the third sentence in favor of the fact presented in the second sentence if participants' performance was influenced by recency. Finally, if they demonstrate an attributional bias, they should complete the third sentence as supporting the particular antecedent fact.

Method

Participants

A total of 74 (65 females, and 9 males) Turkish speaking and 75 English speaking college students (48 females, and 27 males) were recruited for the experiment. Turkish speakers' age raged from 18 to 38 years with a mean age of 22.6. The Turkish data were collected in Istanbul, Turkey, and the participants were tested in Turkish, their native language. Although most of the Turkish participants studied English and/or Arabic in school, they considered themselves as monolingual because their second language knowledge was at the beginner level. English speakers' ages ranged from 18 to 27 years with a mean age of 18.57. English speakers' data were collected at Texas A&M University. They were predominantly monolingual speakers of English and did not know another language beyond a beginner level.

Materials and design

A total of 30 sets of sentence pairs of event description were prepared. One of the sentences per set described a general fact and the other described a particular event. The design was a 3 x 2 x 2 factorial. The list of independent variables was Pairing of sources, Order of mention of source, and Sentence order. Three evidential sources –namely first-hand, hearsay, and inference were paired with three sentences indicating a contradicting situation, using all combinations of the sources. Therefore, three conditions of Pair of sources were set as first-hand vs. hearsay (F vs. H), first-hand vs. inference (F vs. I) and inference vs. hearsay (I vs. H). For example:

F vs. H:

Jack was afraid of heights. But he *reportedly* rented an apartment on the 10th floor.

F vs. I:

Jack was afraid of heights. But he *apparently* rented an apartment on the 10th floor.

I vs. H:

Jack was *apparently* afraid of heights. But he *reportedly* rented an apartment on the 10th floor.

The variable of source pairing was manipulated within subjects. Participants saw 10 sentences for each condition. The sources were counterbalanced between the sets of sentences. The sentences were presented in a fixed random order.

The second independent variable was the order of mention of evidential sources within the sets. Here the aim was to measure any primacy or recency effect on participants' decisions. Half of the participants received the order as presented above while the other half of the participants received the reversed order of the sources. For the examples above, the reverse order would be:

H vs. F:

Jack was *reportedly* afraid of heights. But he rented an apartment on the 10th floor.

I vs. F:

Jack was *apparently* afraid of heights. But he rented an apartment on the 10th floor.

H vs. I:

Jack was *reportedly* afraid of heights. But he *apparently* rented an apartment on the 10th floor.

The order of mention of source variable was manipulated between subjects and participants were randomly assigned one of the two groups.

The third and final independent variable was sentence order. The aim of setting this variable was to measure the effect of evidential expressions on general and particular facts. Half of the participants received the sentences in the straight order as noted above, while the other half of the participants received the flipped order of the sentences, as illustrated in the examples below.

F vs. H:

Jack rented an apartment on the 10th floor. But he was *reportedly* afraid of heights.

F vs. I:

Jack rented an apartment on the 10th floor. But he was *apparently* afraid of heights.

I vs. H:

Jack *apparently* rented an apartment on the 10th floor. But he was *reportedly* afraid of heights.

This variable was manipulated between subjects and participants were randomly assigned to one of the two groups.

Procedure

Participants were shown two sentences per trial and then were to write down a third sentence that completed the story with coherence. Participants were provided the beginning of the third sentence (for the examples above it was "Jack…….") (see Appendix C). Because the first two sentences presented somewhat conflicting information, participants would need to rely more on the information in one of the sentences in order to arrive at a third sentence that makes the overall story coherent. For each of the three conditions (F vs. H; F vs. I; I vs. H) the relative reliance on the source (which implies closer proximity) was coded. The source is first-hand in the F vs. H, and F vs. I condition, and inference in the I vs. H condition. Thus, the dependent variable was the proportion of the defined source relied on more out of the total of 10 sentence sets per source condition.

Participants were tested in groups. Each participant received a booklet containing 30 sets of sentences with instructions telling them to read the first two sentences and then complete the third one (e.g., Kurt was a chubby boy. But he did not eat anything yesterday. Kurt _____). An example of the task was presented to make the instructions clear. After participants completed all of the sentences they were asked to complete a language background questionnaire.

Data coding and analysis

To code the data, two coders independently read each completed sentence and

decided which of two antecedent sentences was relied on more to complete the third sentence for each of the 10 sets within each condition. If the completed sentence did not provide any clue about which antecedent sentence the participants relied on more, then this sentence was coded as 'unidentifiable'. The following list of criteria were used to identify which of the antecedent sentences was relied on more to complete the third sentence:

- *Definitely denying one of the facts:* If one of the facts in the sentences was denie then it was coded that the other fact was relied on more. For example, the d, stimulus 'Jessica reportedly had a lot of genuine leather bags. But she wore an imitation leather bag today. Jessica _____' was completed as 'lied when she said she had genuine leather bags.'
- *Definitely accepting one of the facts:* If one of the facts was totally accepted, then it was coded that that sentence was relied on more. For example: The stimulus 'Carl believed superstitious sayings. Bu he apparently acted reasonably yesterday. When he saw a black cat, Carl _____' was completed as 'made sure not to cross its path'.
- *Rationalize denying one of the facts:* If the third sentence rationalizes why the fact happened accidentally, then the other fact was considered more reliable. For example: The stimulus 'Matt did not like musicals. But he reportedly went to the theatre to see Les Miserables. Matt _____' was completed as

'did not know it was a musical' or 'was forced by his girlfriend to see that movie'.

- *Weaken the fact by mentioning a change:* If the third sentence mentioned a change in one of the facts, then it was coded that the other fact was considered stronger and more reliable. For example: The stimulus 'Jack was apparently afraid of heights. But he reportedly rented an apartment on the tenth floor of a high-rise. Jack _____' was completed as 'tolerated and overcame his fear'.
- *Playing with the meaning of the words:* If participants completed the sentence in such a way that the meaning of a fact changed, it was considered that they denied the fact stated in the sentence and that the other sentence was coded more reliable. For example: The stimulus 'Bill did not like his stepsister. But he apparently cried when she left home for college. Bill _____' was completed as 'cried for joy'. Another example was 'Chase apparently did not drink alcoholic beverages. But he reportedly was drunk last night. Chase _____' was completed as 'was drunk for love'.
- *Unidentifiable sentences:* If the completed sentence did not provide any clue about which sentence the participant relied on more, it was coded as 'unidentifiable'. For example: The stimulus 'Lisa supported affirmative action policies for university admission. But she reportedly held negative stereotypes about Hispanics. Lisa's view about race _____' was completed as 'is ambiguous'. Further, if the sentence was somehow completed by supporting two

of the facts, it was coded as 'unidentifiable'. For example: The stimulus 'Alexa apparently did not know how to drive. But she reportedly bought a car yesterday. Alexa _____' was completed as 'then enrolled in driver's ed'.

