

The Semantics of Hearsay Evidentials in Propositional Attitude Constructions

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Abstract: This paper argues that neither the classical semantic treatment of the propositional attitudes (Hintikka (1969)) nor the previous semantic analyses of the hearsay or reprotative evidentials fit into the semantics of the English hearsay evidentials. This is mainly because not only is the notion of the compatibility that is employed in the semantics of propositional attitudes inappropriate for that of hearsay evidentiality, but they can be interpreted to convey an assertion, in which the speaker commits to the truth of the embedded proposition, and a proffering, in which the speaker does not. In order to account for the different interpretations, this paper develops an analysis of the English hearsay evidential, which is along the lines of that proposed by Krazter (1991), by positing different ordering sources for each of the interpretations. The introduction of the different ordering sources into the semantics of the hearsay evidentials plays the role of indicating whether or not the speaker commits to the truth of the proposition expressed by the embedded clause.

Key words: hearsay evidentiality, modal base, ordering sources, propositional attitudes

1. Introduction

Hearsay sentences in English which are expressed in the form of propositional attitude constructions are often used to report what is heard regardless of whether it is true or false, as illustrated in (1a-b):

- (1) a. I heard that she is out of town.
 b. I was told that she is out of town.

In the sentences in (1a) and (1b), the speaker reports or relays the proposition expressed by the embedded clause, and bases her report on evidence which is called hearsay. For this reason, sentences like (1a-b) can be taken to be examples of (hearsay) evidentiality which serves to encode the source of information.

It is the characteristic of hearsay evidentials in many languages such as Cheyenne, Cuzco Quechua, and Tuyuca that the speaker does not so much commit to the truth of an evidential proposition as simply reports what she has heard without such a kind of commitment (Barnes (1984), de Haan (1999), Faller (2002, 2006), and Murray (2010) among others). As was mentioned in von Stechow and Gillies (2007) and Rooryck (2001), and Simons (2007), however, one should note that when they are the answers to the question, “Why is Jane not coming to the party?”, the English hearsay evidential sentences in (1a-1b) can be interpreted in two different ways: an assertion and a proffering. In the former case, the speaker asserts that she heard that Jane is out of town, and in the latter case, on the other hand, the speaker offers an explanation of Jane’s absence. This suggests that the speaker’s commitment to the truth of the embedded proposition is valid in the assertion case, whereas it is not in the proffering case. Given this, it is obvious that the English hearsay evidential sentences do not pattern like their counterparts in many other languages, and hence, to my knowledge, they do not fit into the semantic analyses of hearsay evidentials that have been proposed in the evidential literature. Thereby, this paper is mainly concerned with exploring a semantic analysis of the English hearsay evidentials within possible worlds semantics to account for their semantic properties.

This paper is constructed as follows: section 2 is devoted to discussing evidential phenomena in English. Section 3 addresses the properties of evidentials in English that are distinctive from those in other languages. Section 4 and 5 point out the problems that may arise from the classical semantics of propositional attitudes and the previous analyses of evidentials, respectively, when they apply to English hearsay evidential sentences. Finally, section 6 offers a semantic treatment of the hearsay evidentials.

2. Evidential Phenomena in English

Evidentiality refers to a grammatical expression that functions to signal a source of information or evidence on which the speaker bases her statement. In many languages such as Tuyuca (Barnes (1984)), a Tucanoan language that is spoken in the western Amazon region, and Cuzco Quechua (Faller (2002)), a language that is spoken in Peru, which are rich in evidential markers, evidentiality is expressed in terms of specific morphemes (or enclitics) that are attached to the stems of verbs (see also Chafe (1986), de Hann (1999), Murray (2010), and Willet (1988)).¹

In contrast, English is a language that is set apart from those languages mentioned above. It has no specific evidential morphemes or inflections whatsoever that are added to the base of a verb. Instead, it employs certain syntactic structures to express evidentiality, as it has been noted in the literature that evidentiality is expressed in certain languages by adverbs or certain syntactic structures (cf. Chafe and Nichols (1986), Cinque (1999), and Rooryck (2001) among others). To see this, consider the following sentences:

- (2) a. I heard that Mary is out of town.
b. I was told that Mary is out of town.
- (3) a. People say that Mary is out of town.
b. They say that Mary is out of town.
- (4) a. Apparently, Mary is out of town.
b. Actually, Mary is out of town.

