frightfully, *awfully*, *terribly* can induce new senses: thus the term *starve* meant in Middle English just 'to die', but through uses parallel to (231) has of course come to mean 'suffer from severe hunger' in most dialects of English (we have now to specify 'starve to death' if that is what we mean; see Samuels, 1972: 53 from which these examples are taken; see also Ullman, 1962).

(231) I'm dying to see you

Although the process is well documented, we do not know exactly how it works: is there a point at which implicatures suddenly become conventional senses, or is there some gradual process of conventionalization (and if so, how does this accord with our concept of the lexicon)? In some limited domains one seems to be able to find a series of stages in the linguistic change: e.g. from particularized to generalized conversational implicature, then to conventional implicature, in the case of some conventionally encoded honorifics in Asian languages (see Levinson, 1977: 47–60), not to mention second person polite pronouns in Indo-European languages (see Brown & Gilman, 1960, and references therein). Other questions arise: do the observable syntactic correlates of such semantic shifts (e.g. the acquisition of a *to*-complement for *die* in (231) above) follow the creation of a new sense, or do they cause it? We simply do not yet know much about the role of implicature in this process (but see Cole, 1975; Brown & Levinson, 1978: 263ff; Morgan, 1978 for comment and speculation).[33]

In any case it is clear that implicature plays a major role in language change, triggering both syntactic and semantic changes. Indeed it seems to be one of the single most important mechanisms whereby matters of language usage feed back into and affect matters of language structure. It is thus a major route for functional pressures to leave their imprint on the structure of a language.

[33] This is not to deny the existence of a rich literature on semantic change, but to suggest that the theory of implicature may provide interesting re-analyses of this material.

4
Presupposition

4.0 Introduction

In the previous Chapter we discussed conversational implicature as a special kind of pragmatic inference. Such inferences cannot be thought of as semantic (i.e. as pertaining to the meanings of words, phrases and sentences) because they are based squarely on certain contextual assumptions concerning the co-operativeness of participants in a conversation, rather than being built into the linguistic structure of the sentences that give rise to them. We turn in this Chapter to another kind of pragmatic inference, namely **presupposition**, that does seem at least to be based more closely on the actual linguistic structure of sentences; we shall conclude, however, that such inferences cannot be thought of as semantic in the narrow sense, because they are too sensitive to contextual factors in ways that this Chapter will be centrally concerned with.

The reader should be warned of two things at the outset. The first is that there is more literature on presupposition than on almost any other topic in pragmatics (excepting perhaps speech acts), and while much of this is of a technical and complex kind, a great deal is also obsolete and sterile. The volume of work is in part accounted for by a long tradition of philosophical interest which, because it is much referred to in the linguistic literature, will be briefly reviewed in 4.1. In addition presupposition was a focal area in linguistic theory during the period 1969–76, because it raised substantial problems for almost all kinds of (generative) linguistic theories then available. As a consequence of the large literature, the assiduous student will find just about every pronouncement in this Chapter contradicted somewhere in the literature; if the views expressed here seem partial, that is in part because they have the benefit of hindsight. Much that seemed confusing and mysterious has become clearer now that some basic

distinctions and frameworks have been established (but see Oh & Dinneen, 1979 for a lively compendium of divergent modern views).

The second caveat concerns the distinction that has evolved between the ordinary usage of the word *presupposition* and its technical usage within linguistics. The technical concept accommodates only a small proportion of the usages associated with the ordinary language term, and the reader who hopes for a full explication of the latter within a single pragmatic concept is bound to find the rather narrow range of phenomena discussed below disappointing. The following examples illustrate some 'ordinary' senses of the term that are *not* dealt with within a theory of presupposition in pragmatics, although many of the cases have accounts within other branches of pragmatic theory:[1]

(1) Effects presuppose causes
(2) John wrote Harry a letter, presupposing he could read
(3) John said "Harry is *so* competent", presupposing that we knew Harry had fouled things up – in fact we didn't know and so failed to realize that he was being ironic
(4) Harry asked Bill to close the door, presupposing that Bill had left it open as usual; he hadn't so he threw a chair at Harry
(5) Adolph addressed the butler as "sir", presupposing that he was the host Sir Ansel himself
(6) The theory of evolution presupposes a vast time-scale
(7) The article by Jackendoff presupposes Chomsky's theory of nominalizations

What these examples have in common is that they use the ordinary language notion of presupposition to describe any kind of background assumption against which an action, theory, expression or utterance makes sense or is rational. In contrast, the technical sense of presupposition is restricted to certain pragmatic inferences or assumptions that seem at least to be built into linguistic expressions and which can be isolated using specific linguistic tests (especially, traditionally, constancy under negation, as will be discussed below).

[1] For example, (3) would be given an explication in terms of the exploitation of a conversational maxim (see Chapter 3); (4) in terms of the notion of *felicity condition* employed within the theory of speech acts (Chapter 5); and (5) in terms of the notion of *conventional implicature* (Chapter 3).

4.1 Historical background

Once again concern with this topic in pragmatics originates with debates in philosophy, specifically debates about the nature of reference and referring expressions. Such problems lie at the heart of logical theory and arise from consideration of how referring expressions in natural language should be translated into the restricted logical languages.

The first philosopher in recent times to wrestle with such problems was Frege, the architect of modern logic. In elliptical discussion that allows considerable freedom of interpretation, he raised many of the issues that were later to become central to discussions of presupposition. For example, he said:

> If anything is asserted there is always an obvious presupposition[2] that the simple or compound proper names used have a reference. If one therefore asserts 'Kepler died in misery', there is a presupposition that the name 'Kepler' designates something. (Frege, 1892 (1952: 69))

And he went on immediately to say that it is not part of the meaning of *Kepler died in misery* that 'Kepler designates something'; if it was then *Kepler died in misery* would have the logical form 'Kepler died in misery & Kepler designates something', and thus the sentence *Kepler did not die in misery* would be equivalent to 'Kepler did not die in misery or the name Kepler has no reference'.[3] That he felt would be absurd. He adds:

> That the name 'Kepler' designates something is just as much a presupposition of the assertion 'Kepler died in misery', as for the contrary [i.e.negative] assertion. (ibid.)

Similarly he considers the special status of the meaning of temporal clauses:

> 'After the separation of Schleswig-Holstein from Denmark, Prussia and Austria quarrelled.' ... It is surely sufficiently clear that the sense is not to be taken as having as a part the thought that Schleswig-Holstein was once separated from Denmark, but that this is the necessary presupposition in order for the expression 'After the separation of Schleswig-Holstein from Denmark' to have any reference at all. (1892 (1952: 71))

[2] The German term that Frege used was *Voraussetzung*.

[3] This follows from the equivalence of $\sim (p \,\&\, q)$ to $\sim p \vee \sim q$, where p is 'Kepler died in misery' and q is 'The name Kepler refers'.

A Chinaman, he goes on, ignorant of the historical facts,

> will take our sentence ... to be neither true nor false but will deny it to have any reference, on the ground of absence of reference for its subordinate clause. This clause would only apparently determine a time. (ibid.)

Frege thus sketches a theory of presupposition with the following propositions:

(i) Referring phrases and temporal clauses (for example) carry presuppositions to the effect that they do in fact refer
(ii) A sentence and its negative counterpart share the same set of presuppositions
(iii) In order for an assertion (as he put in the Kepler case) or a sentence (as he put in the Schleswig-Holstein case) to be either true or false, its presuppositions must be true or satisfied

As is clear from (iii), Frege held more than one view of presupposition – sometimes he speaks of uses of sentences (assertions) as having presuppositions, sometimes of sentences themselves as having presuppositions, and elsewhere he even talks of speakers holding presuppositions (see Atlas, 1975a): "when we say 'the Moon' ... we presuppose a reference" (1892 (1952: 61)). Later these distinctions came to have importance. But it is clear that we have here in embryo the parameters that have guided much of the subsequent discussion of presupposition.

Now Russell, writing in 1905, thought that Frege's views were simply wrong. Struggling with the same problems in the theory of reference, he came to quite different conclusions. One problem was how to account for the fact that sentences that lacked proper referents, like (8), could be meaningful.

(8) The King of France is wise

Frege had an answer provided by his distinction between sense and reference: such sentences retain their sense or meaning even if they lack referents and thus fail to have a truth value. But Russell argued that Frege's views led to anomalies, and he proposed instead his well-known **theory of descriptions**, which for forty-five years was to dominate such inquiries. He held that definite descriptions like *The so & so* have nothing like the simple logical translation that one might imagine. Whereas they occur in natural languages as subjects, as in

(8) above, in logical form they are not logical subjects at all but correspond instead to conjunctions of propositions. So instead of translating *The* F *is* G into the simple subject-predicate formula G(*The* F), he held it should be decomposed into the conjunction of the following three assertions:

(9) There is some entity x, such that:
  (a) x has property F
  (b) there is no other entity y which is distinct from x and has property F
  (c) x has property G

Thus the logical form of (8) is not (10) but rather the complex (11) (where we will let 'King' stand for *King of France*):

(10) Wise(the King)
(11) $\exists x$ (King(x) & $\sim \exists y$ (($y \neq x$) & King(y)) & Wise(x))
(Paraphrasable as 'There is a King of France and there's no one else who's King of France and he is wise')

Russell was able to show that this analysis handled the difficulties that arose on other views. For example, on this account (8) is meaningful because it is simply false; it is an assertion that, by virtue of the Russellian expansion of the phrase *The King of France*, also asserts the existence of that individual (by (9) above).

One particular advantage that Russell saw in his analysis was that it allowed what we today call **scope-ambiguities**. Thus the negative sentence:

(12) The King of France is not wise

can be taken two ways: either it is presumed that there is a King of France and it is asserted that he is non-wise, or (less usually) what is denied is that it is true that there is both a King of France and that he is wise. The latter reading is the only one that can be involved in the following sentence:

(13) The King of France is not wise – because there is no such person

Russell's formula in (11) allows (at least) two slots for negation to capture this ambiguity: negation either occurs with **wide scope** as in (14) or with **narrow scope** as in (15) below:

(14) $\sim$ ($\exists x$ (King(x) & $\sim \exists y$ (($y \neq x$) & King(y)) & Wise (x)))
(Paraphrasable as 'It is not the case that: (a) there's a King of

France, and (b) there's no one else who's King, and (c) he's wise')

(15) $\exists x\,(\text{King}(x) \,\&\, \sim \exists y\,((y \neq x) \,\&\, \text{King}(y)) \,\&\, \sim \text{Wise}(x))$
(Paraphrasable as 'There is a King of France and there's no one else who's King of France, and the King of France is not wise')

The former wide-scope negation allows one to use (12) to deny that the King of France exists, while the latter narrow-scope negation only denies that the predicate applies to him.

Russell's analysis remained largely unchallenged until Strawson (1950) proposed a quite different approach. Many of the puzzles arise, argued Strawson, from a failure to distinguish sentences from *uses* of sentences to make, for example, statements that are true or false. Russell's conflation of the distinction led him to think that because (8) is significant, and has a clear meaning, it must be either true or false. But *sentences* aren't true or false; only *statements* are. Hence the statement of (8) may well have been true in A.D. 1670 and false in A.D. 1770, but in 1970 the statement cannot sensibly be said to be either true or false: due to the non-existence of a King of France in 1970, the question of its truth or falsity does not even arise.

Strawson was therefore led to claim that there is a special kind of relationship between (8) and (16):

(16) There is a present King of France

namely, that (16) is a precondition for (8) being judgable as either true or false. He called this relation **presupposition**, and he held that it was a special species of (what would now be called) pragmatic inference, distinct from logical implication or entailment, a species which derives from conventions about the use of referring expressions. These conventions, he held, are considerably more complex than can be captured by the "jejune existential analysis" (as he termed Russell's theory – Strawson (1952: 187)), and are bound up with conventions about what it is to assert or state something. More formally he held that a statement A presupposes a statement B iff B is a precondition of the truth or falsity of A (Strawson 1952: 175).

One consequence of Strawson's disagreement with Russell, not directly addressed, is that, in rejecting the complex logical form underlying definite descriptions, he has lost a means of explaining negative sentences like (13), where the presuppositions themselves

are cancelled. For normally, on Strawson's view (as on Frege's), a negative sentence, when uttered, will preserve its presuppositions. Russell could point to the two scopes or slots for negation provided by his complex logical forms. Strawson, had he faced up to this difficulty, would have had to claim that the word *not* is ambiguous: on one reading or sense it preserves presuppositions, on another it includes presuppositions within its scope and is thus compatible with denying them. What he actually contended, however, was that there was only one reading of (12), namely that in (15) where the predicate is negated, which of course leaves the denial of presuppositions in (13) quite unexplained.