After evaluating each completed sentence using the above rubric, the proportion of reliability of the closer proximity source out of the identifiable completed sentences of each condition was computed. For example out of 10 sentence sets in the [F vs. H] condition, how many were completed relying on the first-hand source, hearsay source and unidentifiable were coded. Then the number of first-hand reliance of [F v H] sentences was divided by the sum of first-hand and hearsay reliance and multiplied by 100.

In order to increase the coding reliability and eliminate the shortcomings of coding open-ended responses two methods were followed. Inter-coder reliability was computed as a correlation coefficient of the data from two independent coders. The second coder reliability analyses revealed a very high correlation both for Turkish ($r(36) = .85, p < .01$) and English ($r(36) = .81, p < .01$) coding. Further intra-coding reliability was computed as an additional method. The first coder (the author) coded the same data after three weeks and the results demonstrated a high intra-coder reliability correlation ($r(12) = .89, p < .01$).

After finalizing data coding, a 3 (Pair of Sources: [F v. H] vs. [F v. I] vs. [I v. H]) x 2 (Source order: Straight vs. Flipped) x 2 (Sentence order: General-Particular vs. Particular-General) x 2 (Language: English vs. Turkish) ANOVA was performed.

Results

Because the scores were computed as the proportion of the reliance on the strong evidence over the weaker evidence, the means greater than 50% demonstrated greater reliance on the strong evidence, means under 50% showed greater reliance on weaker evidence. The means and standard deviations of each groups and conditions are displayed in Table 4 and Figure 12.

Table 4

Mean Percent Reliance on the Strong Evidence of Turkish and English Speaking Participants by Sentence and Source Order

Language	Sentence order	Strong evidence first			Strong evidence second		
		F-I	F-H	I-H	F-I	F-H	I-H
English	G-P	37.60	43.48	33.65	67.51	74.44	69.68
		(26.72)	(23.41)	(21.39)	(22.26)	(21.46)	(21.47)
	P-G	49.25	46.04	42.67	53.79	65.26	57.38
		(27.28)	(25.33)	(16.89)	(18.22)	(22.55)	(25.75)
Turkish	G-P	21.63	23.82	23.64	80.78	77.82	67.59
		(14.36)	(23.65)	(18.32)	(18.96)	(24.6)	(20.64)
	P-G	53.89	58.63	57.43	57.1	33.9	55.32
		(22.32)	(26.03)	(27.3)	(21.14)	(24.11)	(26.89)

Note. Standard deviations were displayed in parenthesis. G-P = General-Particular, P-G = Particular-General, F-I = First-hand-Inference, F-H = First-hand=Hearsay, I-H = Inference-Hearsay

A 3 x 2 x 2 x 2 analysis of variance demonstrated a significant Source order main effect, F (1, 134) = 78.57, $p < .001$, $\eta_p^2 = 37$. When the strong evidence was presented second (M = 64.36, SD = 17.72) participants relied on that evidence significantly more

than when they were presented with it in the first sentence (M = 40.16, SD = 19.05), t (140) = 7.84, p < .001. Other main effects did not reveal significant results (Pair of sources main effect: F (2, 268) = .39, p = .68; Sentence order main effect: F (1, 134) = .09, p = .77; Language main effect: F (1, 134) = .93, p = .34).

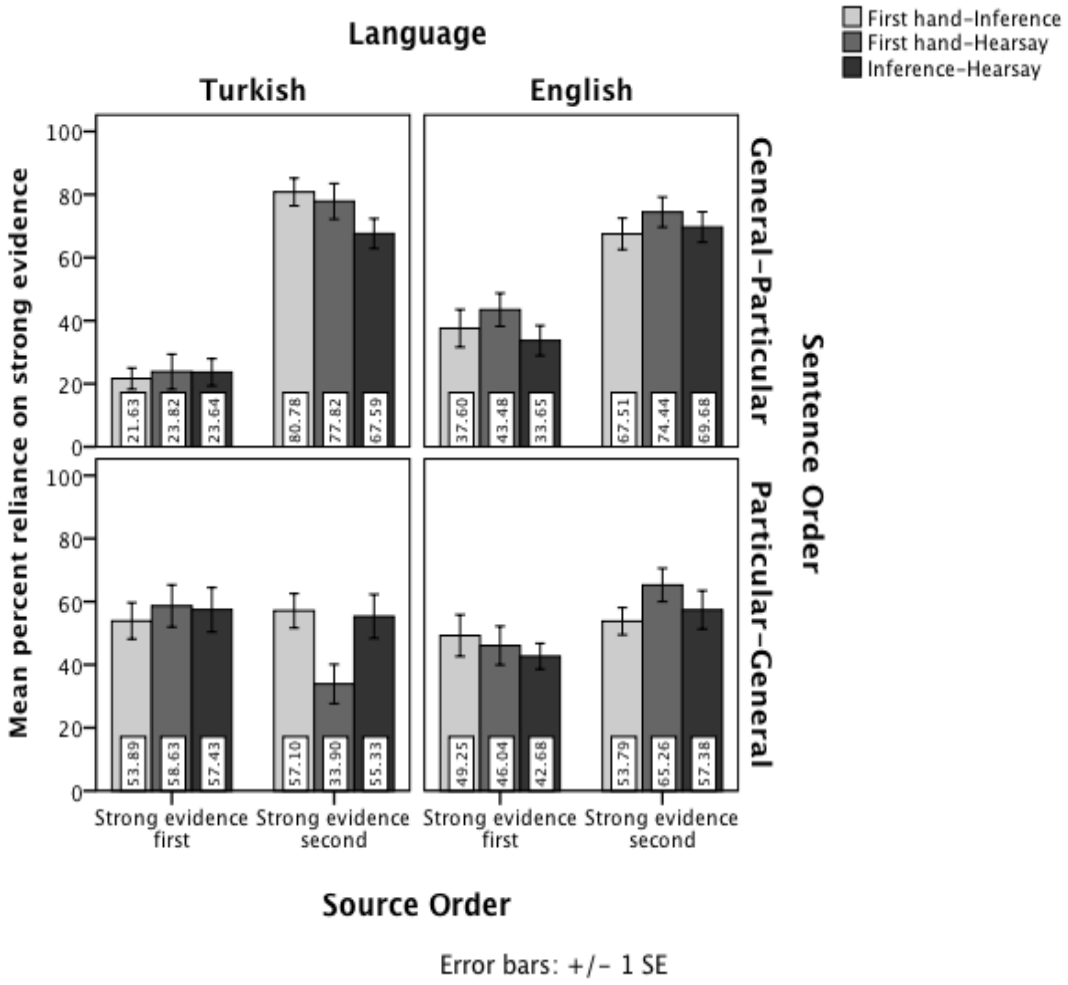

Figure 12. Mean percent reliance on the strong evidence of Turkish and English speakers by source pair, sentence and source order.