The sentences in (2a-b) are those which are involved in expressing hearsay evidentiality and they take a form of a propositional attitude construction where a clause is embedded under

¹ I will not get into more details here since the semantic discussion of the use of evidentiality in such languages is beyond the present study. Instead, I will simply touch upon how evidentiality is expressed in those languages.

another clause. Although the syntactic form of sentences like (3a) and (3b) also that of the propositional attitude construction, their subjects refer to unspecific ones, more precisely people in general, so (3a-b) could be interpreted to mean that Mary is said to be out of town, or according to what people say, she is out of town. Finally, unlike (2a-b) and (3a-b), sentences like (4a-b) occur with adverbs like *apparently* and *actually* to describe inferential evidentiality. The data presented above show that the English language employs certain syntactic constructions or lexical items such as evidential adverbs like *apparently* and *actually* and epistemic modal verbs such as *must* and *may* etc.,² to express evidentiality, instead of using evidential morphemes, or evidential markers, that are supposed to be added to the bases or stems of certain syntactic categories, which is widely accepted in languages that are full of evidentials.

3. Evidence

In this section, I will discuss the English examples in the previous section behave like evidential, based on the main characteristics of evidentials that have been mentioned in the literature. It is argued in the literature that if the meaning of a certain linguistic expression is subject to the challengeability tests, according to which its content can be questioned, rejected (or doubted), or agreed with, it commits to the truth of the proposition expressed by that expression, whereas if it is not, it does not (see Faller (2002), Lyons (1977), Murray (2010), Palmer (2001), and Sweetser (1990) among others). As was discussed in earlier evidential works such as Faller (2002, 2006) and Murray (2010), the proposition (more precisely the evidential scope proposition) under the scope of evidentials is directly challengeable, whereas the evidential part itself is not. This indicates that the speaker does

² Recent papers about the semantics of epistemic modality argue that epistemic modal verbs like *must*, *should*, and *may* can be treated as inferential evidentiality, as in *John must be a doctor* (see Drubig (2001), von Stechow and Gilles (2007), Song (2009), Westmoreland (1998) and among others).

not necessarily commit to the truth of the evidential proposition.

The English examples in (2a-b) are considered as hearsay evidentials in the sense that the speaker simply reports what she has heard to the addressee. Given what has been discussed in the previous passage, it would have to be predicted that the English examples in (2) and (3) pattern with evidentials since they are subject to the challengeability tests. To see this, consider the following examples:

- (5) a. A: I heard that Mary wants to be a professor.
 b. B: That is not true.
 c. B: Is that so?
 d. B: I agree.

(5b), (5c), and (5d), which are the speaker B's response to what the speaker A utters, are examples of rejection, doubt, and agreement respectively. As we can see from the above examples, what is rejected, doubted, and agreed is not the evidential part itself expressed by the embedding clause that functions to encode the source of information, but rather the evidential scope proposition. This implies that the speaker does not necessarily commit to the truth of what is conveyed by the embedded proposition.³ The source of information on which the speaker bases her statement is something that is accepted as true, whether or not the proposition in question is true.

However, this is not the case with belief sentences, as illustrated in the following contrast:

³ One should note, however, that the English hearsay evidentials are different from those in other languages since they can be interpreted to convey an assertion and a proffering, which will be discussed in section 5. When it comes to the assertion, the speaker commits herself to the truth of the evidential proposition, while she does not in case of the proffering.

- (6) a. I heard from Susan that Mary went to school today, but that was not true.
 b. #I believes that Mary went to school, but that was not true.

A sentence like (6a) clearly demonstrates that the speaker does not commit herself to the truth of the proposition expressed by the embedded clause because it is directly challengeable by the second part of (6a). Such a denial sounds quite natural. However, a sentence like (6b) is a belief sentence which does not allow for the denial of the proposition expressed by the embedded clause. This suggests that unlike the hearsay evidential sentence in (6a), the speaker commits herself to the truth of the proposition under consideration. Thereby, the denial of what the speaker believes leads to contradiction, which cannot be accepted as a natural discourse. Given this, propositional attitude sentences, more precisely hearsay evidential sentences, like (5a) can have an evidential flavor.

4. Previous Studies on the Semantics of Propositional Attitudes

To my knowledge, no rigorous semantic analysis of hearsay evidential sentences like (2a-b) has been proposed in the literature of the formal semantics. The examples we are considering in this paper demonstrate a parallelism with propositional attitude constructions like belief sentences, in that their complement clauses are embedded under the matrix clauses. Thus, the semantics of the propositional attitudes proposed by Hintikka (1962, 1969) and Quine (1956) can be extended to that of the hearsay evidential sentences in (2a-b). According to Hintikka, the semantics of propositional attitude constructions like a belief sentence is given in a similar way to the semantics of modality in terms of an accessibility relation which denotes a set of possible worlds where an individual's beliefs are true. This accessibility relation is called a doxastic accessibility relation. The doxastic accessibility relation can be defined as follows:

- (7) A world w' is doxastically accessible from w iff $w' \in \text{Dox}_a(w)$, where $\text{Dox}_a(w)$ is a set of worlds where every belief an individual a has in w is true.

As (7) indicates, doxastically accessible worlds are those which are compatible with what an individual believes. Based on (7), the semantics of a belief sentence can be defined as follows:

- (8) $\llbracket a \text{ believes that } p \rrbracket^{w, g}$ is true iff $\text{Dox}_a(w) \subseteq p$, where g is a variable assignment function.