Strawson and Frege thus held very similar views in opposition to Russell's approach to definite descriptions. Presuppositional theories of course have one signal attraction: they seem much more in line with our direct linguistic intuitions that, for example, when we utter (8) there is a foreground assertion, namely that a particular individual is wise; the implication that that individual exists is somehow a background assumption against which the assertion makes sense. Certainly Russell had no account of this.

By the time linguists became interested in the concept of presupposition (mostly after about 1969), a set of important distinctions and alternative approaches were thus well established in the philosophical literature. Foremost among these were:

(i) the distinction between logical implication or entailment and presupposition (in the work of Frege and especially Strawson)
(ii) the contrast between assertion and presupposition (again, in the work of Frege and Strawson)
(iii) the issue of whether it was proper to think of presupposition as a relation between *sentences* (as Frege sometimes did), between *statements* (as Strawson held) or between *speakers* on the one hand and assumptions on the other (as Frege did on other occasions)
(iv) the issue of whether the apparent ambiguity of negation between a presupposition-denying sense and a presupposition-preserving sense is to be thought of as a *scope* distinction (a structural ambiguity) or a *lexical* ambiguity[4]
(v) the possibility that apparently background assumptions, presuppositions, could in fact be viewed as assertions or

[4] This was not actually an explicit element in philosophical discussion, but it is an issue implicitly raised by Strawson's attack on Russell's views.

entailments, on a par with the rest of a sentence's meaning (Russell's approach)

In addition, a certain range of presuppositional phenomena had been adduced in the philosophical literature, including the presuppositions of:

(a) singular terms, e.g. definite descriptions, proper names
(b) quantified noun phrases, e.g. *All of John's children* can be claimed to presuppose 'John has children' (Strawson, 1952)
(c) temporal clauses (as in Frege's example quoted above)
(d) change-of-state verbs: e.g. *Bertrand has stopped beating his wife* can be claimed to presuppose 'Bertrand had been beating his wife' (Sellars, 1954)

When Strawson's notion of presupposition came to the attention of linguists, it seemed to open up a new and interesting possibility. Up till this point linguists had been operating with one crucial semantic relation in particular, namely **entailment** or **logical consequence**.[5] This relation can be defined in terms of valid rules of inference, or alternatively in terms of the assignment of truth and falsity ('semantically' as logicians say). **Semantic entailment** is thus definable as follows:

(17) A *semantically entails* B (written A ||- B) iff every situation that makes A true, makes B true (or: in all worlds in which A is true, B is true)

Such a relation is basic to semantics. Not only does it capture logical truths, but all the other essential semantic relations (like equivalence, contradiction) can be directly defined in terms of it. The interesting possibility opened up by the notion of presupposition was that we might be able to add a new and distinct semantic relation to the inventory of the well-known ones. In doing so we would be bringing logical models more into line with natural language semantics. This programme, the creation of a new, well-defined semantic relation that would play a role within formal semantic theories, was realized within a number of theories of **semantic presupposition** (to be contrasted with pragmatic theories of presupposition below).

[5] Caveat: in just some logical systems (those with truth-value gaps or non-bivalence) one may wish to make a distinction between the notions of entailment and logical consequence, but logical terminology is not consistent here.

In order to achieve such a programme, it was necessary to make some subtle but important changes in Strawson's view. Strawson's concept of presupposition can be stated as follows:

(18) A statement A presupposes another statement B iff:
(a) if A is true, then B is true
(b) if A is false, then B is true

The simplest view of semantic presupposition on the other hand would be based on the following definition:

(19) A sentence A semantically presupposes another sentence B iff:
(a) in all situations where A is true, B is true
(b) in all situations where A is false, B is true

or equivalently, given our definition of entailment in (17) above (and assuming a definition of negation where if a sentence is neither true nor false, its negation is also neither true nor false):

(20) A sentence A semantically presupposes a sentence B iff:
(a) A ||- B
(b) ~ A ||- B

The important and significant difference between (18), on the one hand, and (19) or (20), on the other, is that the first, Strawson's view, is a relation between statements (i.e. particular uses of sentences), whereas the second (semantic) view is a relation between sentences. It is clear that Strawson would not have approved of the shift.[6]

Now it becomes rapidly clear that the definition of semantic presupposition in (20) requires some fundamental changes in the kind of logic that can be used to model natural language semantics. To see this, consider the following argument, based on classical logical assumptions:

(21) 1. A presupposes B
2. Therefore, by definition (20), A entails B and ~ A entails B
3. (a) Every sentence A has a negation ~ A
(b) A is true or A is false (Bivalence)
(c) A is true or ~ A is true (Negation)
4. B must always be true

[6] The general thrust of Strawson's views, firmly in the Oxford school of ordinary language philosophy, are summed up by the closing sentence of the (1950) article: "Neither Aristotelian nor Russellian rules give the exact logic of any expression in ordinary language; for ordinary language has no exact logic." See also Garner, 1971.

Suppose now A = *The King of France is bald*, and B = *There is a present King of France*. Then the conclusion of the argument above (which is valid on classical assumptions) is that the sentence *The King of France exists* is a tautology, or always true. Since the whole point of such presuppositional theories is to deal with presupposition failure and to explain the intuition that when their presuppositions fail sentences are neither true nor false, some of the classical logical assumptions must be abandoned to avert conclusions like that of (21). The simplest way to reconcile a definition of semantic presupposition like that in (20) with the bulk of accepted logical apparatus, is to abandon the assumption that there are only two truth values (the assumption of **bivalence**). Instead we can adopt three values, *true*, *false* and *neither-true-nor-false* (the latter for sentences whose presuppositions are false), and make just the modifications in the rest of the logical system that this change requires (notably, the abandoning of *modus tollens*, and bivalence).[7] It has been shown that perfectly well-behaved logics with three values can be constructed and it could be claimed that such logical systems are (by virtue of their ability to handle presuppositions) a notable advance in models of natural language semantics (see e.g. Keenan, 1972). It is also possible to retain what is formally a two-valued system by allowing **truth-value gaps** instead of a third value, and this would now be the preferred method. However, such systems have many of the same formal properties (e.g. the invalidity of *modus tollens*) and will prove just as inadequate as models of presupposition for the same reasons that we shall adduce against three-valued models. (Since students tend to find value-gap systems harder to conceptualize, they are not discussed here – but see Van Fraassen, 1971.)

The intellectual moves made here were congenial to the linguistic theory called *generative semantics* (which flourished 1968–75), for workers in this theory were concerned to expand and modify logical models of semantics to accommodate as many of the distinctive properties of natural language as possible. It thus became their aim to *reduce* pragmatic phenomena to the orderly domain of semantics (see especially G. Lakoff, 1972, 1975). However it soon became apparent that there are some presupposition-like phenomena that don't behave in quite the way that the concept of semantic pre-

[7] *Modus tollens* is the inference from $p \rightarrow q$ and $\sim q$ to $\sim p$ (see Allwood, Andersson & Dahl, 1977: 101).

supposition requires. For example, Keenan noted that the use of the pronoun *tu* in the French sentence (22) seems to presuppose that "the addressee is an animal, child, socially inferior to the speaker, or personally intimate with the speaker" (1971: 51):

(22) Tu es Napoléon

But suppose I use (22) when none of these conditions obtains – it would be strange to say that what I said was neither true nor false: it is true just in case the addressee is indeed Napoleon and false otherwise. And the polite or formal (23) shares just the same truth conditions:

(23) Vous êtes Napoléon

Thus the 'presuppositions' concerning the relationship holding between speaker and addressee, expressed by the use of *tu* or *vous*, simply do not affect truth conditions. Keenan (1971) therefore held that such examples form an independent and distinct class of pragmatic inferences which he called **pragmatic presuppositions**, which are best described as a relation between a speaker and the appropriateness of a sentence in a context.[8]

Other putative cases of presupposition that do not fit the definition of semantic presupposition soon emerged, cases where the inferences in question seem to be context-sensitive in a way that will occupy us below. Hence, for a while it was suggested that there are two distinct kinds of presupposition in natural languages, semantic presuppositions and pragmatic presuppositions, existing independently (see e.g. Keenan, 1971). But from 1973 onwards it became increasingly clear that there were so many problems with the notion of semantic presupposition that a theory of language (and specifically of semantics) would do better without it. The reasons for abandoning the notion of semantic presupposition rest firmly in the nature and properties of the phenomena when properly explored, a task to which we should now turn.

4.2 The phenomena: initial observations

Frege's and Strawson's claim that presuppositions are preserved in negative sentences or statements – a claim embodied in

[8] Note, though, that we have already argued that this kind of inference is in fact an aspect of social deixis (see 2.2.5) encoded as a conventional implicature (see 3.2.3).

Strawson's definition (18) above – provides us with an initial operational test for identifying presuppositions. We can simply take a sentence, negate it, and see what inferences survive – i.e. are shared by both the positive and the negative sentence. It should be noted that from now on we shall sometimes talk as if sentences are the objects that presuppose; this is a looseness adopted simply for purposes of exposition, and in fact it is a theory-relative matter as to whether it is sentences or utterances (sentence-context pairs) that presuppose, as we shall see.[9]

Let us start by taking the relatively simple sentence in (24):

(24) John managed to stop in time

From this we can infer:

(25) John stopped in time
(26) John tried to stop in time

Now take the negation of (24) (note that 'the negation' here means the negation of the main verb or the topmost clause in a complex sentence):

(27) John didn't manage to stop in time

From this we *cannot* infer (25) – in fact the main point of the utterance could be to deny (25). Yet the inference to (26) is preserved and thus shared by both (24) and its negation (27). Thus on the basis of the negation test (and the assumption of its sufficiency), (26) is a presupposition of both (24) and (27).

Note that whenever (24) is true, (25) must be true, but that when (27) is true, (25) need not be true. So, (24) entails (25), but (27) does not entail (25), by the definition of entailment in (17) above. Clearly, then, when we negate (24) to obtain (27), the entailments of (24) are no longer the entailments of (27). In short, negation alters a sentence's entailments, but it leaves the presuppositions untouched. Thus (25) is an entailment of (24) which constitutes at least part (and it has been claimed, all)[10] of the truth conditions of (24), while (26) is a

[9] In the linguistics literature, at any rate, the third possible notion of a speaker presupposing has played little important role in theorizing. However, those theories (discussed below) that seek to reduce presupposition to conversational implicature could be seen as built on this third notion.

[10] See e.g. Halvorsen, 1978; on the semantic view of presupposition the presupposition (26) would also be part, but a special part, of the truth conditions of (24).

presupposition of both (24) and (27). Behaviour under negation makes a basic distinction between presupposition and entailment.

Where does the presupposition in (24) come from? From the word *manage* of course. If we substitute the word *tried* in (24) the inference to (26) of course is the same, but this is now an entailment as is shown by considering the negative sentence (28):

(28) John didn't try to stop in time

So presuppositions seem to be tied to particular *words* – or, as we shall see later, aspects of surface structure in general. We shall call such presupposition-generating linguistic items **presupposition-triggers**.

Let us now take a somewhat more complex example. Consider (29) and its negation (30):

(29) John, who is a good friend of mine, regrets that he stopped doing linguistics before he left Cambridge
(30) John, who is a good friend of mine, doesn't regret that he stopped doing linguistics before he left Cambridge

There are quite a large set of inferences that seem to hold good both for (29) and for its negation (30), for example:

(31) There is someone uniquely identifiable to speaker and addressee as 'John'
(32) John is a good friend of the speaker's
(33) John stopped doing linguistics before he left Cambridge
(34) John was doing linguistics before he left Cambridge
(35) John left Cambridge

Since these are constant or invariant under negation, they are candidate presuppositions under the Frege/Strawson conception. Notice too that each of the inferences can be tied back to particular words or constructions that give rise to them. Thus (31) seems to be tied to, or arise from, the use of the proper name *John*; (32) seems to arise because relative clauses of this informative (non-restrictive) sort are not affected by the negation of a main verb outside the clause, and are thus preserved in their entirety under negation; and similarly for (35), which seems to arise from the fact that temporal clauses (initiated by *before*, *after*, *while*, *when*, etc.) are likewise unaffected by the negation of a main verb. The source of (33) is a little more opaque: it arises because (33) is the complement of a particular kind of verb (called **factive**), here *regret*; it appears that it simply makes

no sense to talk about *X regretting Y*, or alternatively *X not regretting Y*, unless *Y* is an event that has happened or will definitely happen. So the complement *Y* is *presupposed* by both positive and negative sentences with main verbs in this class. The source of (34) is easier to locate: if one asserts that *X stopped Ving*, then one presupposes that *X* had been *Ving*, an inference shared by the assertion that *X has not stopped Ving*. So the verb *stop* is responsible for the presupposition (34).

