CHAPTER IV.9

# PRESUPPOSITION*

*by Scott Soames*



## 1. BASIC QUESTIONS

To presuppose something is to take it for granted in a way that contrasts with asserting it. For example, if one assertively utters

(1a) It was Sam who broke the typewriter.

one presupposes that the typewriter was broken and asserts that Sam was the one who did it. Similarly, if one assertively utters

(2a) John is going to drop out of school again.

one presupposes that he has dropped out of school before and asserts that he will drop out in the future. In each case, the speaker commits himself both to that which he presupposes and to that which he asserts. However, there are important differences between the two.



*D. Gabbay and F. Guenthner (eds.), Handbook of Philosophical Logic, Volume IV*, 553–616.

One such difference is that commitments that are presupposed are highly heritable, whereas those that are only asserted are not. If assertive utterances of a sentence *S* are used to assert *A* and presuppose *P*, then assertive utterances of more complicated sentences containing *S* often presuppose *P* without carrying any commitment to *A*. This is illustrated by the examples in (1) and (2).

(1b) It wasn't Sam who broke the typewriter.

(1c) Maybe it was Sam who broke the typewriter.

(1d) It is unlikely that it was Sam who broke the typewriter.

(1e) If it was Sam who broke the typewriter, then he will have to fix it.

(P) Someone broke the typewriter.

(A) Sam broke the typewriter.

(2b) John isn't going to drop out of school again.

(2c) Maybe John is going to drop out of school again.

(2d) It is unclear whether John is going to drop out of school again.

(2e) Either John will pass the course or he is going to drop out of school again.

(P) John has dropped out of school before.

(A) John will drop out of school in the future.

Heritability is such a striking feature of presuppositions that they are often identified as those commitments that are inherited in the kinds of linguistic environments just mentioned. However, presuppositions are not inherited in all environments. For example, utterances of the sentences in (3) do not presuppose *P* even though they contain constituents that do.

(3a) If the typewriter was broken, then it was Sam who broke it.

(3b) The typewriter was broken and it was Sam who broke it.

(3c) Either the typewriter wasn't broken, or it was Sam who broke it.

(P) The typewriter was broken.

The contrast between these examples and those given above raises three basic questions which, in broadest terms, define the descriptive task for linguistic theories of presupposition.

DESCRIPTIVE QUESTIONS

(Q1) What presuppositions do various constructions give rise to?

(Q2) Which constructions allow utterances to inherit the presuppositions of their constituents and which do not?

(Q3) What do utterances of arbitrary sentences presuppose?

Although these questions are important, they are not the only ones that theories of presupposition are responsible for. In addition to the descriptive task of identifying the presuppositions of various utterances, a theory of presupposition should specify the kind of phenomenon presupposition is, and how it fits into general theories of the semantic encoding of information by sentences and the pragmatic exchange of information in communicative situations. In short, an adequate theory should answer not only descriptive questions about the scope of presupposition, but also foundational questions about its nature.

FOUNDATIONAL QUESTIONS

(Q4) What is presupposition – what does it mean to say that $x$ presupposes $y$?

(Q5) Why are there linguistically expressed presuppositions at all – what functions do presuppositions have in the representation and communication of information?

(Q6) How are presuppositions of utterances affected by the semantic rules that determine the information encoded by a sentence relative to a context, and the pragmatic rules that specify the manner in which utterances increment sets of assumptions common among conversational participants?

Historically, three main approaches to presupposition have been developed corresponding to three different answers to (Q4). The first approach consists of theories of logical presupposition, deriving ultimately from the work of Gottlob Frege.[1] According to these theories, presupposition is, in its primary sense, a relation between propositions. A proposition $P$ is said to logically presuppose a proposition $Q$ iff the truth of $Q$ is a necessary condition for $P$ to be either true or false.

*Logical Presupposition*: A proposition $P$ logically presupposes a proposition $Q$ iff for all possible circumstances $w$, if $P$ is true or false in $w$, then $Q$ is true in $w$.

Sentences are said to bear logical presuppositions in a derivative sense: A sentence $S$ logically presupposes a proposition $Q$ (relative to a context $C$ of utterance) iff $S$ expresses a proposition $P$ (in $C$) that logically presupposes $Q$.

The second approach derives from the work of Peter Strawson and consists of theories of what might be called "expressive presupposition".[2] According to these theories, presupposition is a relation between a sentence, or a use of a sentence, and a proposition. A sentence (or use of a sentence) $S$ can be said to expressively presuppose a proposition $P$ iff the truth of $P$ is a necessary condition for $S$ (or a use of $S$) to express a proposition. On this view, an assertive utterance of a sentence $S$ in a context $C$ fails to semantically express a proposition if one or more of the relevant presuppositions is false.

The third approach consists of theories of pragmatic presupposition in roughly the sense articulated by Robert Stalnaker.[3] According to these theories, presuppositions are requirements that sentences, or utterances of sentences, place on sets of common background assumptions built up among conversational participants. Typically, the requirement is that this set of assumptions contain a specific proposition, or some proposition from a limited range of alternatives. Presuppositions in this sense are essentially things taken for granted at a given point in a conversation. The sources of these pragmatic presuppositions vary from case to case, and theory to theory. For example, logical presuppositions, expressive presuppositions, conventional implicatures, conversational implicatures, and general pragmatic strategies of context incrementation have all been held to play important roles in determining the pragmatic presuppositions of utterances. On this view, theories of presupposition are neither exclusively semantic nor exclusively pragmatic, but rather require the integration of both kinds of information.

The leading ideas behind these three approaches can be made clearer by considering some paradigmatic examples in historical context.

## 2. THREE APPROACHES TO PRESUPPOSITION

### 2.1. *Fregean Examples of Logical Presupposition*

The most widely discussed (putative) examples of logical presupposition are so-called referential presuppositions, corresponding to uses of singular

terms. The classical Fregean explanation of these examples relies on his bipartite semantics of sense and reference. For example, consider the positive version of (4).

(4) The queen of England is (isn't) popular.

(P) England has a (unique) queen.

According to Frege, the proposition expressed by this sentence can be broken down into two parts: one part consisting of the sense (or meaning) of the subject expression, and the other part consisting of the sense (or meaning) of the predicate. Each of these is a "mode of presentation" of a referent. Senses of predicate expressions present functions from objects to truth values (Truth and Falsity). Senses of singular terms present objects. The truth value of the proposition expressed by a simple subject-predicate sentence (as well as that of the sentence itself) is defined to be the value of the function referred to by the predicate at the argument referred to by the subject.

An important aspect of Frege's distinction between sense and reference is his recognition that some singular terms have senses that fail to present referents – for example, 'the Democrat elected President of the U.S. in 1980'.[4] It follows from Frege's semantics that sentences containing such terms (in environments in which they occur with their customary sense and reference) must lack truth values. One such sentence is the positive version of (5).

(5) The Democrat elected President of the U.S. in 1980 is (isn't) popular.

(P) A (unique) Democrat was elected President of the U.S. in 1980.

By definition, the truth value of this example is the value of the function referred to by the predicate 'is popular' at the argument referred to by the subject. But since the subject fails to refer, there is no such argument and hence no such truth value. Therefore, the example is truth valueless.

Negations are treated similarly. The propositions expressed by the negative versions of (4) and (5) are taken to consist of the propositions expressed by their positive counterparts together with with sense of a sentential negation operator. This sense presents a function $f$ as referent from Truth and Falsity to Falsity and Truth. The truth value of each of these negative propositions is defined to be the value of the negation

function *f* at the argument consisting of the truth value of the corresponding positive proposition. Where this positive proposition is truth valueless, there is no such argument and, hence, no truth value for the negation. Thus, corresponding positive and negative examples are either jointly truth valued or jointly truth valueless.

In both cases (4–5), the truth of *P* is a necessary condition for the positive and negative propositions to have a truth value. As a result, these propositions (and the sentences that express them) logically presuppose *P*. As such, they illustrate the more general point that negations share the logical presuppositions of their positive counterparts.

It is worth distinguishing those aspects of this analysis that are peculiar to Frege from those that are central to theories of logical presupposition in general. For Frege, claims about presuppositions are consequences of his compositional theory of sense and reference. His decision to take predicates to designate (total) functions from objects to truth values has the consequence that truth valuelessness arises from reference failure on the part of singular terms. His decision to take truth functional operators to denote functions from the truth values of their operands to the truth values of larger, compound sentences has the consequence that these sentences will be truth valued only if each of their truth functional constituents is. Neither of these decisions is constitutive of logical presupposition in general.

What is constitutive is an analysis of (4–5) in terms of the following pair of assumptions:

(i) The negative versions of (4–5), and the propositions they express, are (logically) negations of their positive counterparts.[5]

(ii) In each case, *P* is entailed (necessitated) by both the positive and negative propositions (sentences).[6]

It follows from these assumptions that the positive and negative examples in each case logically presuppose P; and, hence, that these examples are neither true nor false when *P* is untrue.

It so happens that the only logical presuppositions generated by Frege's explicit semantics are referential presuppositions (which express necessary conditions for the propositional constituents corresponding to singular terms to present referents). However, there is nothing essential in this either to theories of logical presupposition in general, or to Frege's basic

semantic framework. Suppose one dropped the Fregean requirement that the functions designated by predicates be total. For example, the function designated by 'is forgetful' might be defined only on animate beings; and the function designated by the factive verb 'realize' might be defined only over pairs consisting of individuals and true propositions. On this analysis, the deviance of the examples in (6) could be traced to the falsity of the logical presupposition arising from the sortal restriction on the predicate; and the inferences from (7a) and (7b) to (7P) could be treated on a par with those in (4–5).

(6a) The speed of light is (isn't) forgetful.

(6b) The sum of 2 and 3 is (isn't) forgetful.

(7a) John realized that time was running out.

(7b) John didn't realize that time was running out.

(P) Time was running out.

A similar analysis could, in principle, be applied to the examples in (8).[7]

(8a) All graduate students in the class wrote term papers.

(8b) Not all graduate students in the class wrote term papers.

(P) There were graduate students in the class.

Since presupposition was not one of Frege's main concerns, he did not canvass natural language to determine the different kinds there might be. In particular, he did not consider nonreferential examples like those just illustrated. However, the ease with which his system can be extended to provide a unified account of referential and nonreferential cases has made it an important model for later theories of logical presupposition.

Unfortunately, there is one respect in which Frege's theory is clearly mistaken. We have seen that Frege takes $n$-place truth functional operators to designate $n$-place truth functions; and that he defines the truth value of a truth functional compound to be the value of the relevant $n$-place truth function at the $n$-tuple of truth values of its truth functional constituents. As a result, the argument used to show that a negation is truth valueless iff its positive counterpart is truth valueless can be generalized to yield the conclusion that a truth functional compound is truth valueless iff one of its constituents is.[8] But this conclusion is incorrect, as is shown by the fact

that (9a) is true, and by the fact that the examples in (9) do not presuppose (9P).[9]

(9a) Either there is no king of France or the king of France is in hiding.

(9b) If there is a king of France, then the king of France is one of the few remaining European monarchs.

(9c) There is a king of France and the king of France is wise.

(P) There is a (unique) king of France.

A more reasonable treatment of truth functional connectives that avoids the difficulties posed by (9) is given in (10).

(10a) *A* or *B*

| *A* \ *B* | *T* | *F* | * |
|---|---|---|---|
| *T* | *T* | *T* | *T* |
| *F* | *T* | *F* | * |
| * | *T* | * | * |

(10b) If *A*, then *B*

| *A* \ *B* | *T* | *F* | * |
|---|---|---|---|
| *T* | *T* | *F* | * |
| *F* | *T* | *T* | *T* |
| * | * | * | * |

(10c) *A* and *B*

| *A* \ *B* | *T* | *F* | * |
|---|---|---|---|
| *T* | *T* | *F* | * |
| *F* | *F* | *F* | *F* |
| * | * | * | * |

(10d) Not *A*

| *A* | Not *A* |
|---|---|
| *T* | *F* |
| *F* | *T* |
| * | * |

The consequences of this treatment of the connectives will be explored further in Section 3.3.2.

2.2. *Strawsonian examples of expressive presupposition*

The examples in (11) illustrate a different kind of presupposition.

(11a) He is wealthy.

(11b) This is a fine red one.

(11c) That little bug is harmless.

In each case, a singular term is used to refer to an entity which the rest of the sentence says something about. This entity is intimately involved in what is said by the utterance in a way that contrasts with examples like (12).

(12) The president of General Motors (whoever he may be) is wealthy.

For example, imagine a situation in which the pronoun in (11a) is used demonstratively to refer to a man *m* who, in fact, is the president of General Motors. Let *P* be the proposition expressed by such a use of (11a) and *Q* be the proposition expressed by a use of (12). Clearly, *P* and *Q* are different propositions. *P* is true in a possible circumstance of evaluation *w* iff *m* is wealthy in *w*. *Q* is true in *w* iff whoever happens to be the president of General Motors in *w* is wealthy in *w*. In effect, that which a use of 'he' contributes to the truth conditions of what is said by an utterance is its referent in the context: whereas that which a use of 'the president of General Motors' contributes is its descriptive sense. Thus, an utterance of (13a) is true just in case the (present) referent *m* of 'he' was poor 20 years ago; whereas (13b) is true just in case 20 years ago General Motors had a pauper for a president.

(13a) Twenty years ago he was poor.

(13b) Twenty years ago the president of General Motors (whoever he may have been) was poor.

The point seems to hold even in propositional attitude constructions. For example, the assertions made by utterances of the sentences in (14) seem to be the same.

(14a) Mary said that he was poor. (Uttered pointing at *m*.)

(14b) Mary said that I was poor. (Uttered by *m*).

(14c) Mary said that you were poor. (Uttered to *m*).

This suggests that the contribution of a demonstrative or indexical to the proposition expressed by an utterance of a sentence containing it is simply its referent in the context. Following David Kaplan, we may refer to this view as the thesis that demonstratives are directly referential

What happens when a use of a directly referential term fails to semantically determine a referent? In such a case, it is natural to suppose that the sentence fails to semantically express a proposition relative to the context.

With this in mind, one can define a notion of expressive presupposition as follows:

*Expressive Presupposition*: A sentence *S* expressively presupposes a proposition *P* relative to a context *C* iff the truth of *P* is necessary for *S* to semantically express a proposition in *C*.

(11a–c) can then be characterized as expressively presupposing (15a–c).

(15a) There is a contextually salient male under discussion.

(15b) 'This' refers to something relative to the context.

(15c) There is a contextually salient little bug under discussion.

Although both logical and expressive presupposition have been motivated using examples in which the truth of a proposition is necessary for a (use of a) singular term to secure a referent, the two kinds of presupposition are conceptually quite different. If *S* logically presupposes *P* relative to a context *C*, then the proposition expressed by *S* in *C* must entail (necessitate) *P*. This is not so when *S* expressively presupposes *P* relative to *C* (even when *S* succeeds in expressing a proposition).

One can think of this difference as corresponding to two different stages in the semantic evaluation of a sentence. The first stage consists in associating the sentence with the proposition it expresses in the context. The semantic mechanisms responsible for this are what give rise to expressive presuppositions. The second stage consists in evaluating the truth or falsity of that proposition with respect to different (possible) circumstances of evaluation. The semantic mechanisms for determining the extensions (referents) presented by propositions and their various constituents are what give rise to logical presuppositions.