In plain English, a belief sentence is true in a world w if and only if a set of a believer's accessible worlds is included in a set of worlds where p is true. In other words, it is true just in case p is entailed by the believer's worlds. For example, a belief sentence like *John believes that Mary is pretty* is true in w iff $\text{Dox}_j(w) \subseteq \{w' : \text{Mary is pretty in } w'\}$. To put it more simply, *John believes that Mary is pretty* is true in w iff for every world compatible with what John believes, Mary is pretty.

The hearsay evidential we have seen above can be semantically treated much in the same way as (10). To see this, consider the sentence in (2a), repeated below as (9):

- (9) I heard that Mary is out of town.

The truth conditions for a sentence like (9) can be stated as follows: (9) is true in a world w iff Mary is out of town is true in every possible world compatible with what the speaker heard (i.e. (9) is true iff $\text{HEAR}_{\text{speaker}}(w) \subseteq \{w' : \text{Mary is out of town in } w'\}$, where

$\text{HEAR}_{\text{speaker}}(w)$ is a set of worlds where what the speaker heard is true.

However, there arise two objections to this kind of semantic analysis of hearsay (or reportative) evidentials. First, what is it that it means to say “a set of worlds that are compatible with what an individual (more precisely the person who hears what is being conveyed) hears”? Is this really intuitively appropriate? Recall that a set of worlds compatible with what an individual hears means a set of worlds where what that individual hears holds. One problem might arise from this is that the compatibility-based definition is too vague and obscure. According to this definition, whatever an individual hears must be taken to hold in every possible world compatible with what that individual hears, even though the individual hears non-sense linguistic expressions, noise, and so on. It would definitely be non-sense to say that a car engine noise is true or that it is false. Note that the hearsay evidentials are used to send out a proposition (or information and message) that an individual hears to someone else. Given this, whatever is reported must consist of linguistic expressions that make sense and are appropriate for a given context. Thus, it seems to be reasonable to confine the notion of the accessibility relation based on the compatibility with what an individual hears to a set of meaningful propositions that she hears, excluding noise or non-sense expressions, when it comes to the semantics of the hearsay evidential sentences.

The following is another piece of evidence that also shows that the semantics of the hearsay evidentiality cannot be properly dealt within the Hintikka’s proposal. Suppose that John knows that Mary did not go to school today because she was very sick. Susan, one of Mary’s closest friends, is mistaken about Mary’s going to school and says, “Mary has come to school today.” John reports this and asserts that this is not true by uttering the following sentence:

(10) I heard from Susan that Mary went to school today, but that was not true.

Obviously, there is nothing wrong with John's utterance of (10) in this situation. The Hintikka's semantics would have to predict incorrectly that the first sentence in (10) is true. Its truth conditions can be stated informally as follows:

- (11) *I heard from Susan that Mary went to school today* is true in a world w iff Mary went to school on a day including the utterance time is true in every possible world that is compatible with what the speaker heard from Susan.

The truth condition in (11) does not work here, since in the situation mentioned above, the proposition expressed by the embedded clause is definitely false in all the possible worlds that are compatible with what the speaker John heard from Susan for the proposition is not compatible with a set of possible worlds where John's knowledge that Mary did not go to school today holds. As far as John knows, the embedded proposition in (10) is false, even though he heard it from Susan. Thereby, the addition of the utterance of the second sentence in (10) is not contradictory at all.⁴ Given what I have discussed so far, the Hintikka style of semantic analysis does not fit in the semantics of the hearsay or reportative evidentiality.

5. Previous Studies on Evidentiality

In the literature of semantics of evidentiality, two major approaches have been proposed for the analysis of the meaning of evidentials, according to the level at which they are semantically or pragmatically interpreted. One is to argue that their interpretation takes place at the propositional level or the truth-conditional level, and the other is, on the other hand, to

⁴ As was discussed earlier, this is not the case with belief sentences. The following sentence *I believe that Jane is doctor, but that is not true* is contradictory, which indicates that the proposition expressed by the embedded clause must be true in every world compatible with John's beliefs.

argue that they are interpreted at the level of the non-propositional level (beyond the semantic level).⁵ According to the former approach, evidentials are said to behave like epistemic modals since they contribute to the truth value of a sentence, so they can be treated in terms of the semantics of modality (Faller (2011), Izvorski (1997), McCready (2008), Ogata (2007), Rullmann et al. (2008) among others). In contrast, according to the latter approach, evidentials function to modify speech acts, more precisely illocutionary acts, because they do not contribute to the truth of an evidential sentence (Demonte and Fernández-Soriano (In press), Faller (2002, 2006), and Murray (2010)).