These are fairly heterogeneous sources, and natural questions then arise of the sort: what are all the structures and lexemes that give rise to presuppositions?, do they have anything in common?, why do some linguistic items have such inferences built into them and not others? and so forth. But before we explore these, let us note that there is a way in which there is an intuitive unity to this set of inferences. For the basic intuition is that they are all in some important sense *background assumptions* against which the main import of the utterance of (29) is to be assessed. A useful analogy here is the notion of *figure* and *ground* in Gestalt psychology: in a picture a figure stands out only relative to a background, and there are well-known visual illusions or 'ambiguities' where figure and ground are reversible, demonstrating that the perception of each is relative to the perception of the other. The analogy is that the figure of an utterance is what is asserted or what is the main point of what is said, while the ground is the set of presuppositions against which the figure is assessed. (There are even some cases where figure and ground, i.e. assertion and presupposition, seem to get inverted like the classic Gestalt ambiguities; see Langendoen, 1971.) To see that the set of presuppositions really forms a set of background assumptions, and not just a set of inferences picked out by some technical definition of presupposition, consider what happens when we convert (29) into a question:

(36) Does John, who is a good friend of mine, regret that he stopped doing linguistics before he left Cambridge?

Here the main point of an utterance of (36) will be to question whether John really does regret stopping doing linguistics, rather than to assert that he does (as in (29)) or to deny that he does (as in (30)). But (36) shares all the presuppositions listed above for (29) and (30). Thus the main point of an utterance may be to assert or to deny or to question some proposition, and yet the presuppositions can

remain constant, or – to employ our analogy – the figure can vary within limits, and the ground remain the same. This is of course the intuition that lies behind the position taken by Frege and Strawson, and the way in which the technical notion of presupposition is intended to capture at least part of our pre-theoretical intuitions about what is presumed or (in the ordinary language sense) presupposed when we speak.

Let us now return to the questions that arose above. What sort of range of presuppositional phenomena is there? We may begin by listing some of the constructions that have been isolated by linguists as sources of presuppositions, i.e. by constructing a list of known **presupposition-triggers**. Karttunen (n.d.) has collected thirty-one kinds of such triggers, and the following list is a selection from these (the examples provide positive and negative versions separated by '/' to allow the reader to check the inferences; the presupposition-triggers themselves are italicized; the symbol ›› stands for 'presupposes'):

1. *Definite descriptions* (see Strawson, 1950, 1952):

(37) John saw/didn't see *the man with two heads*
›› there exists a man with two heads

2. *Factive verbs* (see Kiparsky & Kiparsky, 1971):

(38) Martha *regrets*/doesn't *regret* drinking John's home brew
›› Martha drank John's home brew

(39) Frankenstein was/wasn't *aware* that Dracula was there
›› Dracula was there

(40) John *realized*/didn't *realize* that he was in debt
›› John was in debt

(41) It was *odd*/it wasn't *odd* how proud he was
›› he was proud

(42) some further factive predicates: *know*; *be sorry that*; *be proud that*; *be indifferent that*; *be glad that*; *be sad that*

3. *Implicative verbs* (Karttunen, 1971b):

(43) John *managed*/didn't *manage* to open the door
›› John tried to open the door

(44) John *forgot*/didn't *forget* to lock the door
›› John ought to have locked, or intended to lock, the door

(45) some further implicative predicates: X *happened to V* ›› X didn't plan or intend to *V*; X *avoided Ving* ›› X was expected to, or usually did, or ought to *V*, etc.

4. *Change of state verbs* (see Sellars, 1954; Karttunen, 1973):

(46) John *stopped*/didn't *stop* beating his wife
›› John had been beating his wife

(47) Joan *began*/didn't *begin* to beat her husband
›› Joan hadn't been beating her husband

(48) Kissinger *continued*/didn't *continue* to rule the world
›› Kissinger had been ruling the world

(49) some further change of state verbs: *start*; *finish*; *carry on*; *cease*; *take* (as in *X took Y from Z* ›› Y was at/in/ with Z); *leave*; *enter*; *come*; *go*; *arrive*; etc.

5. *Iteratives*:

(50) The flying saucer came/didn't come *again*
›› The flying saucer came before

(51) You can't get gobstoppers *anymore*[11]
›› You once could get gobstoppers

(52) Carter *returned*/didn't *return* to power
›› Carter held power before

(53) further iteratives: *another time*; *to come back*; *restore*; *repeat*; *for the nth time*

6. *Verbs of judging* (see Fillmore, 1971a):

This kind of implication is, arguably, not really presuppositional at all; for, unlike other presuppositions, the implications are not attributed to the speaker, so much as to the subject of the verb of judging (see Wilson, 1975).

(54) Agatha *accused*/didn't *accuse* Ian of plagiarism
›› (Agatha thinks) plagiarism is bad

(55) Ian *criticized*/didn't *criticize* Agatha for running away
›› (Ian thinks) Agatha ran away

7. *Temporal clauses* (Frege, 1892 (1952); Heinämäki, 1972):

(56) *Before* Strawson was even born, Frege noticed/didn't notice presuppositions
›› Strawson was born

(57) *While* Chomsky was revolutionizing linguistics, the rest of social science was/wasn't asleep
›› Chomsky was revolutionizing linguistics

(58) *Since* Churchill died, we've lacked/we haven't lacked a leader
›› Churchill died

(59) further temporal clause constructors: *after*; *during*; *whenever*; *as* (as in *As John was getting up, he slipped*)

8. *Cleft sentences* (see Halvorsen, 1978; Prince, 1978a; Atlas & Levinson, 1981):

Sentence (60) exhibits what is known as the *cleft construction* (cf. unclefted *Henry kissed Rosie*), (61) what is known as the *pseudo-cleft* construction (cf. unclefted *John lost his wallet*). Both constructions seem to share approximately the same

[11] In British English *anymore* is a negative polarity item, i.e. can only generally occur in negative declarative sentences, hence the lack of a positive exemplar in (51).

presuppositions, and share in addition – it has been claimed (see Halvorsen, 1978) – a further presupposition that the focal element (*Henry* in (60) and *his wallet* in (61)) is the only element to which the predicate applies.

(60) It was/wasn't Henry that kissed Rosie
›› someone kissed Rosie

(61) What John lost/didn't lose was his wallet
›› John lost something

9. *Implicit clefts with stressed constituents* (see Chomsky, 1972; Wilson & Sperber, 1979):

The particular presuppositions that seem to arise from the two cleft constructions seem also to be triggered simply by heavy stress on a constituent, as illustrated by the following examples where upper-case characters indicate contrastive stress:

(62) Linguistics was/wasn't invented by CHOMSKY!
›› someone invented linguistics
(cf. It was/wasn't Chomsky that invented linguistics)

(63) John did/didn't compete in the OLYMPICS
›› John did compete somewhere (cf. It was/wasn't in the Olympics that John competed)

10. *Comparisons and contrasts* (see G. Lakoff, 1971):

Comparisons and contrasts may be marked by stress (or by other prosodic means), by particles like *too*, *back*, *in return*, or by comparative constructions:

(64) Marianne called Adolph a male chauvinist, and then HE insulted HER
›› For Marianne to call Adolph a male chauvinist would be to insult him

(65) Adolph called Marianne a Valkyrie, and she complimented him *back/in return/too*
›› to call someone (or at least Marianne) a Valkyrie is to compliment them[12]

(66) Carol is/isn't a *better linguist than Barbara*
›› Barbara is a linguist

(67) Jimmy is/isn't *as unpredictably gauche as Billy*
›› Billy is unpredictably gauche

11. *Non-restrictive relative clauses*:

Note that there are two major kinds of relative clause in English – those that restrict or delimit the noun phrase they modify (**restrictive** as in *Only the boys who are tall can reach the cupboard*) and those that provide additional parenthetical information (**non-restrictive** as in *Hillary, who climbed Everest*

[12] But perhaps the inference is more restricted: 'For someone (or at least Adolph) to call someone (or at least Marianne) a Valkyrie is to compliment them'. See the cautionary note re verbs of judging in 6 above.

in 1953, was the greatest explorer of our day). The latter kind is not affected by the negation of the main verb outside the relative clause and thus gives rise to presuppositions:

(68) The Proto-Harrappans, who flourished 2800–2650 B.C., were/were not great temple builders
 ›› The Proto-Harrappans flourished 2800–2650 B.C.

12. *Counterfactual conditionals*:

(69) *If Hannibal had only had twelve more elephants*, the Romance languages would/would not this day exist
 ›› Hannibal didn't have twelve more elephants

(70) *If the notice had only said 'mine-field' in English* as well as Welsh, we would/would never have lost poor Llewellyn
 ›› The notice didn't say mine-field in English

13. *Questions* (see Katz, 1972: 201ff; Lyons, 1977a: 597, 762ff) As noted in connection with (36) above, questions will generally share the presuppositions of their assertive counterparts. However, interrogative forms themselves introduce further presuppositions, of a rather different kind, which are what concern us here. It is necessary to distinguish different types of questions: **yes/no questions** will generally have vacuous presuppositions, being the disjunction of their possible answers, as in (71). These are the only kinds of presuppositions of questions that are invariant under negation. **Alternative questions**, as in (72), presuppose the disjunction of their answers, but in this case non-vacuously. **WH-questions** introduce the presuppositions obtained by replacing the WH-word by the appropriate existentially quantified variable, e.g. *who* by *someone*, *where* by *somewhere*, *how* by *somehow*, etc., as in (73). These presuppositions are *not* invariant to negation.

(71) Is there a professor of linguistics at MIT?
 ›› Either there is a professor of linguistics at MIT or there isn't

(72) Is Newcastle in England or is it in Australia?
 ›› Newcastle is in England or Newcastle is in Australia

(73) Who is the professor of linguistics at MIT?
 ›› Someone is the professor of linguistics at MIT

The above list contains perhaps the core of the phenomena that are generally considered presuppositional.[13] However it is important to bear in mind that any such list is crucially dependent on one's definition of presupposition. For example, taking constancy under negation alone as the definitional criterion one would include phenomena like those immediately below, even though these would

[13] There are other good candidates, though, which happen to have received less attention. For example, adverbs, and especially manner adverbs, generally trigger presuppositions; thus *John ran/didn't run slowly* will presuppose 'John ran'.

probably be better accounted for under different aspects of pragmatic theory, as indicated by the rubrics in parentheses after each example (where ››? stands for 'putatively presupposes'):

(74) Do/don't close the door
 ››? the door is open (*felicity condition on requests*)

(75) Vous êtes/n'êtes pas le professeur
 ››? the addressee is socially superior to or non-familiar with the speaker (*conventional implicature*)

(76) The planet Pluto is/isn't larger than Ceres
 ››? s the speaker believes the proposition expressed (*The maxim of Quality*, or alternatively, *sincerity condition on assertions*)

Or suppose instead we abandon constancy under negation as the acid test of presuppositionhood (as Karttunen (1973) advised), substituting behaviour in say *if... then* clauses (see below), then we might be led to claim that certain particles like *only*, *even*, *just* are presupposition-triggers. The grounds would be that, even though they do not yield inferences that survive negation, the inferences do survive in conditional contexts where entailments do not, as illustrated below:

(77) If *only* Harry failed the exam, it must have been easy
 ››? Harry failed the exam
 (cf. If *only* Harry didn't fail the exam, it must have been easy
 ››? Harry didn't fail)

(78) If *even* Harry didn't cheat, the exam must have been easy
 ››? Harry is the most likely person to cheat
 (cf. If *even* Harry cheated, the exam must have been easy
 ››? Harry is the least likely person to cheat)

(79) If I *just* caught the train, it was because I ran
 ››? I almost didn't catch the train
 (cf. If I *just* didn't catch the train, it was because I ran
 ››? I almost did catch the train)

The isolation of the range of the phenomena thus depends crucially on the definition of presupposition adopted. But any theory of presupposition might reasonably be required to handle at least the majority of the cases listed in 1–13 above. We shall use this set of core phenomena to investigate some further basic properties that presuppositions exhibit.