It is just this two stage conception of semantics that is needed to distinguish expressive and logical presuppositions involving directly referential and non-directly-referential singular terms.[10] However, there is a historical irony in this. The first presentation and discussion of expressive presuppositions is given in Peter Strawson's influential paper 'On Referring', long before the systematic development of two stage semantic theories by David Kaplan, and others.[11] As a result, Strawson's important insights were obscured and he was unable to successfully distinguish his new notion of expressive presupposition from the Fregean notion of logical presupposition. Since Strawson's work has been highly influential

in bringing presupposition to the attention of semantic theorists, it may be worthwhile to say a word about this.

The central theses of "On Referring" are as follows:

*Thesis 1:* Meaning is a property of expressions; referring, being true or false, and saying something are properties of uses of expressions in contexts.

*Thesis 2:* A sentence is meaningful iff it could be used to say something true or false.

*Thesis 3:* To give (or know) the meaning of a sentence is to give (or know) a rule for determining the contexts in which it is used to say something true and the contexts in which it is used to say something false.

*Thesis 4:* The semantic function of a singular term (demonstrative, pronoun, name, definite description) in its primary referring use[12] is to refer to an entity which the rest of the sentence is used to say something about. The meaning of such an expression is a rule for determining its referents in different contexts.

*Thesis 5:* If a singular term $b$ in a sentence $\ulcorner Fb \urcorner$ is used referringly in a context $C$, then this use of $\ulcorner Fb \urcorner$ in $C$ says something true (false) in $C$ iff in $C$, the referent of $b$ has (doesn't have) the property $F$ is used to express. If the use of $b$ fails to refer to anything, then the use of $\ulcorner Fb \urcorner$ in $C$ doesn't say anything true or false.

*Thesis 6* (Definition): If the truth of $P$ is a necessary condition for a use of $S$ in $C$ to say something true or false, then $S$ presupposes $P$ relative to $C$.

*Thesis 7:* Uses of $\ulcorner G$[the $F$]$\urcorner$, $\ulcorner$All $F$'s are $G$'s$\urcorner$, $\ulcorner$Some $F$'s are $G$'s$\urcorner$, $\ulcorner$No $F$'s are $G$'s$\urcorner$, and $\ulcorner$Some $F$'s are not $G$'s$\urcorner$, presuppose that which is expressed by $\ulcorner$There is at least one $F\urcorner$.

The key thesis is Thesis 3. However, there is a problem with it. As it stands, it does not rule out, and may even be taken to suggest, that the meaning of a sentence can be represented as a function from contexts of utterance to truth values. This is at variance with the two stage conception of semantics in which the meaning of a sentence is represented by a function from contexts to propositions, where the latter determine functions from

(possible) circumstances of evaluation to truth values. Since the circumstance of the context is one of these possible circumstances, the meaning of a sentence determines the one stage mapping from contexts to truth values suggested in Strawson's Thesis 3. However, the latter does not determine the former. As a result, there are important semantic distinctions that Thesis 3 does not explicitly accommodate.

This is illustrated by (16a) and (16b).

(16a) I exist.

(16b) I am here now.

Any context in which one of these would express a truth (falsehood) is a context in which the other would as well. Nevertheless, they do not have the same meaning. If I were to assertively utter both in the present context, my utterance of (16a) would express the proposition that Scott Soames exists; whereas my utterance of (16b) would express the proposition that Scott Soames is in Santa Cruz on April 6, 1984. Since these are different propositions, the semantic contents of (16a) and (16b) must be distinguished. To make this explicit, Thesis 3 should be replaced with Thesis 3′.[13]

*Thesis 3′:* The meaning of a sentence is a rule for determining the propositions it expresses in different contexts. Each such proposition determines a rule for assigning truth values to (possible) circumstances of evaluation.

This requires corresponding changes in Theses 4 and 5. To make these changes, one must decide what singular terms contribute to the propositions expressed by uses of sentences containing them. Strawson's insistence that the semantic function of a singular term is to refer to an object, and his tendency to treat referring uses of demonstratives as prime examples of this function, suggest a reformulation in which all referring uses of singular terms are directly referential.[14]

*Thesis 4′:* The propositional constituent corresponding to a (referring) use of a singular term $b$ in a context $C$ is the referent of $b$ in $C$. The meaning of a singular term is a rule for determining the propositional constituents corresponding to uses of the term in different contexts.

*Thesis 5′:* If a singular term $b$ in a sentence $\ulcorner Fb \urcorner$ is used to refer to an object $o$ in a context $C$, and if $F$ is used in $C$ to express the property $P$, then

⌜*Fb*⌝ expresses a proposition in *C* which is true (false) in a possible circumstance *w* iff *o* has (doesn't have) *P* in *w*. If *b* fails to refer to anything in *C*, then there is no propositional constituent corresponding to *b* in *C*, and ⌜*Fb*⌝ fails to semantically express a proposition in *C*.

The theory of presupposition that emerges from this reconstruction of Strawson's theses is a theory of expressive presupposition, as defined above. As we have seen, the combination of Theses 3′–5′ provides a plausible account of examples like those in (11) in which a pronoun, demonstrative, or demonstrative phrase is used referringly. However, it clearly produces incorrect results when extended to the range of cases mentioned in Thesis 7.

This extension also conflicts with Strawson's expressed intentions. In Chapter 6 of *Introduction to Logical Theory*, Strawson defines presupposition as follows:[15]

(17) A statement (proposition) *S* presupposes a statement (proposition) *S′* iff the truth of *S′* is a necessary condition for *S* to be true or false.[16]

It was apparently this definition that he had in mind when discussing presuppositions of examples of the kind mentioned in Thesis 7 (both in 'On Referring' and in *Introduction to Logical Theory*). Since (17) defines logical presupposition, Strawson's adoption of it belies any clear commitment to expressive presupposition, or any systematic analysis of the constructions mentioned in Thesis 7 along directly referential lines.

This points up a second possible reconstruction of Strawson's position. On this construal, his account of presupposition is basically the same as Frege's, without the compositional semantics, but with an explicit stipulation that propositions involving restricted quantifiers are bearers of presuppositions. This theory is potentially broad in scope and has been historically influential. However, its leading ideas are not original with Strawson.

As a historical point, it would be a mistake to attribute to Strawson either an account of presupposition that is systematically Fregean (logical) or an account that is systematically expressive. His major discussions include elements of both, the conflict being masked by his failure to articulate the crucial account of meaning given in Thesis 3′. Once this deficiency is corrected, Strawson's main original contribution to the study of presupposition lies in the reconstructed account of expressive

presupposition suggested by his work. This account is attractive for examples involving various kinds of indexical elements. Some have suggested that it may be possible to extend it from examples involving demonstrative phrases like 'this little bug' to corresponding examples involving definite descriptions like 'the little bug'.[17] What it cannot be is a comprehensive theory of presupposition in general.

### 2.3. *Pragmatic presupposition*

Robert Stalnaker, and others, have argued that in order to arrive at a comprehensive theory, it is necessary to adopt a pragmatic account of what presupposition is. The account is based on the observation that sentences are used in communication to contribute to an already existing conversational record, which contains a set of common background assumptions built up among conversational participants. Because of this it is natural for speakers to develop conventional means of indicating what assumptions they are making about the common background to which their utterances contribute. In particular, it is understandable that certain words and constructions should come to be used for this purpose.

For example, the following (a)-constructions seem to be designed for use in conversations in which the information expressed by the (b)-constructions is already assumed.

(18a) It was *NP* that *VP*ed.

(18b) Something (someone) *VP*ed.

(19a) Even *NP* *VP*ed.

(19b) Others under consideration, besides *NP*, *VP*ed. Of those under consideration, *NP* was among the least likely to *VP*.

A sentence that indicates that such assumptions are being made can be thought of as putting requirements on the conversational record at the time of utterance – requirements that must be satisfied if the speaker's communicative intentions are to be fulfilled. Presuppositions, on this view, are just such requirements.

Suppose now that a speaker utters a sentence *S* which requires that the conversational record satisfy a certain condition – say that it contain a specific proposition *P* as part of the common background. Suppose further that *P* is not already part of the background, but that the conversational

participants are ready to accept *P* as uncontroversial, at least for present conversational purposes. What sort of response would be reasonable on the part of hearers in such a case?

The legalistic response would be to object to the speaker's remark on the grounds that *P*, which was required by the remark, had not already been established prior to the utterance. The speaker could then ask whether his hearers were willing to accept *P*, and be told that they were. After adding *P* to the context, the speaker could repeat his original remark and continue along as before.

But there is really no point in this. Since the hearers are ready to accept *P* anyway, they might as well add it to the background and let the speaker go on without objection. In other words, the most efficient and cooperative response on the part of the hearers is to accommodate the speaker by updating the conversational record so that it meets the requirements of the speaker's utterance.

The reasoning leading to this strategy of accommodation is something that conversational participants can be expected to be familiar with, or to work out for themselves. Knowing this, a speaker can exploit the strategy by uttering sentences whose presuppositional requirements he knows are not already satisfied by the existing conversational record. So long as he takes the content of these requirements to be both recognizable and unlikely to provoke objections, he can rely on his hearers to accommodate him by incrementing the common background in the appropriate way. A speaker can use presuppositions in this way to introduce new information, as well as, in some cases, to subtly insinuate a point of view regarding what can be taken to be uncontroversial, and hence beyond further discussion.[18]

On this picture, the presuppositions of a sentence are conditions it imposes on conversational records. Often these conditions take the form of requirements that the common background assumptions present in the record contain a specific proposition. However, other types of presuppositional requirements are also possible. For example, a sentence may require that the common background contain at least one proposition from a specified range of propositions, it may require that it contain no propositions of a specified sort; or it may require that the topic of conversation at the time of the utterance be one thing rather than another. Once the presuppositional requirements of sentences have been determined, incrementation of the record occurs in accordance with the strategy of accommodation.

An important feature of this approach is its eclecticism regarding the factors that give rise to different presuppositional requirements. Proponents

of pragmatic presupposition have suggested that these requirements might be derived from a variety of sources – including logical presupposition, expressive presupposition, conventional implicature, and non-conventional pragmatic facts.

For example, in discussing logical presupposition as a source of pragmatic presuppositional requirements, Robert Stalnaker says the following:

> The relation between the semantic [logical] notion of presupposition and the pragmatic notion of presupposition requirement is not, of course, just accidental. Among the reasons that a pragmatic presupposition might be required by the use of a sentence, by far the most obvious and compelling reason would be that the semantical rules for the sentence failed to determine a truth value for the sentence in possible worlds in which the required presupposition is false. Since the whole point of expressing a proposition is to divide the relevant set of alternative possible situations – the presupposition set – into two parts, to distinguish those in which the proposition is true from those in which the proposition is false, it would obviously be inappropriate to use a sentence which failed to do this. Thus, that a proposition is presupposed by a sentence in the technical semantic sense provides a reason for requiring that it be presupposed in the pragmatic sense whenever the sentence is used. This explains where the semantic notion gets its name, and why linguists and philosophers have been tempted to identify presupposition in general with this semantic relation.[19]

According to this picture, the exchange of information in a conversation increases the number of propositions in the common background against which the conversation takes place. Taken together, these propositions determine a set of possible worlds which, at any given moment, represent the alternatives compatible with everything that has been said or assumed in the conversation up to that point. The function of an assertive utterance of a sentence $S$ is to further constrain these alternatives by eliminating the worlds in which the proposition expressed by $S$ is false, while retaining those in which it is true. Note that if $S$ logically presupposes a proposition $Q$ which is not entailed by the propositions in the common background, then the set of conversationally alternative worlds will contain some members $w$ in which the proposition expressed by $S$ cannot be correctly characterized as either true or false. Stalnaker's contention is that in such a case the assertive utterance will fail in its primary purpose of determining a new set of alternative possibilities, since it will fail (barring accommodation) to determine what should be done with worlds in the old alternative set in which $Q$ is false. Thus, Stalnaker maintains, logical presuppositions provide one kind of principled explanation of the pragmatic presuppositional requirements of sentences.

A similar story might be told regarding expressive presuppositions. Suppose that the truth of $P$ is a necessary condition for a use of $S$ to

semantically express a proposition in a context $C$. Suppose further that speakers standardly intend to assert, and to be recognized as asserting, the proposition semantically expressed by the sentence assertively uttered, relative to the context of utterance. Then, a speaker will assertively utter $S$ in $C$ only when the truth of its expressive presupposition $P$ can be taken for granted – only when $P$ is either already part of the conversational record, or uncontroversial enough to be added by accommodation. Thus, expressive presupposition may be another source of pragmatic presuppositional requirements.[20]

Finally, proponents of pragmatic presupposition maintain that some presuppositional requirements arise from more straightforwardly pragmatic sources. For example, Lauri Karttunen and Stanley Peters [1979] argue that the pragmatic presuppositions of (18a) and (19a) are Gricean conventional implicatures that are carried by these sentences independently of the propositions they express. Particularly interesting from a pragmatic point of view are constructions which, though they don't give rise to presuppositions themselves, allow compound sentences to inherit the presuppositions of their constituents. Two examples of such constructions are conjunctions and indicative conditionals.[21] The presuppositional requirements of these constructions have been characterized as follows: A set $R$ of common background assumptions satisfies the presuppositional requirements of $\ulcorner A$ and $B\urcorner$ and $\ulcorner$If $A$, then $B\urcorner$ iff $R$ satisfies the requirements of $A$, and the result $R'$ of adding the proposition expressed by $A$ to $R$ satisfies the presuppositional requirements of $B$. Roughly speaking, $\ulcorner A$ and $B\urcorner$ and $\ulcorner$If $A$, then $B\urcorner$ inherit all the presuppositional requirements of $A$, plus those requirements of $B$ that are not automatically satisfied by the addition of $A$ to the conversational record.

Different theorists have proposed different explanations of these requirements. Among the simplest is one suggested by Robert Stalnaker. Stalnaker's proposed explanation is based on two principles. First, whenever something is asserted or supposed, it is immediately added to the conversational record (in the case of supposition, the addition is often temporary). Second, someone who assertively utters a conjunction asserts the proposition expressed by its first conjunct prior to uttering the second conjunct; someone who assertively utters a conditional posits the proposition expressed by its antecedent as a supposition prior to uttering the consequent. Since the initial conversational record is augmented with $A$ prior to the utterance of $B$, this guarantees that the only substantive presuppositional requirements arising from $B$ will be those that remain

unsatisfied after the addition of the proposition expressed by *A*. In this way, Stalnaker attempts to provide a non-semantic explanation of the presuppositional requirements of these compound sentences.

Whether or not this explanation proves to be correct, there is something both right and important about the pragmatic approach. Presupposition is, first and foremost, a matter of what is assumed or taken for granted. As such, linguistically expressed presuppositions should be described in terms of the beliefs and assumptions of language users. Although this makes presupposition a pragmatic notion, it does not rule out semantic explanations of pragmatic facts. What it does do is avoid conflating data about the commitments carried by various utterances with highly theoretical accounts of those commitments in terms of one or another kind of semantic presupposition.

This theoretical neutrality makes the pragmatic approach extremely useful in investigating the scope of presupposition in natural language. In recent years, linguists and philosophers have used this approach in pursuing the following three part strategy: First, the scope of pragmatic presupposition is described by specifying both the natural language constructions that give rise to presuppositions and those that allow larger compounds to inherit the presuppositions of their constituents. Second, an inquiry is made into the sources of pragmatic presuppositions in particular cases. Third, an attempt is made to determine whether semantic presuppositions are needed to explain pragmatic ones; or whether purely pragmatic mechanisms suffice to account for the data without appeal to special semantic assumptions.

