Conversational Implicature in Montague Grammar
Author(s): Lauri Karttunen
Proceedings of the First Annual Meeting of the Berkeley Linguistics Society (1975), pp. 266-278

Conventional Implicature in Montague Grammar*

Lauri Karttunen
University of Texas at Austin
Stanley Peters
University of Texas at Austin and the Institute for Advanced Study

In this paper we try to spell out some of the content of the notion of conventional implicature, and we propose to treat many of what have been called presuppositions as conventional implicata.

The notion of conventional implicature is due to H. P. Grice (1975). We hope that we are using his term in the original spirit, but we cannot, of course, be absolutely sure of this. In any case, we try to integrate this notion with the syntactic and semantic framework of Montague grammar.

An implicature in Gricean terms means the following. If the uttering of a sentence S in a given context licenses the inference that p, although the proposition p is something over and above what the speaker actually says, then he has implicated that p and p is an implicatum of the utterance of S. Grice discusses two kinds of implicatures: conventional and conversational. The latter sort is intimately connected with his notion of cooperative conversation, in which the participants observe certain conversational maxims. Grice himself is primarily interested in conversational implicatures. He has very little to say about conventional implicatures, which is the kind we are going to discuss.

Conventional implicatures arise, not from the interplay of what is said with the conversational maxims, but from the conventional meanings of words that are used to say it. Grice gives the following example.

> If I say (smugly) "He is an Englishman; he is, therefore, brave," I have certainly committed myself by virtue of the meaning of my words, to its being true that his being brave is a consequence of (follows from) his being an Englishman. But while I have said that he is an Englishman, and said that he is brave, I do not want to say that I have said (in the favored sense) that it follows from his being an Englishman that he is brave, though I have certainly indicated, and so implicated, that this is so. I do not want to say that my utterance of this sentence would be, strictly speaking, false should the consequence in question fail to hold. So some implicatures are conventional ---
>
> Grice 1975, p. 66

One typical characteristic of conventional, as opposed to conversational, implicatures is that in the case of conventional implicature the implicatum is detachable from what is being said. It is possible to find another way of saying the same thing which does not give rise to the implicature. In Grice's example, the speaker could have expressed the same proposition by uttering

"He is an Englishman and he is brave," which does not implicate that one follows from the other.

In the following, we will identify Grice's notion of what is actually said with the logical form of the sentence that was uttered. To say that the two sentences cited above have the same logical form is to say that they translate to equivalent formulas in some model-theoretically interpreted language, such as Montague's intensional logic, which in turn means that they express the same proposition.

Conventional implicatures seem to us to a large extent co-extensive with phenomena that have been called "pragmatic presuppositions". For the purposes of this paper we identify the two notions; however, we certainly do not claim that everything that has been called a case of pragmatic presupposition is a case of conventional implicature. More likely, the former term, as it has been used in the literature, covers a heterogeneous class of phenomena. In any case, what is said above about Grice's therefore-example, which is the only one of this kind that he discusses in detail, applies equally well to sentences with words such as manage, fail, again, even, etc., which are said to induce pragmatic presuppositions.

For example, it is clear that whoever utters

(1) John managed to find a job.

commits himself to the view that it isn't easy to find a job, or at least not easy for John.[1] By asserting (1) the speaker warrants the conclusion that finding a job must have taken some trying, some directed effort on John's part. But this is not what the speaker actually says when he utters (1). If it wasn't so, he would not have said anything false. The truth of (1) depends solely on whether John actually found a job, the rest is a conventional implicatum to which the speaker commits himself by using the word manage. Had he chosen not to do this, he could have expressed the same proposition by uttering (2) instead of (1).

(2) John found a job.

In addition to particular lexical items, conventional implicatures may also be associated with certain grammatical constructions, such as the cleft construction in English. For example,

(3) It wasn't Rosemary who got the job.

commits the speaker to the view that someone got the job. This is what he conventionally implicates by using the cleft construction to express the proposition that Rosemary didn't get the job. Thus we do not require that conventional implicatures be always attributable to the meaning of individual words.