4.3 The problematic properties

Constancy under negation is not in fact a rich enough definition to pick out a coherent, homogeneous set of inferences.

However, if we examine the core phenomena listed above we soon find that actually presuppositions do exhibit a further set of distinguishing characteristics. We shall find that presuppositions seem to have the following properties:

(i) They are *defeasible*[14] in (a) certain discourse contexts, (b) certain intra-sentential contexts;
(ii) They are apparently tied to particular aspects of surface structure

The first property will prove to be the undoing of any possible semantic theory of presupposition, while the second property may serve to distinguish presuppositions from conversational implicatures, the other major form of pragmatic inference.

Defeasibility turns out to be one of the crucial properties of presuppositional behaviour, and one of the touchstones against which all theories of presupposition have to be assessed. In addition there is another problematic property of presuppositions, known as **the projection problem**, namely the behaviour of presuppositions in complex sentences. In part the problems raised here overlap with those raised under the rubric of defeasibility, but we shall deal with the problems one by one.

4.3.1 *Defeasibility*

One of the peculiar things about presuppositions is that they are liable to evaporate in certain contexts, either immediate linguistic context or the less immediate discourse context, or in circumstances where contrary assumptions are made. A simple example of this is provided by a certain asymmetry to do with the factive verb *know*. In sentences where *know* has second or third person subjects, the complement is presupposed to be true, as in (80). But where the subject is first person and the verb is negated, the presupposition clearly fails; thus (81) does not presuppose (82):

(80) John doesn't know that Bill came
(81) I don't know that Bill came
(82) Bill came

The reason of course is that the presupposition that the speaker knows (82) is precisely what the sentence denies, and such denials override contradictory presuppositions (see Gazdar, 1979a: 142ff).

[14] See 3.1 above for explication of this term.

Similarly, when it is mutually known that certain facts do not obtain, we can use sentences that might otherwise presuppose those facts, with no consequent presuppositions arising. For example, if participants mutually know that John failed to get into a doctoral course, we can say:

(83) At least John won't have to regret that he did a PhD

despite the fact that *regret* normally presupposes its complement. The presupposition is simply cancelled by prevailing assumptions. Note that in other contexts, e.g. where John has just finally got a job after finishing a PhD, the normal presupposition will hold.[15]

Consider another example. As noted above, propositions expressed by *before*-clauses are generally presupposed. Hence if I say (84) I shall – other things being equal – have communicated that I know (85):

(84) Sue cried before she finished her thesis
(85) Sue finished her thesis

But now compare (86):

(86) Sue died before she finished her thesis

which certainly does not presuppose (85), but rather conveys that Sue never finished her thesis. Thus in (86) the presupposition seems to drop out. The reason for this seems to be the following: the statement of (86) asserts that the event of Sue's death precedes the (anticipated) event of her finishing her thesis; since we generally hold that people (and we assume Sue is a person) do not do things after they die, it follows that she could not have finished her thesis; this deduction from the entailments of the sentence together with background assumptions about mortals, clashes with the presupposition (85); the presupposition is therefore abandoned in this context, or set of background beliefs (see Heinämäki, 1972). Again, presuppositions prove to be defeasible.

This sensitivity to background assumptions about the world seems to be something quite general about presuppositions, and not some peculiar property of those due to *before*-clauses, as shown by the following examples (Karttunen, 1973):

(87) If the Vice-Chancellor invites Simone de Beauvoir to dinner, he'll regret having invited a feminist to his table

[15] For another example of the same kind see (200) below.

(88) If the Vice-Chancellor invites the U.S. President to dinner, he'll regret having invited a feminist to his table
(89) The Vice-Chancellor has invited a feminist to his table

Now (88) here seems to presuppose (89) (assuming that the U.S. President is not a feminist). The presupposition is due, of course, to the factive verb *regret*, which presupposes its complement. But if we compare (87), we see that (87) does not seem to presuppose (89), despite the identical presence of *regret* and its complement. This, it is clear, is because if we know that Simone de Beauvoir is a well-known feminist, then we tend to interpret the phrase *a feminist* as anaphorically referring back to Simone de Beauvoir. But since the use of the conditional in (87) specifically indicates that the speaker does not know for certain that the Vice-Chancellor has invited Simone de Beauvoir,[16] the presupposition (89), where *a feminist* is assumed to refer to Beauvoir, is cancelled. The crucial point here is that the presupposition (89) is sensitive to our background assumptions: if we assume the U.S. President is not a feminist, then (88) will presuppose (89); if we assume Beauvoir is a feminist, then (87) will not presuppose (89). Again, then, a presupposition turns out to be defeasible in certain belief contexts.

Here is yet another example of the same kind (due to Karttunen, 1974). Consider (90):

(90) Either Sue has never been a Mormon or she has stopped wearing holy underwear
(91) Sue has stopped wearing holy underwear
(92) Sue used to wear holy underwear

The presuppositions inferrable from (90) depend on one's beliefs about whether Mormons wear holy underwear. For the second disjunct or clause of (90) is (91), which as we have seen will presuppose (92) by virtue of the change of state verb *stop*. The whole sentence, (90), shares this presupposition (92) with (91) *unless* we assume that only Mormons habitually wear holy underwear.[17] In that

[16] The indication is due to the clausal implicatures of the conditional: *if p then q* implicates {P*p*, P $\sim$ *p*}, i.e. that the speaker doesn't know whether *p* is or is not the case, as discussed in 3.2.4.

[17] Actually, because there is a generalized conversational implicature from *p or q* to there being non-truth-functional connections between *p* and *q* (as discussed by Grice, 1967), we tend to favour this assumption. Perhaps a clearer case in which the presupposition (92) would generally survive would be *Either Sue has lengthened her dresses, or Sue has stopped wearing holy underwear*. The presupposition would then only be cancelled if we made the (unlikely) assumption 'All people who lengthen their dresses have never worn holy underwear'.

case, the first clause might be true (Sue has never been a Mormon) with the implication that Sue never did wear holy underwear; this implication is inconsistent with the presupposition (92), and the latter thereby evaporates.

Another kind of contextual defeasibility arises in certain kinds of discourse contexts. For example, recollect that a cleft sentence like (93) is held to presuppose (94):

(93) It isn't Luke who will betray you
(94) Someone will betray you

Now consider the following argument that proceeds by elimination (see Keenan, 1971; Wilson, 1975: 29ff):

(95) You say that someone in this room will betray you. Well maybe so. But it won't be Luke who will betray you, it won't be Paul, it won't be Matthew, and it certainly won't be John. Therefore no one in this room is actually going to betray you

Here each of the cleft sentences (*It won't be Luke*, etc.) should presuppose that there will be someone who will betray the addressee. But the whole purpose of the utterance of (95) is, of course, to persuade the addressee that no one will betray him, as stated in the conclusion. So the presupposition is again defeated; it was adopted as a counterfactual assumption to argue to the untenability of such an assumption.

A slightly different kind of discourse context can also lead to the evaporation of presuppositions, namely where evidence for the truth of the presupposition is being weighed and rejected. For example, consider (96):

(96) A: Well we've simply got to find out if Serge is a KGB infiltrator
B: Who if anyone would know?
C: The only person who would know for sure is Alexis; I've talked to him and he isn't aware that Serge is on the KGB payroll. So I think Serge can be trusted

The sentence (97) in the exchange in (96) should presuppose (98), for *be aware that* is a factive predicate which presupposes the truth of its complement (i.e. (98)).

(97) He isn't aware that Serge is on the KGB payroll
(98) Serge is on the KGB payroll

However the point of C's utterance in (96) is to argue that since (97) is true, (98) is probably false. So once again a specific discourse context can override a presuppositional inference. There are a number of further kinds of discourse setting that can have similar effects.

So far we have shown that some of the core examples of presuppositional phenomena are subject to presupposition cancellation in certain kinds of context, namely:

(i) Where it is common knowledge that the presupposition is false, the speaker is not assumed to be committed to the truth of the presupposition
(ii) Where what is said, taken together with background assumptions, is inconsistent with what is presupposed, the presuppositions are cancelled, and are not assumed to be held by the speaker
(iii) In certain kinds of discourse contexts, e.g. the construction of *reductio* arguments or the presentation of evidence against some possibility or assumption, presuppositions can systematically fail to survive

There are no doubt many other kinds of contextual defeasibility as well, but these examples are sufficient to establish that presuppositions are defeasible by virtue of contrary beliefs held in a context.

In addition to such cases, there are also many kinds of intra-sentential cancellation or suspension of presuppositions. For example, bearing in mind that (99) presupposes (100), note that when we embed or conjoin (99) in the range of sentences that follow, (100) cannot be a presupposition of the resulting complex sentences:

(99) John didn't manage to pass his exams
(100) John tried to pass his exams
(101) John didn't manage to pass his exams, in fact he didn't even try
(102) John didn't manage to pass his exams, if indeed he even tried
(103) Either John never tried to pass his exams, or he tried but he never managed to pass them
(104) John didn't *manage* to pass his exams; he got through without even trying

But the problems raised here are best dealt with in conjunction with the general problem of how presuppositions of component sentences

behave when these components are part of complex and compound sentences, a problem to which we should now turn.[18]

4.3.2 *The projection problem*

Frege held that the meanings of sentences are compositional, i.e. that the meaning of the whole expression is a function of the meaning of the parts. It was originally suggested by Langendoen & Savin (1971) that this was true of presuppositions too, and moreover that the set of presuppositions of the complex whole is the simple sum of the presuppositions of the parts, i.e. if S_0 is a complex sentence containing sentences S_1, S_2, ... S_n as constituents, then the presuppositions of S_0 = the presuppositions of S_1 + the presuppositions of S_2 ... + the presuppositions of S_n. But such a simple solution to the presuppositions of complex sentences is far from correct, and it has proved in fact extremely difficult to formulate a theory that will predict correctly which presuppositions of component clauses will in fact be inherited by the complex whole. This compositional problem is known as the **projection problem** for presuppositions, and the particular behaviour of presuppositions in complex sentences turns out to be the really distinctive characteristic of presuppositions.

There are two sides to the projection problem. On the one hand, presuppositions survive in linguistic contexts where entailments cannot (i.e. the presuppositions of component sentences are inherited by the whole complex sentence where the entailments of those components would not be). On the other hand, presuppositions disappear in other contexts where one might expect them to survive, and where entailments would.

Let us start by considering the peculiar survival properties of presuppositions. The first and obvious kind of context in which presuppositions survive where entailments do not is, of course, under negation. One may, but need not, take this as a defining characteristic of presuppositions. Thus (105) could be held to presuppose (106) and entail (107):

[18] In traditional grammar, complex sentences are those formed by embedding (or subordinating) sentences within sentences, compound sentences those formed by sentences linked by conjunction (Lyons, 1968: 178, 266). Hereafter, we shall use the term complex sentence to subsume both, simply as a shorthand, reserving the term compound sentence for sentences containing clauses linked by any of the logical connectives (whether or not, for example, the conditional construction is thought of as subordinating).

(105) The chief constable arrested three men
(106) There is a chief constable
(107) The chief constable arrested two men

If we now negate (105), as in (108), the entailment (107) does not survive; but the presupposition (106) does; this being of course the initial observation from which presuppositional theories sprang.

(108) The chief constable didn't arrest three men

So much is obvious. But in a precisely similar way, presuppositions survive in other kinds of context in which entailments do not. One such is modal contexts, i.e. embedding under modal operators like *possible*, *there's a chance that* and so on. Thus (109) intuitively continues to presuppose (106):

(109) It's possible that the chief constable arrested three men

But (109) certainly does not entail (107), because one cannot logically infer from the mere possibility of a state of affairs that any part of it is actual. This survival in modal contexts will turn out to be an extremely important fact, and it is worth while noting that the same behaviour occurs under, for example, deontic modalities like those expressed by *ought*, *should* and the like. Hence (110) presupposes (106) but does not entail (107), just like (109):

(110) The chief constable ought to have arrested three men

Consider also a sentence like (111) which has several interpretations depending on how *could* is taken – e.g. in the permission sense, or the ability sense; but whichever interpretation is taken (111) presupposes (106) and fails to entail (107):

(111) The chief constable could have arrested three men

A rather different set of contexts in which presuppositions distinguish themselves by the ability to survive, are the compound sentences formed by the connectives *and*, *or*, *if... then* and their equivalents.[19] Take for example (112):

[19] The logical connectives can always be expressed in various alternative ways: e.g. the conditional by *Given A, then B*, or *Suppose A, then B*, or *Assuming A, then B* and so on. The remarks throughout this Chapter concerning compound sentences formed from the connectives should carry over to all these equivalent or near-equivalent means of expressing the same logical relations.