A two-way interaction of Source order and Sentence order emerged, F (1, 134) = 62.17, p < .001, η_p^2 = 32. For participants who received the general sentence first (e.g. *Jack was afraid of heights. But he rented an apartment on the tenth floor of a high-rise*)

their reliance on the sources changed depending on when the strong evidence was presented. Those who were presented the strong evidence in the second sentence relied on the strong evidence more than those who were presented it in the first sentence (M = 72.91, SD = 14 vs. 31.04, SD = 15.22), t (75) = 12.57, $p < .001$. However, there was no difference between the source order groups when the particular sentence was presented first (*Jack rented an apartment on the tenth floor of a high-rise. But he was afraid of heights*), t (63) = .77, p = .44. Moreover, within the strong evidence first group, participants who received the particular sentences first showed more reliance on the strong evidence than those who received the general sentences first, t (68) = 5.09, $p < .001$. Conversely, within the strong evidence second group, participants who saw the general sentence first relied on the strong evidence significantly more than those who saw the particular sentence first, t (70) = 5.21, $p < .001$.

The interaction of Pair of Source by Language approached significance, F (2, 268) = 2.44, p = .089, η_p^2 = 018. The post hoc analysis demonstrated that only English speakers' reliance scores were significantly greater for first-hand-hearsay pairs (M = 57.55, SD = 26.27) than inference-hearsay pairs (M = 51, SD = 25.52), t (74) = 1.99, $p < .05$. The other comparisons of the source pairs for English and Turkish speakers were found not significant. Further, English and Turkish speakers only differed from each other in their reliance scores of first-hand-hearsay pairs, t (147) = 2, $p < .05$. English speakers relied more on the first-hand source (M = 57.55, SD = 26.27) than Turkish speakers did (M = 47.85, SD = 32.5) when it was paired with hearsay source. The other two-way interactions were not significant (Pair of sources by Sentence order: F (2, 268)

= 1.5, p = .23; Pair of sources by Source order: F (2, 268) = .41, p = .66; Sentence order by Language: F (1, 134) = 1.18, p = .28; Source order by Language: F (1, 134) = .004, p = .95).

A significant three-way interaction of Sentence order by Source order by Language emerged, F (1, 134) = 16.26, $p < .001$, $\eta_p^2 = .11$ (see Figure 13). Turkish speakers who received the general sentences first showed a source order difference. Participants who saw the strong evidence second showed more reliance on the strong evidence than those who saw the strong evidence first, t (35) = 12.38, $p < .001$. On the other hand, Turkish speakers who received the particular sentence first did not reveal such a difference between source orders, t (28) = 1.38, p = .18.

Similar to Turkish speakers, English speakers who received the general sentences first showed a sentence order difference. Those who saw the strong evidence second relied on the strong evidence more than those who saw the strong evidence first, t (38) = 7.12, $p < .001$. Differently from Turkish speakers, the difference between the source orders of English speakers persisted for those who received the particular sentences first, t (33) = 2.22, $p < .05$.

When sentence orders were compared to each other separately for Turkish and English speakers and the source order, it was found that Turkish speakers who received the strong evidence first showed a sentence order effect. Those who saw the particular sentences first showed greater reliance on the strong evidence than those who saw the general sentence first, t (31) = 6.96, $p < .001$. Turkish speakers who received the strong evidence second demonstrated a reversed effect. Those who saw the general sentences

first relied on the strong evidence more than those who saw the particular sentences first, t (32) = 5.34, $p < .001$.

The pattern found for English speakers, however, was somewhat different. Similar to Turkish speakers, English speakers who received the strong evidence second showed a sentence order effect, whereas those who saw the general sentences first relied on the strong evidence more than those who saw the particular sentence first, t (36) = 2.37, $p < .05$. On the other hand, English speakers who received the strong evidence first did not reveal a significant difference between sentence orders. Finally, when comparing English with Turkish speakers, only the group who received the strong evidence and general sentence first demonstrated a significant language effect. English speakers relied on the strong evidence more than Turkish speakers (t (36) = 3.52, $p < .001$), although both of their scores were less than 50%.