We also allow for the possibility that what is conventionally

implicated by uttering the sentence may, at the same time, be semantically entailed by it. For example, we assume that by uttering

(4) It was Rosemary who got the job.

the speaker says that Rosemary got the job and conventionally implicates that someone got the job. In this case, the conventional implicatum is also semantically entailed by the proposition that the sentence expresses.

To round out the picture of pragmatic presuppositions as conventional implicata, we can show how they play a role in the ordering of discourse in terms of a notion which is often used in defining pragmatic presupposition. This is the idea of common ground.

Imagine a group of people engaged in an exchange of talk. At each point in their conversation there is a set of propositions that any participant is rationally justified in taking for granted, for example, by virtue of what has been said in the conversation up to that point, what all the participants are in a position to perceive as true, whatever else they mutually know, assume, etc. This set of propositions is what we call the common ground or the common set of presumptions.[2] In the course of the conversation these presumptions may change; indeed, if the purpose of the conversation is to exchange information, enlarging the common ground may be thought of as one of the participants' goals. When a participant says something, thereby advancing the conversation to a new point, the new set of common presumptions reflects the change from the preceding set in terms of adjunction, replacement, or excision of propositions depending on the exact relation of what was said to the previous common ground.

Definitions of pragmatic presupposition that have been given in the literature make use of the notion of common ground in the following way (e.g. see Karttunen 1974).

(5) Sentence S pragmatically presupposes proposition p
$=_{def}$
it is felicitous to utter S in order to increment a common ground Γ only in case p is already part of (= entailed by) Γ.

In essence, this definition says that each time the common ground is to be changed as a result of the speaker uttering a new sentence the presuppositions of this incremental sentence should be satisfied by the existing set of presumptions. This way of thinking about presuppositions gives us a very natural account of presuppositions of compound sentences, which pose a difficult problem for any purely semantic theory of presuppositions.

We now think that it is better to regard most cases of pragmatic presupposition as conventional implicatures, not as felicity conditions. However, we do not claim that the earlier approach is entirely misguided. On the contrary, we hope to show how the

import of conventional implicatures for the felicity of utterances can be explained. To do this, we want to point out the following generalization and to explain why it holds.[3]

(6) As a general tendency, it is in the interest of the participants in a discourse to organize their contributions in such a way that the conventional implicata of the sentence uttered are already part of the common ground at the time of the utterance.

In commenting on this observation, we rely on ideas put forth by R. H. Thomason (1973) and R. C. Stalnaker (1974). The argument is based on the cooperative nature of conversation. All parties to a conversation have an interest in avoiding disruption of the flow of discourse. If an utterance makes a controversial point which is not set apart where it can be challenged directly, disruption is likely to follow. For example, if the speaker asks

(7) Did you forget to call Harry?

either one of the two possible casual answers signals the answerer's tacit acceptance of the proposition that he intended to call Harry. To disassociate himself from this proposition, he has to digress from answering the question. The conversation is disrupted because there is no simple way to indicate the rejection of the controversial proposition. If the speaker believes that the addressee might disagree with the point, he should perhaps ask

(8) Did you call Harry?

instead, to avoid potential disruption. So it is usually uncooperative to put forward in conversation a sentence to which the addressee cannot make a simple response without committing himself to something he may not wish to accept at all. As sentence (7) illustrates, conventional implicata are not set apart so they can be challenged in a simple way. Consequently, in cooperative conversation a sentence ought to be uttered only if nothing it conventionally implicates is a subject of controversy in the conversational setting. Of course, the least controversial propositions of all are those in the common ground, which all participants already accept. In the limit, then, every conventional implicatum of a sentence belongs to the common set of presumptions which the utterance of that sentence is intended to increment. This may be the source of the temptation to regard conventional implicata as felicity conditions, that is, as pragmatic presuppositions in the sense of the definition in (5).

Hitherto, conventional implicatures have not received much attention, and no formal treatments exist to our knowledge. We will try to show that they can be studied with the same explicitness and rigor that we have come to expect elsewhere in semantics.

