Article

English sentence adverbials and truth-conditional meaning:
A questionnaire study*

Yukiko KOIZUMI

1. Introduction

Modifiers, such as adjectival and adverbial elements, are sometimes considered to be less central to the meaning of the sentence, especially from a viewpoint of truth-conditional semantics where the meaning of a sentence is defined as its truth-conditions. For example, the sentence *John is happily walking* is typically understood to be true as long as John is walking, and whether he looks happy doing so may not be taken to be as important as the rest of the sentence. However, modifier meaning can play an important part in sentence comprehension, and how a modifier might contribute to the meaning of the sentence can depend not only on its lexical content, but also the context in which it occurs and how it is spoken in an utterance. The central question of the present paper is how adverbials can contribute to the truth-conditional meaning of the sentences. I will explore this question by looking into a class of English adverbials that take the whole clause or sentence as their scope (sentence adverbials).[1]

There has been a considerable amount of literature on semantic or pragmatic properties of sentence adverbials, including, but not limited to, Greenbaum (1969), Lehrer (1975), Bellert (1977), Mittwoch (1977), McConnell-Ginet (1982), as also overviewed in Okada (1985). In particular, I will focus on four types of sentence adverbials, classified here as illocutionary, attitudinal, evidential and hearsay adverbials, because they greatly vary in terms of the positions in which they can occur as well as the ways in which their interpretations interact with the truth-conditional content of the utterances.

Few studies have fully addressed the question of when and why certain adverbials may or may not be part of the truth-conditions (hence logical form) of the sentence. Ifantidou's research within the framework of relevance theory (Sperber and Wilson 1995) proposed the way in which one can test whether an adverbial is truth-conditional, or part of the truth-conditions of the sentence. However, her research only laid out intuitive ideas and did not provide empirical data.

In order to fill this gap, the present study reports the results of a questionnaire study using her 'truth-conditionality test' scheme. The results will first confirm that a pragmatic framework, such as the relevance

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1   I shall use the terms "sentence adverbials" to refer to those lexical items which typically modify a clause or a sentence itself, rather than a mere verbal phrase. In some other studies, they are referred to as "sentence adverbs", "sentential adverbs", and so on, but here I shall follow the terms used in the series of studies pursued in the relevance-theoretic framework, which I shall also work with here. The term "adverbials" is intended to imply a similar explanation for adverbial phrases (e.g. parentheticals), though I will not discuss it here extensively.

theory, would be best fitted for explaining how diversely sentence adverbials may be interpreted in the utterances in which they occur. The details of the results will also shed more light on how diversely these adverbials are interpreted in terms of their truth-conditional status, and what might be the source of the diversity that seems to be at work. Hopefully they will inform us on what is happening at the interface between semantics/pragmatics and sentence comprehension.

The organization of the present paper is as follows. After introducing the four types of sentence adverbials in Section 2, I will introduce previous theoretical work on sentence adverbials that discuss possible ways to treat them in relation to the truth-conditions of the sentences in Section 3. In Section 4, I will report the questionnaire survey on the sentence adverbials using the 'truth-conditionality test'. I will discuss the findings and their implications in the final section.

2. Four types of sentence adverbials

Given below are the four types of sentence adverbials that are of interest in this study. They have been discussed in the literature for their significantly different and interesting properties especially in terms of their truth-conditional status. They include adverbials sometimes called "pragmatic adverbials".

 [1] *illocutionary adverbials*. According to the classic extensive study of adverbials by Greenbaum (1969), illocutionary adverbials are equivalent with some of the "style disjuncts" which concern the stylistic properties of the utterance that contains them. In a more recent study, they are considered to function as modifying an implicit illocutionary verb (Bach and Harnish 1979:225). Adverbs like *frankly, confidentially, honestly, seriously,* belong to this type. Examples (1a-1c) would be understood as communicating (2a-c), respectively.

(1) a. *Frankly*, I'm bored.

   b. She has, *confidentially*, failed the exam.

   c. *Seriously*, your new novel is excellent.

(2) a. I tell you frankly that I am bored.

   b. I inform you confidentially that she has failed the exam.

   c. I tell you seriously that your new novel is excellent.

The remaining group of adverbials, broadly termed as "attitudinal disjuncts" by Greenbaum (1969), are further classified into three types.

 [2] *attitudinal adverbials*. Attitudinal adverbials are associated with the speaker's attitude or judgement to the statement s(he) makes, rather than naming the speech-act performed in communicating the proposition. *Unfortunately, sadly, happily, luckily,* are the representatives of this type of adverbial.

(3) a. *Unfortunately*, John missed the train.

b. *Sadly*, Mary lost her wallet.

c. *Happily*, Bill succeeded in completing the course.

d. *Luckily*, Jane has got the scholarship.

(4) a. It is unfortunate that John missed the train.

b. It is sad that Mary lost her wallet.

c. It is happily true that Bill succeeded in completing the course.

d. It is lucky of Jane that she has got the scholarship.