## 3. RECENT DESCRIPTIVE WORK

### 3.1. *The scope of pragmatic presupposition*

As we have seen, traditional discussions of presupposition by philosophers have tended to focus on a small range of presupposition creating and inheriting constructions – the prime examples of the former being singular terms and restricted quantifiers, the prime example of the latter being negation. Recent descriptive work has greatly expanded both classes of cases.

Among the constructions that give rise to pragmatic presuppositions one finds a large variety of different types in addition to those discussed

by Frege and Strawson; for example:

| | | |
|---|---|---|
| (20a) | Bill regrets that he lied to Mary. | (Factive) |
| (P) | Bill lied to Mary. | |
| (21a) | Ivan has stopped beating his wife. | (Aspectual) |
| (P) | Ivan has beaten his wife. | |
| (22a) | Harry managed to find the book. | (Implicative Verb) |
| (P) | Finding the book required some effort. | |
| (23a) | Andy met with the PLO again today. | (Iterative) |
| (P) | Andy has met with the PLO before. | |
| (24a) | It was in August that we left Connecticut. | (Cleft) |
| (P) | We left Connecticut sometime. | |
| (25a) | What John broke was his typewriter. | (Pseudo cleft) |
| (P) | John broke something. | |
| (26a) | Pat is leaving, too. | (Focus on 'Pat') |
| (P) | Someone other than Pat is leaving. | |
| (27a) | Even Sam passed the test. | |
| (P) | Others, besides Sam, passed the test; and of those under consideration Sam was among the least likely to do so. | |

One also finds a variety of constructions that typically inherit the pragmatic presuppositions of their constituent clauses. These include, in addition to negation, epistemic modals, indicative conditionals, disjunctions, conjunctions, and sentences containing certain complementizable verbs.

| | |
|---|---|
| (28a) | It wasn't Jane who solved the problem. |
| (28b) | Maybe it was Jane who solved the problem. |
| (28c) | Either it was Jane who solved the problem, or they awarded the fellowship to the wrong person. |
| (28d) | If the problem was as important as they indicated, then it was probably Jane who solved it. |
| (28e) | That it was Jane who solved the problem isn't very likely. |

One way of thinking about these sentences is to see the pragmatic presuppositions of the constituent clauses as projected onto, and hence inherited by, the larger sentences. In this respect, the sentences in (28) contrast with their counterparts in (29).

(29a) Jane didn't solve the problem.

(29b) Maybe Jane solved the problem.

(29c) Either Jane solved the problem, or they awarded the fellowship to the wrong person.

(29d) If the problem was as important as they indicated, then Jane probably solved it.

(29e) That Jane solved the problem isn't very likely.

The difference between these two sets of sentences is that those in (28) have the cleft sentence (30) as a sentential constituent, whereas those in (29) have its noncleft counterpart, (31).

(30) It was Jane who solved the problem.

(31) Jane solved the problem.

Although both (30) and (31) entail (32), only (30) presupposes it.

(32) Someone solved the problem.

Utterances of (28a–e) inherit this presupposition. Utterances of (29a–e) have nothing to inherit.

This sort of projection is all but ubiquitous. However, it is not universal, as was illustrated by (3a–c) in Section 1. The chief descriptive problem occupying presupposition theorists in the past several years – the projection problem – has been to determine which utterances inherit the presuppositions of their constituents, which do not, and why.

It is useful in approaching this problem to have a characterization of the pragmatic notion of an utterance presupposition. This is given below, using the notion of the conversational background to represent the background information, common among speakers and hearers, against which utterances are evaluated.

*The Conversational Background:* The conversational background at a time $t$ is the set of propositions $P$ such that at $t$ the conversational participants believe or assume $P$; and recognize this about each other.

*Utterance Presupposition:* An utterance $U$ presupposes $P$ iff one can reasonably infer from $U$ that the speaker $S$ accepts $P$ and regards it as uncontroversial, either because

(a) $S$ thinks that $P$ is already part of the conversational background at the time of $U$; or because
(b) $S$ thinks that the conversational participants are prepared to add $P$, without objection, to the background.

The projection problem is the problem of determining the presuppositions of utterances of compound sentences in terms of presuppositions associated with their clausal constituents.

### 3.2. *The projection problem*

Standardly, presuppositions associated with a sentential constituent become presuppositions of an utterance of a compound sentence of which the constituent is a part. There are, however, three factors that can prevent this from happening – cancellation of the presupposition by propositions in the conversational background, cancellation by Gricean conversational implicatures, and suspension of the presupposition by "local context incrementation" utilizing other clauses in the compound sentence.

The first of these factors is illustrated by a discourse in which (33b) is uttered after (33a) (where the utterances may be by the same or different speakers).

(33a) There is no king of France.

(33b) Therefore the king of France isn't in hiding.

(33b) is the negation of a sentence that presupposes that France has a king. Although negations typically share the pragmatic presuppositions of their positive counterparts, this utterance of (33b) does not. The reason it doesn't is that the putative presupposition conflicts with a proposition already placed in the conversational background. When this happens, utterances of negative sentences may be felicitous, but they do not inherit the presuppositions of their positive counterparts.[22]

The second way in which presupposition inheritance can be blocked is illustrated by the contrast between (34) and (35).

(34) If I regret later that I haven't told the truth, I will confess it to everyone.

(A) I will regret later that I haven't told the truth.

(P) I haven't told the truth.

(35) If I realize later that I haven't told the truth, I will confess it to everyone.

(A) I will realize later that I haven't told the truth.

(P) I haven't told the truth.

In each case, the antecedent *A* presupposes *P*. Since utterances of indicative conditionals normally inherit the pragmatic presuppositions of their antecedents, one would expect utterances of these sentences to presuppose *P* as well. However, this is true only of (34). In the case of (35) the presupposition is blocked by the conversational implicature that the speaker doesn't know the antecedent of his statement to be true. (If he did, he could have made a stronger statement.) Since he doesn't know that he will later realize that he hasn't told the truth, one may conclude (in normal circumstances) that he doesn't now know that he hasn't told the truth. In this way, the normal presumption that the speaker is taking the presupposition of the antecedent for granted is defeated by a conversational implicature that indicates that he cannot be doing so.[23]

The third way in which presupposition inheritance can be blocked is illustrated by (36).

(36) If all the Smith brothers have children, then John Smith's children will probably inherit the family fortune.

(B) John Smith's children will probably inherit the family fortune.

(P) John Smith has children.

Here, *P* is not presupposed by an utterance of (36) even though it is presupposed by its consequent *B*. There is also no conversational implicature to the effect that the speaker is not assuming *P*. Rather the utterance is noncommital regarding his attitude toward *P* – it neither indicates that he takes it to be true, nor indicates that he does not take it to be true.

This can be explained using assumptions (i) and (ii).

(i) The pragmatic presuppositional requirement of *B* arising from its grammatical subject is that a certain contextually defined set of propositions entails *P*.

(ii) When $B$ occurs as the consequent of an indicative conditional the contextually relevant set is the one that results from adding the proposition expressed by the antecedent to the conversational background prior to the utterance.

These assumptions guarantee that the relevant presuppositional requirement of $B$ will be satisfied by an utterance of (36) no matter whether $P$ is in the conversational background prior to the utterance or not. (We assume that it is part of the background that John Smith is one of the Smith brothers.) Hence, the utterance provides no indication whether the speaker regards $P$ to be true, or whether he is unsure of its truth value.

The three factors capable of preventing presupposition inheritance have provided the basis for three different theories of presupposition projection. The first of these, presented in Karttunen [1974], is based entirely on the kind of presupposition suspension illustrated by (36). The theory takes the form of an inductive definition of a two place relation of admittance between sets of propositions (called "contexts") and sentences. It is assumed that a context $C$ will admit (20a)–(27a) only if $C$ entails (20P)–(27P), respectively. Clauses for compound sentences include the following:

(37) A context $C$ admits a negation of a sentence $A$ iff
$C$ admits $A$.

(38) A context $C$ admits ⌜Maybe $A$⌝, ⌜It is likely that $A$⌝, ⌜It is possible that $A$⌝, iff $C$ admits $A$.

(39) A context $C$ admits ⌜$A$ and $B$⌝, ⌜If $A$, then $B$⌝ iff
$C$ admits $A$, and
$C \cup [A]$ admits $B$.[24]

(40) A context $C$ admits ⌜Either $A$ or $B$⌝ iff
$C \cup [-A]$ admits $B$, and
$C \cup [-B]$ admits $A$, and
for all propositions $P$, if $P$ is entailed by every context that admits both $A$, and $B$, then $C$ entails $P$.[25]

Pragmatic presuppositional requirements are consequences of the inductive definition plus a general requirement that the conversational

background prior to an utterance admit the sentence uttered. In cases in which the background does not admit the sentence, the strategy of accommodation is invoked to allow for utterance presuppositions to introduce new information.

This theory accounts for presupposition suspension both in simple cases like (36) and in more complicated examples like (41).

(41) If Martha buys a blue dress and Susan buys a blue dress too, then Martha will regret buying a dress that is the same color as one bought by Susan.

However, it cannot be accepted as it stands. The basic problem, as shown in Gazdar [1979], Soames [1979], and Soames [1982], involves a conflict between conversational implicatures and presuppositional requirements generated by the admittance conditions. The conflict arises in cases in which the latter make a prediction that something is being taken for granted, which the former deny. One example of such a case is (35). The Karttunen theory predicts that (35) requires the conversational background to entail $P$, and hence that utterances of (35) commit the speaker to $P$. The theory of conversational implicature, on the other hand, tells us that (normal) utterances of (35) conversationally implicate that the speaker is not assuming $P$. In every such case, the conversational implicature is genuine and the presupposition is nonexistent.[26]

The ability of conversational implicatures to prevent presupposition inheritance was noted independently and used to develop an alternative approach to presupposition projection in Gazdar [1979] and Soames [1979]. The basic ideas of the approach are the following:

(i) Presupposition creating constructions like those in (20–27) give rise to "potential presuppositions" (illustrated by 20P–27P).

(ii) Compound sentences inherit all the potential presuppositions of their constituents.

(iii) If $Q$ follows from potential presuppositions $P_1, \ldots, P_n$ of $S$, then an utterance $U$ of $S$ presupposes $Q$ unless
  (a) $P_1, \ldots, P_n$ are jointly incompatible with the conversational background; or
  (b) $U$ conversationally implicates that the speaker is not taking $P_1, \ldots, P_n$ for granted.

In effect, utterances presuppose all the presuppositions of their constituents except those that are incompatible with the conversational background or cancelled by conversational implicatures.

This approach handles much of the data that motivated the Karttunen theory while accounting for counterexamples like (35).[27] However, there is a range of examples, specified in Soames [1979], [1982], that this approach cannot accommodate. Two such examples are (36) and (42).

(42) Maybe Bill proved the theorem and Mary proved it too.

(P) Someone other than Mary proved the theorem.

In each case, an utterance of the sentence as a whole fails to inherit the constituent presupposition P, even though there is no cancelling conversational implicature. The reason for this seems to be that the presupposition is suspended by the kind of "local context incrementation" proposed by Karttunen.

The upshot of this is that a proper theory of pragmatic presupposition projection must include both mechanisms for suspending presuppositions of the sort suggested by Karttunen and mechanisms for cancelling them of the kind suggested by Gazdar and Soames. This conclusion is drawn in Soames [1982] where two different methods of incorporating these mechanisms into a single theory are explored. According to one method, Karttunen-like devices are used to generate pragmatic presuppositional requirements of sentences that are cancellable by contextual and conversational means. According to the other method, cancellation first eliminates certain potential presuppositions, with the remaining uncancelled potential presuppositions providing the input for a computation of utterance presuppositions along Karttunen-like lines. Although the second method was ultimately selected in that paper, each method has its own advantages. The end result, though not entirely free of descriptive problems, extends the reach of descriptive theories of pragmatic presupposition to a significant range of data.[28]

### 3.3. *Foundational implications of descriptive work*

3.3.1. *Cancellation and accommodation.* Although contextual and conversational cancellation seem to be indispensable parts of an adequate descriptive account of pragmatic presupposition, they also appear to threaten the original conception of pragmatic presupposition outlined in

Section 2.3. According to that conception, a theory of pragmatic presupposition can be thought of as a bipartite affair. The first part specifies the presuppositional requirements that various sentences place on conversational backgrounds. These requirements are illustrated by (37–40), and by requirements that (20P–27P) be entailed by the conversational backgrounds for (20a–27a). The second part of the theory specifies the role of presuppositional requirements in determining how conversational backgrounds are incremented on the basis of utterances. The crucial element here is the strategy of accommodating apparent violations. According to this strategy, an assertive utterance of a sentence $S$ that pragmatically presupposes $P$ will result in the addition of $P$ to the conversational background unless the hearers object.

The combination of this foundational conception of pragmatic presupposition, together with the descriptive requirements just mentioned, encapsulates the Karttunen theory discussed in the last section. Since that theory is descriptively inadequate, some change in either foundational structure or descriptive requirements is needed. The introduction of contextual and conversational cancellation into this picture worked out in Soames [1982] can be thought of as a change in the former. The basic idea is to introduce a new kind of accommodation to supplement the Lewis–Stalnaker variety that we have been considering up to now.

The kind of accommodation discussed by Lewis and Stalnaker might be called "de facto accommodation". When a presuppositional requirement is not met because the conversational background does not entail the presupposed proposition, the law does not change (the requirement remains in force); rather, the conversational facts are adjusted to bring the speaker's performance into line with the law (the proposition is added). However, this is not the only kind of accommodation possible. Suppose a speaker utters a sentence that requires the conversational background to satisfy a certain condition – say, to entail the proposition $P$. Suppose also that something about the speaker's utterance makes it clear that the requirement is to be waived in this case. The hearers, recognizing this, will not add $P$ to the background, but will go ahead with the process of incrementing it on the basis of the proposition asserted.

This sort of accommodation can be called "*de jure* accommodation". In this case, apparent violations of presuppositional requirements are accommodated not by adjusting the existing conversational facts to fit the requirements, but by adjusting the requirements to fit the facts. In effect, presuppositional requirements become defeasible. Unless there is an

indication to the contrary, they remain in force. However, there are means available to cancel them in particular cases.

The addition of this kind of accommodation to the foundational conception of pragmatic presupposition increases not only its descriptive accuracy, but also its intuitive plausibility. It must be remembered that incrementation of the conversational background is a complex process involving the nature of the preceding background, the syntactic form and semantic content of the sentence uttered, the presuppositional requirements of the sentence, plus the conversational implicatures of the utterance. Without *de jure* accommodation, the interaction of general principles involving various aspects of this process could easily lead to communicative conflicts.

For example, suppose all sentences of a certain form require preceding backgrounds to contain some proposition *P*. Suppose further that in certain special cases the content of the sentence, plus Gricean conversational principles, and the conversational background, generate a conversational implicature to the effect that *P* is not being assumed. A pragmatic strategy allowing *de facto*, but not *de jure*, accommodation would give rise to a communicative impass, since the addition of *P* to the background would be both required by the rules governing presupposition and prohibited by a conflicting conversational implicature.

The existence of *de jure* accommodation allows speakers to avoid this kind of difficulty, while adhering to simple and general rules for determining presuppositional requirements. By allowing these requirements to be defeasible, one keeps the task of computing them manageable, with exceptions to one's general rules being clearly recognizable in virtue of other, independently needed, pragmatic principles. Thus, there is good reason why pragmatic presuppositions ought to be governed by *de jure*, as well as *de facto*, accommodation.

3.3.2. *The insufficiency of conventional implicature and logical presupposition as sources of pragmatic requirements.* We now have the outlines of a theory of pragmatic presupposition that combines significant descriptive content with plausible answers to a number of basic foundational questions, including the following elaborations of the original Q5 of Section 1.