We will of course make use of all the insights that have been obtained in the course of studying pragmatic presuppositions and we hope to make those largely informal results more precise.

To carry out this program we will need, in describing the meaning of sentences in a language, to associate with each sentence two functions, defined on assignments of values to deictic expressions. One function should map such assignments into semantic values appropriate to record the sentence's semantic content, to specify its logical form. This aspect of meaning has received study by Stalnaker, R. Montague, D. Lewis, among others. The second function should have as values propositions which specify the conventional implicata of the sentence; this is where we propose to extend current conceptions of meaning. Accordingly, our next task is to present a mechanism by which a finite system of rules can recursively associate with each of a language's infinitely many sentences the two required functions.

For this purpose, it is very convenient to make use of the framework for linguistic description developed by Montague. We adopt this approach strictly for reasons of convenience; for all we know, another descriptive framework might yield just as satisfactory an account of conventional implicature. In the following discussion, we presuppose some familiarity by the reader with Montague's theory and, in particular, with the description of a fragment of English which he presented in "The Proper Treatment of Quantification in Ordinary English" (henceforth, PTQ). Moreover, to facilitate understanding we key our examples as much as possible to that description so that only our innovations will be new to those familiar with PTQ. Rather than define with strict formality here the apparatus we are introducing, we rely on a semi-formal exposition supplemented with examples to convey our intentions.

Recall that in PTQ rules come in pairs. A syntactic rule applies certain operations to members of specified grammatical categories and determines the syntactic category of the resulting expressions. The corresponding translation rule assigns to each expression thus obtained a translation which is a function of the translations of the expressions operated on by the syntactic rule. Such rule pairs apply recursively, beginning from a list for each category of its basic members with their corresponding translations. In PTQ the translations are expressions in an interpreted formal language called intensional logic.

We will modify this to have each translation consist of more than one such logical expression, since we wish to specify not only the extension of each English phrase we generate but also its potential for conventional implicature. In addition to providing each phrase with a more complex translation than PTQ does, we shall enlarge the sets of basic expressions (lexical items) in order to discuss more examples of conventional implicature. Otherwise we shall not change the linguistic description presented in PTQ in any essential way; in particular, we leave the syntactic rules of Montague English almost completely unaltered.

One of the expressions our translation procedure will assign to each generated phrase will be called the extension expression of that phrase. It will be identical to the single expression Montague's translation assigns. As in PTQ, the extension expression of the phrases produced by a syntactic rule will be obtained by applying certain formal operations to the extension expressions of the rule's input phrases.

Another of the expressions we will assign to each generated English phrase we call the implicature expression. The determination of this expression for a non-basic phrase is a somewhat more complicated matter than with the extension expression. Our method of obtaining it reflects the general fact that the implicatures incipient in a complex phrase can arise in two ways: (i) they may be induced by the dominant functor phrase, or (ii) they may originate in the subordinate argument phrase. For example, the implicatures incipient in regret that John has failed to win are in part due to the main verb being regret that, and in part due to the complement sentence John has failed to win. Those of the former kind are obtained by letting the implicature expression of regret that apply to the sense of the complement, those of the latter variety are derived by applying the "heritage expression" of the main verb to the sense of the complement's implicata.

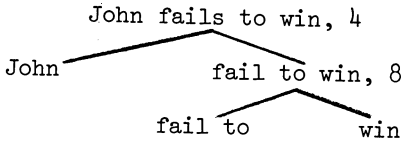
The third expression, the heritage expression, associated with each English phrase is needed only to facilitate the assignment of implicature expressions by helping to determine the form in which the conventional implicata of argument phrases are "inherited" by the complex phrase which is constructed from them. It is the heritage expression which determines whether a functor phrase is a "hole" or a "plug" or a "filter" in terms of Karttunen 1973.

At this point it is best to look at a detailed example. Consider the sentence

(9) John fails to win.

which says that John doesn't win and conventionally implicates that he either tries or is expected to win.[4] The syntactic derivation of this sentence is illustrated by the analysis tree in (10), where "4" and "8" refer to the syntactic rules of PTQ that were used to derive the expression in question.