(5) a. *I tell you unfortunately that John missed the train.

b. *I tell you sadly that Mary lost her wallet.

c. *I tell you happily that Bill succeeded in completing the course.

d. *I tell you luckily that Jane has got the scholarship.

　　Examples (3a-c) are understood as communicating (4a-d), rather than (5a-c), suggesting that the adverbials take a sentential scope, rather than the illocutionary verb *tell*.

　　[3] *evidential adverbials*.　Evidential adverbials are seen as indicating the source or the degree of strength of the speaker's evidence, or in other words, indicating the different types of the speaker's commitment towards the content, or the truth-value of the proposition (s)he makes (Urmson 1963: 228, Palmer 1986: pp66-76).　Adverbials like *evidently, clearly, obviously* belong to this type. (6a-c) are understood as communicating (7a-c).

(6) a. *Evidently*, the money has disappeared.

b. *Obviously*, John gained weight.

c. *Clearly*, Jane was irritated with the traffic jam.

(7) a. It is evident that the money has disappeared.

b. It is obvious that John gained weight.

c. It is clear that Jane was irritated with the traffic jam.

　　[4] *hearsay adverbials*.　 Hearsay adverbials, such as *allegedly* and *reportedly,* are generally treated as a subtype of evidentials (Palmer 1986); they are claimed to indicate that the source of the knowledge that the speaker communicates is not the speaker themselves but someone else.　Greenbaum (1969) goes on to describe them as expressing the "speaker's doubt" towards the truth of the proposition she expresses: the speaker thinks the truth of the proposition is somewhat dubious. Examples (8a-b) are understood as communicating (9a-b), respectively.

(8) a. *Allegedly*, the cook has poisoned the soup.

b. *Reportedly*, Jane has killed her husband.

(9) a. It is alleged that the cook has poisoned the soup.

b. It is reported that Jane has killed her husband.

These four types of adverbials have traditionally been treated as evidence against truth-condition-based semantics for some lexical items and for speech act semantics (Ifantidou-Trouki 1993). However, they appear to have more diverse properties than what has traditionally been found, which has motivated further investigation in the present study.

3. Previous research: three possible approaches

There are three logically possible semantic and pragmatic approaches concerning the treatment of the truth-conditional contributions of these adverbials. Let us look at each one of them along with the corresponding previous studies, even though not all of them offered extensive discussion on these adverbials in particular.

3.1 The 'non-truth-conditional' approach: Speech-act theory

Speech-act theory, first introduced by the philosopher J. L. Austin in his book "How to Do Things with Words" (1962), proposed a series of ideas that are seen as a reaction to truth-conditional approaches to sentence meaning. According to Austin, language is used not always to "describe" the world, but also to perform certain types of actions called speech-acts: asking questions, begging, guessing, warning, making a promise, and so on. One of the central concerns of the speech act theory is to propose the existence of certain linguistic devices that indicate the "illocutionary force" of the utterance.

Austin also claims that an illocutionary act, such as warning, asserting, or ordering, can be performed only if there is a conventional means of performing it, i.e. if there is some device that functions to indicate the performance of the speech act. So-called performative verbs and parentheticals such as "I think" (Urmson, 1963), as well as certain classes of sentence adverbials, have been treated as illocutionary force indicators that function as signaling the kind of speech act being performed.

Following this line of analysis, let us consider some examples containing illocutionary adverbials in (10) and (12):

(10) Confidentially, she failed the exam.

(11) a. She failed the exam.

 b. I inform you confidentially that she failed the exam.

(12) Frankly, John is stupid.

(13) a. John is stupid.

 b. I tell you frankly that John is stupid.

The adverbials here are also claimed to function as illocutionary force indicators: the speaker of (10) and (12) communicates (11a)-(11b) and (13a)-(13b), respectively. (11b) and (13b) show what kind of

speech-act is being performed when the speaker produces the utterance.

In the speech-act theorists' view, such indicators are considered to be non-truth-conditional, since their function should <u>not</u> be to *describe* the illocutionary force of the utterance, but to *indicate* it. Thus, they are predicted not to contribute to the truth-conditions of the utterance or, in other words, to the proposition expressed by the utterance in which they occur. Although sentence adverbials have not been discussed extensively enough in the speech-act literature, it seems possible to extend this view to analyze other classes of sentence adverbials. Ifantidou (1994) summarizes the salient features of speech-act approaches to sentence adverbials as follows:

(a) illocutionary, attitudinal, evidential and hearsay adverbials are standardly treated as non truth-conditional and,

(b) non truth-conditional expressions are treated as indicating a speech-act or propositional attitude rather than describing a state of affairs.

(Ifantidou 1994: 132)

According to this analysis, illocutionary adverbials like *frankly, confidentially,* or *seriously,* that we have seen in (10) and (12) above, do not modify any of the propositional content. They merely indicate the type of speech-act performed (cf. Bach and Harnish 1979).

One advantage of adopting this line of analysis is that it can, for example, capture certain types of ambiguity in interpretations for (14):

(14) Seriously, is he coming?