(112) The two thieves were caught again last night

which entails, *inter alia*, (113) and presupposes (114) by virtue of the iterative *again*:

(113) A thief was caught last night
(114) The two thieves had been caught before

Now embed (112) in the antecedent of a conditional as in (115):

(115) If the two thieves were caught again last night, P.C. Katch will get an honourable mention

Here (113) is not an entailment of (115), but the presupposition (114) survives unscathed. Similarly, when (112) is embedded in a disjunction, its presuppositions but not its entailments survive:

(116) Either the two thieves were caught again last night, or P.C. Katch will be losing his job

Presuppositions also have a habit of disappearing within such compound sentences formed with the connectives (as will be discussed below at length), but the circumstances are quite specific.

There are other environments in which it could be claimed presuppositions survive in a special way. Karttunen (1973), for example, lists a large set of complement-taking verbs or sentential operators, which he calls **holes** because they allow presuppositions to ascend to become presuppositions of the complex whole, where entailments would be blocked. The list includes the factive verbs, modal operators, negation and so on. It then becomes possible to define presuppositions not as inferences that merely happen to survive negation, but that also systematically survive in a range of other contexts where entailments do not. A problem here is that in many of these cases it can be reasonably claimed that the positive sentences constructed with *holes* in fact *entail* their alleged presuppositions, and it is only in negative, modal, disjunctive or conditional contexts that the uniquely presuppositional survival behaviour manifests itself.

Let us now turn to the second side of the projection problem, namely the way in which presuppositions of lower clauses sometimes fail to be inherited by the whole complex sentence. In other words, presuppositions are sometimes defeasible by virtue of intra-sentential context.

The most straightforward way in which such disappearances occur is where the presuppositions of a sentence are overtly **denied** in a co-ordinate sentence, as for example in:

(117) John doesn't regret doing a useless PhD in linguistics because in fact he never did do one!
(118) John didn't manage to pass his exams, in fact he didn't even try
(119) Le Comte de Berry claims to be the King of France, but of course there isn't any such King anymore

Obviously, one can't do this with entailments on pain of direct contradiction:

(120) *John doesn't regret doing a useless PhD because in fact he does regret doing a useless PhD

The possibility of denying one's own presuppositions is a fundamentally important property of presuppositional behaviour, which forces semantic theories of presupposition into special claims about the ambiguity of negation in ways which we shall describe below (see also Wilson, 1975: 32ff).

In connection with overt denials as in (117)–(119), it is important to note that at least in many cases they are not possible with positive sentences. Thus the following sentences seem in contrast quite unacceptable:

(121) *John regrets doing a PhD because in fact he never did do one
(122) *Florence has stopped beating her husband and in fact she never did beat him
(123) *It was Luke who would betray him, because in fact no one would

A simple but important explanation of this is to claim that, at least in these cases, the affirmative sentences *entail* what we have hitherto called the presuppositions of each of them. Thus (121)–(123) are simply contradictions and thus semantically anomalous. This claim leaves it open whether in addition to being entailed the alleged presuppositions are also (redundantly) presupposed in the affirmative sentences, although most presuppositional theorists would claim that they are.[20] The asymmetries that thus show up between negative and

[20] But not those who seek to reduce presupposition to conversational implicature – see discussion in 4.4.2 below. Note that the entailment claim allows an essentially Russellian treatment of, for example, definite descriptions in the affirmative cases.

positive sentences with respect to overt denial of presuppositions argue strongly for the entailment analysis in positive sentences (see Wilson, 1975: 25–8; Gazdar, 1979a: 119–23 for further argument).

In addition to the overt denial of presuppositions there is the possibility of what Horn (1972) has called **suspension**. Here the use of a following *if*-clause can very naturally suspend the speaker's commitment to presuppositions as illustrated by:

(124) John didn't cheat again, if indeed he ever did
(125) Harry clearly doesn't regret being a CIA agent, if he actually ever was one

Such suspension behaviour is probably just part of the special ways in which presuppositions behave in conditionals, which we shall turn to immediately below.

Much more controversial is another kind of blocking of the presuppositions of constituent parts of complex sentences, which appears to take place under certain verbs of propositional attitude like *want*, *believe*, *imagine*, *dream* and all the verbs of saying like *say*, *tell*, *mumble*, *retort*, etc. Apparently clear cases are the following:

(126) Loony old Harry believes he's the King of France
(127) Nixon announced his regret that he did not know what his subordinates were up to
(128) The teacher told the students that even he had once made a mistake in linear algebra

which do not seem to have, respectively, the expectable presuppositions:

(129) There is a present King of France
(130) Nixon did not know what his subordinates were up to
(131) The teacher is the least likely person to make a mistake in linear algebra

In view of this behaviour, Karttunen (1973) has dubbed such verbs of propositional attitude and verbs of saying **plugs**, because, in contrast to *holes*, they block the presuppositions of lower sentences ascending to become presuppositions of the whole. However, it is far from clear that this is generally true. Consider for example:

(132) a. The mechanic didn't tell me that my car would never run properly again
b. My car used to run properly

(133) a. Churchill said that he would never regret being tough with Stalin
b. Churchill was tough with Stalin

Here the *a* sentences continue to presuppose the *b* sentences despite the presence of *plugs*. So if one believes in the existence of *plugs* one is forced to account for these apparently presuppositional inferences in another way (Karttunen & Peters (1975) employ the notion of generalized conversational implicature). This is such an awkward solution – requiring non-presuppositional inferences to produce presupposition-mimicking inferences – that one has to conclude that the existence of *plugs* is very dubious indeed.

We come now to the most troublesome aspect of the projection problem, namely the behaviour of presuppositions in complex sentences formed using the connectives *and*, *or*, *if... then* and the related expressions that include *but*, *alternatively*, *suppose that* and many others. As we have already noticed, presuppositions tend to survive in disjunctions and conditionals where entailments do not, and one might therefore be tempted to claim that these constructions are *holes* that just let presuppositions through. That this is not the case is shown by examples like:

(134) If John does linguistics, he will regret doing it
(135) John will do linguistics

Here the consequent (second clause of the conditional) alone would presuppose (135), but the whole conditional does not – clearly because the presupposition is mentioned in the first clause and is thus made hypothetical. This turns out to be completely general. Now consider:

(136) Either John will not in the end do linguistics, or he will regret doing it

Here again the second clause alone presupposes (135), but the whole does not. The presupposition seems to be cancelled in this case because the alternative expressed in the first clause is the negation of the presupposition of the second clause. Once again this is a completely general phenomenon.

Because of this treatment of presuppositions in compounds formed by the connectives, Karttunen (1973) dubbed the connectives **filters**: they let some presuppositions through but not others. He stated the filtering conditions as follows:

(137) In a sentence of the form *if p then q*, (and also, perhaps, in a sentence of the form *p* & *q*) the presuppositions of the parts will be inherited by the whole *unless q* presupposes *r* and *p* entails *r*

(138) In a sentence of the form *p or q*, the presuppositions of the parts will be inherited by the whole *unless q* presupposes *r* and $\sim p$ entails *r*

For those who think that presupposition and entailment are mutually exclusive, i.e. that a sentence cannot both presuppose and entail the same proposition, then it also makes sense to set up filtering conditions for conjunctions. Thus one might want to claim that (139) does not presuppose (135) but rather asserts or entails it:

(139) John is going to do linguistics and he is going to regret it

On this account, (139) fails to presuppose (135) because the first conjunct asserts what the second presupposes. It is not difficult to see that, viewed in this way, the filtering condition for conjunctions is identical to that for conditionals stated in (137) above. However, it is far from clear that this is a sensible way to view things: the doctrine of the mutual exclusivity of presupposition and entailment seems to be left over from the contrast in the philosophical literature between presupposition and assertion which has not proved of much use to linguistic analysis. In addition, as we showed above, a good case can be made for viewing many cases of alleged presuppositions in positive sentences as entailments, in which case either one will have systematically to block presuppositions in such simple positive sentences or simply accept that a sentence can both entail and presuppose the same proposition.

The filtering conditions stated in (137) and (138) above are to a large extent observationally adequate, and any would-be theory of presupposition that cannot predict this kind of behaviour cannot be taken very seriously. One way in which they are not quite adequate, though, was noted by Karttunen (1974) himself: we have to allow for the fact that the first clause may be taken together with background information and that these premises (in conditionals) or the negation of the first clause plus the background assumption (in disjunctions) may then filter out a presupposition of the second clause by entailing it. This is the explanation for the context-sensitivity of the presuppositions in (88) and (90) noted above.[21]

[21] Consider, for example, (90): if we take the first clause, *Sue has never been a Mormon*, and negate it, we obtain 'It's not the case that Sue has never been

We now have the essential delimitations of the projection problem. Any theory of how presuppositions are compositionally collected must be able to deal with the following basic facts:

> (i) Presuppositions may be overtly denied without contradiction or anomaly; and they may also be suspended by the use of *if*-clauses
> (ii) Presuppositions may be filtered in specifiable contexts when they arise from sentences that are part of compounds formed by the use of the connectives *or*, *if... then* and others
> (iii) Presuppositions survive in contexts where entailments cannot: in modal contexts, conditionals and disjunctions in particular

One influential way of talking about these projection properties, due to Karttunen (1973, 1974) is to talk of the contexts in (iii) as *holes*, and those in (ii) as *filters* – a terminology we introduced in passing. For Karttunen there is also the third important category of *plugs*, including the verbs of saying, which we have already shown to be a dubiously genuine property of the projection problem.

Although this discussion has introduced no great complexities, testing out potential solutions to the projection problem in fact involves considering how presuppositions behave in multiply-embedded sentences constructed out of such *filters*, *holes* and so on, up to a complexity that strains the intuitions. Readers may for example like to compare their intuitions with the predictions made by the filtering conditions, and other principles discussed above, on the following sentence:[22]

(140) If after taking advice you determine to file form PF101, then either you have paid arrears and no deductions will be made from source or before PF101 is filed the Inland Revenue regrets that deductions will be made from source

a Mormon', i.e. 'Sue has been a Mormon'. If we now take the background assumption 'Mormons always wear holy underwear' together with 'Sue has been a Mormon', we can infer 'Sue has worn holy underwear'. This entails the presupposition (92) of the second clause, (91). Therefore, on the background assumption that Mormons wear holy underwear, the presupposition (92) will be filtered in line with the condition in (138).

[22] Hint: to work out the predictions from the filtering rules note that the logical form of the sentence is $p \rightarrow ((q \ \& \ r) \vee s)$, where s has, *inter alia*, two presuppositions, one entailed by $\sim r$ and the other (making certain assumptions) by p.

4.4 Kinds of explanation

The properties of presupposition that we have surveyed are sufficiently intricate to narrow down the contending theories of presupposition to a handful of current runners. To show this we shall first of all demonstrate that no semantic theory of presupposition is likely to be viable, and we shall then proceed to evaluate the three main kinds of pragmatic theory that have been proposed.

4.4.1 *Semantic presupposition*

There are two main classes of semantic theories available to linguists at the present time. One is the truth-conditional class of theories, around which this book is primarily organized since it alone makes clear predictions about what cannot be captured in semantics. The other is the (not necessarily mutually exclusive) class that assumes that all semantic relations are definable in terms of translations of sentences into atomic concepts or semantic features. Attempts have been made to formulate semantic theories of presupposition in both frameworks; but both attempts, we shall argue, are misplaced. We shall deal with the theories one by one.

In order to incorporate presupposition into truth-conditional theories, presupposition has been characterized as a special species of entailment, as in (19) and (20) above, namely one in which a logical consequence relation can be defined in such a way that it is unaffected by negation. Such theories, we noted, require a drastic re-organization of the entire logical structure of a semantic theory. Such a re-organization might be justified if the properties of presupposition could thereby be captured, but it is not difficult to see that any such theory cannot in principle succeed.