(Q5a) Why should there be linguistically expressed pragmatic presuppositions at all?

(Answer) To provide speakers with conventional means of indicating what assumptions they are making about the conversational backgrounds to which their utterances contribute.

(Q5b) Why, given that there are such presuppositions, should conversational participants be ready to follow a policy of *de facto* accommodation when the presuppositional requirements of a sentence are not satisfied by the conversational background prior to the utterance?

(Answer) To allow speakers to use presuppositions to introduce new, but uncontroversial, information; and to avoid pointless objections involving propositions they are ready to accept.

(Q5c) Why should pragmatic presuppositions be defeasible?

(Answer) To avoid communicative conflicts with other pragmatic implicatures; and to allow the rules for computing the presuppositional requirements of sentences to be kept manageably simple.

If one were designing a language for use in communication one would presumably want it to incorporate the main elements of this account. Thus, it is not surprising that natural languages do.

This points up the explanatory attractiveness of the pragmatic theory. There is, however, a serious gap in this explanatory picture. Although we have explained why there ought to be pragmatic presuppositions in general, we have not explained why various sentences carry the particular presuppositional requirements they do.

In some cases, the requirements seem to be simply matters of linguistic meaning. For example, in the case of the word 'even' it is plausible to hold that its meaning consists in the presuppositions, illustrated by (27P), that it introduces. A similar point might be made about the cleft construction, illustrated by (24a) and (30). If this is right, then what the meaning of the cleft construction adds to the meaning of (30) (that is not contained in the meaning of its noncleft counterpart (31)) is a certain presuppositional requirement.

Lauri Karttunen and Stanley Peters have suggested that these presuppositional requirements are Gricean conventional implicatures that are independent of the propositions expressed by sentences bearing them.[29] This suggestion is generalized to cover the constructions in (20–27), as well as the presuppositions arising from definite descriptions, quantified phrases, negations, conditionals, conjunctions, and disjunctions.[30] For the constructions covered in Karttunen's 1974 theory, this amounts to taking

the presuppositional requirements corresponding to (37–40) to be conventional implicatures arising from a recursive assignment of "non-truth-conditional" content to sentences that parallels the more familiar assignment of propositional content.[31]

Although the resulting system is elegant, it suffers from both explanatory and descriptive problems. On the explanatory side, pragmatic presuppositional requirements are reduced to arbitrary linguistic conventions associated with lexical items and constructions. This is plausible for examples like 'even' and clefts; but it is implausible for other cases, particularly the connectives. Surely, there is some connection between the truth conditional content of the connectives and the pragmatic presuppositions of sentences containing them.[32] We are not inclined to think that learning their meanings consists of two separate and unrelated tasks; nor do we expect to find natural languages containing connectives that share the truth conditional contents of their English counterparts while differing arbitrarily from them in their contributions to presupposition inheritance. This suggests some explanatory link between pragmatic presuppositions, truth conditional content, and general principles governing communication – a link that is missing from the Karttunen–Peters account.

There are also serious descriptive problems arising from the systematic identification of pragmatic presuppositions with conventional implicatures. As Grice, Karttunen, and Peters all have stressed, such implicatures are aspects of linguistic meaning, and are therefore uncancellable. Thus, the examples of presupposition cancellation cited in Gazdar [1979], Soames [1979], and [1982] refute the Karttunen–Peters account, along the original theory of Karttunen [1974].[33] Nor is the problem resolvable by simply changing the content of the implicatures.[34] Rather, it seems that some pragmatic presuppositions are not conventional implicatures after all.

A corresponding point can be made about logical presupposition. Suppose one wanted systematically to derive the pragmatic presuppositions of sentences from their logical presuppositions (including (20–27), negations, conjunctions, conditionals, disjunctions, and so on). To do this, one would need a nonbivalent semantics incorporating the truth tables in (10), together with the bridge principle (43) (justified by the Stalnaker argument given in Section 2.3).

(43) If $S$ logically presupposes $P$ relative to a context $C$, then an utterance of $S$ in $C$ pragmatically requires the conversational background to entail $P$.

According to this analysis, the logical presuppositions of negations, conjunctions, conditionals, and disjunctions are given in (P) – where ⌜Pre: $S$⌝ expresses a proposition whose truth is a necessary and sufficient condition for the proposition expressed by $S$ to be true or false.

(Pa) Pre: Not $S$ = Pre: $S$

(Pb) Pre: ($A$ and $B$) = (Pre: $A$ & ($A \rightarrow$ Pre: $B$))

(Pc) Pre: (If $A$, then $B$) = (Pre: $A$ & ($A \rightarrow$ Pre: $B$))

(Pd) Pre: ($A$ or $B$) = ($A \vee$ Pre: $B$) & ($B \vee$ Pre: $A$)

Since these presuppositions parallel those predicted in Karttunen [1974] and Karttunen and Peters [1979], the examples of presupposition cancellation that falsify those theories falsify the present analysis as well.[35] It is shown in Soames [1979] that this problem cannot be solved by simply changing the nonbivalent truth tables of the connectives.[36]

The upshot of this is that pragmatic presuppositions cannot be systematically explained as arising from either logical presuppositions or conventional implicatures. We have not shown that no pragmatic presuppositions are logically presupposed, or conventionally implicated; only that, in each case, some are not. In one respect, this conclusion is not surprising. After all, pragmatic presuppositions were introduced, in part, to allow for radically different sources of presuppositional requirements. However, in another respect, the result is disquieting. As indicated earlier, there seem to be some expressions – including truth functional connectives – whose contributions to pragmatic presuppositions are not arbitrary matters of linguistic convention or pragmatic practice, but rather are linked in some way to their propositional content, plus general pragmatic principles governing cooperative communication. Until this link is spelled out precisely, we have no explanation of why various compound sentences bear the presuppositions they do.[37]

This explanatory difficulty is an important unsolved problem in the field that will be taken up again in Section 5. Before doing that, however, it is worthwhile to examine the more basic question of whether logical presuppositions ever provide the explanation of pragmatic ones. Is there any sentence $S$ and proposition $Q$ such that the reason that $S$ pragmatically presupposes $Q$ is that it logically presupposes $Q$?

## 4. PHILOSOPHICAL FOUNDATIONS OF NONBIVALENT ANALYSES

### 4.1. *Why truth value gaps don't explain presuppositions*

In order to derive pragmatic presuppositions from logical ones, a nonbivalent semantics plus the bridge principle (43) are needed. In order for such a derivation to have significant explanatory force, both the semantics and the bridge principle should be independently motivated. The point of the derivation is not simply to state the pragmatic requirements of various sentences, since (in most cases) we can do that directly. Rather, the point is to explain those requirements in terms of deeper semantic and pragmatic principles that are important for the explanation of other phenomena as well. Thus, if pragmatic presuppositions are to be ascribed to logical sources, we will need both a reason for abandoning bivalence and an account of (43) according to which it reflects something more than an arbitrary and unexplained correlation.

The main attempt to give the latter is the one by Robert Stalnaker discussed in Section 2.3 above. According to him, the link between the logical presuppositions of sentences and their pragmatic presuppositional requirements is provided by the function of assertions in incrementing conversational backgrounds. Stalnaker notes that the propositions in the background determine a set of conversationally alternative possible worlds compatible with everything established or assumed in the conversation at a given point. The function of an assertion is to further constrain these alternatives by eliminating some of the worlds and retaining the rest. The ones to be eliminated are those that are incompatible with the proposition asserted. These, Stalnaker maintains, are those in which the proposition expressed by the sentence uttered is false. The ones to be retained are those in which the proposition is true. Note, if $S$ logically presupposes (relative to the context) a proposition $Q$ which is not entailed by the propositions in the conversational background, then the set of conversationally alternative worlds will contain some members $w$ in which the proposition $P$, expressed by $S$, cannot be correctly characterized as either true or false. Stalnaker's point is that in such a case the assertion will fail in its primary purpose of determining a new set of alternative possibilities, since it will fail, barring accommodation, to determine what should be done with worlds in the old alternative set in which $Q$ is false. If this is right, it provides a straightforward explanation of why a sentence that logically

presupposes $Q$ (relative to a context) should give rise to a pragmatic requirement (subject to satisfaction via accommodation) that $Q$ be entailed by the conversational background.

But is it right? Certainly, if $Q$ is false in $w$, then there is no basis for retaining $w$, since retention is possible only if the world is one in which $P$ is true. But if $P$ is not true in a world $w$ in which its presupposition fails, then, surely, $w$ will be incompatible with $P$, and should be eliminated. For suppose that $P$ is definitely not true in a world in which $Q$ is false. Conversational participants who accept $P$ should be in a position to remove the world from the set of alternative worlds among which the conversation has not decided. Since Stalnaker's argument assumes that $w$ isn't eliminated on this basis, it requires a notion of radical presupposition in which a sentence or proposition with a false presupposition cannot be correctly characterized either as true or as not true. (This is implicit in his remark that a sentence with a false presupposition will fail to divide the set of conversationally alternative worlds into two exhaustive parts. Surely it would do so if the true and the not true were jointly exhaustive.)[38]

The idea, apparently, is that $P$ cannot be correctly characterized either as being true in $w$ or as being not true in $w$. Because of this, it fails to determine whether $w$ should be retained or eliminated from the set of alternative possibilities among which it is the function of the assertion to discriminate. Thus, Stalnaker's argument for (43) depends on the view that the relevant presuppositions constitute not just necessary conditions for their bearers to be correctly characterized as true or false, but rather, necessary conditions for their bearers to be correctly characterized either as true or as not true.

Let us see if we can construct an example that exhibits these stronger conditions.[39] Imagine the predicate 'smidget' being introduced into a language by the following semantic stipulation.

(44) Smidget: Stipulative Definition

(i) Any adult human being under three feet in height is a smidget.

(ii) Any adult human being over four feet in height is not a smidget (or is such that it is not the case that he/she is a smidget.)

The stipulation consists of a sufficient condition for something to be a smidget and a sufficient condition for something not to be a smidget. On

the basis of these conditions, there will be clear cases in which one is justified in characterizing someone as a smidget and clear cases in which one is justified in saying of someone that he is not a smidget. Moreover, these characterizations will convey information to other members of the linguistic community. An assertive utterance of 'Jack is a smidget' will convey to one's hearers the information that Jack is an adult under three feet tall and an assertive utterance of 'Jack is not a smidget' will convey the information that Jack is an adult over four feet tall. In short, 'smidget' will enter the language as a useful and meaningful predicate.

The interesting thing about the predicate is, of course, that the defining conditions for something to be a smidget, and for something to fail to be a smidget, are not jointly exhaustive. Adults between three and four feet tall cannot be correctly characterized either as being smidgets or as not being smidgets.

The same point can be made in certain cases in which the predicate is introduced ostensively. Rather than recite a stipulative definition, one might point to a number of adults under three feet tall and say "These people are smidgets", and a number of adults over four feet tall and say "These people are not smidgets" (or "It is not the case that these people are smidgets"). We may suppose that adults between three and four feet in height are extremely rare, and perhaps unheard-of in the linguistic community. Thus, the occasion may never arise during the period in which the term is being introduced to specify how such individuals are to be characterized. Language, being an institution designed to meet various practical contingencies, doesn't require linguistic conventions to be framed in terms of all logically, or metaphysically, possible circumstances.

Suppose now that the word 'smidget' has become entrenched in the language. We now consider the question of whether a man three feet six inches tall is or is not a smidget. This question might arise either because we finally encounter a man of that height, or because we wish to evaluate a counterfactual claim. Note, the question is not "Should the concept smidget be extended so as to include or exclude the individual in the relevant circumstance?"; rather it is, "Given the concept smidget as it already exists in the language, is the individual a smidget in the circumstance or is he not?". I suggest that our linguistic conventions provide no basis for answering this question. To characterize the man as not being a smidget would be just as unjustified as to characterize him as being a smidget. The concept is simply not designed for this case. As a result,

neither (45a) nor (45b) can be accepted.

(45a) He is a smidget. (Said referring to the 3′ 6″ man)

(45b) He is not a smidget. (Said referring to the same man)

(45c) That he is (isn't) a smidget is true.

(45d) That he is (isn't) a smidget is not true.

If 'true' and 'apply' satisfy (i–iii), it will follow that (45c–d) cannot be accepted either. (In (i–iii) ⌜$A$ iff $B$⌝ holds whenever $A$ and $B$ have the same status – both true, both false, both neither true nor false, or both such that they cannot be correctly characterized as true or not true.)

(i) For any predicate $P$ and term $t$, ⌜$Pt$⌝ is true (not true) iff $P$ applies (doesn't apply) to the referent of $t$.

(ii) For any sentence $S$, ⌜$-S$⌝ is true (not true) iff $S$ is not true (true).

(iii) The predicate 'red' applies (doesn't apply) to an object $o$ iff $o$ is (isn't) red.
The predicate 'smidget' applies (doesn't apply) to an object $o$ iff $o$ is (isn't) a smidget.

.
.
.

Under these assumptions, the radical partiality of 'smidget' results in the radical partiality of 'apply' and 'true'.[40]

This suggests that there are sentences and propositions of the kind required by Stalnaker's argument – sentences and propositions that cannot be correctly characterized as true or as not true unless certain conditions are met. What must be noted, however, is that the examples that have traditionally been analyzed as instances of logical presupposition are not of this kind.

For example, consider (46).

(46) The king of France is cultured (whoever he may be).

Although this example expresses a proposition, the proposition it expresses isn't true. Since there is no king of France, it can't be true. Unlike the smidget case, we don't feel that it would be just as wrong to say that (46) is not true as to say that it is true. Nor will one get an argument about

this from traditional defenders of logical presupposition. The standard claim about such examples is that the falsity of their logical presuppositions leads to their being neither true nor false. But if (46) is neither true nor false, then it is not true, and hence distinguished from (45).

This means that Stalnaker's argument does not apply to the cases for which it was intended. In fact, the situation is worse. Examples like (45), to which Stalnaker's argument ostensibly applies, do not give rise to pragmatic presuppositional requirements on conversational backgrounds. If they did, then those requirements would be inherited in the normal way by larger presupposition inheriting constructions. However, examples like (47) do not bear the relevant pragmatic presuppositions.

(47a) Maybe Bill's uncle is a smidget.

(47b) It is unlikely that Bill's uncle is a smidget.

(47c) If Bill's uncle is a smidget, then he is probably entitled to special benefits from the government.

Although utterances of these sentences presuppose that Bill has an uncle, they do not presuppose that Bill's uncle is over four feet or under three feet tall. This suggests that Stalnaker's argument is not only inapplicable to standard cases of logical presupposition, but unsound as well.

Since the argument is unsound, no pragmatic presupposition can be explained by appeal to it. Thus, if any pragmatic presuppositions are to be derived from logical ones, a new argument is needed, which excludes smidget type cases.

Let us introduce some terminology. Following traditional discussions of logical presupposition we will reserve the term 'logical presupposition' for examples that satisfy the following definition.

*Logical Presupposition:* A proposition $P$ logically presupposes a proposition $Q$ iff

(a) for all possible circumstances $w$, if $P$ is true or false in $w$, then $Q$ is true in $w$; and

(b) for all possible circumstances $w$, if $Q$ is not true in $w$, then $P$ is neither true nor false in $w$ (i.e. $P$ is not true in $w$ and $P$ is not false in $w$).

Smidget type cases are instances of a different relation, in which the "presupposition" constrains acceptance or assertability rather than truth values directly.