(15) a. I ask you seriously to tell me whether he is coming or not.

　　 b. I ask you to tell me seriously whether he is coming or not.

(Bach and Harnish 1979: 221)

The word *seriously* in (14) has two possible readings, illustrated in (15a) and (15b) respectively, each successfully indicating the type of speech-act performed by different persons. The speech-act account captures this difference.

It is important to note that the speech-act view would predict these types of adverbials to be non-truth-conditional. They would be all considered "semantically external" to the proposition expressed by the utterances which carry them (Ifantidou 1994). However, as we will see below, sentence adverbials we are concerned with seem to behave more diversely than this would predict. In later sections, I shall examine the validity of this prediction in view of the data that I have obtained.

3.2 The 'truth-conditional' approach: Lycan's view and its extension

In contrast with the 'non-truth-conditional' approach advocated by speech-act theory, the view that all sentence adverbials, even speech-act related ones, are truth-conditional and hence part of the logical form

of the sentence, is proposed by Lycan (1984). Lycan (1984)'s claim is based on the assumption that every linguistic expression should be truth-conditional although there are different ways of encoding information (not only describing, but also asking, stating, entailing, etc.).

After the Davidsonian treatment of propositional attitude reports (Davidson 1968, cf. McKay and Nelson 2014), Lycan shows how a paratactic analysis of the semantic contributions made by sentence adverbials can be represented in its logical form. Consider the example below.

(16) Confidentially, the boss is a moron.

(17) a. the boss is a moron.   b. I state that confidentially.

(Lycan 1984)

According to Lycan, the logical form of (16) is (17). In Lycan's original words, (17a) is 'displayed' or 'introduced simply as an example or token of the kind of thing that speaker is referring to by means of his demonstrative' (Lycan 1984:148). The second part that involves the adverbial *confidentially*, in (17b), is *entailed* but not asserted. The result of this analysis is, therefore, that what is asserted by the utterance (16) is (17a), but the truth-conditions are given by (17b). Hence, on Lycan's account, *confidentially*, an illocutionary adverbial, is truth-conditional.

Although Lycan himself did not go on to provide a comprehensive account of sentence adverbials, extending Lycan's analysis would yield interesting predictions. Recall that the truth-conditions of (16) would be (17b). (17b) would be true whenever (16) is appropriately uttered, because it follows from (17b) that (17a) is being stated, or asserted. Hence, under this analysis, the illocutionary adverbial *confidentially* is predicted to be part of the truth-conditions of the utterance.

Also, this model would predict other types of sentence invariably truth-conditional as well. For example, consider the following sentences.

(18) Mary, reportedly, failed the exam.

(19) a. Mary failed the exam.   b. This was reported.

(20) Mary, unfortunately, failed the exam.

(21) a. Mary failed the exam.   b. I think that it is unfortunate.

Extending Lycan's analysis to a case of a hearsay adverbial *reportedly* and a case of an attitudinal adverbial *unfortunately*, the logical form of (18) and (20) would be something like (19) and (21), respectively, which contain the adverbials in the truth-conditions given in (19b) and (21b). This analysis does not predict the variations in the truth-conditional contributions of sentence adverbials.

3.3 The 'hybrid' approach: A relevance-theoretic view

The third logical possibility is a somewhat 'hybrid' approach, which is that sentence adverbials can, but do not have to be, part of the sentence's truth-conditions. This possibility is explored in Ifantidou (1994)

within the framework of Sperber and Wilson's relevance theory (Wilson and Sperber 1993, Sperber and Wilson 1995).

3.3.1 Relevance-theoretic view of communicated information

Wilson and Sperber classify types of communicated information in terms of two factors: (a) whether the communicated content is explicit or implicit, and (b) whether it encodes conceptual or procedural information. Let us briefly look at the two factors in turn.

(a): explicature vs. implicature distinction. Sperber and Wilson assume that interpreting utterances involves deriving both the explicitly communicated content (explicatures) and the implicitly communicated content (implicatures).

Further extending Grice's (1975) theory of conversational principles and the notion of "implicit" communication, Sperber and Wilson defined their original notion of "explicitness" as follows:

(22) *explicitness*

An assumption communicated by an utterance *U* is *explicit* if and only if it is a development of a logical form encoded by *U*.

(Sperber and Wilson 1995: 182)

Sperber and Wilson claim that the explicitly communicated content, or the explicatures, of an utterance typically includes the proposition expressed by the utterance (its logical form or the truth conditions, similar to "what is said" in Grice's terms), as well as various more complex information obtained through 'developing its logical form', or embedding the proposition expressed under an appropriate speech-act or propositional-attitude description. The implicatures of an utterance are propositions communicated by the utterance but are not developments of its logical form.

Another claim made by Sperber and Wilson is that part of the explicatures of an utterance can be derived by a combination of linguistic decoding and inference. The explicatures obtained by a process of context-based inference include higher-level explicatures (Wilson and Sperber 1993) [2]. Some of these higher-level explicatures are associated with the type of speech-act performed.