(10)



The basic lexical items in (10) are John, fail to, and win. In order to make it more convenient to present their translations, we introduce the notational conventions given in (11).

(11) John' = the translation of John

$John^e$ = the extension expression of John

$John^i$ = the implicature expression of John

$John^h$ = the heritage expression of John

Thus John' = $\langle John^e, John^i, John^h \rangle$, fail-to' = $\langle$fail-to^e, fail-to^i, fail-to$^h\rangle$, etc. Let us define John' and fail-to' as follows.

(12) $John^e = \lambda P P\{\hat{}j\}$ $\quad win^e = ---$

$John^i = \lambda P \bigvee u \Box u=j$ $\quad win^i = ---$

$John^h = \lambda P P\{\hat{}j\}$ $\quad win^h = ---$

fail-to$^e = \lambda P \hat{x} \neg P\{x\}$

fail-to$^i = \lambda P \hat{x}[$try-to$^e(P)(x) \vee \bigvee y$ expect-that$^e(y, \hat{}P\{x\})]$

fail-to$^h = \lambda P \hat{x} P\{x\}$

We have left the translation of win unspecified in (12) since it is not germane to the present discussion.

Let us first examine the translation of fail to. The heritage expression, fail-to^h, guarantees that each complex phrase, such as fail to win, which is formed by combining fail to with a verb phrase inherits all the conventional implicatures inherent in the latter. It makes fail to a hole in terms of Karttunen 1973. The implicature expression, fail-to^i, is such that an implicature of trying or expectation is associated with any sentence whose main verb is fail to. Finally, the extension of fail to, fail-to^e, reflects the fact that semantically this verb behaves like a negation operator that applies to verb phrases.

In the translation of John, the extension expression comes straight from Montague; the implicature part appears in PTQ as a meaning postulate stipulating that John is a rigid designator. These do not concern us here. The only relevant part is the heritage expression, $John^h$, which is identical to the extension of John but has an entirely different purpose. It guarantees, among other things, that any sentence formed by combining John with a verb phrase conventionally implicates that John has all the properties specified by the implicature expression of the verb phrase.

To show how all this works, we have to present the two syntactic rules and the corresponding translation rules needed to derive John fails to win in the manner shown by the analysis tree in (10). We will start with Rule 8 that forms fail to win by combining fail to and win. For the sake of convenience, we will present the syntactic and translation rules together.

(13) Rule 8. If δ is a phrase of category IV//IV and β is a phrase of category IV, then $\delta\beta$ is a phrase of category IV. If δ translates to $\langle \delta^e, \delta^i, \delta^h \rangle$ and β to $\langle \beta^e, \beta^i, \beta^h \rangle$, then $\delta\beta$ translates to $\langle \delta^e(\hat{}\beta^e),\ \hat{x}[\delta^i(\hat{}\beta^e)(x) \wedge \delta^h(\hat{}\beta^i)(x)],\ \hat{x}\ x=x \rangle$.

The syntactic part of the rule comes unchanged from PTQ. Our modified translation rule looks rather complicated but the idea is actually fairly simple. It seems best to discuss it by considering our example fail to win.

First of all, the rule assigns to fail to win an extension which is identical to what the translation of this phrase would be according to the original PTQ system. This is given in (14).

(14) $\text{fail-to-win}^e = \text{fail-to}^e(\hat{}\text{win}^e)$

The conventional implicature of fail to win consists of two parts. The first is formed by taking the implicature expression of fail to and by applying it to the sense of the extension of win. The second part is obtained from the heritage expression of fail to as applied to the sense of the implicature of win. For certain trivial technical reasons we need to introduce an additional variable, "x", in order to conjoin these two parts. The result is given in (15).

(15) $\text{fail-to-win}^i = \hat{x}[\text{fail-to}^i(\hat{}\text{win}^e)(x) \wedge \text{fail-to}^h(\hat{}\text{win}^i)(x)]$

The first half of fail-to-win^i says that the trying or expectation which fail conventionally implicates has to do with winning. The second half guarantees that all the implicatures inherent in win are carried on, for example, being eligible to win.