*Radical Presupposition:* A proposition $P$ radically presupposes a proposition $Q$ iff (for all circumstances $w$) the proposition that $P$ is true (in $w$) as well as the proposition that $P$ is not true (in $w$) must be rejected if $Q$ is not true (in $w$).

A more general relation encompassing both logical presupposition and radical presupposition is the following:

*R-Presupposition:* A proposition $P$ $R$-presupposes a proposition $Q$ iff (for all circumstances $w$) both the proposition that $P$ is true (in $w$) and the proposition that $P$ is false (in $w$) must be rejected if $Q$ is not true (in $w$).

Derivative relations holding between sentences, contexts, and propositions can be defined in the usual way in each of these cases.

We have used the smidget examples to show that some radical presuppositions, and hence some $R$-presuppositions, are not pragmatically presupposed. Since $R$-presupposition is not enough to yield pragmatic presupposition, no pragmatic presupposition $Q$ of $S$ can be explained simply by claiming that $S$ $R$-presupposes $Q$. If there is to be an argument explaining some pragmatic presuppositions in terms of logical ones, it must apply to logical presuppositions alone.

The difficulty in finding such an argument is illustrated by the following attempt. Suppose a speaker asserts a proposition $P$ in a conversation in which one of its logical presuppositions, $Q$, is potentially controversial. Since $Q$ is potentially controversial, the hearers might reject it, and thereby reject $P$. However, they cannot do this by assertively uttering the negation of the speaker's sentence, since on the preferred interpretation this sentence will express a proposition that commits them to $Q$. Thus if they are to reject $P$, they must say something more complicated – e.g. "Since it is not the case that $Q$, the proposition $P$ cannot be accepted." Now, it might seem that a cooperative speaker should avoid putting his hearers in the position of having to go to such lengths. That is, it might seem that he should assert a proposition $P$ only if he thinks that any objection to $P$ on the part of his hearers can be expressed simply by negating his remark.

If this argument were correct, it would provide a rationale for the view that logical presuppositions give rise to pragmatic presuppositions. However, the argument cannot be correct. For the same line of reasoning applies with even greater force to smidget type cases in which $P$ radically presupposes $Q$; and these don't give rise to pragmatic presuppositions.

Results like these present a challenge to the idea that pragmatic presuppositions can ever be explained in terms of logical presuppositions. There simply is no known reason why language use ought to be governed by the bridge principle (43) (rather than by analogous principles covering radical presuppositions). Indeed, it is hard to see how any explanation could be forthcoming. If there is no such explanation, then the fact that *S* pragmatically presupposes *Q* can never be explained simply by citing the (alleged) fact that *Q* is a logical presupposition of *S*.

This argument does not show that there is no such thing as logical presupposition; nor does it show that no pragmatic presuppositions are logically presupposed. Rather, it suggests that the connection between the two notions is at best indirect. If there are logical presuppositions, they must be motivated independently of pragmatic presuppositions. If pragmatic presuppositions are to be explained, their explanation can never rest simply on logical presupposition.

### 4.2. *Paradox, partiality, and presupposition*

The importance of the smidget example to the arguments just given might lead one to wonder whether there are non-artificial smidget type predicates in natural language. I believe there are. Many vague predicates, and predicates learned ostensively, share the kind of partial definedness that characterizes 'smidget'. So, I believe, do natural language truth predicates. Indeed, it was Kripke's theory of partially defined truth predicates that provided the model for 'smidget'.[41]

An important feature of this approach to truth lies in its avoidance of the strengthened liar paradox.

(48) Sentence (48) is not true.

A proper treatment of the paradox should explain the characteristics of the truth predicate that provide the basis for rejecting both the claim that (48) is true and the claim that (48) is not true. (Where to reject these claims is to refuse to accept them, without, of course, asserting their negations.)[42] This is what one gets if, following Kripke, one analyzes the truth predicate as partially defined in the manner of 'smidget'.[43]

What hasn't been sufficiently appreciated is that this kind of partiality is a fundamentally different phenomenon, semantically and pragmatically, from traditional examples of presupposition studied by philosophers and linguists.[44] If the argument in the previous section is correct, analyses of

semantic (and other) paradoxes in terms of partially defined predicates must be sharply distinguished from theories of logical presupposition, expressive presupposition, and pragmatic presupposition generally.

### 4.3. *Three possible deviations from bivalence*

Think of a sentence obtaining a truth value as a result of the following process: First, the sentence is placed in a context and a proposition is determined by applying its meaning to the context. (The meaning is thought of as a function from contexts to propositions.) Next a possible circumstance is selected and the proposition is evaluated for truth value relative to it. This gives the truth value of the sentence relative to the context and circumstance.

There are three ways in which this process might lead one to reject a strong principle of bivalence for sentences. First, the meaning of the sentence might fail to be defined on the context in question, in which case the sentence will fail to express a proposition in the context. Second, the proposition expressed might contain a partially defined property that makes determinate evaluation impossible at the given circumstance. Third, the process of evaluating the proposition at the circumstance might yield a value of neither truth nor falsity.

The first of these ways corresponds to a failure of what I have called "expressive presupposition" and is definitely relevant to the study of pragmatic presupposition in natural language. The second way corresponds to smidget type cases, and is not. The third type of deviation is not as clear cut. If there are such cases, they can be used to characterize a notion of logical presupposition. However, it appears that this notion has no direct connection with presupposition in the primary sense of that which is taken for granted.

With this in mind, I now turn to another attempt to explain the basis for such presuppositions.

## 5. DISCOURSE SEMANTICS AND THE EXPLANATION OF PRAGMATIC PRESUPPOSITIONS

### 5.1. *A recent proposal*

Why do various sentences bear the pragmatic presuppositions that they do? In Section 3.3.2, it was suggested that pragmatic presuppositions

arising from certain lexical items, like 'even', and certain syntactic constructions, like clefts, could be viewed as non-truth-conditional aspects of the conventional meanings of these elements. However, it was also argued that the presupposition inheriting characteristics of connectives, including 'and', 'or', and 'if, then', cannot be treated in this way. Since these characteristics are neither arbitrary, nor the result of special semantic stipulation, it ought to be possible to link them to the semantic contents of the connectives, plus general pragmatic principles governing communication. We have seen that this link is not provided by three valued truth tables that give rise to logical presuppositions. Thus, some other explanation is needed.

Recently, Irene Heim has attempted to provide such an explanation.[45] The key innovation is the development of a semantics for entire discourses, rather than individual sentences. Since pragmatic presupposition is itself a discourse phenomenon, it is natural to think that it might be linked to such a semantics.

Heim's semantic system is designed to assign (single) propositions to discourses, where propositions are taken to be sets of possible worlds and discourses are thought of as sequences of sentences. In this framework, the meaning of a sentence is given by a rule that determines its contribution to the propositions expressed by discourses containing it. These propositions are determined by starting with the set of all possible worlds and eliminating those incompatible with each of the sentences in turn. The end result is the "proposition" that the semantics assigns to the discourse as a whole.

To begin with, we can think of semantic-contexts as sets of possible worlds. The semantics consists of a recursive definition of a function, $+$, from sentences and semantic-contexts to semantic-contexts. For example, the clauses in the definition for negation, conjunction, and material conditionals are given in (49).

(49a) $C + \ulcorner A \text{ and } B \urcorner = (C + A) + B$

(49b) $C + \ulcorner \text{Not } A \urcorner = C \backslash (C + A)$

(49c) $C + \ulcorner \text{If } A, \text{ then } B \urcorner = C \backslash ((C + A) \backslash ((C + A) + B))$

($X \backslash Y$ is the intersection of $X$ with the complement of $Y$.)

The discourse sensitivity of the semantics shows up in an analysis of indefinite noun phrases designed to handle discourses like (50).

(50) Mary met a man$_i$. He$_i$ was $F$.

The problem illustrated by this example arises from two elementary observations. The first is that the initial sentence expresses an existential rather than a singular proposition. The second observation is that the pronoun in the second sentence is anaphoric with the indefinite *NP* in the initial sentence. This suggests that the semantic value of the pronoun in the context should be tied to that of the indefinite *NP*. If the two were in the same sentence, separated by 'and', this would be no problem for standard semantic accounts, since the pronoun could be seen as functioning as a variable bound by an existential quantifier. However, in (50) the pronoun and noun phrase are in different sentences. This creates a problem for standard systems in which variables can be bound within, but not across, sentences. It is this difficulty which motivates Heim to expand the scope of semantics from the single sentence to the entire discourse.

Her treatment of discourses containing indefinite *NP*'s consists of several elements: First, the semantic representation (51) is assigned to the discourse (50).

(51) $x_i$ is a man, Mary met $x_i$, $x_i$ was *F*.

Next, the notion of a semantic-context is enriched to make sense of the contribution of an open sentence to a discourse.

*Enriched Notion of a Semantic-Context:* A semantic-context is a set of pairs, $\langle g, w \rangle$, such that $g$ is an infinite sequence of individuals and $w$ is a possible world.

*The Proposition Determined by a Semantic-Context:* The proposition determined by a semantic-context $C$ is the set of worlds $w$ such that for some sequence of individuals $g$, $\langle g, w \rangle$ is a member of $C$.

Finally, the effect of incrementing a semantic-context with an open sentence is specified (informally) as follows.

*Incrementation of a Semantic-Context by an Open Sentence:* $C + Ax_i =$ the set of all $\langle g, w \rangle$ in $C$ such that $g(i)$ is an $A$ in $w$ (where $g(i)$ is the $i$th element of the sequence $g$).

Applying this rule to the representation (51) of (50), we end up with a context that determines a proposition every member of which is a world in which Mary met a man who was *F*.

Intuitively, what is happening is this: When one uses an indefinite description one sets aside a certain variable for the rest of the discourse. One stipulates, in the case of (50), that from now on the variable $x_i$ will be used only to express further constraints on men Mary met. This permanent setting aside of the variable means that constraints on these individuals can be built up piece by piece throughout the discourse. It is like letting the scope of an existential quantifier go across sentences, except the semantics is set up so that no explicit quantifier is needed.

In order to make this work, one needs to be careful about introducing variables. Whenever variables are bound by quantifiers or introduced by an indefinite description they must be distinct from all previously used free variables in the discourse. If this convention is observed, a universally quantified sentence ⌜Every $A$ is $B$⌝ can be represented as ⌜Every $x_i$, $Ax_i$, $Bx_i$⌝, with the semantics given in (52).[46]

(52) $C$ + ⌜Every $x_i$, $Ax_i$, $Bx_i$⌝ = The set of $\langle g, w\rangle$ in $C$ such that for every individual $a$, if $\langle gi/a, w\rangle$ is a member of $C + Ax_i$, then $\langle gi/a, w\rangle$ is a member of $(C + Ax_i) + Bx_i$. (Where $gi/a$ is the sequence that results from $g$ by substituting $a$ for its $i$th element.)

Using this definition, plus the above treatment of indefinites, Heim provides a semantics for problematic "donkey sentences" like (53).

(53) Every man who owns a donkey beats it.

Although the pronoun in this sentence is outside the scope of the relative clause containing its antecedent, Heim's theory succeeds in predicting that (53) is true iff every farmer who owns a donkey beats every donkey that he owns.

In addition to semantic predictions of this sort, Heim believes that her theory can be used to explain the semantic basis of pragmatic presuppositions. Her leading idea can be reconstructed in terms of the notion of a semantic discourse presupposition:

*Semantic Discourse Presupposition:* $P$ is a semantic discourse presupposition of $S$ iff for all semantic-contexts $C$, $C + S$ is defined only if the proposition determined by $C$ is a subset of (i.e. entails) $P$.

In the case of clefts, Heim simply adds to the characterization of $C$ + ⌜It was *NP* who *F*ed⌝ the condition that this operation is defined only if the

proposition determined by $C$ entails that someone has *F*ed. Here, the presuppositional requirement is a separate semantic stipulation, independent of other aspects of the meaning of the construction.

No such stipulations are needed to capture the inheritance characteristics of truth functional compounds. For example, consider conjunctions. It follows from (49a) that $C + \ulcorner A$ and $B\urcorner$ is defined only if $C + A$ is defined, and $(C + A) + B$ is defined. That will be the case only if the initial context $C$ determines a proposition that entails the semantic discourse presuppositions of $A$, and, moreover, the result of incrementing $C$ with $A$ determines a proposition that entails the semantic discourse presuppositions of $B$. Note, this inheritance condition for semantic discourse presuppositions parallels the Karttunen [1974] condition for pragmatic presuppositions, later incorporated in modified form in Karttunen and Peters [1979] and Soames [1982]. A similar result holds for negations and indicative conditionals. Heim's point is that in her system the inheritance conditions carried by these constructions are direct consequences of their semantics. Thus, they are explained by the same devices that determine the truth conditional content of the connectives.

Of course, pragmatic presupposition is not the same as semantic discourse presupposition. The former has to do with requirements that utterances place on the conversations in which they occur; the latter has to do with requirements that one sentence in a sequence places on the semantic-context it increments in determining the proposition expressed by the entire sequence. Suppose that $P$ is a semantic discourse presupposition of the $n$th member of a sequence of sentences. If the semantic context incremented by $S_n$ does not determine a proposition that entails $P$, then the entire sequence fails to express any proposition. However, if $S_1, \ldots, S_n$ represent the sentences uttered in a conversation, and the conversational record incremented by $S_n$ does not satisfy its pragmatic presuppositional requirements, then it is typically not the case that the conversation is empty of content. Thus, if Heim's system is to explain the pragmatic presuppositions of sentences, some way of relating the semantics and pragmatics of discourses must be found.

Although she is not fully explicit on this point, Heim seems to assume that assertive utterances increment contexts that contain all the semantic and pragmatic information contained in conversational backgrounds. Since the incrementation proceeds in accordance with the + function, requirements on the contexts in which it is defined become requirements on conversational backgrounds. Suppose now that a sentence is uttered in

a situation in which the proposition determined by the preceding conversational background does not entail one of its semantic discourse presuppositions. In such a case, the + function will be undefined and the conversation will come to a halt, unless the hearers either object or accommodate the speaker by adding the needed presupposition to the background against which the speaker's remark is to be evaluated. In this way, Heim's semantic discourse presuppositions can be seen as giving rise to pragmatic presuppositions that trigger the Lewis–Stalnaker strategy of (*de facto*) accommodation.

Two further points are needed to fill out the basic picture. The first involves the interaction of presupposition and quantification illustrated by (54).

(54) Every student likes his advisor.

Heim takes this sentence to presuppose that every student has an advisor. She derives the presupposition by representing (54) as

(55) Every $x_i$, $x_i$ is a student, $x_i$ likes $x_i$'s advisor.

and stipulating that

(56) $C + \ulcorner x_i$ likes $x_i$'s advisor$\urcorner$

is to be defined only when every $\langle g, w \rangle$ in $C$ is such that $g(i)$ has an advisor in $w$. The attractive feature of this is that the mechanisms for generating presuppositions arising from subsentential constructions like singular terms apply to open as well as closed expressions. Although this feature is not uncommon in semantic approaches to presupposition, it has proven difficult to incorporate into pragmatic approaches.

Finally, a word must be said about the different kinds of accommodation required by Heim. We have already noted the use she makes of the Lewis–Stalnaker strategy of (*de facto*) accommodation. In Sections 3.2 and 3.3, we demonstrated the need for another kind of accommodation in which pragmatic presuppositional requirements are cancelled by conversational implicatures and pre-existing contextual information (*de jure* accommodation). Since one can hardly use pragmatic facts to cancel definedness conditions on the + function, Heim needs to find another way to get the essential effects of *de jure* accommodation.

The simplest illustration of this point involves negation.