For example, consider (23) below.

(23) It's raining outside.

(24) The speaker of (23) believes that it is raining outside.

(23) is the proposition expressed by the utterance. If we assume that the speaker of (23) is asserting that it is raining, then the higher-level explicatures of (23) should include (24), a complex proposition obtained by embedding the proposition expressed under an appropriate speech-act description.

2　Some part of the proposition expressed (e.g. temporal meaning of the conjunctive and), is also developed through context-based inference, known as pragmatic enrichment (cf. Carston 1998).

Sperber and Wilson observe that not all linguistically encoded meanings are part of the truth conditions: mood indicators and parenthetical verbs are their instances of non-truth-conditional linguistic encoding. However, their approach is unique in that they do not deal with all non-truth-conditional meanings in a unified manner. They argue that linguistically encoded information is classified not only as communicated explicitly or implicitly, but also as *conceptual* or *procedural*. Let us turn to examining this claim further.

(b) conceptual vs. procedural encoding. Following Fodor's theory of mind (Fodor 1983), Sperber and Wilson (1993) assumes two types of encoded information: conceptual information, related to conceptual representations in the hearer's mind, and procedural information, related to the manipulation of the conceptual representations.

According to them, a conceptual representation has the following features. First, it has logical properties: it enters into entailment or contradiction relations, and can act as the input to logical inference rules. Second, it has truth-conditional properties: it can describe or partially characterize a certain state of affairs. On the other hand, procedural information is carried by those expressions which help to indicate the way we should "take" the conceptual representation encoded by a sentence or a phrase in which they occur.

Instances of encoding of procedural information have been elaborated by Diane Blakemore (Blakemore 1987, 1992). According to her, certain discourse connectives, such as *so, but, or after all,* encode procedural information. Let us consider the following example. The sequence (25) has two possible interpretations, which are shown in (26):

(25) a. Peter is not stupid.   b. He can find his own way home.

(26) a. Peter's not stupid; so he can find his own way home.

b. Peter's not stupid; after all, he can find his own way home.

(Wilson and Sperber 1993)

The interpretation (26a) reads (25a) as evidence for the conclusion (25b); in contrast, on the second interpretation (26b), the (25a) serves as a conclusion is confirmed by the evidence in (25b). Blakemore argues that the information that discourse connectives such as so or *after all,* convey is not conceptual; instead, these connectives provide a constraint on the inferential phase of utterance comprehension. They convey procedural information that helps us reduce the processing effort required to reach the first acceptable interpretation and hence make the interpretation more relevant. These discourse connectives are considered not to be part of the truth-conditions of an utterance. It is important to note, however, that not making contributions to the truth-conditions does not always imply encoding procedural information.

3.3.2 Relevance-theoretic analysis of sentence adverbials

Elly Ifantidou's work on evidentials (Ifantidou-Trouki 1993, Ifantidou 1994), while discussing many

examples in Turkish, also discusses quite a wide range of English sentence adverbials and parentheticals in the relevance theoretic framework. Ifantidou argues that certain classes of sentence adverbials are truth-conditional, while others are non-truth-conditional, using a 'truth-conditionality test'. Consider the following examples.

(27) a. Mary failed the exam.

　　 b. Mary has unfortunately failed the exam.

　　 c. If Mary has unfortunately failed the exam, she can take it again next year.

　This 'truth-conditionality test' works as follows: we create a bi-clausal sentence by embedding a target with a sentence adverbial (27b) into a conditional logical connective *if*-clause (27c), and see whether it falls within the scope of the connective. Namely, on (27c), we ask under what circumstance the event in the consequent clause in (27c) would occur: Under what circumstance is the speaker of (27c) claiming that Mary can retake the exam in the following year? In this case, clearly, the speaker is claiming that the retake will take place under the situation (27a), rather than (27b). Therefore, we can see that the adverbial *unfortunately* is outside the scope of the logical reasoning with the connective *if* and is therefore deemed as non-truth-conditional. Now consider (28a-c).

(28) a. The cook poisoned the soup.

　　 b. Allegedly, the cook has poisoned the soup.

　　 c. If the cook allegedly poisoned the soup, the police should make an inquiry.

　In this example, the question to examine the truth-conditional status of the hearsay adverbial *allegedly* is: under what circumstances is the speaker of (28c) suggesting that the police should make an inquiry? In this case, the circumstance is (28b), rather than (28a), because unless someone makes an allegation that the cook poisoned the soup, the police would not make any inquiry even if the cook actually did poison the soup. Hence, it seems that the hearsay adverbial *allegedly* here is truth-conditional.

　Ifantidou discussed the four types of sentence adverbials introduced in this paper in terms of this truth-conditionality test and argued that hearsay adverbials and evidential adverbials are truth-conditional in some cases at least, while illocutionary and attitudinal adverbials are non-truth-conditional. That is, not all sentence adverbials have the same truth-conditional status.