What remains to be explained is the heritage expression of fail to win. As shown in (13), this is given directly without any consideration of the particular phrases that are involved. Thus we get (16).

(16) $\text{fail-to-win}^h = \hat{x}\ x=x$

This makes fail to win a plug. If there were some rule that combines an intransitive verb phrase with some other phrase in such a way that the verb phrase is treated as the functor expression, then the implicatures of the argument phrase would not become implicatures of the resulting phrase. However, this is a moot point since there are no such rules in PTQ. Hence it doesn't actually matter here what fail-to-win^h is.

We are now finally in the position to give the precise translation of fail to win. By making use of the equivalences and notational conventions of PTQ, we can reduce it to the form given in (17).

(17) fail-to-win' = $\langle \hat{x}\neg win^e(x),$

$\hat{x}[[try\text{-}to^e(x,\hat{}win^e) \vee \forall y\ expect\text{-}that^e(y,\hat{}win^e(x))] \wedge win^i(x)],$

$\hat{x}\ x=x\rangle$

The extension of fail to win comes out to be the same as that of not to win (assuming that this were derivable in PTQ). The implicature part is the same as the extension of try to win or be expected to win conjoined with "being such as winning implicates" (whatever that is). The heritage expression, as we noted above, is a matter of arbitrary choice.

Let us now pass on to the second syntactic rule we need to use in deriving John fails to win. Our version of this rule is given in (18) combined with the corresponding translation rule.

(18) Rule 4. If δ is a phrase of category t/IV and β is a phrase of category IV, then $\delta\overline{\beta}$ is a phrase of category t, where $\overline{\beta}$ is the result of replacing the first verb in β by its third person singular present tense form. If δ translates to $\langle \delta^e, \delta^i, \delta^h\rangle$ and β translates to $\langle \beta^e, \beta^i, \beta^h\rangle$, then $\delta\overline{\beta}$ translates to $\langle \delta^e(\hat{}\beta^e),\ [\delta^i(\hat{}\beta^e) \wedge \delta^h(\hat{}\beta^i)],\ [p \vee \neg p]\rangle$.

As before, we leave Montague's syntactic rule in PTQ unchanged. The general form of the translation rule in (18) is identical with that of (13). This is also true of the corresponding translation rules in PTQ.

The rule in (18) makes the extension expression of a sentence identical to what its full translation would be in PTQ. This is illustrated in (19).

(19) $John\text{-}fails\text{-}to\text{-}win^e = John^e(\hat{}fail\text{-}to\text{-}win^e)$

The conventional implicatum of the sentence is a conjunction, as shown in (20).

(20) $John\text{-}fails\text{-}to\text{-}win^i =$

$John^i(\hat{}fail\text{-}to\text{-}win^e) \wedge John^h(\hat{}fail\text{-}to\text{-}win^i)$

The first conjunct in (20) is the conventional implicature created by the subject phrase, John, which is of little interest to us here. The second conjunct is formed by applying the heritage expression of John to the sense of the implicature expression of fail to win. In effect, this amounts to forming the proposition

that John has all the properties this verb phrase implicates.

As the heritage expression of John fails to win, the rule in (18) gives a trivial tautology.

(21) $\text{John-fails-to-win}^h = p \vee \neg p$

Since there is no rule in PTQ that treats sentences as functor expressions, this is a matter of arbitrary choice, it plays no role in the generation of more complex sentences.

The full translation of John fails to win is given in (22) in reduced form.