(57) There is no king of France. Therefore the king of France isn't in hiding.

First, the conversational background is incremented on the basis of the initial sentence in the discourse. The proposition determined by the resulting conversational context entails that France doesn't have a king. Next, this context is incremented using the second sentence of the discourse. Since the sentence is a negation, incrementation proceeds in accordance with (58).

(58) $C\backslash(C + A)$

(where in this case $A$ = 'The king of France is in hiding')

However, this operation is defined only if the proposition determined by $C$ entails that France has a king. But now we seem to be faced with a dilemma. If the hearers fail to accommodate the speaker, then the theory predicts that the conversation will be contentless. Yet if they do accommodate the speaker, the resulting context will determine the empty, or incoherent, proposition, and the theory will characterize the discourse as contradictory. Neither of these results is correct.

Heim avoids them by introducing a new kind of accommodation. The kind of accommodation countenanced up to now is one that takes the presupposition $P$ of $A$, eliminates all non-$P$ worlds from $C$ (let us express this by '$C$ & $P$'), and then computes (59).

(59) $(C \,\&\, P)\backslash((C \,\&\, P) + A)$

In the case of the second sentence of (57), this results in the empty set, which Heim doesn't want. However, there is another way of ensuring that $+$ is defined in this case – namely by computing (60).

(60) $C\backslash((C \,\&\, P) + A)$

Here accommodation occurs internally. Since the added proposition $P$ is used only for computational purposes, it is not entailed by the proposition determined by the context that results from the utterance. Heim calls this "local accommodation" and contrasts it to the usual "global accommodation" in which the added proposition is entailed by the result of context incrementation.

In the case of (57) local accommodation in the evaluation of the second sentence of the discourse results in a context identical with the one resulting from the evaluation of the initial sentence. Thus, the discourse as a whole is assigned the same truth conditions as the initial sentence. In this way, local accommodation has the effect of cancelling the presuppositional requirement of the negation, and producing the right truth conditions.

This illustrates a general strategy of using local accommodation to account for the phenomena of contextual and conversational cancellation emphasized by Gazdar and Soames. In order to preserve empirical content in the theory, it is, of course, necessary to specify when global accommodation is to be employed and when local accommodation is to be used. Although Heim does not offer any precise proposals on this point, she does suggest that global accommodation is "strongly preferred" over local accommodation, except in cases – like the second sentence of (57) – in which global accommodation would result in an inconsistent context.[47] If this strategy is to be pursued, conversational implicatures that conflict with global accommodations must also be given precedence, thereby forcing local accommodation.[48] In this respect, Heim's proposal is like that of Soames [1982] in containing Karttunen-like inheritance conditions together with conversational and contextual devices capable of blocking, or cancelling, normal accommodation of presuppositional requirements. However, the overall theoretical frameworks of the two approaches are very different, as are some of the specific empirical results.

### 5.2. *Potential problems*

5.2.1. *Explanatory incompleteness.* A central goal of Heim's proposal is to explain the inheritance characteristics of truth functional operators in terms of an independently motivated semantics. Thus, the question "Why does operator $O$ have inheritance property $P$?" is answered by citing the semantic characterization of the + function corresponding to $O$. In this way Heim provides a unified account of presuppositional requirements and semantic information.

Nevertheless, certain explanatory questions remain. Suppose one asks why a conjunction, $\ulcorner A$ and $B\urcorner$, normally inherits a pragmatic presupposition corresponding to (61a) rather than (61b) or (61c)?

(61a) Pre: $A$ & ($A \rightarrow$ Pre: $B$)

(61b) Pre: $B$ & ($B \rightarrow$ Pre: $A$)

(61c) Pre: $A$ & Pre: $B$

(Where $\ulcorner$Pre: $P\urcorner$ expresses the pragmatic presuppositions of $P$.)

It is not sufficient to answer that (61a) is a consequence of the semantics, (49a), for conjunction. For then one wants to know why (49a), rather than

(49a′) or (49a″), is the proper semantics for conjunction.

(49a) $(C + A) + B$

(49a′) $(C + B) + A$

(49a″) $C + A \cap C + B$

Aside from questions of presuppositions and accommodation, these alternatives are semantically equivalent in Heim's system. Thus, it would seem that the reason for selecting (a) over (a′) and (a″) is just that it does the better job in predicting presuppositions. But it cannot be that the reason that conjunctions inherit presuppositions in the way that they do, rather than in accord with (61b) or (61c), is because the semantics of conjunction are given by (49a); and, moreover, that the reason that (49a), rather than (49a′) or (49a″), gives the semantics of conjunction is that conjunctions inherit presuppositions in the way that they do.

This argument does not show that Heim's theory is incorrect; nor does it deny the attractiveness of deriving inheritance conditions from semantic specifications. What it shows is that Heim's theory leaves open some explanatory gaps of its own. For example, Heim criticizes the theory of Karttunen and Peters [1979] for having a structure that leaves open the possibility that "there could well be a lexical item – presumably not attested as yet – whose [truth conditional] content and presupposition properties are identical to those of 'if', while its heritage property [for presuppositions] is different".[49] However, the structure of Heim's theory allows this possibility to be realized (in a relatively small number of ways) through the selection of truth conditionally equivalent, but presuppositionally different, specifications of the + function. Unless some basis can be found for further limiting these alternative specifications, the aim of explaining the inheritance properties of truth functional connectives will not have been fully realized.

5.2.2. *Quantification and accommodation.* The second major goal of Heim's treatment of presupposition is to account for the interaction of presupposition and quantification by extending the mechanisms generating presuppositions to expressions containing free variables. Although Heim is reasonably successful in cases like (54), she notes that her theory faces problems with examples like (62a), which she represents as (62b).

(62a) Everyone who serves his king will be rewarded.

(62b) Every $x_i$, $x_i$ serves $x_i$'s king, $x_i$ will be rewarded.

One of the steps in evaluating $C$ + (62a) involves computing $C + \ulcorner x_i$ serves $x_i$'s king$\urcorner$. In order for this to be defined every $\langle g, w \rangle$ in $C$ must be such that $g(i)$ has a king in $w$. In Heim's system this means that the proposition determined by $C$ must entail that everyone has a king.[50] So if (a) is uttered in a conversation in which it is not already assumed that everyone has a king, then (a) should fail to express a proposition unless the hearers accommodate the speaker. Global accommodation is expected here, since the proposition to be added may be consistent with everything else in the conversation. Thus, the theory incorrectly predicts that utterances of (a) pragmatically presuppose that everyone has a king.

The only way to block the prediction, within the overall framework of the theory, is to appeal to local rather than global accommodation. But this contradicts the general rule selecting global over local accommodation except in cases in which the former would result in inconsistency. Thus, the challenge posed by (62a) is to determine whether it is possible to modify this rule in some principled fashion.

A similar challenge is posed by (63).

(63a) A fat man was pushing his bicycle.

(63b) $x_i$ was a fat man, $x_i$ was pushing $x_i$'s bicycle

Reasoning similar to that in (62) leads to the incorrect prediction that (63a) presupposes that every fat man had a bicycle. Heim notes that this result can be avoided if the context relevant for accommodation is not the context $C$ preceding the utterance, but rather the internal context $C + \ulcorner x_i$ was a fat man$\urcorner$. If this context, $C'$, is amended to a context $C''$ in which each $\langle g, w \rangle$ is such that $g(i)$ had a bicycle in $w$, then $C'' + \ulcorner x_i$ was pushing $x_i$'s bicycle$\urcorner$ will be defined even though the proposition determined by the resulting context does not entail that every fat man had a bicycle. Heim contends that although this accommodation is, in a certain sense, "internal", it should also be regarded as global, since the accommodated information is not used simply for computational purposes, but rather "remains in the context for good."[51] Thus, she maintains that it does not threaten the principle that global accommodation takes precedence over local.

However, there are two problems here. First, even if the accommodation in question is global, it is a different sort of global accommodation from "external" accommodation on the initial context $C$. Unless principles are formulated specifying when each of the different varieties of "global

accommodation" is to be available, the theory will fail to make empirical predictions in crucial cases. Second, by embedding (63a) in various constructions, one can create situations in which the accommodation Heim advocates must be classified as "local". For example, it is clear that (64) does not presuppose that every fat man had a bicycle.

(64) If a fat man pushed his bicycle across the flowers, you should have called a cop.

The only way for Heim to account for this is to require accommodation involving information that does not "remain in the context for good". Thus, some more precise statement of the principles governing accommodation is needed.

There are, of course, both descriptive and explanatory issues at stake. Principles of accommodation must be stated in order for the theory to make definite empirical predictions. If the explanatory goals of the theory are to be met, these principles should not be *ad hoc*, language particular stipulations, but general and independently motivated rules.

5.2.3. *Other constructions.* Many constructions important to theories of presupposition have so far not been treated in Heim's framework. Included among them are epistemic modals and propositional attitude verbs, which pose profound and familiar problems for semantic systems based on the notion of truth-supporting circumstances. However, important questions arise even with more elementary constructions.

Disjunctions are a case in point. Although Heim doesn't give an explicit semantics for disjunction, the most natural treatment in her framework is (65).

(65) $C + \ulcorner A \text{ or } B \urcorner = C + A \cup C + B$

Her account of presupposition will then predict that a disjunction inherits all the semantic discourse presuppositions of its disjuncts. Thus, disjunctions will not be assigned Karttunen-like inheritance conditions for presupposition, even though other truth functional connectives will.

This raises certain difficulties. For example, consider (66) and (67).

(66a) If France has an intelligent king, then the king of France is one of the few intelligent monarchs in Europe.

(66b) Either France doesn't have an intelligent king, or the king of France is one of the few intelligent monarchs in Europe.

(66c) Either the king of France is one of the few intelligent monarchs in Europe, or France doesn't have an intelligent king.

(P) There is a king of France.

(67) There has been some speculation that the projection problem has been solved, perhaps even by someone at the conference. Do you know anything about that?

(67a) If anyone at the conference solved the problem, then it was Susan who solved it.

(67b) Either no one at the conference solved the problem, or it was Susan who solved it.

(67c) Either it was Susan who solved the problem, or no one at the conference did.

(P) Someone solved the problem.

In each case, (a), (b), and (c) do not pragmatically presuppose $P$, even though they contain constituents that do. In the case of (a), Heim captures this by a semantic condition, (49c), which guarantees that the presuppositional requirement, $P$, of the consequent will be satisfied (without accommodation) no matter what context precedes the utterance. Since (65) does not have this character, the preference for global accommodation will incorrectly predict that (b) and (c) presuppose $P$.

The problem with the (b) sentences could be avoided by trading (65) for the more complicated condition (65′).

(65′) $C + \ulcorner A \text{ or } B \urcorner = C + A \cup (C + \ulcorner \text{Not } A \urcorner) + B$

However, the (c) sentences remain problematic. Nor can they be handled by the symmetric condition (65″), which, in the absence of unexplained local accommodation, gives rise to the same presuppositions as (65).

(65″) $C + \ulcorner A \text{ or } B \urcorner = (C + \ulcorner \text{Not } B \urcorner) + A$
$\cup (C + \ulcorner \text{Not } A \urcorner) + B$

Moreover, no other formulation of the clause for disjunction does any better.

It must be admitted that clear, unproblematic examples of the (c) type are somewhat unusual, and difficult to construct. However, unless an

explanation of them is found within Heim's framework, they will pose a serious threat to the theory.

5.2.4. *What is said vs what is suggested.* It is customary to distinguish what is said by an assertive utterance of a sentence from what is merely suggested, implicated, or presupposed by the utterance. If $P$ follows from what is said, then its truth is a necessary condition for the truth of the sentence, as used on that occasion. Otherwise, $P$ may be part of the total information conveyed by the utterance, but it will not be part of the truth conditions of the sentence so used.

It is vital for a theory of pragmatic presupposition to respect this distinction. However, it is not clear how to do this in Heim's framework. For example, consider (68).

(68a) Even Bill likes Mary.

(P) Others besides Bill like Mary; and of the people under consideration, Bill is among the least likely to like Mary.

It has been argued, convincingly, in Horn (1969), Stalnaker (1973), and Karttunen and Peters (1979) that the pragmatic presupposition $P$ of (68a) is not part of its truth conditions.

What is needed is a way of expressing this within Heim's framework. Let $C$ be a context that does not contain the information $P$ and therefore does not satisfy the definedness conditions on the $+$ function corresponding to (68a). Let $C'$ be the result of accommodating $C$ so that the conditions are satisfied. One can't hold that what is said is determined by $C + (68a)$, since there is no such set. Nor can one hold that what is said is determined by $C' + (68a)$, since the proposition it determines entails $P$, which is not part of what is said. Perhaps what is said is determined by what $C + (68a)$ would be if presuppositional requirements weren't definedness conditions on the $+$ function. But if so, isn't this evidence that, in fact, at least some presuppositional requirements are not conditions of this kind?

## 6. VARIETIES OF PRESUPPOSITION: UNRESOLVED ISSUES

One of the most striking lessons of recent work is that there are many kinds and sources of presupposition; so many that there may be no single theory capable of incorporating them all. For example, it seems likely that expressive presuppositions and their pragmatic counterparts arise from a

theoretical framework quite different from that which underlies presuppositions of the kind carried by 'even'. Thus, future progress in the field may call for the development of a number of circumscribed theories of well articulated types of presupposition, rather than one all encompassing model.

With this in mind, it may be useful to note certain kinds of variation that have not as yet been widely appreciated. One of these involves the cancellation of pragmatic presuppositional requirements by contextual and conversational means. The reality of this phenomenon is demonstrated in Gazdar [1979] and Soames [1979] and [1982], where many instances of cancellation involving compound sentences are cited – particularly negations, disjunctions and conditionals. However, these works fail to note that some pragmatic presuppositions cannot be cancelled in this way. For example, one cannot felicitously cancel the pragmatic presupposition *P* of (68a) in the manner in which the normal presupposition of (33b) is cancelled by the presence of (33a) in a discourse.

(33a) There is no king of France.

(33b) Therefore, the king of France isn't in hiding.

Karttunen and Peters were sensitive to this point, taking the non-cancellability of (68P) as showing that it is a conventional implicature of (68a). Unfortunately, they over-generalized in the opposite direction by extending the conventional implicature model to all sorts of pragmatic presuppositions, many of which turned out to be cancellable. What is needed at this point is a careful separation of cancellable and non-cancellable presuppositions, and principled explanations of each.

Another dimension along which pragmatic presuppositions vary involves the ease with which they allow the Lewis–Stalnaker variety of (*de facto*) accommodation. The standard case is illustrated by examples (69) and (70).

(69a) John managed to find the book.

(P) Finding the book required some effort.

(70a) Bill's son is (isn't) a genius.

(P) Bill has a son.

With these examples, accommodation works as expected. An utterance of a sentence in a conversation in which the common background does not already contain *P* results in the addition of *P* to the background, provided

no objection is heard. Typically, there is no pretense that *P* has been part of the preceding background; nor is there any awkwardness or infelicity owing to the fact that it has not been.

By contrast, there are cases in which presuppositional requirements resist accommodation. For example, consider (71).

(71) The foreman was fired too. (Focus on 'The foreman')

This is often said to presuppose (72).[52]

(72) Someone other than the foreman was fired.

Suppose, however, that (71) were uttered in a conversation in which (72) was not already assumed. Even if the hearers were disposed to accept the suggestion that someone else had been fired, the remark would call for some further identification of the person or persons in question. Thus, (71) requires something other than (72).

I suggest that (71) requires the preceding conversational background to contain a set of propositions characterizing individuals both as being distinct from the foreman and as having been fired. If the sentence is uttered in a conversation containing the information in (73), but not that in (74), then the latter will typically be added by accommodation.