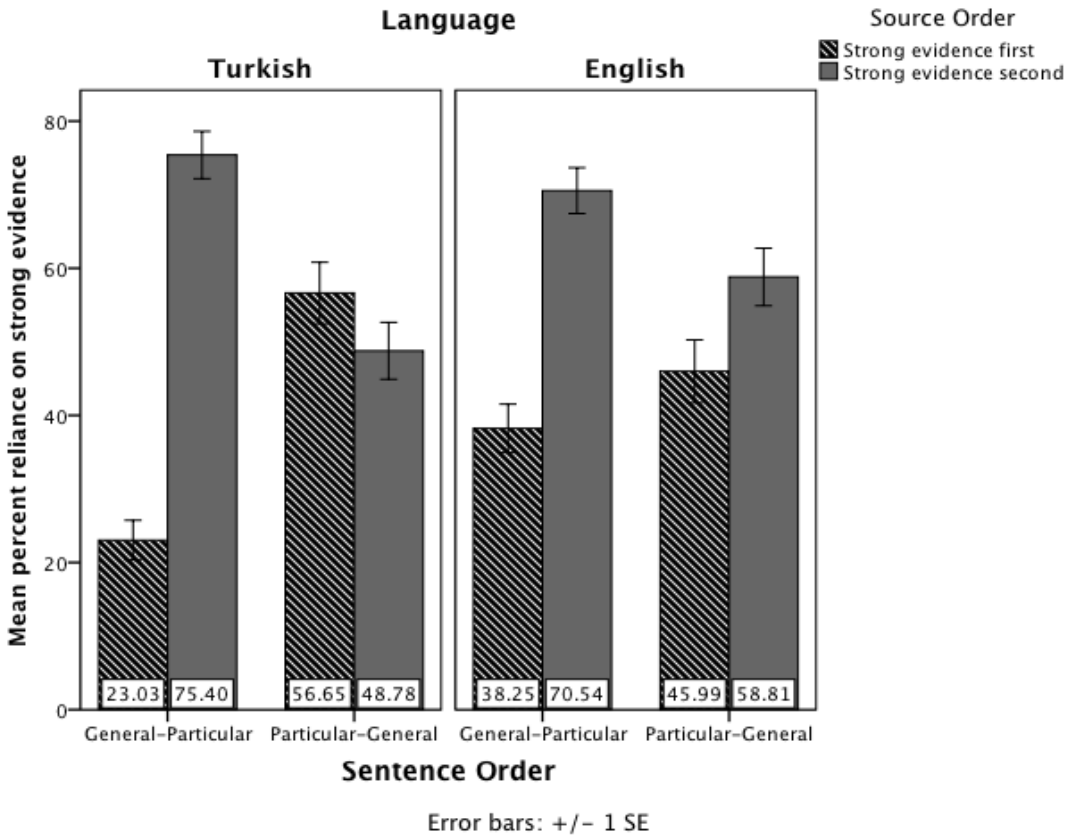

Figure 13. Mean percent reliance on the strong evidence by language, source and sentence order.

Another three-way interaction that emerged in the analysis was the Pair of sources by Source order by Language interaction, F (2, 268) = 3.25, $p < .05$, $\eta_p^2 = .024$. Turkish speakers who received the strong evidence second relied on the first-hand source more when it was paired with inference than hearsay, t (37) = 1.94, $p = .06$. The other comparisons of Pair of sources were not significantly different within the strong evidence first group and within the strong evidence second group separately. Further, English speakers who received the strong evidence second demonstrated a reverse effect than Turkish speakers. They relied on the first-hand source more when it was paired with

hearsay than when it was paired with inference, t (37) = 2, p = .053. The other three-way interactions were not significant (Pair of sources by Sentence order by Source order: F (2, 268) = .68, p = .51; Pair or sources by Sentence order by Language: F (2, 268) = .94, p = .39).

Finally a four-way interaction of Pair of sources by Source order by Sentence order by Language approached significance, F (2, 268) = 2.64, p = .074, η_p^2 = .019 (see Figure 12). Turkish speakers who received the strong evidence second and saw the general sentence first relied on the strong evidence more when the pair was first-hand-inference than when it was inference-hearsay, t (18) = 2.19, $p < .05$. Moreover, Turkish speakers who received the strong evidence second but saw the particular sentence first relied on the strong evidence less when the pair was first-hand-hearsay than when it was first-hand-inference (t (18) = 2.2, $p < .05$), and inference-hearsay (t (14) = 2.18, $p < .05$). On the other hand, English speakers in any different source and sentence order groups did not behave differently to the different source pairs.

Discussion

This experiment was designed to investigate implicitly the influence of evidentiality on decision-making. Similar to the developmental evidentiality investigations that used the hidden object task (e.g. Fitneva, 2008; Matsui et al., 2006; Öztürk, 2008), participants were torn between two facts contradicting each other and presented with different evidential sources. Participants had to make a choice to complete the task. Their decisions demonstrated which of the evidential sources they relied on more. Differently from the hidden object task, participants were not given the

facts by two different characters/experimenters. Instead, the contradicting facts were presented as part of a story. Further, participants were not asked directly which of the facts/evidential source they relied on while making their decision. Instead, they were asked to complete the third sentence to make the story coherent so that they would have to make a decision based on a greater weighting of one of the two facts given to them in the two antecedent sentences.

The reason for using such a design was to measure the reliance on different evidential sources without asking participants explicitly to select a reliable source. Further, the discourse completion task was open-ended; therefore, participants did not need to select one of the sources to base their decisions, but could find some other way to complete the third sentence. Thus, the task did not force participants to select one of the sources to make their decision.

The results demonstrated that the hypothesis of reliance on the proximity of the speaker to the reported event (as conveyed by the evidential source) was supported partially. Participants' reliance on the stronger evidence in terms of its proximity to the event changed depending on some specific conditions. The overall mean percent of reliance on the stronger evidence was near chance level for both Turkish (50.09%) and English speakers (53.55%). Moreover, regardless of participants' language, their reliance on the stronger evidence did not change depending on the pairs of sources. However, when Turkish and English speakers were considered separately, English speakers' reliance to source pairs supported the hypothesis.

It was expected that the distance between first-hand and hearsay (as the most remote proximity in terms of place and time) would be further apart than the distance between first-hand and inference and between inference and hearsay. English speakers demonstrated that they relied on the first-hand source more (57.55%) when it was paired with hearsay. This is consistent with de Haan (1998) and Barnes (1984), who predicted that the source of hearsay represented further proximity to the reported event. Thus, speakers should rely less on hearsay information than first-hand and inference. On the other hand, Turkish speakers did not show a significant difference between the pairs of sources.

Although no difference was expected between Turkish and English speakers, their response patterns were found to be significantly different. English speakers demonstrated a source order effect. Regardless of the order of presentation of general and particular facts, English speakers relied on the stronger evidence when it was presented in the second sentence. In the example, *Jack was apparently/reportedly afraid of heights. But he rented an apartment on the tenth floor of a high-rise*, English speakers completed the third sentence in a way that indicated that they believed that Jack had rented the apartment. However, when the stronger evidence appeared in the first sentence, their reliance on the strong evidence decreased to slightly under 50%, or chance level. This finding can be considered as a recency effect, that is, English speakers tended to complete the third sentence by relying on the most recent fact they saw, regardless of the evidential source of the sentence. Then, when the strong evidence was

presented in the first sentence, English speakers' reliance score decreased, presumably because the second sentence in that group had the weaker evidential marker.

A recency effect was demonstrated in previous decision-making and judgment studies. For example, Bruine de Bruin (2005) and Bruine de Burin and Keren (2003) tested the serial position effect on decision-making in various experimental contexts such as blind date selection, dorm room selection, and various real life contexts such as Eurovision Song Contest, European and World Figure Skating Contests. Their findings demonstrated that when competing options were presented in a serial order, the most recent options were more likely to be judged more positively or to be selected. A recency effect may similarly be operating in the present study with English speakers' reliance on the most recent information.