What dooms such semantic theories of presupposition are the two cardinal properties of presuppositional behaviour we isolated above: defeasibility and the peculiar nature of the projection problem. The point about defeasibility is that presuppositions do not always survive in certain discourse contexts, as we showed above in connection with examples (93)–(98). It is often sufficient that contrary beliefs are held in a context to cause presuppositions to evaporate, without any sense of semantic or pragmatic anomaly. Now, the definition of semantic presupposition in (20) is constructed using the notion of semantic entailment; and the definition of semantic entailment in (17) specifies that for a proposition p to semantically entail a proposition q it is

necessary that in *all worlds* in which p is true, q is true. The consequence is that semantic presupposition is a necessarily *invariant* relation: if p semantically presupposes q, then p *always* semantically presupposes q (providing that p is not embedded in a linguistic environment – other than negation – in which p fails to entail q). But the examples that we raised above under the rubric of defeasibility are not special linguistic contexts, they are specific extra-linguistic contexts where presuppositions drop out.

If we now turn to one side of the projection problem, namely the way in which presuppositions are defeasible or fail to project in specified linguistic environments, exactly the same problems emerge. Consider, for example, (141) and (142):

(141) Either John is away or John's wife is away
(142) Either John has no wife or John's wife is away
(143) John has a wife

(141) straightforwardly presupposes (143) (although getting semantic presupposition to model even that may not be so easy, as we shall see immediately below). But (142) fails to presuppose (143) as of course predicted by the filter for disjunctions in (138) above. Again we are faced with the problem of cancelling presuppositions in some environments and not others, here just in case the first disjunct when negated entails the presupposition of the second disjunct. While it is easy to imagine that a semantic relation like semantic presupposition should be affected systematically by embedding in a disjunction, it is not easy to see how such an invariant relation could be sensitive to the content of another disjunct (but cf. Peters, 1979).

An exactly similar point can be made with respect to conditionals: on the semantic theory of presupposition (144) and (145) should have the same presuppositions, but in fact only (144) presupposes (146):

(144) If Harry has children, he won't regret doing linguistics
(145) If Harry does linguistics, he won't regret doing it
(146) Harry is doing linguistics

In linguistic contexts like (145) (as generally described by (137) above) presuppositions are not invariant relations as semantic presupposition would require: they sometimes do and sometimes do not survive when the constructions that give rise to them are embedded in the consequent clause of a conditional.

We noticed also that it is possible to overtly deny a presupposition without causing anomaly, as in (147) and examples (117)–(119) above:

(147) John doesn't regret having failed, because in fact he passed

Now clearly such examples pose severe problems for the semantic presuppositionalist, for by definition semantic presuppositions survive negation – but in that case (147) should amount to a contradiction: it both semantically presupposes (148) and entails by virtue of the *because*-clause that (148) is false:

(148) John failed

Faced with examples like these, there is only one way out for the semantic presuppositionalist: he must claim that negation is ambiguous between a presupposition-preserving kind of negation and a kind in which both entailments and presuppositions get negated. These are sometimes called **internal** or **predicate** negation and **external** or **sentence** negation respectively, but here this terminology is misleading because the claim required to salvage semantic presupposition is not the Russellian claim that there are different scopes for negation, but rather that the negative morphemes are actually ambiguous (Wilson, 1975: 35). Further, the semantic presuppositionalist can point to the fact that his trivalent logic (or equivalent truth-value gaps) allows the definition of two distinct logical negations, thus making the ambiguity claim technically feasible (see Gazdar, 1979a: 65 for details).

The problem with this claim is that there is no evidence whatsoever that there is such an ambiguity in natural language negations, and considerable evidence that there is not. Linguistic tests for ambiguity do not confirm the claim (Atlas, 1977), and there appear to be no languages in which the two senses are lexically distinguished (Horn, 1978; Gazdar, 1979a), whereas the claim would lead one to expect that it was sheer coincidence that only one word exists for the two senses in English. (For sundry other arguments against the claim see e.g. Allwood, 1972; Kempson, 1975: 95–100.) Moreover the notion of a presupposition-destroying negation lands in technical difficulties as soon as iterations of such an operator are considered (see Atlas, 1980). The failure of the ambiguity claim means that semantic presuppositionalists have no account of sentences like (147), or rather the semantic theory makes the wrong predictions (here, that (147) should be drastically anomalous due to semantic contradiction).

Let us now turn to consider how semantic presupposition fares with the other side of the projection problem: namely accounting for how presuppositions survive in contexts where entailments don't. Such contexts we noted include modals of various sorts, as illustrated by (149), which when embedded in a modal context, as in (150), continues to presuppose (151):

(149) John is sorry that he was rude
(150) It's possible that John is sorry that he was rude
(151) John was rude

When this was first noted, it was correctly pointed out that in order to maintain a presuppositional relation between (150) and (151) it would be necessary to change the definition of semantic presupposition, so that instead of reading as in (20) above it would read as in (152) below:

(152) A semantically presupposes B iff:
(a) $\Diamond$ A ||- B
(b) $\Diamond \sim$ A ||- B

(see Karttunen, 1971a). The problem with this definition is that it has been proved that none of the standard logical systems can accommodate such a semantic relation.[23] The technical difficulties here militate strongly against the possibility of maintaining any coherent notion of semantic presupposition.

In addition, possibility is not the only modal operator presuppositions survive through – as pointed out above deontic modalities also let presuppositions through in a way that is quite irreconcilable with a relation based on entailment. Also, except under the special conditions noted above, presuppositions survive embedding in conditionals and disjunctions where entailments do not. If *p* entails *r*, and we embed *p* in *either p or q*, we can no longer infer *r*; but if *p* presupposes *s* then *either p or q* will presuppose *s* unless filtered under the condition in (138). Thus (153) below entails (154) and presupposes (155), but only (155) survives embedding in a disjunction as in (156):

[23] The proof is due to an unpublished note by Herzberger (1971); a further demonstration that such a relation can be accommodated in much more complex logical systems, namely two-dimensional four-valued modal logics, is due to Martin (1975, 1979), but there would need to be considerable independent justification for adopting such logical systems as models for natural language semantics.

(153) The Duke of Westminster has four houses
(154) The Duke of Westminster has three houses
(155) There is a Duke of Westminster
(156) Either the Duke of Westminster has four houses or he borrows other people's stationery

It is quite unclear how the definition of semantic presupposition could be modified to allow presuppositions to be preserved in such disjunctive contexts.

As a final problem, note that even if the definition of semantic presupposition could be altered to accommodate all these contexts in which presuppositions and not entailments survive,[24] the same problem that arose concerning the ambiguity of negation would plague such a definition with a vengeance. For wherever in such contexts it is possible to add an overt denial of the presuppositions of other clauses, one would have to claim that there was an ambiguity between presupposition-preserving and presupposition-destroying senses of the expressions involved (Wilson, 1975). Thus given that one can say (157) without anomaly, it would be necessary to claim that the possibility operator in (152) above is ambiguous in just the same way that negation is:

(157) It's possible that Nixon regrets tampering with the tapes, although I don't believe he ever did

This assortment of problems is sufficient to rule out the possibility of an account of presupposition within a truth-conditional theory of semantics.

Let us now turn to the attempts to accommodate presupposition within a semantic theory based on atomic concepts or semantic primes or features. The properties of such semantic theories are much less well defined than logical models, and to a certain extent this makes them more adaptable to handling new kinds of supposed semantic relations. Thus Katz & Langendoen (1976) maintain that semantic presupposition is a perfectly viable concept, indeed the only viable one, when modelled within a feature-style semantics (see also Leech, 1974). In actual fact it has been shown that Katz & Langendoen's suggestions simply cannot handle the projection problem (see the critique in Gazdar, 1978). Given the informal nature of such semantic theories, it is open to Katz & Langendoen to make another attempt

[24] And note that these would include the verbs of saying if one does not subscribe to the view that these are *plugs*.

using quite different apparatus invented for the purpose, and it is therefore difficult to prove that no such attempt could be successful.

However it is not difficult to show that any such attempt, given the avowed goals of such semantic theories, is simply misplaced. For the aim of such theories is to tease apart our knowledge of the semantics of our language from our knowledge of the world, and to isolate the relatively small set of atomic concepts required for the description of the semantics alone (see e.g. Katz & Fodor, 1963). Semantics on this view is concerned with the context-independent, stable meanings of words and clauses, leaving to pragmatics those inferences that are special to certain contexts (see e.g. Katz, 1977: 19ff).

Given this much, it is clear that presupposition belongs in pragmatics and not in semantics. For presuppositions are not stable, context-independent aspects of meaning – that is shown conclusively by the examples discussed under defeasibility above, one of which is repeated here:

(158) Sue cried before she finished her thesis
(159) Sue died before she finished her thesis
(160) Sue finished her thesis

where the presupposition due to the *before*-clause in (158) does not go through in (159). Why? Because our knowledge of the world, taken together with the truth of (159), is inconsistent with the assumption that (160) is true.

To sum up: semantic theories of presupposition are not viable for the simple reason that semantics is concerned with the specification of invariant stable meanings that can be associated with expressions. Presuppositions are not invariant and they are not stable, and they do not belong in any orderly semantics.

4.4.2 *Pragmatic theories of presupposition*

For the reasons adduced above, and others catalogued by Stalnaker (1974), Kempson (1975), Wilson (1975) and Boër & Lycan (1976), semantic theories of presupposition have largely been abandoned (but see Martin, 1979). In their place, various theories of **pragmatic presupposition** have been put forward. The earlier of these were programmatic, and offered little more than possible definitions of presupposition using pragmatic notions (a list of such definitions and a discussion of them can be found in Gazdar, 1979a: 103ff). These definitions, despite differing terminology, utilized two basic concepts in particular: **appropriateness** (or **felicity**) and

mutual knowledge (or **common ground**, or joint assumption) in the way indicated in the following definition:[25]

(161) An utterance A *pragmatically presupposes* a proposition B iff A is *appropriate* only if B is *mutually known* by participants

The idea, then, was to suggest that there are pragmatic constraints on the use of sentences such that they can only be appropriately used if it is assumed in the context that the propositions indicated by the presupposition-triggers are true. So to utter a sentence whose presuppositions are, and are known to be, false, would merely be to produce an inappropriate utterance, rather than (on the semantic view) to have asserted a sentence that was neither true nor false.

Apart from the sketchiness of such proposals, there are objections to the utility of the notion of *appropriateness* which we raised in Chapter 1. In addition, as Sadock has pointed out (see Stalnaker, 1977: 145–6), the mutual knowledge condition is far too strong: I can very well say (162) in conditions where my addressee did not previously know the presupposition (163):

(162) I'm sorry I'm late, I'm afraid my car broke down
(163) The speaker has a car

It is sufficient, as Gazdar (1979a: 105ff) notes, that what I presuppose is *consistent with* the propositions assumed in the context. It is interesting to note that (164) is probably not appropriate in circumstances where it is not mutual knowledge that the presupposition (165) is true:

(164) I'm sorry I'm late, my fire-engine broke down
(165) The speaker has a fire-engine

presumably because it is not consistent with the average man's beliefs that an average man owns a fire-engine (but see Prince, 1978b for some more complex explanations).

Such problems indicate that definitions like (161) are at least in need of refinement. But in the long run what we are interested in is not a definition, but some model that will accurately predict presuppositional behaviour and capture in particular the problematic properties of defeasibility and projection reviewed above. In fact there are only two sophisticated formal models that get anywhere near accounting for the observable facts, and we shall now review these

[25] On the concepts of *mutual knowledge* and *appropriateness* see 1.2 above; on *felicity* see 5.1 below.

in detail, returning later to ask whether any other kinds of approach are available as alternatives.

We have established that presuppositional inferences cannot be thought of as semantic in the usual sense, and we have indicated above that presuppositions seem to be tied to the surface form of expressions. Thus it could be claimed, not necessarily correctly but nevertheless plausibly, that the following sentences all share the same truth conditions:

(166) John didn't give Bill a book
(167) It wasn't a book that John gave to Bill
(168) It wasn't John who gave Bill a book

and differ only in that (167) has the additional presupposition (169), and (168) the additional presupposition (170):

(169) John gave Bill something
(170) Someone gave Bill a book

The presupposition of a cleft sentence (like those in (167) and (168)) can therefore be identified with a proposition formed by taking the material after the relative clause marker (*who*, *that*) and inserting a variable or indefinite existential expression like *somebody*, *something* that agrees in number, gender (and indeed grammatical category) with the item in focus position. There seems therefore to be a conventional association between the surface organization of constituents in a cleft construction and particular presuppositions.