　The fact that some types of sentence adverbials contribute to the truth-conditional meaning of a sentence while others do not appears to be puzzling to the view that the meaning of a sentence is its truth conditions only. How and why do they differ from one another? What type of linguistic information do non-truth-conditional adverbials encode? Ifantidou offers an account in the relevance-theoretic framework, using the conceptual/procedural distinction that we have seen in the previous section. Her first claim is that all sentence adverbials encode conceptual, rather than procedural, information, even though they may vary in terms of their truth-conditional status. A series of arguments are provided to support this claim.

Firstly, she points out that this analysis explains the fact that non-truth-conditional elements can be true or false in their own right, even though they do not make any contribution to the truth-conditions of the utterance in which they occur. Consider (29) and (30) below.

(29) Peter: Frankly, this party is boring.

Mary: You are not being frank. I've just seen you dancing with the blonde beauty in blue.

(30) Peter: Unfortunately, John lost his job.

Mary: It's not unfortunate! He got a fellowship in Oxford instead!

(Ifantidou-Trouki 1993: 208)

The information conveyed by the adverbials in (29) and (30) can be denied by the hearer. This can be explained if we assume that they encode elements of conceptual representations which can be true or false in their own right. Secondly, Ifantidou argues that the assumption that sentence adverbials encode conceptual information is compatible with the intuitive idea that when they are ambiguous between the sentence and verb phrase ('manner') adverbials, the two readings seem to share the encoding of conceptual information, as we see in (31) and (32) below.

(31) Peter spoke frankly.

(32) It's unfortunately true that John lost his job.

Thirdly and finally, Ifantidou introduces an argument from *compositionality* (Wilson and Sperber 1993). As shown in (33) below, illocutionary and attitudinal adverbials can have syntactic and semantic structures that are quite complex.

(33) Quite frankly, he is a fool.

(34) In the strictest confidence, he is a fool.

(35) Very sadly and regrettably, your fete will be rained off.

(ibid.)

The possibility of these complex structures supports the claim that they encode conceptual information: they can be combined with other words to create more complex conceptual representations.

Hence, on Ifantidou's argument, sentence adverbials always encode conceptual information. Then, how could one characterize the difference in semantic contributions that sentence adverbials make to the truth-conditions of the sentence? Following Wilson and Sperber (1993), Ifantidou claims that the difference between those adverbials which are truth-conditional and those which are not manifests itself as a difference in the "levels" of the explicatures they contribute to: while sentence adverbials which are truth-conditional contribute to the *proposition expressed* by the utterance, those which are non-truth-conditional contribute to its *higher-level explicatures*. Even though they do not contribute to the truth-conditions of the utterance in which they occur, they encode conceptual information and can be true or false in their own right. Recall the examples of *frankly* and *unfortunately* in Peter's utterances in (29) and (30). Although

these adverbials appear to be non-truth-conditional, the information they encode can be true or false in its own right and thus can be negated, as Mary's response shows.

Thus, according to Ifantidou, the distinction between truth-conditional and non-truth-conditional adverbials is attributable to the difference in types of information each adverbial conveys: whether they convey information belonging to the proposition expressed or to the higher-level explicatures. This analysis allows for variations in sentence adverbials with respect to the degree of contributions to the truth-conditions of the utterances they occur in. Ifantidou's analysis is based on intuitive observations, however, and is limited to certain representative adverbs. More evidence from the interpretations of various adverbs will help investigate further the aspects of adverbial interpretation and their semantic and pragmatic contributions to utterance comprehension. The results of a questionnaire study, reported in the next section, aim to achieve this goal.

4. Adverbials in sentence interpretation: a questionnaire study

This section reports the questionnaire study conducted on native English speakers. It aimed to help us understand more on how sentences adverbials are interpreted, or more specifically, whether or not they are part of the truth conditions of the utterance.

4.1 Study protocol

Participants. Twenty-two people voluntarily participated in this pencil and paper questionnaire, who all identified themselves as native speakers of British or American English. The majority of the participants were students of the University of London, and there were a small number of non-students who were referred to the author by some of the student participants.

Materials. Each questionnaire list consisted of twenty sets of sentences and accompanying questions, randomly selected out of sixty-three sentences prepared in the form of Ifantidou's 'truth-conditionality test' by a native speaker of British English. Each adverbial tested belongs to one of the four types of adverbials according to Ifantidou's classification. Let us look at one of the examples used in the questionnaire, given in (36):

(36) John still manages to stay cheerful, although he is injured, obviously.