(22) $\text{John-fails-to-win}' = \langle \neg \text{win}^e(\hat{}j),\ [\forall u\, \Box u{=}j \wedge [\text{try-to}^e(\hat{}j, \hat{}\text{win}^e) \vee \forall y\, \text{expect-that}^e(y, \hat{}\text{win}^e(\hat{}j))] \wedge \text{win}^i(\hat{}j)],\ [p \vee \neg p] \rangle$

As we see in (22), the extension expression says that John doesn't win. The second part of the translation gives us a conjunction of three implicatures: (i) John is a rigid designator, (ii) either John tries to win or someone expects John to win, and (iii) John has the properties implicated by win, say, eligibility. This is exactly the result we wanted. Note that, as the example shows, any word in a sentence can give rise to implicatures; (i) is contributed by John, (ii) by fail to and its complement, and (iii) by the verb win. Note moreover that the specific form of the implicature created by fail to is influenced by the heritage expression of John, and the implicature brought in by win is influenced by the heritage expressions of both fail to and John.

At this point it is time to recall what it is that we are doing here. We start from the assumption that a lexical item may contribute in two ways to the meaning of a sentence in which it occurs. First of all, it may help to determine the logical form of the sentence, what it is that the sentence literally says. Secondly, a lexical item - as well as certain grammatical constructions - may be a source of implicatures. By asserting the sentence, the speaker commits himself equally to the proposition that the sentence expresses (logical form) and to the proposition that the sentence conventionally implicates (implicature expression), as well as to all of the propositions that these jointly entail.

By using the framework of Montague grammar, we have outlined a theory which treats both aspects of meaning equally explicitly. In a forthcoming paper we will expand our remarks to cover all of Montague's PTQ. We will also discuss a wider variety of conventional implicatures, for example, those that accompany words such as again, whole, regret, fortunately, etc.

As a final example of what can be done along these lines, consider the verb phrase adverb almost, for which we give the following translation.

(23) $\text{almost}_1' = \langle \lambda P \hat{x}\ \text{almost}_2^e(\hat{}P\{x\}),\ \lambda P \hat{x}\ \neg P\{x\},\ \lambda P \hat{x} P\{x\} \rangle$

Syntactically we treat almost here as a verb phrase adverb, let us call it almost_1. Consequently, the extension expression in (23) is of the type appropriate to translate a member of syntactic category IV/IV. We assume that there is a related sentence adverb, almost_2, whose extension is made use of in specifying the extension of almost_1. Almost_2^e ought to mean something like "come close to being the case". As the implicature expression of almost_1 tells us, asserting that something almost has a given property implicates that it doesn't (cf. barely, which gives the opposite implicature). The heritage expression of almost_1 tells us that this adverb is a hole; all implicatures of the phrase it modifies are inherited by the resulting phrase.

The syntactic rule of PTQ that generates phrases such as almost win and almost fail to win is given in (24).[5]

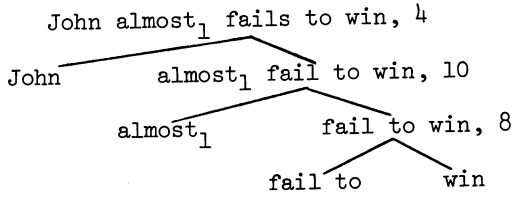
(24) Rule 10. If δ is a phrase of category IV/IV and β is a phrase of category IV, then $\delta\beta$ is a phrase of category IV. If δ translates to $\langle \delta^e, \delta^i, \delta^h \rangle$ and β to $\langle \beta^e, \beta^i, \beta^h \rangle$, then $\delta\beta$ translates to $\langle \delta^e(\hat{}\beta^e),\ \hat{x}[\delta^i(\hat{}\beta^e)(x) \wedge \delta^h(\hat{}\beta^i)(x)],\ \hat{x}\ x{=}x \rangle$.

As in PTQ, the translation rule in (24) is identical to the corresponding rule in (13), and its general form matches that of the translation rule in (18).

With the three syntactic rules we have discussed, we can derive (25) in the manner shown in (26).

(25) John almost fails to win.

(26)



The resulting translation is given in (27) in reduced form.