The two theories we are about to review both assume that presuppositions are therefore part of the conventional meaning of expressions, even though they are not semantic inferences. This should serve to distinguish presuppositions from conversational implicatures, which otherwise share many of the same properties of defeasibility, for conversational implicatures are (as we noted in Chapter 3) *non-detachable*: i.e. it is not possible to find another way of conveying the same truth conditions that will lack the implicatures in question. On the other hand, there appears to be no problem in finding a way of expressing the same truth-conditional content as in (167) or (168), while avoiding conveying (169) or (170) respectively – for example by saying (166).[26]

[26] The detachability of presuppositions by paraphrase will in fact be questioned below; and it is not in fact clear that (166), (167) and (168) actually share truth conditions (see Atlas & Levinson, 1981).

The first such conventional theory we shall review has been developed by Karttunen & Peters (1975, 1979). The theory is expressed in the framework of **Montague grammar**, in which clauses are built up from their constituents from the bottom up rather than from the top down as in transformational generative grammar.[27] In such a theory, the semantic content of an expression is built up in tandem with the syntax, so that in the process of sentence generation semantic representations are constructed stage by stage in parallel to the construction of the surface natural language expression. Thus every word, clause or syntactic operation can have associated with it a semantic representation or **extension expression**, as Karttunen & Peters call it. Now the basic idea in Karttunen & Peters' theory is simply to add to the framework of Montague grammar an additional set of meaning expressions to be generated in the same sort of way as extension expressions, as sentences are built up from their constituent parts; these meaning expressions will, just like extension expressions, be associated with words, clauses, and constructions – but here just with what we have called presupposition-triggers. And unlike extension expressions these presuppositional expressions will not generally play any part in the specification of truth conditions, for their function is purely to represent the presuppositions of constituents. Thus, on this theory, the distinction between truth-conditional aspects of meaning and presuppositional inferences is captured by the generation of two quite separate kinds of meaning for each natural language expression.

Karttunen & Peters call the meaning expressions that capture presuppositions **implicature expressions** or **conventional implicatures**, and the terminology overtly identifies presuppositions with those pragmatic inferences that Grice (1975) isolated as being conventional, non-cancellable and yet not part of the truth conditions. For on Karttunen & Peters' theory, presuppositions (or, as they would have it, conventional implicatures) are in fact non-cancellable. But Karttunen is well aware of the defeasibility and projection properties of presuppositions – indeed he was the first to explore them in detail. How then can it be claimed that presuppositions are non-cancellable?

The answer lies in the details of Karttunen & Peters' system. The idea is that in addition to implicature expressions capturing the

[27] See Dowty, Peters & Wall, 1981 for an introduction to Montague grammar.

presuppositional content of each presupposition-triggering item, there will be associated with each constituent a **heritage expression** whose sole function will be to govern the projection of the presuppositions expressed in the implicature expressions. In this way, Karttunen's (1973) classification of embedding constructions into *plugs*, *filters* and *holes* can be incorporated into the Montague grammar framework: for example, where an embedding complement is a plug it will have a heritage expression that will block the presuppositions (expressed by the implicature expressions) from ascending to be presuppositions of the whole sentence. Thus (171) will not have the presupposition (172) because the word *claims* will have an associated heritage expression that will block it:

(171) Nato claims that the nuclear deterrent is vital
(172) There exists a nuclear deterrent

As we noted above, it is not clear that plugs are a useful category, but if they are, here is a coherent way of modelling them. Similarly with the class of filters: each connective will have associated with it a heritage expression that will block the presuppositions of the lower constituent sentences just in case the filtering conditions in (137) and (138) are met. For example, the heritage expression that captures the filtering condition for conditionals can be thought of as something like (173):

(173) The conventional implicatures of *if p then q* (and also perhaps of *p and q*) are the conventional implicatures of *p* together with the expression 'if *p* then the conventional implicatures of *q*'

To see how this works apply it to a case like (174) where the presupposition, (175), of the consequent is filtered:

(174) If John has children, all of John's children must be away
(175) John has children

Here the presuppositions of the whole will be whatever the presuppositions of the antecedent are (e.g. John exists), plus the proposition that if John has children, then he has children. Since this proposition is tautologous, it is vacuous, and the speaker is specifically not committed to (175) even though the phrase *all of John's children* presupposes (or conventionally implicates, in the terminology of this theory) (175).

For *holes* Karttunen & Peters can obviously just let the heritage

expression allow the implicature expressions to ascend to become the conventional implicatures of the whole.

Thus, on this theory, presuppositions are not actually cancelled, they are blocked during the derivation of the sentence and simply do not arise from the whole. In many ways this is a highly sophisticated and carefully constructed model that can be fully formalized within what is perhaps the most rigorous of contemporary linguistic theories.

Karttunen & Peters connect their theory to the earlier attempts to define pragmatic presupposition, along the following lines: cooperative participants have the obligation to "organize their contributions in such a way that the conventional implicata of the sentence uttered are already part of the common ground at the time of utterance" (1975: 269). As we have seen, this is too strong a constraint, and it will be sufficient to require that the so-called conventional implicata are consistent with the common ground.

There are a number of substantial problems for this theory. It is formulated specifically to deal with the problems of projection that we reviewed above, and the solutions offered are what we may call 'engineering solutions' – i.e. whatever is required in the way of formal apparatus is simply built into the compositional process of sentence construction. In order to handle the intricacies of the projection problem, therefore, the details of the engineering must become increasingly complicated. It is possible, for example, to show that the latest formulation does not in fact handle some of the more intractable cases. For example, the filtering rule for conditionals we sketched in (173) is identical to the rule for conjunctions, and so the rule for conjunctions incorrectly predicts that (176) has the presupposition (177) (this counter-example is drawn from the substantial set assembled in Gazdar, 1979a: 108–19):

(176) It is possible that John has children and it is possible that his children are away
(177) John has children

This happens because the filtering rule in (173) will predict that the presuppositions of (176) are (or at least include) those in (178):

(178) John exists and if it is possible that John has children then John has children

But since the antecedent of the conditional in (178) is entailed by

(176), (176) plus the conditional entails (177). So it is predicted, incorrectly, that (176) will have (177) as a presupposition. Since the solutions are simply of an engineering sort, it remains open to Karttunen & Peters to try to re-tool the solutions to cope with the known counter-examples of this sort. Rather more troublesome is the evidence that the proposed filtering constraints are asymmetrical in the way that (137) is above – this makes it impossible to account for the filtering in (179) (drawn from Wilson, 1975) where the consequent entails what the antecedent presupposes, namely (180):

(179) If Nixon knows the war is over, the war is over
(180) The war is over

Again, though, it is possible that with sufficient ingenuity more complex filtering rules that will acount for (179) can be built into the apparatus.

Where the theory begins to get into the greatest difficulty is where it has to deal with some of the other aspects of contextual defeasibility that we have reviewed above. For example, to handle the simple examples of overt presupposition denial like (181) and (182), the conventional implicature theory is forced to adopt the view that the negative morphemes in natural languages are ambiguous between presupposition-preserving and presupposition-negating senses:

(181) John didn't manage to stop – he didn't even try
(182) John didn't regret losing the game, because in fact he won

Because presuppositions are, on this theory, really conventional implicata, they cannot be cancelled, and since they must ordinarily survive negation (and this has to be built into the heritage expressions for negative morphemes), the negation in (181) and (182) must be a different kind of negation, namely one which does not let conventional implicata survive. But this view runs into all the objections we raised above against the view that negation is ambiguous (and others: see Atlas, 1980).

But the main objection is that such a theory cannot handle contextual defeasibility of the sorts illustrated in examples (84)–(96). It cannot do this for the same reasons that semantic theories of presupposition cannot: there is no reference, in the calculation of the presuppositions of a sentence, to the assumptions that are made in the context. There is merely an additional pragmatic constraint that the speaker should not presuppose what is not already mutually

assumed (which is too strong as we have noted). Therefore, if there are any ways in which contextual assumptions, modes of discourse, or the like serve to nullify presuppositions – which, we have argued, there are in abundance – such a theory is going to make the wrong predictions about what inferences participants make from sentences in context. It is also going to make the wrong predictions wherever the classification of linguistic items into *holes*, *plugs* and *filters* is itself subject to pragmatic re-classification. A number of relevant cases were brought up by Liberman (1973), who pointed out that two sentences like the following ought to behave quite differently under the filtering rule for conjunctions (as in (137)), and yet in fact both have the presuppositions of their second clauses filtered out:

(183) Perhaps John has children but perhaps John's children are away
(184) Perhaps John has no children, but perhaps John's children are away

Now we have already noted, in connection with (176) above, that the filtering theory makes the wrong predictions with sentences like (183): let us therefore assume, as a way of patching up the theory, that the presuppositions of modal sentences are calculated first on the basis of their non-modal subordinate sentences (this expedient will not, in the long run, work – see Gazdar, 1979a: 111–12). Then (183) will not presuppose that John has children, despite the potential presupposition due to the phrase *John's children*, for the first clause (ignoring the modal) will entail the presupposition, and the presupposition will therefore be filtered in accord with the filtering rule for conjunctions in (137) or (173). This seems the correct result, and is to be expected on the assumption that *but* has the logical properties of *and* (as argued in Chapter 3). However, now consider (184): intuitively this also fails to presuppose that John has children. But we cannot account for this in terms of the filtering rule for conjunctions, as readers may verify for themselves. However, we *could* account for it if *but* was here functioning like *or*, for then the filtering condition for disjunctions in (138) would correctly predict the loss of the presupposition. And, intuitively, this is the correct analysis: the most likely use of (183) is as a single speculation, but of (184) as two alternative or disjunctive speculations. So it is the use of an utterance in discourse for specific conversational purposes, rather than the logical properties of the particular connective, that seems to determine

the appropriate filtering condition. Once again, presupposition proves contextually dependent.

In short, Karttunen & Peters' theory suffers from much of the inflexibility of theories of semantic presupposition, even though it differs from those theories by not including presuppositional inferences in the truth conditions of sentences.

The other sophisticated attempt to deal with the projection problem handles the problems of contextual defeasibility as well. In this theory, which is due to Gazdar (1979a, 1979b), presuppositions are assumed once again to be non-truth-conditional aspects of the meaning of linguistic expressions. As on the prior theory there is no way to predict the presuppositions of any linguistic expression simply given its truth-conditional characterization; instead presuppositions have to be arbitrarily associated with linguistic expressions, principally in the lexicon.

In contrast to the prior theory, in Gazdar's theory presuppositions are actually cancelled. First, all the **potential presuppositions** of a sentence are generated as a complete set, as in the original Langendoen & Savin (1971) suggestion. So at this stage, the presuppositions of any complex sentence will consist of all the presuppositions of each of its parts. Then a cancelling mechanism is brought into play which culls out of this total set of potential presuppositions all those that will survive to become **actual presuppositions** of a sentence uttered in a particular context. (Note that this distinction will allow us to talk sensibly about both sentences and utterances presupposing: sentences will be associated with potential presuppositions, utterances with actual presuppositions.)

The cancelling mechanism works in this way. The context here consists of a set of propositions that are mutually known by participants, or which would at least be accepted to be non-controversial. Participants therefore bring to a conversation or discourse some set of accepted propositions: e.g. 'France is a republic', 'the second world war ended in 1945', 'Joe Bloggs lives in Liverpool', or whatever. When they converse, participants augment the context by the addition of the propositions they express.[28] Crucial to Gazdar's theory is that this augmentation should proceed in a specific order:

[28] Actually, Gazdar's formulation is phrased only in terms of an individual speaker's commitment to what his utterances entail, implicate and presuppose, but there is a natural, though not necessarily simple, extension to what is jointly assumed by participants.

first the entailments of what are said are added to the context, then the conversational implicatures, and only finally the presuppositions. More precisely the order in which an utterance's inferences are added is that in (185):

(185)
1. the entailments of the uttered sentence S
2. the *clausal* conversational implicatures of S
3. the *scalar* conversational implicatures of S
4. the presuppositions of S

The ordering is important because there is a crucial constraint put on the addition of new propositions to the context: at each step, the additional proposition may only be added if it is consistent with all the propositions already in the context. It is essential to the formalization of the theory, although it will not concern us here, that all potential implicatures and presuppositions are epistemically modified – i.e. what is implicated or presupposed as the proposition p on other theories, will here have the form 'the speaker knows that p' or symbolically, Kp.