　　Question A: What is obvious, according to the speaker?

　a. the fact that John still manages to stay cheerful

　b. the fact that he is injured

　c. the whole statement

　　Question B: In contrast to what circumstance is the speaker of this sentence claiming that John still

manages to stay cheerful?

a. the fact that he is injured

b. the fact that it is obvious that he is injured

Following the target sentence, two multiple-choice questions were posed and the participants were instructed to choose only one answer per question. The first one (Question A) is intended to check the scope of the adverbial, and the second one (Question B) concerns its truth-conditional status, or whether it falls within the scope of the logical relations established between the two events depicted in the bi-clausal structure. In the sample set (36), with an evidential adverbial *obviously*, Question A asks what is obvious, to see the scope of the adverbial *obviously*. Question B, of our chief interest here, is to test its truth-conditional status. As for the connective *although*, which suggests a contrast between the event in the main clause and that in the embedded clause, the question asked was "In contrast to what circumstances" the event in the main clause would occur. If a participant chooses the answer *a* (without the adverbial), then that suggests the adverbial is judged as being non-truth-conditional (i.e. it does not fall within the scope of the connective) and if (s)he chooses *b* (with the adverbial), it is judged as truth-conditional.

In order to further investigate on Ifantidou's truth-conditionality test scheme, test sentences contained some additional characteristics. First, even though Ifantidou's discussion used only the non-factive connective *if*, we tested using factive connectives, such as *although, while,* and *since*. Also, the positions of the adverbials within the clause or the sentence were varied in order to check whether this affected their scope. We also checked whether the presence or absence of commas emphasizing parenthetical status was reflected as a difference in the acceptability of the sentence. The list of test sentence sets is provided in the Appendix. The sentences were randomly assigned to the three questionnaire lists prepared, and no participant was given the same sentence twice. Some filler materials (similar to the target sentences) were also included in the test.

Procedure and data treatment. Participants answered the questions at their own pace. Typically, it took a participant around 20-25 minutes to complete the questions. Out of all of the answers obtained, there were participants that chose both alternatives as possible. Those answers were excluded from the analysis.

4.2 Results

The results are summarized in the Table below.

Table. Adverbials' truth-conditionality judgements as a function of adverbial type.

Adverbial Type	Total judgements (n=)	Part of Truth-Conditions?	
		Yes %	No %
illocutionary	119	15.1	84.9
attitudinal	76	21.1	78.9
evidential	88	31.8	68.2
hearsay	106	50.9	49.1

Overall results indicate the diversity of interpretations of sentence adverbials occurred within utterances. It is not the case that these adverbials are always outside of the truth conditions of the sentence, but it is also not the case that they fall inside of the logical form of the sentence. These overall tendencies are in line with Ifantidou's (1993) predictions rather than those made by the other two approaches. Let us look at a representative example of each of the four types of adverbials. [3]

[1] *illocutionary adverbial:* Overall, nearly 85% of the times, illocutionary adverbials were judged as non-truth-conditional. Let us consider an example of the illocutionary adverbial *frankly.*

(37) She failed all her exams, frankly.

(38) Mary looks quite well although she failed all her exams, frankly.

To test the truth-conditional status of the illocutionary adverbial *frankly* in (37), the question (38) is asked, where (37) is embedded in a clause headed by a factive logical connective *although*. This allows us to see if the adverbial falls within the scope of the connective. Being asked what is being contrasted with the content of the main clause (Mary looking quite well), 26 of the 27 judgments on this particular item were "the fact that she failed all her exams", rather than "the speaker tells you frankly that she failed..." This suggests that the adverbial is not part of the world situations being contrasted with the main clause, and is therefore non-truth-conditional. Note here that this result does not fit the predictions made by Lycan's model discussed in the previous section, because it predicts all the sentence adverbials to be invariably part of the truth-conditions of the utterance.

[2] *attitudinal adverbials*. The same point will be suggested for attitudinal adverbials, which were interpreted as non-truth-conditional 78.9% of the times. Let us look at an example of an attitudinal adverbial *unfortunately*.

(39) He was, unfortunately, diagnosed with cancer.

(40) He feels quite well although he was, unfortunately, diagnosed with cancer.

In order to test the truth-conditional status of *unfortunately* in (39), (40) was presented. Being asked

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3　Attention should be paid mainly on the *ratio* of the truth-conditional and non-truth-conditional judgements since the number of items for each adverbial type is slightly different from each other.

what is being contrasted with the fact that he feels quite well, again, 23 of the 25 participants chose the answer "the fact that he was diagnosed with cancer", rather than "that it is unfortunate that he was diagnosed...", which indicates that the attitudinal adverbial here is read as non-truth-conditional. This result is also incompatible with what Lycan's or any other account that predicts all sentence adverbials to be part of the truth-conditions would predict.

[3] *Evidential adverbials*. The overall 31.8 percent of the total evidential adverbial judgments were truth-conditional. Consider an example of *evidently*.

(41) The money has, evidently, disappeared.

(42) Since the money has, evidently, disappeared, the police are looking into the matter.

In (42), the target sentence (41) is embedded under the subordinate *since* clause, and this time, 18 out of the 33 subjects given this sentence interpreted the adverbial *evidently* as falling within the scope of *since,* i.e. the reason that the police are looking into the matter is that <u>it is evident</u> that the money has disappeared, rather than merely the fact that the money has disappeared. This suggests that *evidently* here can be part of the sentence's truth-conditions.