Although English speakers demonstrated a recency effect in both sentence order groups (general and particular facts), their reliance on the strong evidence when it appeared in the first sentence increased when the particular facts were presented first, compared to when general facts were presented first (from 38.25% to 45.99%) (e.g., *Jack rented an apartment on the tenth floor of a high-rise. But he was apparently/reportedly afraid of heights*). Thus, it is a possibility that having the strong evidential marker in the first sentence could reduce the recency effect of English speakers only for particular facts.

On the other hand, Turkish speakers demonstrated the recency effect only when the sentence was presented in the order of general fact first and particular fact second. This was the case for both source order conditions. Thus, when the strong evidential

marker was presented in the second sentence Turkish speakers' reliance on the strong evidence increased. When the strong evidence marker was presented in the first sentence, their reliance on the strong evidence decreased, as was the case for English speakers.

However, when the sentences were presented in the order of particular sentence first and general sentence second, the tendency to rely on the recent fact disappeared. Further, Turkish speakers' reliance on the strong evidence increased even when it appeared in the first sentence with the presentation of particular fact first order (from 23.03% to 56.65%). They supported the first, particular fact with strong evidence. However, their reliance on the strong evidence decreased when they saw the strong evidence marker on the second sentence with the particular-fact-first order (e.g., *Jack apparently/reportedly rented an apartment on the tenth floor of a high-rise. But he was afraid of heights*) compared to the reverse sentence order (general-particular) with same source order (from 75.40% to 48.78%).

In summary, both Turkish and English speakers demonstrated a recency effect when they received the general facts first and particular facts second. However, the recency effect disappeared for Turkish speakers when they were presented the particular facts first. For English speakers the same recency effect was observed when the particular facts were presented first, although the effect reduced comparing to the general-facts-first order group. This finding suggests that when the facts were presented as particular first and general second Turkish people look for other signs or clues available to resolve the dissonance and to make their decisions. At this point the reliability of the source markers was one of the signs that they could use for arriving at

their decision. This can be observed in the particular-general order with strong evidence first group. They were more likely to rely on the strong evidence (56.65%) even though the recent fact indicated contradicting information.

However, the reason for this increase could be due to Turkish speakers' reliance on the particular facts as well. Turkish speakers demonstrated an attributional bias, where they tended to rely on the particular situational fact (*Jack rented an apartment on the tenth floor of a high-rise*) over the general fact (*he was afraid of heights*). This situation was discussed by Kahneman and Tversky (1973, 1974) and Nisbett et al. (1976). Kahneman and Tversky focused on base rate bias in uncertain situations. The dissonance created in our experiment would lead participants to feel uncertain and make a probability bias by relying on the particular situation. Further, Nisbett et al. discussed the influence of the perceived vividness of the particular situation over the general fact. This could be another possible explanation of the present results where Turkish speakers relied more on the particular fact.

The difference between Turkish and English speakers when they received the particular sentence first could reflect cultural differences between the two groups. As Nisbett (2003) and Choi, Nisbett and Norenzayan (1999) indicated, there are differences between members of Eastern vs. Western cultures in reasoning in terms of their attibutional processes. People from Western cultures tend to describe objects, persons or reasons based on context-free general attributions (e.g., *Joe is generous*) while people from Eastern cultures tend to describe things in context-specific ways (e.g., *Joe is generous to his friends*). Consistently in our experiment, Turkish speakers, as a part of

Eastern culture, demonstrated this attributional bias while they based their judgments or decisions on the particular fact rather than the general one. English speakers, however, did not show a fact/sentence order effect.

The developmental evidential studies exhibited a clear evidentiality effect on relying on a fact while making a decision (Fitneva, 2008; Matsui et al., 2006; Öztürk, 2008). Although the evidentiality effect on individuals' decision-making was partially supported, the results of this study demonstrated that there are various other possible variables (e.g., the recency effect, specificity of the fact) that influence resolution of dissonance and decision-making. The difference in the findings may be due the difference of participants' age. The developmental studies' samples consisted of 5-9 years old children, while this study tested adult participants. Further, although the tasks of the experiments had some similarities, what was asked from participants was conceptually different. In developmental studies, children were asked to pick either A or B. In this experiment; however, participants were asked to solve a conflict and produce a new sentence to resolve inconsistences of the preceding sentences.

There were some limitations of the present investigation. Having an open-ended task makes the data coding open to the coders' own interpretations which may or may not be consistent with participants' actual interpretations. Although the inter-coder and intra-coder reliability was high, it is suggested that in further analyses, a close ended, multiple-choice task would be another way of ensuring objectivity. Multiple choice or close-ended decision-making tasks would also help to reduce data loss, because in this study almost one third of the completed sentences could not be categorized as supporting

one of the antecedent sentences. However, multiple-choice tasks make the experiment less natural. Thus, there is a need to conduct further investigations with better controlled decision-making, while attending to issues of external validity.

CONCLUSIONS AND FUTURE DIRECTIONS

The present research taken as a whole aimed to bring about a better understanding of evidentiality and resolve some critical questions about what kind of information evidentiality conveys to language users. The first study endeavored to answer the question of what evidentiality means to speakers and what was the nature of the relationship between evidentiality and modality. By explicitly asking participants to make source judgments of evidential sentences, the study aimed to examine whether speakers themselves interpret evidential expressions as they are claimed to interpret them based on the linguistics literature. By the same token, asking participants to make confidence judgments of modal sentences aimed to investigate speakers' interpretations of modal expressions and how they correspond with theorized claims in the linguistic literature. Further, asking participants to make source judgments of modal expressions and confidence judgments of evidential expressions was designed to address the relationship between evidentiality and modality.

The second study aimed to investigate implicitly the influence of evidentiality on discourse coherence decision-making with the consideration that evidentiality conveys not only the source of reported knowledge but also the epistemic value of the proposition. Therefore this study served as a real life application of evidentiality in practice.

Results from the first study demonstrated that people could find enough information to interpret the epistemic value of various evidential sources, and the source of information of the various modals. Interestingly, Turkish speakers were more likely to

respond ‘not enough information’ when making their judgments than English speakers, although both evidentiality and modality are marked in grammar in Turkish. This finding can be explained by cultural differences, with Turkish culture being more aligned to Eastern cultures, and American culture as a Western culture. Previous cultural psychology investigations found that people of Western cultures are more likely to look into even slight details to find one single correct answer, while people of Eastern cultures are comfortable with a dialectical response (Matthew & Busemeyer, 2011; Nisbett, 2003).