(27) $\text{John-almost}_1\text{-fails-to-win}' = \langle \text{almost}_2^e(\hat{}\neg \text{win}^e(\hat{}j)),\ [\text{win}^e(\hat{}j) \wedge \text{John-fails-to-win}^i],\ [p \vee \neg p] \rangle$

As (27) shows, (25) commits the speaker to the view that (i) John comes close to not winning, (ii) John wins, and (iii) all the implicatures of John fails to win hold, in particular, John tries or is expected to win.[6]

It is important to realize that this intuitively correct result depends crucially on distinguishing between the logical form (extension expression) and the conventional implicatures of fail to win. As the extension expression in (27) reflects, the proposition which is asserted by (25) to be a close call is simply that John doesn't win. If John loses resoundingly, then even if the additional propositions implicated by John fails to win come close to being true, (25) is false. By the same token, the implicature of falsehood arising from almost applies only to the proposition that John doesn't win. The implicata of John fails to win are shared by (25), rather than the contrary. So clearly it would not do to suppose that all conventional implicata of the sentence are semantically entailed by it, and accordingly to regard the meaning of fail to win simply as a compound property, conjoining the extension with the implicature presented in (17).

The capability to deal with facts of this sort provides strong support for the mode of analysis we are proposing. By deepening and extending this explicit account of conventional implicature we anticipate that a number of long-standing problems about presupposition can be solved.

****

Footnotes

* The first author's research for this paper was supported in part by a workshop on the semantics and syntax of non-extensional constructions conducted by the Mathematical Social Science Board and the second author's research by the Institute for Advanced Study.

[1] In a paper in this same volume, L. Coleman points out that the implicature associated with manage may in fact be less specific than what we here take it to be. She gives persuasive examples which indicate that manage can implicate a number of things ranging from trying and difficulty to mere unlikelihood.

[2] R. C. Stalnaker (1974) prefers the term "presupposition" for what we call "common presumption". Our notion of common ground is similar to his concept of presupposition set.

[3] We do not mean that (6) is a principle governing cooperative conversation. It merely summarizes a trend in the conversational practice of talkers who are cooperating rationally. This tendency is, we maintain, a result of people generally observing a Gricean maxim of manner, perhaps: Set points which may be controversial apart; say them so that they can be easily challenged. Some reasons for supposing this are sketched in the text below.

[4] This is a very rough attempt to specify the conventional implicatures of fail. We are presenting it only to make it possible to give a concrete example of how conventional implicatures of

complex phrases are derived in accordance with our rules. It has been pointed out to us by L. Coleman, J. J. Katz, J. D. McCawley, and others that it is difficult to pin down exactly what the implicature of fail is. Perhaps fail implicates no more than that there is some reason for someone to take seriously the possibility that the proposition in question might be true. For an interesting discussion of this question, see Coleman's paper in this same volume.

5 We deviate here slightly from PTQ syntax by letting the rule place the adverb in front of the verb rather than the other way around.

6 Our analysis presents an improvement over the treatment of almost and fail given by M. Bennett in his dissertation (1974). For a discussion of Bennett's solution, see Karttunen 1975.

Bibliography

Bennett, Michael R. (1974) Some Extensions of a Montague Fragment of English, unpublished Doctoral dissertation, UCLA.

Coleman, Linda (1975) "The Case of the Vanishing Presupposition," in this volume.

Grice, H. P. (1975) "Logic and Conversation," in D. Davidson and G. Harman, eds. The Logic of Grammar, Dickenson, Encino, Cal.

Karttunen, Lauri (1973) "Presuppositions of Compound Sentences," Linguistic Inquiry 2, 566-69.

Karttunen, Lauri (1974) "Presupposition and Linguistic Context," Theoretical Linguistics 1, 181-94.

Karttunen, Lauri (1975) "On Pragmatic and Semantic Aspects of Meaning," Texas Linguistic Forum 1, Univ. of Texas, Dept. of Linguistics, Austin.

Montague, Richard (1974) "The Proper Treatment of Quantification in Ordinary English," (PTQ) in R. Thomason, ed. Formal Philosophy. Selected Papers of Richard Montague, Yale Univ. Press, New Haven, Conn.

Stalnaker, Robert C. (1974) "Contexts and Possible Worlds," unpublished paper.

Thomason, Richmond H. (1973) "Semantics, Pragmatics, Conversation, and Presupposition," unpublished paper.