These results suggest that the speech-act account summarized in 2.1, predicting sentence adverbials to be invariably non-truth-conditional, is not sufficient to capture the whole picture of the semantic contributions of sentence adverbials. Although the speech-act theorists correctly analyses some sentence adverbials as illocutionary force indicators, the existence of adverbials that are truth-conditional needs to be explained in a different way.

[4] *hearsay adverbials*. The overall truth-conditional judgment ratio for hearsay adverbials was 50.9%, the highest of all the four adverbial types.

Look at an example of the hearsay adverbial *reportedly*.

(43) He was, reportedly, killed in the accident.

(44) Because he was, reportedly, killed in the accident, his relatives have arrived at the scene.

The sentence (43) is embedded into a clause headed by a factive logical connective *because* in (44). The participants were to determine the reason of the man's relatives arriving at the scene; if they choose the answer that it is the fact that his being killed was reported, it suggests that the adverbial falls within the scope of the logical connective and is therefore truth-conditional, and if the reason is interpreted to be merely his being killed, it is non-truth-conditional. For this item, out of the 27, 17 of them judged *reportedly* to be truth-conditional, whereas the other 10 judged it as non-truth-conditional. The data pattern observed here would not be compatible with the speech-act analysis.

4.3 Discussion

The results above indicate that there is a significant variety in the interpretations of the four types

of adverbials with respect to the truth conditions of the sentence. This finding would not be explained by the theories that view sentence adverbials to be invariably part of, or not part of, the truth-conditions. The relevance-theoretic analysis as developed by Ifantidou's (1993, 1994), which would predict that adverbials may vary in degrees of contributions to the truth-conditions, seems to best fit the observations reported in the questionnaire.

In fact, the questionnaire study revealed more diversity and fuzziness of the truth-conditional status of adverbials than Ifantidou may originally have anticipated. Not only did more participants than expected judge evidential and hearsay adverbials to be non-truth-conditional, their truth-conditionality judgements varied even more. For example, in the case of *reportedly* in (44) above, 17 judged it as truth-conditional and 10 participants judged it as non-truth-conditional. However, in a different example of the same adverbial in (45) below, the pattern was the exact opposite: 17 participants judged it as non-truth-conditional whereas 10 judged it as truth-conditional.

(45) Jane poisoned her husband, reportedly, although she claims he died of natural causes.

The finding that even a single adverb may be interpreted in various ways seems to differ from what Ifantidou would expect. She admits in her dissertation: "the truth-conditional status of hearsay and evidential adverbials is quite complicated" (Ifantidou 1994: 148). The empirical data here confirmed the complexity of adverbial interpretations.

Then, when and how can a sentence adverbial be important enough to be part of the sentence's truth-conditions, and what factors can contribute to this process? Ifantidou offered a line of explanation. In a nutshell, she pointed out that hearsay adverbials can affect the truth-conditions by marking them as a case of 'interpretive use' rather than 'descriptive use', and also that as for the evidential ones, they can affect the truth-conditions by strengthening (*obviously, clearly,* etc.) or by weakening (*apparently, seemingly*) the speaker's commitment to the truth of the proposition.

This line of explanation seems promising, though it may require further refinement because the results of the survey revealed that the truth conditional status of sentence adverbials might vary even within a single adverb. Let's recall the example of the hearsay adverbial *reportedly* in (45). One of the feedback comments on an earlier version of this paper pointed out that the verb *claim* in (45) is 'attributively used' (e.g. the speaker of the utterance indicates that she attributes the embedded statement to someone else's and herself does not commit to the truth of it) and therefore somehow cancels out the meaning of *reportedly*. If this is the case, the meaning of *reportedly* is not central to the meaning of the sentence as a result of interacting with the rest of the content of the sentence.

Even though the verb *claim* in this example was intended to be merely an alternative verb choice to a somewhat colloquial *say* in 'she said her husband died of natural causes', admittedly, there is a possibility

that the readers interpreted the verb attributively[4]. To that end, I tested two additional sentences without the verb in question, which are given below.

(46) a. John, reportedly, attempted to kill Mike.

　　b. John killed Mary although he, reportedly, attempted to kill Mike.

(47) a. Jerry's family, allegedly, had a car accident today.

　　b. Jerry cannot leave work although his family, allegedly, had a car accident today.

　In both of the (b) sentences, the adverbial *allegedly* takes its scope over the embedded clause only. However, 3 out of 3 native speakers of English judged it as non-truth-conditional. Regardless of the presence or absence of *claim*, the similar data pattern was observed for the adverbials here. Yet, the context given by the rest of the sentences might play a role in determining whether an adverbial can make a significant contribution to the truth-conditions or not.

　Another factor that was not taken into consideration in Ifantidou's test as well as the present survey was prosody. Intuitively, the different readings the participants may obtain could be associated with the different ways that the sentence is presented: if the sentence is presented auditorily, with different prosody, the results may be very different.

(48) Because he was reportedly killed in the accident, his relatives have arrived at the scene.

(49) Because he was, reportedly, killed in the accident, his relatives have arrived at the scene.