In addition to ‘not enough information’ findings, Turkish and English speakers interpreted evidential and modal expressions differently. Turkish speakers judged the source of all evidential markers except assumption, as would be expected based on their grammar. Also, they judged the epistemic value of the evidential expressions at various levels in the order of inference, with the greatest certainty followed by assumption, hearsay and conjecture. On the other hand, English speakers judged all evidential expressions except assumption as hearsay. Interestingly, they interpreted the epistemic value of those evidential expressions at various levels, although they judged most of them as hearsay. ‘Reportedly’ received the greatest certainty score and the other adverbs, such as ‘apparently’, ‘presumably’ and ‘supposedly,’ followed. Similar to the interpretations of evidential expressions, the modal expressions were also interpreted differently by Turkish and English speakers. Turkish speakers interpreted all of the modal expressions as the same in terms of both their source of evidence and their epistemic value. On the other hand, English speakers interpreted each modal expression

individually in terms of their source of evidence and epistemic value. The modals' source interpretations varied between inference, assumption, and conjecture. Their epistemic values were varied as 'must' was judged the most certain modal, followed by 'should', 'could' and 'might,' consistent with the literature (e.g., Francis & Wales, 1994).

The second study demonstrated that relying on strong evidence while making decisions was situation-specific. Overall, English speakers exhibited an evidentiality effect only when first-hand and hearsay were paired. Participants completed the third sentence as supporting the fact reported with the first-hand expression. This finding is consistent with what would be expected based on the linguistic literature (e.g. Barnes, 1984; de Haan, 1998) and what was found in developmental evidentiality investigations (Fitneva, 2008, 2009; Matsui et al., 2006; Öztürk, 2008). Considering that English speakers judged the epistemic value of 'reportedly' (hearsay) much greater that 'apparently' (inference) in the first study, it was surprising to find an evidentiality effect in first-hand-hearsay pairs but not in first-hand-inference pairs. According to English speakers' confidence judgments in the first study, it was expected that the distance between the reliability of first-hand and inference would be further apart than the distance between first-hand and hearsay.

Turkish speakers, however, did not demonstrate an overall evidentiality effect. Participants demonstrated a clear recency effect where they completed the last sentence as supporting the fact that was reported in second sentence, regardless of the source of information of the fact. Only when a particular fact appeared first, the recency effect of

Turkish speakers disappeared. This finding can be explained by interference from evidentiality or by an attributional bias in favor of particular information.

Although in the first study participants could judge the epistemic value of the evidential sources, in the second study the evidence that the epistemic value of the evidential sources influenced speakers' decision-making was not clear. Further, the results of the second study are not entirely consistent with previous research investigating the effect of evidentiality on decision-making. Several reasons can be listed for the inconsistent findings. First, the difference between the tasks used in Study 1 and Study 2 could lead to the inconsistent findings. Study 1 was more straightforward than Study 2 from the participants' and coding point of view. Participants were asked to select the source or confidence level option that seemed the right answer to them for a given sentence. Coders were asked to enter what was selected by the participants. On the other hand, in Study 2 participants were asked to produce a new sentence after reading two contradicting antecedent sentences. Further, coders were asked to judge this open-ended data. Although coders were provided a coding rubric and the reliability of different coders was strong, the task was less straightforward than a multiple-choice task.

Second, the difference between the findings can be due to the distinction of the nature of the two studies. Study 1 measured the epistemic value of the evidential sources explicitly by directly asking participants to make confidence judgments. In contrast, Study 2 measured the epistemic value of the evidential sources implicitly, by creating a dissonance between two facts presented in different evidential sources. In this study, participants were never asked which fact they trusted (as was the case in the

developmental studies). Instead, they were asked to complete a third sentence with the assumption that they would rely more on one of the facts and that this would be detectable by how they completed the vignette. This can also explain the difference between the findings of the previous studies and the present one.

Finally, the inconsistent findings can be due to the difference in the level of language examined. Study 1 examined the sentence level out of context, while Study 2 provided a sentence context. Participants in Study 1, therefore, had to focus on a single sentence and make their judgments depending on what was provided to them, which was basically the evidential expressions. On the other hand, participants in Study 2 had more information than a single sentence, and the context that was provided to them could lead them to consider other factors besides evidential markers in making their decisions. Overall, the findings demonstrated that the epistemic value of the source of information might not be the only foundation for people to consider while making their decisions. However, people can interpret the source of information and epistemic value of both evidential and modal expressions in a single sentence. This result is worth discussing for its linguistic and theoretical implications.

Implications for the Views of the Relationship between Evidentiality and Modality

Study 1 was specifically designed to address the debate on the relationship between evidentiality and modality. As discussed in the chapter of the first study, the results provide insight on this long-standing debate. First, although Turkish and English speakers' interpretations revealed some differences from each other, one constant

finding was that both groups could interpret both the epistemic value of evidential expressions and the source of information of modal expressions. This demonstrated that evidentiality and modality are not entirely independent disjointed properties. Instead, they overlap significantly. Thus, the complete disjoint view by Aikhenvald (2004), Lazard (2001) and Oswalt (1986) is rejected.

Furthermore, English speakers interpreted both the source and epistemic value of each and every evidential expression, while they responded more with 'not enough information' to the modal sentences. A very similar picture was drawn by the inclusion view, where evidentiality was considered as a subtype of modality (e.g., Bybee, 1985; Mithun, 1999; Palmer, 1986; Willett, 1988). According to English speakers, all evidentials were modals, but not all modals were evidentials (see Figure 10). According to English speakers' source and confidence judgments, in their evidentiality and modality intersection modals were represented individually because they were judged differently from one another in term of the source and epistemic value. Within the evidential expressions only assumption (*presumably*) was judged to be different. The other evidential expressions were judged as the same source, hearsay, while their epistemic value varied from the strong, medium to weak. Thus, they were represented as under one set of sources with various certainty levels.

Turkish speakers, on the other hand, reported more 'not enough information' responses, while interpreting evidential and modal expressions for both source and confidence judgment tasks. Thus, Turkish speakers' evidentiality and modality interpretations were similar to the picture of the overlap view (see Figure 11) by

DeLancey (2001), Faller (2002) and van der Auwera and Plungian (1998). Differently than English speakers, all evidential expressions were represented independently in Turkish speakers' intersection between evidentiality and modality, while all modal expressions were represented as the same.