Izvorski (1997) presents the semantics of Bulgarian indirect evidential on the basis of Krazter's (1991) theory of modality, which is along the line of the former approach. Since then, there have been attempts to explore the modal-based semantic analysis of evidentials in other languages (cf. Faller (2011) and McCready and Ogata (2007)). What they have in common is that evidentiality can be semantically analyzed exactly in the same way as epistemic modality is. So, the epistemic modal base, a set of propositions that are known to the speaker, and the ordering source, a set of propositions that function to order possible worlds according to the ordering relation in question, play an important role in providing a semantic treatment of evidentials. For example, Izvorski argues that the modal base for evidential is a set of propositions which the speaker considers indirect evidence, as in the modal base = {p: the speaker consider p indirect evidence in w}. She also claims that the ordering source for evidential is a set of propositions which the speaker believes with respect to the evidence, as in the ordering source = {p: the speaker believes p with respect to the evidence in w}. The worlds where the ordering relation established by the ordering source is fully satisfied are the best worlds for evidential. Given this, an evidential sentence is true in a

⁵ Under Papafargou's (2006) sense, the interpretation at the sentential level is taken to be propositional, while the interpretation at the suprasentential level non-propositional.

world w if and only if it is true in all best worlds that are epistemically accessible from w .

One problem that may arise from the modal approach is that all cross-linguistic evidentials cannot necessarily be analyzed as being equivalent to epistemic modals. As was discussed in the previous section, there are many evidential markers across languages that seem to be irrelevant to epistemic modals in the sense that, as noted by Faller (2002), the evidentials in Cuzco Quechua are not affected by the challengeability tests, which indicates that they do not commit to the truth values of the proposition under the evidential operator. Due to this, evidentials should be semantically treated differently from epistemic modals which are said to commit to the proposition under the scope of the modal operator, as noted by Papafragou (2006). Besides, I have argued in the previous section that in some aspect, the evidentials in the propositional attitude construction we are considering in the present study are also subject to the property evidentials have. This kind of flavor needs to be incorporated into the semantics of evidentiality, which can be taken to be a problem with the treatment of an evidential as an epistemic modal. In addition to this, Izvorski (1997)'s proposal has its own limitation in dealing with English hearsay evidentiality, since it concentrates on the semantics of inferential evidentials, which is distinctive from the English hearsay evidentials in the sense that unlike inferential evidentials, they do not necessarily commit to the truth of the evidential proposition.

Faller (2011) also proposes a semantic analysis of the Cuzco Quechua reportative evidential *-si* in her recent work in terms of Kratzer's (1991) modal semantics. She argues in her treatment that no ordering source is required when it comes to the meaning of direct evidence like visual and reportative evidence. This is not only because in the Cuzco Quechua reportative evidential *-si*, the speaker does not commit to the truth of the reportative evidential proposition in *-si*, but because the direct evidence typically allows for an "immediate entailment" which can be directly entailed from the modal base without posing

an ordering source. However, Faller's analysis has a difficulty in dealing with the English hearsay evidentials since they might be interpreted to convey the speaker's assertion which suggests that the speaker commits herself to the truth of the hearsay evidential proposition (cf. von Stechow and Gillies (2007), Hooper (1975), Rooryck (2001), and Simons (2010) among others).⁶ The criticism I have offered here also can apply to other modal approaches to the reportative evidentials in other authors' work including Rullmann et al. (2008).

Let us get back to the second approach in which evidentials are dealt with at the non-truth-conditional level. This approach mainly argues that the evidentials function to modify a speech act, more precisely an illocutionary act (Demonte and Fernández-Soriano (In press), Faller (2002, 2006), and Murray (2010)) in that they are analyzed as speech act operators which can affect (or determine) the felicity conditions of a speech act. For example, Faller (2002) proposes a pragmatic treatment of evidentials such as the reasoning *-cha*, the direct *-mi*, and the reportative *-si* in Cuzco Quechua as modifiers of illocutionary acts within the speech act theory proposed by Searle (1969) and Searle and Vanderveken (1985), arguing that they are distinguished from epistemic modals.⁷ Because the current purpose of the paper is to discuss the semantics of the hearsay (or reportative) evidential, I will focus on Faller's proposal for the reportative *-si* in what follows among the other Cuzco Quechua evidentials.

Faller (2002, 2006) argues that evidentials which signal a source of information primarily play the role of modifying an illocutionary act with a sincerity condition. In other words, evidentials are functions from illocutionary acts of assertion to illocutionary acts of assertion with an added sincerity condition. For instance, the reportative *-si* maps from illocutionary act of assertion to illocutionary acts of presentation because the speaker does not commit to the truth or falsity of the proposition under the scope of the reportative

⁶ This will be discussed in more detail in section 6.