(73) John was fired.

Betty was fired.

The man from New Jersey was fired.

(74) John wasn't the foreman.

Betty wasn't the foreman.

The man from New Jersey wasn't the foreman.

However, if (71) is uttered in a conversation not containing information of the sort illustrated by (73), accommodation will generally not occur. The reason it won't is that the hearers may have no way of knowing how to accommodate the speaker, even if they desire to do so. The crucial point is that what (71) requires is not that the general proposition (72) be in the preceding background, but that one or more members of a set of more specific propositions be there.[53] If this requirement is not met, hearers will typically not know which propositions to add, and so will have to ask for clarification. Here, resistance to accommodation is explained by the nature of the requirement to be accommodated.[54]

A related example intermediate between (69) and (70), on the one hand, and (71), on the other, is (75).

(75) It was Mary who broke the typewriter.

This is often said to presuppose (76).

(76) Someone broke the typewriter.

Suppose, then, that it is uttered in a conversation that lacks this assumption. Accommodation may take place and the conversation might proceed without comment. However, there is something a bit odd about such a case – a kind of pretense that the (or a) topic of conversation prior to the remark was that of determining who broke the typewriter. For a speaker to utter (75) in a conversation in which this is not at issue is for him to reveal that his conception of the conversational plan differs from that of the other conversational participants.

This suggests that (75) pragmatically requires the (or a) topic of conversation prior to the utterance be that of determining who broke the typewriter. A conversation satisfying this requirement will be one in which (76) is entailed by the common background. However, it will also be one in which the conversational agenda is specified in a certain way.

These examples indicate that pragmatic presuppositions are more varied and complicated than is often assumed. Standard accounts have tended to view conversational records as sets of commonly assumed propositions, and pragmatic presuppositions as requirements that these sets contain certain specified propositions. The preceding examples illustrate two needed modifications of this picture. The first is the recognition that presuppositional requirements are not always requirements that some identifiable proposition be part of the preceding conversational background. Sometimes the requirement is that unspecified members of an identifiable set of propositions be included in the background. The second modification is the acknowledgement that there is more to conversational records, and requirements, than simply propositions. In particular, conversational records should be thought of as containing specifications of conversational topic and agenda.[55]

This more complex picture has the advantage that it allows a more natural treatment of various vague requirements arising from particular lexical items. For example ⌜$A$ but $B$⌝ requires that the conversational background be such that the two conjuncts be seen as contrasting. This does not mean that the background must contain a proposition stating

that there is some sort of contrast between the two conjuncts. What is required is just that the combination of conjuncts be unexpected in light of what is taken for granted.

One general lesson to be learned from all this is that the conception of pragmatic presuppositions as requirements on conversational records is a fruitful one that brings together a variety of different phenomena. A related moral is that the explanations of these different phenomena may require the conjunction of several different theories. In short, presupposition may not be a single phenomenon with a unitary explanation, but rather a domain of related issues involving the interaction of several semantic and pragmatic principles.

*Department of Philosophy, Princeton University*

## NOTES

* This chapter was written in 1983–1984 while on leave from Princeton University on The Class of 1936 Bicenntenial Preceptorship, and while a guest of the Syntax Research Center at the University of California, Santa Cruz. (Minor revisions were made in 1986 prior to publication.) Portions of the chapter served as the basis for talks in the spring of 1984 at The Center for the Study of Language and Information at Stanford University. I would like to thank the Syntax Research Center at Santa Cruz for the use of their facilities; and also Joseph Almog, Saul Kripke, Julius Moravcsik, and Nathan Salmon for discussion of parts of the manuscript.

[1] See in particular, Frege [1891], 1892a], and [1892b].

[2] Strawson [1950], [1952].

[3] Stalnaker [1972], [1973], [1974].

[4] For Frege, this term results from applying the definite description operator to the complex predicate '_____ is a Democrat and _____ was elected President of the U.S. in 1980'. The referent of the latter is a function from objects to truth values. The referent of the definite description operator is a second level function which takes a function *f* as argument and assigns the value *o* iff *o* is the unique object that *f* assigns the value Truth. In the case of 'the Democrat who was elected President of the U.S. in 1980' there is no such object. As a result, the definite description fails to refer.

Reference failure can also come about in simpler cases, e.g. 'the king of France'. Here the expression 'the king of _____' could be analyzed as referring to a function from countries to their kings, which is undefined at the argument France.

[5] The relevant negation operator is sentential, and the resulting negation is true (false) iff its corresponding positive counterpart is (false) true.

[6] If *R* and *S* are propositions, I say that *R* entails (necessitates) *S* iff there is no possible circumstance *w* such that *R* is true in *w* and *S* is not true in *w*.

[7] For Frege the unrestricted universal quantifier refers to a second level function that takes a function *f* (denoted by a complex predicate) as argument and assigns the value Truth iff *f* assigns Truth to every object; otherwise it assigns Falsity. Taking this as a model, one might

claim that the restricted quantifier 'all graduate students in the class' referred to a second level function that assigned Truth to *f* iff there were graduate students in the class and *f* assigned Truth to each of them; and assigned Falsity to *f* iff there were graduate students in the class and *f* assigned Falsity to at least one of them; and otherwise was undefined.

[8] When a truth functional constituent is truth valueless, there is no such thing as the *n*-tuple of truth values of the constituents; and hence, no such thing as the value of the relevant truth function at that *n*-tuple.

[9] This point was first noted by Bertrand Russell in 'On Denoting'. There Russell criticizes Frege as follows: "Or again consider such a proposition as the following: 'If *u* is a class which has only one member, then that one member is a member of *u*', or, as we may state it, 'If *u* is a unit class, the *u* is a *u*'. This proposition ought to be always true, since the conclusion is true whenever the hypothesis is true. But, 'the *u*' is a denoting phrase, and it is the denotation, not the meaning, that is said to be a *u*. Now if *u* is not a unit class, 'the *u*' seems to denote nothing; hence our proposition would seem to become nonsense as soon as *u* is not a unit class. Now it is plain that such propositions do not become nonsense merely because their hypotheses are false. The King in *The Tempest* might say, 'If Ferdinand is not drowned, Ferdinand is my only son'. Now, 'my only son' is a denoting phrase, which, on the face of it, has a denotation when, and only when, I have exactly one son. But the above statement would nevertheless have remained true if Ferdinand had been in fact drowned" (Russell [1905], p. 484).

If 'truth valueless' is substituted for 'nonsense' in the above quotation, then the passage correctly diagnoses the central difficulty with Frege's theory of presupposition inheritance. Further, implicit, criticism of Frege is contained in Russell's recognition that 'the king of France is not bald' is sometimes understood in such a way that it is true (if there is no king.)

[10] The two stage conception of semantics needed to distinguish logical from expressive presuppositions has important theoretical consequences for the familiar conception of semantic theory as consisting of a definition of truth relative to a context and a circumstance of evaluation. Although such a definition doesn't mention propositions, it does associate sentence/context pairs with functions from circumstances to truth values. If those functions are identified with propositions, then an analysis of an example like 'The largest prime number is odd' as logically presupposing a necessary falsehood will assign the sentence the degenerate function which is undefined on all circumstances. A problem arises when one notices that such a theory will assign the same "proposition" to 'This is a fine red one' in a context in which 'this' fails to refer. (Since 'this' has no referent relative to the context *C*, there is no circumstance *E* such that the referent of 'this' relative to *C* and *E* is a member of the extension or anti-extension of 'is a fine red one' in *E*.) Thus, a semantic theory of this familiar sort will miss the distinction between expressing a proposition that lacks a truth value in every circumstance, and failing to express a proposition at all. This distinction is captured in the semantic frameworks of Salmon [1986] and Soames [1987], where propositions are not identified with functions from circumstances to truth values, but rather are assigned to sentence/context pairs prior to evaluation for truth value.

[11] The seminal work on the two stage conception of semantics is Kaplan [1977]. Kamp [1968] is a significant precursor. The conception is developed further in Salmon [1986] and Soames [1987], where semantic theories assign sentence/context pairs structured Russellian propositions which determine, but are not determined by, functions from circumstances of evaluation to truth values.

[12] In 'On Referring', Strawson says that a (uniquely) referring use of a singular term is one in which the term is used to mention some particular individual. This is intended to rule out the use of 'the whale' in the generic claim (i).

(i) The whale is a mammal.

Strawson also indicates that predicative uses of singular terms are not (uniquely) referring uses. This stipulation is intended to exclude the use of 'the greatest French soldier' in (ii).

(ii) Napolean was the greatest French soldier.

The idea in both cases is to exclude uses in which what is grammatically a singular term is not functioning semantically as a singular term.

It is important not to confuse Strawson's notion of a (uniquely) referring use of a singular term with Keith Donnellan's notion of a referential use of a singular term, Donnellan [1966]. For Strawson, any use of a term which is genuinely singular and non-predicative would seem to qualify as a (uniquely) referring use. There is no recognition in Strawson [1950] or [1952] that some such uses might work in an essentially Fregean fashion, while others might work demonstratively.

[13] The pattern of argument here follows Kaplan [1977].

[14] See also the beginning of section iv of Strawson [1950], where he claims that to state a fact about an individual one must perform the (uniquely) referring task and the attributive task. To use an expression to perform the first of these tasks is, he says, to use it in a uniquely referring way. However, one can perform the same task without using any expression. He illustrates this by examples in which the object is presented directly, without linguistic mediation, as when one paints the words 'unsafe for lorries' on a bridge, or ties the label 'first prize' on a vegetable marrow. The suggestion here seems to be that in all these cases – linguistic and nonlinguistic – the statement made can be thought of as consisting of the object secured by the uniquely referring task, together with the property attributed to it.

[15] Strawson [1952], p. 175.

[16] Strawson distinguished statements from sentence types, sentence tokens, and acts of uttering a sentence in a context. The statement made by an utterance of a given sentence was supposed to be that which was said or asserted by the utterance. Although this made statements sound like propositions, the situation was complicated by Strawson's insistence that there really were no such entities as statements or propositions. This policy of countenancing talk about statements/propositions, without taking them seriously, was an important contributing factor to his failure to distinguish between expressive and logical presupposition.

Had he taken statements or propositions seriously, he might have been led to ask what sorts of things uses of various expressions contributed to them. Where the contributed elements were missing, it might have been natural to describe the situation in terms of expressive presupposition. Where the contributed elements were present, but it still seemed as if the statement or proposition failed to be true or false, logical presupposition would have been the relevant notion.

[17] For discussion see Donnellan [1978], Kripke [1979], Wettstein [1981], Salmon [1982], Barwise and Perry [1983], and Soames [1986].

[18] The strategy of accommodation, implicit in Stalnaker [1973], is explicitly formulated in Lewis [1979].

[19] Stalnaker [1973], p. 452.

[20] A related phenomenon involves cases in which the speaker has an object $o$ in mind that he wants to say something about. In order to identify the object for his hearers, he may use a descriptive or demonstrative phrase that the conversational participants presume applies to $o$. For example, a speaker at a party might assertively utter (a) or (b) with the intention of asserting the singular proposition that he could have expressed by (impolitely) pointing at $o$ and uttering (c).

(a) The man in the corner drinking champagne is famous.

(b) That man in the corner drinking champagne is famous.

(c) He is famous.

Such an utterance would presuppose that $o$ is a man in the corner drinking champagne – i.e. it would indicate that the speaker regards that proposition to be either in the conversational record already, or evident enough to be added by accommodation. The important point about this proposition is not that it be true, but that the conversational participants accept it. If they do, then the speaker may succeed in saying something true about $o$ even though the proposition presupposed by his utterance is false – because $o$ is in fact drinking seltzer.

It should be noted that the true proposition asserted by the speaker may not be semantically expressed by his sentence relative to the context of utterance. Speakers may assert many things instead of, or in addition to, the propositions semantically expressed by their utterances. One of the factors determining what they do assert seems to be the pragmatic presuppositions of their utterances.

[21] Karttunen and Peters maintain that in addition to inheriting presuppositions from their constituents, indicative conditionals carry pragmatic presuppositions that their antecedents are not known to be false. In the interest of simplicity, I am ignoring this for present purposes.

[22] See Gazdar [1979] for further discussion.

[23] This point is made in Stalnaker [1974].

[24] In stating these conditions, I am using $[S]$ to stand for the set whose only member is the proposition expressed by $S$.

[25] (40) is not the condition for disjunction given in Karttunen [1974], but rather a modification formulated in Soames [1979]. See pp. 629–630, 636–640, and footnote 24 of the latter for further discussion.

[26] Further examples of this type are given in (i) and (ii).

(ia) Either Bill regrets voting for Reagan or he regrets not voting for Reagan.

(b) If Bill regrets voting for Reagan or he regrets not voting for Reagan, then he is probably unhappy.

(c) It may be that either Bill regrets voting for Reagan or he regrets not voting for Reagan.

(PRE:A) Bill voted for Reagan.

(PRE:B) Bill didn't vote for Reagan.

(iia) If Mary's boss doesn't have children, then it wasn't his child who won the fellowship.

(A) Mary's boss doesn't have children.

(Pre:A) Mary has a boss.

(Pre:B) Mary has a boss and Mary's boss has a child and someone won the fellowship.

It follows from the definition of the Karttunen admittance relation that a context $C$ admits (ia), (ib), or (ic) only if $C$ entails the proposition expressed by (ia). Thus, the requirement that the conversational background prior to an utterance admit the sentence uttered incorrectly predicts that (ia), (ib) and (ic) pragmatically presuppose the proposition expressed by (ia). In fact, speakers who utter these sentences conversationally implicate that they are not presupposing this.

In the case of (ii), the admittance conditions require the conversational background to entail (iii), which in this case is equivalent to (iv).

(iii) (Pre: $A$ & ($A \rightarrow$ Pre: $B$))

(iv) Mary's boss has a child.

Thus, the theory wrongly predicts that utterances of (iia) presuppose (iv), and fails to predict that they presuppose (v).

(v) Someone won the fellowship.

In fact what happens in this case is that the constituent presupposition (iv) is cancelled by a conversational implicature to the effect that the speaker doesn't know the truth value of the antecedent of his statement.

See Soames [1979], [1982], and Gazdar [1979] for further discussion of these and other examples.

[27] Plus those mentioned in the previous footnote.

[28] One descriptive problem with the account given in Soames [1982] involves conditionals in which the presuppositions of the consequent (together with the common background) entail the antecedent, but the antecedent (together with the common background) does not entail the presuppositions of the consequent.

An example of this kind, given in Heim [1983], is (i).

(i) If John has children, then Mary will not like his twins.

The second method of combining cancellation with Karttunen-like inheritance conditions fails to predict that utterances of (i) intuitively presuppose (ii).

(ii) John has children $\rightarrow$ John has twins.

(See, however, Soames [1982], pp. 502–504 for complicating factors.)

Further descriptive problems are noted and dealt with in Section 6 below.

[29] Karttunen and Peters [1979].

[30] Karttunen and Peters do not explicitly mention all the constructions that their theory is meant to apply to. For example, they do not mention 'stop', 'regret' (though they do explicitly include similar factives such as 'realize'), or 'again' (though they do explicitly include 'too', and 'also'). Nothing in the present discussion relies crucially on any items not explicitly treated by Karttunen and Peters.

[31] Karttunen and Peters adopt a version of Montague semantics in which propositions are identified with functions from circumstances of evaluation to truth values.

[32] This point is made forcefully in Heim [1983]. However, it is also present, in various forms, in Stalnaker [1974], Gazdar [1979], and Soames [1982].