Considering the evidentiality and modality intersections of both Turkish and English speakers, it is a possibility to indicate that how evidentiality and modality are represented is consistent with how these structures are marked in the language. Because English speakers mark modals in the grammar and evidentials in the lexicon, they demonstrated a clear distinction between modal expressions but not for evidential expressions. On the other hand, Turkish speakers mark both evidentiality and modality in the grammar, although modality is marked at a morphosyntactic level. Thus, Turkish speakers interpret evidential source markers differently from one another, and all modal markers as the same, because evidential markers can substitute for modal markers in terms of the information they convey.

The results of this investigation also revealed that the relationship between evidentiality and modality changes from language to language, or how languages mark these structures. Therefore, it can be concluded that this investigation found support for the inclusion and overlap views. However, other uninvestigated languages might reveal support for the other relationship structures between evidentiality and modality. Therefore, future studies should focus on different evidentiality and modality marking structures, such as languages which mark modality in the lexicon and evidentiality in the grammar or which mark both in the lexicon. Further, investigating the evidentiality and

modality relationship structure in bilingual speakers would be an informative step as well. Bilingual speakers whose one language codes evidentiality in the grammar and another language in the lexicon might construct the structure of evidentiality-modality relationship differently depending on their languages. Or else they could build separate structures for each of their language and use the structure of the operating language at the time.

An understanding of the relationship between evidential and modal structures is important not only for its theoretical significance but also because of its real life implications.

Practical Significance of Research on Evidentiality in Relation to Decision-making

Decision-making is one of the basic functions guiding many facets of daily life. Thus, the significance of research on possible variables which influence decision-making processes is unquestionable. Study 2 was designed to address the influence of evidential expressions on decision-making. The results of the study are of particular importance in settings where the decisions that are made have a long-lasting impact on individuals' lives, such as courtrooms, political elections, medical environments, marketing and business, and academia. In these and similar settings linguistic framing is used significantly to manipulate decisions of people (for more information, see Matlock, 2012; Tannen, 1993).

The first study demonstrated that people interpret the reliability of the source of information. The second study, therefore, aimed to examine whether strongly reliable evidential expressions would impact speakers' decision-making.

Previous studies on the impact of evidentiality on decision-making tested child participants with the purpose of investigating comprehension of evidentiality. Participants were given two contradicting responses with different sources of evidence to a given question and asked to answer the same question. Participants' responses were coded depending on which previous response they trusted. Researchers consistently found that children relied on the fact that was presented in first-hand form more than the fact that was presented in non first-hand form (Fitneva, 2008, 2009; Matsui et al., 2006; Öztürk, 2008). Study 2 used a similar method. However, because adult speakers participated in the experiment the design was altered accordingly.

The results of Study 2 exhibited partial support for the influence of evidentiality on decision-making. It was found that there are other variables which appear to influence the decision-making process besides evidential expressions, such as recency of the presented information and the specificity of the information. However, the results are promising in showing that the epistemic value of evidential expressions influences individuals' decisions. People consider that facts that are reported with first-hand source expressions demonstrate a very strong epistemic value. The underlying meaning of the first-hand expression is that the speaker, herself, personally witnessed what was reported. Thus, it is considered more secure to rely on the first-hand evidential expressions. Further, according to Barnes (1984) and de Haan (1998), the source of inference is the

second strongest evidence after first-hand source, because the underlying meaning of inference is that the speaker did not see what exactly happened, but instead she saw at the same place where the reported event happened; that is, she saw the signs and effects of the event. On the other hand, the source of hearsay is the least strong evidence because the underlying meaning of hearsay is that the speakers neither saw the reported event, nor the signs and effects of it. The speaker received the information through language and was neither at the same time nor at the same place as the event occurred. Thus, in terms of proximity, the distance between first-hand and inference is closer than the distance between first-hand and hearsay. This distance can be used while framing in discourse.

The qualitative investigations on discourse and evidentiality demonstrated that evidential expressions are used to indicate assertion and commitment (Berlin 2011a, 2011b), responsibility, entitlement, certainty of knowledge, denial (as non first-hand) of the described situation (Fox, 2008), unbelievable and unreliable situations as fairy tales (Johanson, 2003) and the distance between the speaker and the described situation (Aksu-Koc & Slobin, 1986). Thus, discourse analyses revealed that evidentiality is used by speakers to frame their stories with the underlying meaning of various evidential sources. Thus, they can manipulate their audiences' judgments and decisions. Therefore better designed adult studies are needed to understand how using evidentiality as a linguistic framing device may influence individuals' decisions.

Broader Impact

Indication of evidentiality is available in each language, although there are differences in coding the source of knowledge in terms of the linguistic level. Although linguistic and ethnographic investigations have already examined and discussed evidentiality structure in numerous languages, there are only a few investigations that aimed to examine evidentiality empirically. Empirical investigations contribute an understanding of causal impact of evidentiality on human cognition. Therefore it is possible to answer how subjects comprehend, interpret, produce and judge evidentiality in a controlled environment under certain manipulations. Further, empirical investigations help researchers to test different views on what evidentiality exactly means and conveys to speakers.

This study, to my knowledge, is the first investigation which aimed to answer empirically the long-standing debate on the relationship between evidentiality and modality. Moreover, it is also the first study that investigated the effect of evidentiality on decision-making of adult speakers. Therefore, the findings are a contribution to the evidentiality literature. Further, along with the results of the study, the methodology of the investigations including the materials, design, and procedure is another significant contribution for future investigations.

By way of conclusion, the impact of this study can be summarized as follows: First, it was demonstrated that there was a clear relationship between evidentiality and modality. Evidential expressions convey the epistemic value of the propositions along with the source of evidence. By the same token, modal expressions convey the source of

evidence along with the epistemic value of the propositions. Second, the classifications of the evidential and modal expressions in the linguistic repertoire of speakers change from language to language depending on how evidentiality and modality are marked. Finally, although it was only partially supported, there is promising evidence that evidential expressions influence individuals' decision-making. Evidential expressions with a higher epistemic value are relied on more than those with a weaker epistemic value when making decisions.