⁷ There are other works which are along the line of Faller (2002, 2006), but I will focus on Faller here since her work is one of the influential works on this topic.

evidential. Based on this, Faller (2002, 2006) analyzes the meaning of the reportative *-si* as follows:

$$(12) \quad -si: \text{ASSERT}(p) \quad \rightarrow \quad \text{PRESENT}(p)$$

$$\text{SINC} = \{\text{Bel}(s, p)\} \quad \text{SINC} = \{\exists s_2[\text{Assert}(s_2, p) \ \& \ s_2 \notin \{h, s\}]\},$$

where SINC, *s*, and *h* stand for a sincerity condition, the speaker, and the hearer, respectively.

As in (12), *-si* denotes a function from assertion with the sincerity condition that the speaker believes *p* to presentation with a modified (or reduced, weaker) sincerity condition that there is another speaker₂ who asserts *p* and the speaker₂ is neither the hearer nor the speaker. Notice that the speaker is the one who makes the utterance with the reportative *-si* to report *p* that the speaker₂ has asserted, while the speaker₂ refers to the one who spells out the proposition *p*. Given this, (12) implies that without committing herself to the truth or falsity of *p*, the speaker is simply reporting what she has heard from the speaker₂ who has already asserted *p*.

One should note that Faller's analysis of the reportative evidential is not appropriate for the English hearsay evidential that occurs in the propositional attitude constructions, since it behaves differently from its corresponding reportative evidential *-si* in Cuzco Quechua. Recall that *-si* is non-propositional or non-truth-conditional due to the fact that the speaker does not commit herself to the truth of the proposition under its scope. This may not be true of the English hearsay evidential in the propositional attitudes. To see this, consider the following dialogue:

(13) A: Why didn't Louis come to the meeting yesterday?

B: I heard that she is working on her dissertation.

The hearsay sentence uttered by the speaker B can be interpreted to convey two meanings, as was noted by von Stechow and Gillies (2007), Rooryck (2001), Simons (2007), and Urmson (1952). One meaning is associated with an assertion that the speaker B indeed heard the proposition expressed by the embedded clause, and the other is a proffering in which the speaker B is offering A an explanation of Louis' absence from the meeting. The former case amounts to saying that the speaker B is asserting the reason why Louis didn't make it to the meeting on the basis of the hearsay evidence, implicating that she commits herself to the truth of the proposition expressed by the embedded clause, and thereby it is propositional. On the contrary, the latter case implies that the speaker B is simply offering an answer to the speaker A's question without committing to the truth of the content of the embedded clause, which is similar to the Cuzco Quechua reportative evidential *-si*. Given this, Faller's analysis of *-si* does not fit into the English hearsay evidential in (13). Besides this, the fact that the reportative evidential in (13) is propositional indicates that it must be interpreted at the semantic or truth-conditional level, not at the pragmatic or non-truth conditional level. One should recall that Faller's (2002, 2006) treatments of evidential markers are based on the speech act theory. This suggests that their semantic interpretation is not compositional at all because they are closely related to pragmatic aspects. Thus, we need a new theory which can handle this.

Murray (2010) also argues that Cheyenne evidentials are speech act (or illocutionary act) modifiers because Cheyenne evidentials behave like Cuzco Quechua evidentials in many cases. In spite of this, however, she observes that there are differences between them, inasmuch as Cheyenne has some evidentials whose interpretations do not pattern like those of

Cuzco Quechua evidentials. For example, the distinction comes in when Cheyenne evidentials interact with questions. When Cuzco Quechua evidentials occur with questions, they are usually interpreted as content questions which function to state uncertainty. In contrast, when Cheyenne evidentials are used with questions, they are ambiguous between content questions and polar questions which are subject to interrogative flip. Furthermore, when it comes to the reportative evidentials, Cheyenne evidentials are ambiguous between direct questions and self-asked questions, while Cuzco Quechua evidentials are ambiguous between direct questions and relaying questions. The observation has led Murray to propose a theory of evidentials based on that of Potts (2003), which departs from Faller (2002, 2006).

Murray argues that evidential sentences consist of an evidential contribution which represents an evidential meaning and a propositional contribution which represents a proposition under the scope of an evidential. The evidential contribution, which functions as evidential restriction, is interpreted at the level of the not-at-issue content⁸ which is directly added to the common ground since it is not directly challengeable and negotiable, nor is it the main point of the sentence (Papafragou (2006) and Simons (2007)). On the contrary, the propositional contribution, which is an illocutionary relation functioning to restrict the common ground, is proposed to be added to the common ground, instead of being directly added to it. In other words, it is not added to the common ground until accepted as true.

To see how Murray's proposal fits in the reparative evidential in Cheyenne, consider the following sentence:

(14) É-hó'táheva-**séstse** Floyd.

⁸ Murray (2010) argues that evidential sentences contain both at-issue content and a not-at-issue content. The at-issue content refers to a propositional contribution or the scope proposition that can be challengeable, while the not-at-issue content is an evidential contribution that cannot be directly challengeable. The not-at-issue content produces speech acts, which suggests that it is similar to what Potts (2003) calls the conventional implicature (CI) meaning.

3-win-RPT. 3SG Floyd

‘Floyd won, I hear.’