[33] For example, Karttunen and Peters claim that the conventional implicatures (pragmatic presuppositions) of conjunctions, conditionals, and disjunctions are given in (i). (Where $S$ is a sentence, $\ulcorner$Imp: $S\urcorner$ is an expression that represents the conventional implicatures of $S$, and $\ulcorner$Ex: $S\urcorner$ is an expression that represents its truth conditions.)

(ia) Imp: ($A$ and $B$) = Imp: $A$ & (Ex: $A \rightarrow$ Imp: $B$)

(ib) Imp: (If $A$, then $B$) = Imp: $A$ & (Ex: $A \rightarrow$ Imp: $B$)

(ic) Imp: ($A$ or $B$) = (Ex: $A \vee$ Imp: $B$) & (Ex: $B \vee$ Imp: $A$) & (Imp: $A \vee$ Imp: $B$)

(See pp. 636–640 of Soames [1979] for discussion of (ic).) Applying these conditions to (35), as well as the sentences in Note 26, results in the same incorrect predictions that were shown to falsify the Karttunen (1974) account.

[34] See in particular Soames [1979], pp. 640–650; and Soames [1982], pp. 499–501.

[35] If anything, the problem is worse, since (43) and (LP) lead not only to false predictions about pragmatic presuppositions, but also to false claims about the truth conditions of examples like (33), (35), and the sentences in Note 26.

In the case of (33), the standard response by proponents of logical presupposition has been to claim that negative sentences in natural language are lexically ambiguous between a reading in which negation preserves neither-truth-nor-falsity and a reading in which neither-truth-nor-falsity is mapped onto truth. This response, under increasing attack in Wilson [1975], Kempson [1975], Atlas [1977], and Gazdar [1979], is insufficient, if one's goal is to derive pragmatic presuppositions from logical ones. For example, if the negation in the consequent of (iia) in Note 26 is claimed to be the (logical) presupposition preserving kind, then the conditional is wrongly characterized as entailing the denial of its antecedent. However, if the negation is claimed to be the (logical) presupposition blocking kind, then one gives up any hope of using logical presuppositions to derive the pragmatic presuppositions that do arise from the consequent. In effect, avoiding incorrect predictions about truth conditions requires explaining a significant range of pragmatic presuppositions independently of logical ones.

[36] Pp. 644–646.

[37] Stalnaker [1974] and Soames [1982] suggest that the link is pragmatic. However, they do not spell out mechanisms that apply to the full range of cases that need to be explained.

[38] Stalnaker does not explicitly call for a notion of radical presupposition according to which presupposition failure makes it impossible to correctly characterize the bearer of the presupposition either as true or as not true. However, without this notion his argument loses its force.

[39] The idea that there are predicates of the type illustrated by (44) was suggested to me by Nathan Salmon in a discussion of Kripke [1975].

[40] This point can be reinforced by considering a case in which the stipulative definition of 'smidget' is expanded to include (Siii), and the clauses for 'true' and 'apply' are formulated using (i′)–(iii′).

(Siii) For all $x$, if $x$ is a smidget or is not a smidget, then $x$ is an adult human being.

(i′) For any predicate $P$ and term $t$, $\ulcorner Pt \urcorner$ is true (false) iff $P$ positively applies (negatively applies) to the referent of $t$.

(ii′) For any sentence $S$, $\ulcorner - S \urcorner$ is true (false) iff $S$ is false (true). Any sentence that is false is not true.

(iii′) The predicate 'red' positively applies (negatively applies) to an object iff it is (isn't) red. The predicate 'smidget' positively applies (negatively applies) to an object iff it is (isn't) a smidget.

⋮

Given this expansion, one can correctly say of a child that it is not true that he is a smidget. (Since it is not true that the child is an adult human being, we can conclude from (Siii) that it is not true that the child is a smidget or is not a smidget, from which the result follows.) However, the point about adults between three and four feet tall remains. Neither the claim that they are smidgets nor the claim that it is not true that they are smidgets can be accepted on the basis of the definition. Rather, the definition provides a reason for rejecting both claims without asserting their negations.

[41] Kripke [1975]. The idea of using smidget type examples to illuminate Kripke's conception of truth originated with Nathan Salmon.

[42] See Parsons [1984] for a discussion of relevant issues.

[43] See in particular p. 701, where Kripke indicates his intention of capturing the intuition that 'true' can be explained to someone along the lines of (i) and (ii).

(i) For any sentence $S$, one is entitled to assert that $S$ is true in exactly those circumstances in which one is entitled to assert $S$.

(ii) For any sentence $S$, one is entitled to assert that $S$ is not true in exactly those circumstances in which one is entitled to assert the negation of $S$. (In the interest of simplicity, we equate a sentence's being not true with its being false, and hence with its negation being true. The basic picture could be reconstructed so as to allow sentences that are not true and not false, but nevertheless grounded in Kripke's sense – however, there is no need to do so here.)

If 'true' is introduced in this way, then assertability conditions for claims to the effect that something is or is not true will standardly be grounded in assertability conditions of other claims, and ultimately in assertability conditions for sentences not involving truth at all. However, in "ungrounded" cases like (iii), the directions (i) and (ii) are silent.

(iii) Sentence (iii) is true.

Just as adults between 3 and 4 feet tall are not covered by the instructions governing 'smidget', so ungrounded examples like (iii) are not covered by (i) and (ii).

[44] Even Kripke likens ungrounded sentences to sentences which, for Strawsonian reasons, fail to express propositions. I believe this to be a mistake. One can, I think, construct ungrounded sentences that fail to express propositions. However, the phenomenon of ungroundedness is independent of this. Thus, I take Kripke's comments on pp. 699–700 to be a misstatement of the central philosophical insight underlying his analysis.

Parsons [1984] is, I think, guilty of a different mistake. While correctly noting the radical partiality of the truth predicate on Kripke-like analyses, he wrongly assimilates traditional examples of logical presupposition to this kind of partiality. This is just the converse of the

widespread error in truth-gap solutions to the paradoxes of assimilating what are in fact instances of radical partiality to instances of logical presupposition.

These issues are discussed in greater detail in Soames [1985].

[45] Heim [1982], [1983].

[46] In order to assign the right truth conditions, the system must be set up so that the input context $C$ to (52) satisfies (i) and (ii).

(i) If the proposition $P$ determined by $C$ contains a world $w$ such that for some object $o$ in $w$, $o$ "is an $A$" in $w$ but "is not a $B$" in $w$, then for some $g$ and $j$, $g(j) = o$ and $\langle g, w\rangle$ is a member of $C$. ($C$ contains all relevant "witnesses" from the set of worlds it determines.)

(ii) For any sequences $g$ and $g'$ that differ at most in their $i$th member, and for any world $w$, $\langle g, w\rangle$ is a member of $C$ iff $\langle g', w\rangle$ is a member of $C$. (All "witnesses" can be found in the $i$th place of some sequence.)

$C$ will satisfy (i) and (ii), if the semantic evaluation of sequences of sentences always starts with a context that satisfies them (the set of all $\langle g, w\rangle$), and the convention on introducing new variables is observed.

[47] Heim [1983], p. 120.

[48] Although Heim doesn't mention cancellation by conversational implicatures, her proposal must be formulated so as to include it – if it is to handle the data in Gazdar [1979], Soames [1979], and [1982].

[49] Heim [1983], p. 115.

[50] If it didn't entail this, then for some world $w$ in the proposition determined by $C$ and some individual $o$ in $w$, $o$ would lack a king in $w$. It would then follow by (i) and (ii) of Note 46 that for some $\langle g, w\rangle$ in $C$, $g(i) = o$. But this contradicts the hypothesis that every $\langle g, w\rangle$ in $C$ is such that $g(i)$ has a king in $w$.

[51] Heim [1983], p. 124.

[52] Karttunen and Peters [1979], Soames [1979], [1982].

[53] The theoretical significance of this point is illustrated by the fact that, in their present form, the theories of Gazdar [1979], Karttunen and Peters [1979], and Heim [1983] cannot incorporate this sort of requirement.

[54] A number of facts bearing on this analysis have been brought to my attention by Saul Kripke. For example, consider the sentences in (i).

(ia) Herb's wife will come and Francis will come too.

(ib) If Herb's wife comes, then Francis will come too.

(ic) If Herb and his wife both come, then Francis will come too.

(id) Sam's wife will come. If Herb and his wife come, then Francis will come too.

Kripke observes that the presuppositions of these examples should include the following:

Pre: (ia) Herb's wife will come → Francis is not Herb's wife.

Pre: (ib) Herb's wife will come → Francis is not Herb's wife.

Pre: (ic) Herb and his wife both come → Francis is not Herb and Francis is not Herb's wife.

Pre: (id) Herb and his wife come → Francis is not Sam's wife, and Francis is not Herb, and Francis is not Herb's wife.

He also observes that these presuppositions would not be forthcoming if the pragmatic presupposition arising from 'too' in (ii) were the general proposition expressed by (iii).

(ii) NP VP's too. (Focus on NP)

(iii) Someone(thing) other than NP VP's.

These observations fit the analysis given above. However, Kripke goes further, noting that similar examples can be produced with other constructions.

(iv) If Reagan criticizes Hart in his radio talk, then he will criticize him again in his press conference.

(v) If Bill watches the opera at 2 o'clock, he will stop watching it when the Redskins' game begins.

As before, Kripke points out that the presuppositions of these sentences seem to include:

Pre: (iv) Reagan criticizes Hart in his radio talk → the radio talk will take place before the press conference.

Pre: (v) Bill watches the opera at 2 o'clock → the Redskins' game will begin after 2 o'clock.

These presuppositions would not be forthcoming if the presuppositions of (iv) and (v) arising from 'again' and 'stop' were (vi) and (vii).

(vi) Reagan criticizes Hart in his radio show → Reagan will have criticized Hart prior to the press conference.

(vii) Bill watches the opera at 2 o'clock → Bill will have been watching the opera prior to the beginning of the Redskins' game.

Kripke suggests that in all of these cases, the content of the presupposition of a sentence or clause containing 'too', 'again', or 'stop' may vary with, and be dependent upon, the preceding discourse or conversational context. The idea is that these presupposition creating elements may, in some way, be anaphoric with other elements in the discourse or context. [55] See Lewis [1979] and Thomason (unpublished manuscript, Department of Philosophy, University of Pittsburgh) for further discussion.

## REFERENCES

Atlas, J. D.: 1977, 'Negation, ambiguity, and presuppositions', *Linguistics and Philosophy* **1**, 321–336.

Barwise, J. and J. Perry: 1983, *Situations and Attitudes*, M.I.T. Press, Cambridge.

Donnellan, K. S.: 1966, 'Reference and definite descriptions', *The Philosophical Review* **75**, 281–304.

Donnellan, K. S.: 1978, 'Speaker reference, descriptions and anaphora', in P. Cole (ed.), *Syntax and Semantics 9: Pragmatics*, Academic Press, New York, pp. 47–69.

Frege, G.: 1891, 'Function and concept', in P. Geach and M. Black (eds.) [1952].
Frege, G.: 1892a, 'On concept and object', in P. Geach and M. Black (eds.) [1952].
Frege, G.: 1892b, 'On sense and reference', in P. Geach and M. Black (eds.) [1952].
Gazdar, G.: 1979, *Pragmatics: Implicature, Presupposition, and Logical Form*, Academic Press, New York.
Geach, P. and M. Black (eds.): 1952, *Translations from the Philosophical Writings of Gottlob Frege*, Basil Blackwell, Oxford.
Heim, I.: 1982, *The Semantics of Definite and Indefinite Noun Phrases*, Doctoral dissertation, University of Massachusetts, Amherst.
Heim, I.: 1983, 'On the projection problem for presuppositions', in M. Barlow, D. P. Flickinger, and M. T. Wescoat (eds.), *Proceedings of the West Coast Conference on Formal Linguistics*, Volume 2, Stanford Linguistics Association, Stanford, California, pp. 114–125.
Horn, L.: 1969, 'A presuppositional analysis of 'only' and 'even' ', in R. Binnick, A. Davison, G. Green, and J. Morgan (eds.), *Papers from the Fifth Regional Meeting of the Chicago Linguistics Society*, Chicago Linguistics Society, pp. 98–107.
Kamp, H.: 1968, *Tense Logic and the Theory of Linear Order*, Doctoral dissertation, U.C.L.A.
Kaplan, D.: 1977, 'Demonstratives', unpublished manuscript, U.C.L.A., Dept. of Philosophy.
Karttunen, L.: 1974, 'Presupposition and linguistic context', *Theoretical Linguistics* **1**, 181–194.
Karttunen, L. and S. Peters: 1979, 'Conventional implicature', in Ch.-K. Oh and D. Dineen (eds.), *Syntax and Semantics 11: Presupposition*, Academic Press, New York, pp. 1–56.
Kempson, R.: 1975, *Presupposition and the Delimitation of Semantics*, Cambridge University Press, Cambridge.
Kripke, S.: 1975, 'Outline of a theory of truth', *The Journal of Philosophy* **72**, 690–716.
Kripke, S.: 1979, 'Speaker's reference and semantic reference', in P. French, T. Uehling, and H. Wettstein (eds.), *Contemporary Perspectives in the Philosophy of Language*, University of Minnesota Press, Minneapolis, pp. 6–27.
Lewis, D.: 1979, 'Scorekeeping in a language game', *Journal of Philosophical Logic* **8**, 339–359.
Parsons, T.: 1984, 'Assertion, denial, and the liar paradox', *Journal of Philosophical Logic* **13**, 137–152.
Russell, B.: 1905, 'On denoting', *Mind* **14**, 479–493.
Salmon, N. U.: 1982, 'Assertion and incomplete definite descriptions', *Philosophical Studies* **42**, 37–45.
Salmon, N. U.: 1986, *Frege's Puzzle*, M.I.T. Press, Cambridge.
Soames, S.: 1979, 'A projection problem for speaker presuppositions', *Linguistic Inquiry* **10**, 623–666.
Soames, S.: 1982, 'How presuppositions are inherited: A solution to the projection problem', *Linguistic Inquiry* **13**, 483–545.
Soames, S.: 1985, 'Truth, paradox, and partially defined predicates', unpublished manuscript Princeton University, Dept. of Philosophy.
Soames, S.: 1986, 'Incomplete definite descriptions', *Notre Dame Journal of Formal Logic* **27**, 349–375.
Soames, S.: 1987, 'Direct reference, propositional attitudes, and semantic content', *Philosophical Topics* **15**, 47–87.

Stalnaker, R.: 1972, 'Pragmatics', in D. Davidson and G. Harman (eds.), *Semantics of Natural Language*, Reidel, Dordrecht, pp. 380–397.
Stalnaker, R.: 1973, 'Presuppositions', *Journal of Philosophical Logic* **2**, 447–457.
Stalnaker, R.: 1974, 'Pragmatic presuppositions', in M. K. Munitz and P. K. Unger (eds.), *Semantics and Philosophy*, New York University Press, New York, pp. 197–214.
Strawson, P. F.: 1950, 'On Referring', *Mind* **59**, 320–344.
Strawson, P. F.: 1952, *Introduction to Logical Theory*, Methuen, London.
Thomason, R. H.: 1983, 'Accommodation, conversational planning, and implicature', unpublished manuscript, Dept. of Linguistics, University of Pittsburgh.
Wettstein, H.: 1981, 'Demonstrative reference and definite descriptions', *Philosophical Studies* **40**, 241–257.
Wilson, D.: 1975, *Presuppositions and Non-Truth-Conditional Semantics*, Academic Press, New York.