　The two sentences above are different from each other only in that there are commas around the adverbial *reportedly*, and yet the judgements were different. While all of the 6 participants judged the adverbial in (48) as truth-conditional, only 3 of the 6 judged it in (49) as truth-conditional, surprisingly. The presence of the commas is presumed to make the adverbial somewhat parenthetical, which is linked to the intuition that there is a prosodic boundary separating the adverbial from the rest of the sentence, perhaps making it less a part of the sentence. In this survey, the materials were presented visually and the prosody of the materials was not controlled. In the literature, prosody is known to play an important role in sentence comprehension even in silent reading, as formulated as Fodor's Implicit Prosody Hypothesis (e.g., Fodor 2002). It will be interesting to compare visual and auditory presentations of these sentences.

5. Summary and concluding remarks: preview of further analysis

　In this paper, I reported the results of a questionnaire study conducted in order to investigate how the four types of sentence adverbials may or may not affect the truth-conditions of the utterances, using Ifantidou's 'truth-conditionality test' scheme. The data pattern of the study suggested that while

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4　The intuition is that the verb with the attributive use may bear special prominence in spoken utterances. As the present questionnaire was conducted with written input only, this possible confounding should be resolved in a spoken presentation.

illocutionary and attitudinal adverbials tend to be judged as outside of the truth-conditional content of the sentence, evidential and hearsay adverbials tended to be read as inside of the truth-conditional content. These results provide empirical support for Ifantidou's treatment of sentence adverbials: while they all encode conceptual information, they may vary in terms of their truth-conditional status and the non-truth-conditional adverbials contribute to the higher-level explicatures of the utterances.

The questionnaire study reported here for the present paper was not fully exhaustive and it was not fully controlled as a psycholinguistic experiment. For example, there were not enough filler sentences to prevent the readers from becoming conscious of the construction of interest, or the study did not take intonation (prosody) factors into consideration. However, the study still provided empirical support to Ifantidou's (1993) pragmatic explanation of adverbial interpretations and hopefully it has illuminated readers on some of the varying ways to treat adverbial elements with respect to the truth-conditions of sentences. Future research will continue to further investigate how the linguistic (conceptual) meanings of adverbials and other factors (such as context and prosody) may interact in sentence comprehension in English and other languages as well.

Appendix: List of sentences tested

Given below is the list of target sentences that appeared in the questionnaire. Four versions for each base sentence were created where adverbial positions and the presence or absence of parentheses around the adverbial were varied. An example 4-version set is given below and the rest of the list presents one variant of each target.

Example: *unfortunately*
(i)   He feels quite well although he was unfortunately diagnosed with cancer.
(ii) He feels quite well although he was, unfortunately, diagnosed with cancer.
(iii) He feels quite well, although he was, unfortunately, diagnosed with cancer.
(iv) He feels quite well, although he was diagnosed with cancer, unfortunately.

Illocutionary Adverbials

1. Mary looks quite well, although she, frankly, failed all her exams.

2. He still found the time to entertain his friends while, seriously, he was busy.

3. Because the child honestly is spoiled, we must be strict with her.

Attitudinal Adverbials

4. He feels quite well although he was unfortunately diagnosed with cancer.

5. Although the family had unfortunately been evicted, they managed to find a new place to live.

6. All her friends in the class performed quite well, while she, sadly, failed the exam.

Evidential Adverbials

7. John still manages to stay cheerful, although he is, obviously, injured.

8. John's sister remains very thin while John, obviously, gained weight.

9. Since the money evidently has disappeared, the police are looking into the matter.

10. Since the author is so popular, the book, no doubt, will be a best seller.

11. The play was very entertaining, although the actors, certainly, lacked talent.

12. Although I am not too impressed by the ending, the book, certainly, is very interesting.

Hearsay Adverbials

13. Jane, reportedly, poisoned her husband, although she claims he died of natural causes.

14. While John reportedly won the race, his friends thought he lost it.

15. Because the criminal reportedly has escaped, we must be careful when we go out at night.

16. Because he was, reportedly, killed in the accident, his relatives have arrived at the scene.

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英語文副詞と真理条件的意味について
～アンケート調査の結果から～

小　　泉　　有 紀 子

　本論文では、英語における文副詞（unfortunately, reportedly などの文全体を作用域にとる副詞類）の解釈が文全体の真理条件に及ぼす影響について考察する。先行研究では文副詞の真理条件性を扱ったものは多くないが、考えられる可能性（発話行為論、Lycan の理論、関連性理論などのモデル）のうち、文副詞はすべて概念的情報を持つが、真理条件に寄与するものもそうでないものもあるということを予測する関連性理論の立場の分析が、真理条件性に関するテストにより得た実際のデータの多様性を最もよくとらえているということを見る。本論文は、文副詞の意味内容と文の真理条件、また解釈におけるその他の要因（例えば発話の状況やイントネーションなど）がどのように関わりあっているかを明らかにするための出発点となるものである。