(Murray (2010: 131))

A sentence like (14) can be semantically represented as follows:

(15) $\lambda p[(p = \lambda w[\text{won}(w, \text{Floyd})]) \& \text{HEARD}(v_0, i, p) \& v_1 = v_1]$, where i is the speaker, and w, v_0, v_1 are possible worlds.

In (15), the first conjunct is the at-issue proposition, the second conjunct is an evidential restriction, and the last conjunct is an illocutionary relation. (15) roughly denotes a set of propositions p that Floyd won in w and the speaker heard p and the worlds where p is true are ranked equally to those where p is not true (or all worlds in the common ground are ranked equally). The not-at-issue content (i.e. the second conjunct) is directly added to the common ground since it is not challengeable or negotiable, whereas the at-issue content which represents the proposition that Floyd won is the proposal to add it to the common ground due to the fact that it is challengeable and negotiable for the speaker does not commit to the truth of the at-issue content. Thereby the common ground for the reportative evidentials which has been updated after the evidential contribution intersects the old common ground stops being updated. The fact that the common ground remains the same suggests that the illocutionary relation ranks all worlds in the updated common ground equally, regardless of a set of worlds where Floyd won or where Floyd didn't, since the propositional contribution with the reportative evidential does not play a role in updating the common ground.

Murray's (2010) analysis of the reportative evidential does not fit into the English hearsay evidential for the same reason that Faller's (2002) treatment of the reportative evidential does not. Recall that the English hearsay evidential sentence *I heard that she is*

working on her dissertation in (13) is ambiguous between the assertion and the proffering. When it is interpreted as conveying the assertion, the speaker indeed commits herself to the truth of the proposition contribution p expressed by the embedded clause, so p is added to the common ground, resulting in updating the existing common ground. In this case, the illocutionary relation in Murray's framework would predict that all worlds in the updated common ground cannot be ranked the same (i.e. $v_1 = v_1$ does not work for the assertion), which indicates that all worlds are not preferred equally. Instead, the worlds where p is true are ranked higher than those where p is not true. This suggests the illocutionary relation for the English hearsay evidential would be something like " $p(v_0) \leq p(v_1)$ " which means that p -worlds are ranked higher than $\neg p$ -worlds. This is obviously at odds with the illocutionary relation for the Cheyenne counterpart.

6. Semantic Treatments

I will explore the semantics of the English hearsay evidentials within Kratzer's (1991) modal semantics. Kratzer's theory of modality, which is that of relative modality, is characterized by the fact that it introduces two parameters such as a modal base and an ordering source. The modal base is a conversational background which assigns sets of propositions to possible worlds. It plays the role of defining an accessibility relation. The ordering source is, on the other hand, a conversational background that plays the role of establishing an ordering relation among accessible possible worlds by selecting a set of ideal worlds from those accessible worlds determined by the modal base. The set becomes the domain of quantification of modals.

As Faller (2011) notes,⁹ hearsay evidentials are epistemic since they are closely

⁹ Even though Faller (2011: 676) directly mentions direct evidential, rather than hearsay evidentials, her claim can be extended to the hearsay evidentials since they are included in the direct evidentials.

related to what is known to the speaker. The speaker can be mistaken about what is told, even though it can be considered as a direct piece of evidence that encodes a source of information. This suggests that the interpretation of the hearsay evidential is based on the speaker's epistemic center. The modal base for the hearsay evidentials is therefore a set of propositions that are known to the speaker as a result of the speaker hearing those propositions (or those propositions being relayed to the speaker). Thus, the modal base $f(w)$ for the hearsay evidentials is a conversational background which is a function from possible worlds to propositions that are said or mentioned, which can be represented as follows:

$$(16) \quad f(w) = \{p : p \text{ is what the speaker hears in } w\}$$

Using the modal base in (16), we can define accessibility relations for the hearsay evidentials, as follows:

$$(17) \quad \cap f(w) = \{w' \in W : \forall p[p \in f(w) \rightarrow w' \in p]\}$$

(17) denotes a set of possible worlds where every proposition in the modal base $f(w)$ is true, more precisely, a set of possible worlds where all the propositions that are said are true. In other words, a world w' is hearsay-evidentially accessible from w iff all the propositions in the hearsay evidential modal base are true in w' . The worlds in $\cap f(w)$ are those with respect to which the proposition under the scope of the hearsay evidential will be evaluated.

Given (17), we are now in a position to discuss the ordering source which functions to impose further restrictions on a set of accessible worlds. In order to present a reasonable definition of the ordering source, we need to consider significant properties the English hearsay evidence might have. Unlike reportative evidentials in many other languages such as

Cheyenne, Cuzco Quechua, and St' átimcests, which are said to convey a proffering meaning (see Faller (2002, 2011), Murray (2010), and Rullmann et al. (2008)), the English hearsay evidentials can be interpreted to convey two different meanings, as was discussed briefly in section 5; one is an assertive meaning in which the speaker commits herself to the truth of the evidential proposition, and the other a proffering meaning in which the speaker does not, as illustrated in (21).