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APPENDIX A: INSTRUCTIONS FOR STUDY 1

INSTRUCTIONS (Source judgment)

In this experiment we would like to see how listeners interpret sentences in their language that differ in subtle ways. You will be shown a list of sentences describing some event. Please read each sentence as carefully and closely as you can. Upon reading each sentence, you will be asked to make some judgments, which involve deciding what the source of the reported event is – i.e., is the source hearsay, an inference based on other observation, an assumption or a conjecture. As an example, let's say the sentence was about someone saying there was a mouse in a house. In this case, "Hearsay" would indicate that the information is based on hearing it from someone else. For example, the person's friend told him/her that there was a mouse in the house. "Inference" means that the person who reported the information saw some signs related to the information but did not see what happened. For example, the person saw footprints of the mouse but did not see the mouse itself in the house. "Assumption" indicates that the person who reported the information did not see what happened but reasoned what must have happened based on some knowledge. For example the town where the house located was known for its mice. "Conjecture" would mean that the person who stated that information did not see the event, but also the source of information was unspecified. For example, the person heard people talking about a mouse and s/he guessed that there was a mouse in the house.

INSTRUCTIONS (Confidence judgment)

In this experiment we would like to see how listeners interpret sentences in their language that differ in subtle ways. You will be shown a list of sentences describing some event. Please read each sentence as carefully and closely as you can. Upon reading each sentence, you will be asked to make some judgments, which involve how confident you feel about whether the reported information actually took place: are you extremely confident, quite confident, somewhat confident or not at all confident. For example, for the example given above, you would indicate how confident you would be that there was

actually a mouse in the house if you heard the sentence. Remember that there are no right or wrong answers in this test. We are simply interested in seeing how listeners typically interpret sentences conveying information about an event.

APPENDIX B: SAMPLE STIMULI USED IN STUDY 1

PLEASE MAKE THE SOURCE JUDGMENTS OF THE FOLLOWING SENTENCES

No	Sentence	Hearsay	Inference	Assumption	Conjecture	Not enough information
1	The teacher should have answered the students' questions.					
2	Supposedly the girl drank orange juice at breakfast instead of tea.					
3	The student could have subscribed to the monthly journal.					
4	Presumably he ironed all of his shirts on Sunday.					
5	She might have sworn not to tell anyone.					
6	Presumably the man asked the teacher to stay at his home.					
7	The woman might have gone to the beach to sunbathe.					
8	Reportedly she walked home from school today.					
9	Reportedly the man planted tomatoes and pepper.					
10	Apparently my friend's uncle went into politics.					
11	Supposedly he went to the park for a run this evening.					
12	The boy might have talked in his sleep last night.					

PLEASE MAKE THE CONFIDENCE JUDGMENTS OF THE FOLLOWING SENTENCES

No	Sentence	Extremely confident	Quite confident	Somewhat confident	Not at all confident	Not enough information
1	The teacher should have answered the students' questions.					
2	Supposedly the girl drank orange juice at breakfast instead of tea.					
3	The student could have subscribed to the monthly journal.					
4	Presumably he ironed all of his shirts on Sunday.					
5	She might have sworn not to tell anyone.					
6	Presumably the man asked the teacher to stay at his home.					
7	The woman might have gone to the beach to sunbathe.					
8	Reportedly she walked home from school today.					
9	Reportedly the man planted tomatoes and pepper.					
10	Apparently my friend's uncle went into politics.					
11	Supposedly he went to the park for a run this evening.					
12	The boy might have talked in his sleep last night.					

APPENDIX C: A SUMMARY TABLE OF SOURCE JUDGMENTS

A summary of Turkish and English Speaking Participants' Mean Source Judgment Responses in Percentage to Evidential and Modal Sentence Forms

Sentence form	Language	Source Judgment Responses			
		Hearsay	Inference	Assumption	Conjecture
Hearsay	Turkish	37.91 (38.08)	13.01 (22.18)	12.39 (18.18)	36.68 (37.71)
	English	75.83 (28.24)	9.50 (15.00)	6.83 (11.71)	7.83 (16.78)
Inference	Turkish	18.23 (24.29)	59.68 (33.41)	13.64 (18.33)	8.44 (14.90)
	English	52.61 (35.24)	24.33 (25.42)	13.69 (18.77)	9.37 (16.17)
Assumption	Turkish	17.61 (24.72)	42.02 (25.87)	31.41 (27.60)	8.95 (15.33)
	English	24.81 (26.47)	34.46 (27.46)	29.19 (28.10)	11.54 (16.57)
Conjecture	Turkish	27.22 (34.20)	8.26 (14.52)	15.05 (21.68)	49.47 (38.68)
	English	52.89 (36.05)	18.07 (21.95)	18.98 (24.15)	10.06 (16.05)
Must	Turkish	11.64 (16.48)	45.78 (26.83)	33.50 (25.40)	9.09 (17.09)
	English	4.07 (9.55)	37.83 (26.27)	44.01 (25.55)	14.08 (15.76)
Should	Turkish	12.55 (20.81)	44.70 (31.75)	26.37 (25.81)	16.38 (25.79)
	English	7.78 (16.95)	29.91 (27.55)	31.18 (32.62)	31.14 (33.35)
Could	Turkish	12.08 (19.39)	39.59 (27.40)	38.13 (26.84)	10.19 (18.64)
	English	8.59 (19.50)	28.75 (21.98)	38.34 (25.19)	24.32 (25.50)
Might	Turkish	11.11 (19.69)	40.64 (28.51)	40.23 (29.73)	8.02 (13.79)
	English	4.46 (8.94)	29.08 (23.83)	36.52 (24.76)	29.94 (27.30)

Note. Standard deviations were presented in parenthesis.

APPENDIX D: A SUMMARY TABLE OF CONFIDENCE JUDGMENTS

A summary Table of Turkish and English Speaking Participants' Confidence Judgments Scores of Evidential and Modal Sentence Forms

	Sentence Form	Turkish (n=52)	English (n=60)
Evidential	Hearsay	40.00 (25.84)	65.90 (2.65)
	Inference	59.31 (22.92)	53.13 (17.54)
	Assumption	49.13 (23.28)	47.35 (16.8)
	Conjecture	22.10 (23.87)	44.85 (17.1)
Modal	Must	42.64 (15.65)	58.85 (17.74)
	Should	44.27 (21.85)	45.67 (27.7)
	Could	38.92 (19.32)	41.82 (22.67)
	Might	35.51 (17.92)	36.32 (20.38)

Note. Standard deviations were presented in parenthesis.

APPENDIX E: INSTRUCTIONS FOR STUDY 2

In this study we want to investigate how language users make sense of discourse. In this experiment you will see a set of two sentences at a time. Please read those sentences as if they were part of a story. Then you will be given a part of a third sentence and asked to complete it so that it makes sense, given the preceding sentence. For example:

Kurt was a chubby boy. But he did not eat anything yesterday. Kurt

_____

You might complete this sentence as “was a bit sick then”.

Please ask if you have any questions.