The two different meanings arising from the English hearsay evidentials can be captured by introducing different ordering sources, which is inspired by Portner (2009), who suggests that the ordering source come into play in the semantics of epistemic modality. In other words, the modal base for the hearsay evidentials remains the same in both of the meanings, while the ordering sources are different, depending on which meaning is available in the hearsay evidentials. As was mentioned earlier, the main difference between the two meanings is that the assertive meaning commits the speaker to the truth of the evidential proposition, while this is not the case with the proffering meaning. In the former case, the hearsay evidence is reliable enough for the speaker to believe that the evidential proposition is true, so the ordering source for the assertive meaning is doxastic, i.e. a set of propositions the speaker believes to be true. The modal base is epistemic, more precisely a set of facts that are known to the speaker, and the ordering source is, on the other hand, a set of facts among those known facts which the speaker believes to be true. Thereby, the order source g_{dox} for the assertive meaning of the hearsay evidentials can be stated as follows:

$$(18) \quad g_{\text{dox}}(w) = \{p : \text{Dox}_s(w) \subseteq p\}, \text{ where } \text{Dox}_s(w) \text{ is a set of possible worlds where the speaker's beliefs hold.}$$

According to (18), the ordering source for the assertive meaning is a set of propositions that

are true in all the speaker's belief worlds. Recall that the set of propositions in $g_{\text{dox}}(w)$ functions to impose an ordering on accessible worlds in $\cap f(w)$. To put it differently, the set of worlds which are best-ranked according to the ordering established by $g_{\text{dox}}(w)$ consists of the domain of quantification of the hearsay evidentials which convey an assertion.

Let's get back to the ordering source for the proffering meaning of the hearsay evidentials. Faller (2011) argues that direct evidence including perception and reportatives does not require ordering sources, due to the fact that it is not marked as making an inference and that the speaker does not guarantee the truth of the evidential proposition. What the speaker ends up with as the evidential proposition from direct evidence is the evidential proposition itself that can be directly entailed from the epistemic modal base. According to Faller, the Cuzco Quechua reportative *-si* is a typical example of this. Thus, no ordering sources can be considered in its semantic treatment. Based on her claim, one may argue that no ordering sources are required in the proffering meaning of English hearsay evidential constructions like *I hear that p*, since it behaves like *-si* in the sense that the speaker simply reports or relays *p* without committing to the truth of *p*.

However, this is not the case with the English hearsay evidentials in two aspects. One aspect is related to the literal meaning of the term *proffering* which may be understood as more than a simple report or relay. The other aspect is that English hearsay evidence can be used in the contexts which allows for an inference. To see this, consider the speaker B's response in (13). What B implicates is that Louis couldn't come to the meeting, which is an inference based on the premise that if a person works on a dissertation, he or she must so busy concentrating on the dissertation that he or she can't afford to do something else. In this sense, the English hearsay evidentials behave differently from the Cuzco Quechua reportative *-si*, and ordering sources need to be considered for their semantics.

Recall that what should be noted in the proffering meaning of the hearsay evidentials

is that the speaker does not necessarily commit to the truth of the evidential proposition p . Thus, the ordering source $g_{\text{pro}}(w)$ for the proffering can be defined as follows:

$$(19) \quad g_{\text{pro}}(w) = \{p: \text{Dox}_s(w) \not\subseteq p\}$$

Given the ordering sources, we are now in a position to define an ordering relation \leq_g established by the ordering sources. The partial ordering relation plays the role of stating which world is ranked higher than which world, and it can be defined as follows:

$$(20) \quad \text{For any } v, u \in W, \text{ for any } p \in g(w), v \leq_{g(w)} u \text{ iff } \{p: u \in p\} \subseteq \{p: v \in p\}, \text{ where } g(w) \text{ is either } g_{\text{dox}}(w) \text{ or } g_{\text{pro}}(w).$$

In plain English, (20) says that a world v is better ranked than another world u iff every proposition that is true in u is also true in v . The ordering relation in (20) can apply to both the assertive ordering source $g_{\text{dox}}(w)$ and the proffering ordering source $g_{\text{pro}}(w)$ commonly. On the ground of the modal base and the ordering source, the hearsay evidentials can be semantically defined as follows:

$$(21) \quad \llbracket \text{hear}(\alpha, p) \rrbracket^{f, g, w} = 1 \text{ iff for every } w' \in \{u: \text{best-ranked}(\cap f(w), g(w))\}, \llbracket p \rrbracket^{f, g, w'} = 1, \\ \text{where the ordering source } g(w) \text{ is } g_{\text{dox}}(w) \text{ or } g_{\text{pro}}(w).$$

In (21), $\{u: \text{best-ranked}(\cap f(w), g(w))\}$ is a set of ideal worlds that are calculated by ordering accessible worlds obtained from the modal base $f(w)$ according to the ordering source $g(w)$ established by the ordering relation $\leq_{g(w)}$ in (20). As was mentioned above, the fact that the

hearsay evidential formula $\llbracket \text{hear}(\alpha, p) \rrbracket$ carries two meanings can be accounted for in terms of the introduction of two different ordering sources. If the ordering source $g(w)$ is a set of the speaker's doxastic worlds (i.e a set of worlds where a proposition the speaker believes is true), $\llbracket \text{hear}(\alpha, p) \rrbracket$ is evaluated with respect to the set of the speaker's doxastic worlds, and hence it is interpreted to carry the meaning of assertion. On the contrary, if $g(w)$ is a set of worlds where a proposition whose truth the speaker does not commit to holds, $\llbracket \text{hear}(\alpha, p) \rrbracket$ is evaluated with respect to those worlds, thus carrying the meaning of proffering.

Let us see how the semantic definition of the hearsay evidential in (21) fits in by giving an example. Consider the following sentence:

(22) I heard that Louis is working on her dissertation.

The logical form (LF) for (22) would be something like this:

(23) $[_{CP} [_{IP} I [_{VP} \text{heard} [_{CP} [_C \text{that}] [_{IP} \text{Louis is working on her dissertation}]]]]]$

The LF in (23) can translate as follows:

(24) $\text{heard}(I, (\text{is-working-on-dissertation}(\text{Louis}))$

In (24), *heard* is of type $\langle\langle s, t \rangle, \langle e, t \rangle\rangle$ with the denotation of a function from propositions to sets of individuals. It takes a proposition expressed by the embedded clause to yield the VP meaning (more precisely sets of individuals) which is of type $\langle e, t \rangle$. The truth condition for the meaning of assertion in (24) can be stated as follows:

$$(25) \quad \llbracket \text{heard}(I, (\text{is-working-on-dissertation}(\text{Louis})) \rrbracket^{f, g, w} = 1 \text{ iff for every } w' \in \{u: \text{best-ranked}(\cap f(w), g_{\text{dox}}(w))\}, \llbracket \text{is-working-on-dissertation}(\text{Louis}) \rrbracket^{f, g, w'} = 1$$

As we can see from (25), the best worlds with respect to which (24) is semantically evaluated are those worlds in $\cap f(w)$ where every proposition the speaker believes to be true holds. In this case, the best worlds end up with the speaker's doxastic worlds. In contrast, the truth condition for the meaning of proffering in (24) can be stated as follows.

$$(26) \quad \llbracket \text{heard}(I, (\text{is-working-on-dissertation}(\text{Louis})) \rrbracket^{f, g, w} = 1 \text{ iff for every } w' \in \{u: \text{best-ranked}(\cap f(w), g_{\text{pro}}(w))\}, \llbracket \text{is-working-on-dissertation}(\text{Louis}) \rrbracket^{f, g, w'} = 1$$

Note that the only difference between (25) and (26) is the ordering source. In (26), the best-ranked worlds with respect to which (26) is evaluated are those worlds where a proposition to whose truth the speaker does not commit holds. One should also note that what is common in (25) and (26) is that each of the ideal worlds for (25) and (26) does not necessarily include the actual world. In (25) the ideal worlds are the speaker's belief worlds which might be different from the actual world. In (26), in contrast, the ideal worlds are those worlds where the speaker does not commit to the truth of the evidential proposition, which implies that the hearsay evidential proposition p might have been uttered in the actual world without p being true. Thus, the speaker may believe that p is false. The analysis that has been proposed in this paper correctly captures the properties of the hearsay evidentials that have been discussed in this paper, together with the fact that they can carry two different readings.

7. Closing Remarks

This paper has been an attempt to develop a semantic analysis of the English hearsay evidentials, which have not been properly treated in the literature of semantics, on the basis of Krazter's theory of modality. As noted by such scholars as von Stechow and Gillies (2007), Hooper (1975), Rooryck (2001), and Simons(2007) among other, it is the characteristic of the English hearsay evidential sentences that they are interpreted to convey an assertion and a proffering. This suggests that they do not pattern like hearsay or reportative evidentials in other languages, and hence the previous analyses of evidentials fail to provide a proper treatment of them. One major distinction between the assertive meaning and the proffering meaning is that the former requires the speaker's commitment to the truth of the embedded proposition while this is not the case with the latter. The distinction can be captured in terms of the introduction of different ordering sources. The ordering source for the assertive meaning is a set of propositions that are true in the speaker's doxastic worlds, while this is not the case with the proffering meaning. The domain of the quantification for the assertive meaning is a set of worlds where the speaker believes the embedded proposition to be true, and the domain for the proffering meaning, on the other hand, does not include the speaker's belief worlds, which indicates that she might have reported the embedded proposition without believing it to be true.

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