Some examples will quickly demonstrate how cancellation of both conversational implicatures and presuppositions works. In Chapter 3 we showed that the conditional and the disjunction have the clausal implicatures indicated in (186):

(186) A sentence of the form *if p then q* or *p or q* will clausally implicate {Pp, P $\sim p$, Pq, P $\sim q$} (where Pp is to be read 'It is consistent with all the speaker knows that p')

We also showed that the assertion of a low point on a scale will implicate that a higher point on the scale does not hold, as in the examples in (187):

(187) *some of the boys* implicates 'K(not all of the boys)'
ten boys implicates 'K(not eleven or more)'
the coffee was warm implicates 'K(the coffee was not hot)'

Now given the ordering in (185) and the consistency requirement, (189) will not have the same implicatures as (188) (as we noted in 3.2.4):

(188) Some of the police, if not all of them, beat up the protester
(189) Some of the police beat up the protester

Only (189) implicates (190), and this is accounted for by the fact that

(188) has the additional clausal implicature (due to the parenthetical conditional) (191) which is added to the context before the scalar implicature (190). But (190) is not consistent with (191), so when we come to add (190) to the context, we cannot, due to the fact that (191) has already been added. The implicature in (190) is therefore rejected.

(190) The speaker knows that not all of the police beat up the protester

(191) It is consistent with all the speaker knows that all of the police beat up the protester

Notice that if there had been an inconsistent entailment, as in (192), that also would block (190), which could not therefore be added to the context:

(192) Some of the police, and in fact all of them, beat up the protester

If we now turn to presupposition cancellation, we see that the same mechanisms work. Thus, (193) potentially presupposes (194) due to the definite description in the consequent, but this is cancelled by the clausal implicature of the conditional construction, here (195):

(193) If there is a King of France, the King of France doesn't any longer live in Versailles

(194) The speaker knows that there exists a King of France

(195) It is consistent with all the speaker knows that there is not a King of France

For (195) will be added to the context prior to the potential presupposition (194) and thus will block the addition of the latter, which is inconsistent with (195). The advantages of this mode of presupposition-blocking over the one utilized by Karttunen & Peters' theory become especially clear when one considers disjunctions and conditionals: on Karttunen & Peters' theory the filtering rules treat the clauses asymmetrically with the difficulties pointed out above in connection with (179), but Gazdar's theory makes the order of constituents irrelevant to the cancellation process.

Gazdar's theory also handles the cases of overt presupposition denial very straightforwardly. A sentence like (196) will entail (197), which will be added to the context prior to the potential presupposition (198) so ensuring that the latter is cancelled:

(196) John doesn't regret failing, because in fact he passed

(197) John passed

(198) John failed

As a result this theory is the only extant presuppositional theory that can handle sentences like (199):

(199) The King of France doesn't exist

Other theories would commit their authors, given the truth of (199), to the inconsistent propositions that there is a King of France and there isn't.

In precisely the same way Gazdar's theory handles those cases like (200), where a presupposition is cancelled simply by background knowledge:

(200) Kissinger ceased to be Secretary of State before the third world war started

(201) The third world war started

For the presupposition (201) will simply not be added to the context if it is inconsistent with what is already there. It is for this reason that Gazdar can happily dispense with Karttunen's *plugs* – for example, the presupposition due to ***realize*** in (202) will be rejected not because it falls under a verb of saying but because we happen to know it is not the case:

(202) The student said that he hadn't realized that Wales was a republic

Similarly, for those sentences above like (84)–(96) where reference is made to contextual assumptions in calculating the presuppositions of a complex sentence, only Gazdar's theory allows such reference to be made. Thus the presupposition of the *before*-clause in (203) is cancelled just because it is inconsistent with what we already take for granted (namely, that people without heads do not continue to do things):

(203) King Charles I had his head cut off half an hour before he finished filing through the bars

But the great strength of Gazdar's system is that while handling the cases of contextual defeasibility, it predicts correctly the solutions to the projection problem for sentences of arbitrary complexity. There are relatively few counter-examples known (but see Gazdar 1979a: 156–7, and also Soames, 1979: 660). Given the complexities of the

projection problem, this suggests that there must at least be something correct about Gazdar's solution. It contrasts here with the Karttunen & Peters' solution using the categories of *plugs*, *filters* and *holes*, where no independent reasons for the existence of these categories can be advanced, and where the imperfect filtering conditions also have an unmotivated and *ad hoc* existence.

The two theories discussed above are the most developed theories of presupposition that deal with the projection problem in anything like an adequate way. However, they are by no means the only directions in which the best solutions may ultimately be found. In particular, both theories assume that each presupposition-trigger will have its own presupposition recorded in the lexicon or elsewhere. A theory that would be preferable, if it could be found, would not treat presuppositions item-by-item in this way, but rather would predict the presuppositions from the semantic content of presupposition-triggers, by means of general pragmatic principles. There are a number of indications that such a more powerful explanation will ultimately prove correct. First, there always seem to be intuitively close relations between the semantic content of presupposition-triggers and their corresponding presuppositions. In this way, presuppositions contrast with conventional implicatures, which often have no close relation to the semantic content of the linguistic items that give rise to them (e.g. in Javanese there is a word *pisang* that means 'banana', but conventionally implicates that the addressee is socially superior to the speaker). Secondly, the item-by-item treatment suggests that presuppositions are attached to presupposition-triggers merely by arbitrary convention. In that case, there would be no reason to expect presupposition-triggers in different languages to be parallel in any way; however, even in languages of quite different families, the linguistic items that give rise to presuppositions seem to be precisely parallel, in so far as the syntax and semantics of particular languages allow (see e.g. Annamalai & Levinson, in press). It seems reasonable, then, to hope that some theory of presupposition can be found that, given a trigger's semantic specification, will predict its presuppositions.

In order to show that alternative theories could be viable, it is useful to apply what we may call the *re-allocation programme*, a programme independent of any particular theory of presupposition and a sensible preliminary to any such theory. The first step is to assume that part

of the difficulty of formulating adequate theories of presupposition arises from the fact that what is normally called *presupposition* is actually a heterogeneous collection of quite distinct and different phenomena, some perhaps semantic, others different varieties of pragmatic implication. The task then is to try to reduce presupposition to other kinds of inference, in particular to semantic entailment and matters of logical form on the one hand, and to conversational implicatures, conventional implicatures, felicity conditions and the like on the other. If this reductionist programme leaves no residue, then the notion *presupposition* would be successfully reduced to other more useful concepts. If, on the other hand, some clear cases of presuppositional phenomena remain unreducible, then we can formulate a theory of presupposition to handle just these cases.

Most theorists have assumed that at least some such re-allocation of the phenomena is due, and have argued accordingly (for different versions see e.g. Keenan, 1971; Kempson, 1975; Wilson, 1975; Karttunen & Peters, 1977, 1979). Karttunen & Peters have argued for total reduction, mostly to conventional implicature, but this is little more than a terminological switch, and displaces other phenomena that seem better thought of as conventional implicatures (see Chapter 3 above). In reality their concept of conventional implicature has largely been fashioned to deal precisely with the class of facts once called presuppositions. More genuine reductionism – in this case mostly to matters of entailment and conversational implicature – has been advocated independently by Atlas (1975b), Kempson (1975), Wilson (1975), Boër & Lycan (1976), and more recently by Wilson & Sperber (1979) and Atlas & Levinson (1981).

The attraction and initial plausibility of the reduction to matters of entailment and conversational implicature can be gauged best from some examples. If we take the cleft construction as in (204) and its associated presupposition as in (205):

(204) It was his coat that John lost
(205) John lost something

we can see immediately that in fact (204) entails (205) – in all worlds in which John loses his coat it will also be true that he loses something. It is therefore only necessary to invoke the notion of presupposition in the negative cases, as in (206):

(206) It wasn't his coat that John lost

which still continues to pragmatically imply (205). But here we could say that the implication is in fact a conversational implicature, of the generalized variety. To show this, we must produce a Gricean argument of the standard sort that will show that in order to preserve the assumption of co-operation, a hearer of (206) must assume (205). The argument might go roughly as follows:

1. The speaker has said (206), and not the simpler (207):

(207) John didn't lose his coat

2. The logical form of (206) might be roughly as in (208):

(208) $\sim (\exists x\ (\text{Lost}\ (j, x)\ \&\ (x = jcoat)))$

3. Like most negative sentences (208) is not very informative; therefore if the speaker is co-operating it is likely that he intended to convey more than what the relatively uninformative statement actually means

4. The utterance (206) would be relatively informative if the speaker meant in fact to convey one of the following related propositions:

(209) $\exists x\ (\sim \text{Lost}\ (j, x)\ \&\ (x = jcoat))$
(210) $\exists x\ (\text{Lost}\ (j, x)\ \&\ (x \neq jcoat))$

But (209) is more directly expressed by (211),

(211) It was his coat that John didn't lose

so if the speaker had meant that he should, by the maxim of Manner, have said it directly; since he didn't, (210) is left as the more informative reading of (206).

5. To preserve the assumption of co-operation, the relatively uninformative sentence (206) should be read as (210), which entails the 'presupposition' (205); the speaker has done nothing to stop me so reasoning, so this is what he must intend to convey

An argument of this sort can be faulted in various ways. It is based in fact on the *principle of informativeness* (outlined in 3.2.4) rather than on Grice's maxims, and it fails to explain why the cleft sentence was used in the first place. Moreover such an approach to presupposition in general would be both *ad hoc* and piecemeal: for each kind of presupposition-trigger an argument of this sort will have to be made. An approach based on general principles that would apply to

a large range of presuppositional phenomena would be preferable if it could be found. Here two recent suggestions deserve mention.

The first, advanced by Wilson & Sperber (1979), is that semantic representations should be enriched in such a way that simple pragmatic principles interacting with them will predict what is presupposed. They suggest that all the entailments of a sentence are not on a par; rather an adequate semantic representation would consist of an ordered set of entailments, divided into two sets – **background** and **foreground** entailments. The actual ordering of entailments is logical: if entailment A in turn entails entailment B, then A is ordered before B. However, a sentence may have a number of such chains of entailment, and the importance of one such chain, and the distinction between foreground and background entailments, is determined not by logical considerations, but by grammatical form (including stress). For example, (212) with heavy stress on *Sarah*, will determine the **focal scale** (or chain of entailments) in (213):

(212) John is married to *Sarah*
(213) a. John is married to Sarah (*foreground*)
b. John is married to someone (1st *background* entailment)
c. John has some property
d. Something is the case

This scale is obtained by substituting existentially quantified variables (or *someone*, *something*) for constituents in the sentence, starting with the focus constituent, here *Sarah* (see Chomsky, 1972). Now, the first entailment obtained by substitution of a variable for the focus (here *b*), is the first background entailment; all those entailed by it (here, *c* and *d*) are also part of the background. All entailments ordered above the background, here only *a*, are part of the foreground. Given this much semantic structure, we can then bring a simple pragmatic rule to bear: the background entailments of a sentence are assumed to be not relevant in the context. What is assumed to be relevant, and thus the *point* of saying the sentence, is whatever information has to be added to the background to obtain the foreground – namely the entailments ordered above the background (here *a*). Thus the point of saying (212) would normally be to assert that it is Sarah that is John's spouse, against an assumed background that John is married to someone. Hence, under denial or questioning, the background will continue to be assumed, and only the foreground denied or questioned. In short, so-called 'presuppositions' are just background entailments.

For example, (214) will have the same structure of entailments as (212):

(214) It is Sarah that John is married to

This semantic structure is again determined by grammatical structure – here by the cleft construction rather than by heavy stress. So the alleged presupposition of clefts is simply the first background entailment, here (213b) above.

The idea of enriching semantic representations so that pragmatic principles can interact with them in complex ways seems the correct theoretical move. However, the use of entailment in this way will again raise all the problems that undermined semantic theories of presupposition, namely the joint difficulties of defeasibility in linguistic and extra-linguistic context, and survival in modal and opaque contexts where entailments cannot survive. We will not willingly re-invoke these difficulties if any alternative can be found. And if Wilson & Sperber wish to retreat to an account in terms of conversational implicatures in complex sentences, then they have not shown us how to do this.

The other approach, advocated by Atlas & Levinson (1981), is to take much more seriously the role of logical form (or the structure of a semantic representation) in the production of pragmatic inferences. We have already argued (in 3.2.2) that conversational implicatures are sensitive to the details of logical form; sentences with the same or similar truth conditions, but different logical forms, can have quite different conversational implicatures. But on what grounds, other than predicting the right entailment relations, should we hypothesize a particular logical form for a sentence? Perhaps these: (a) it should capture the intuitively significant semantic structure of the sentence, (b) it should accurately predict the pragmatic inferences it will generate in context. Amongst the aspects of structure in (a) might be the identification of what a sentence is *about* (Putnam, 1958). (What a sentence is about might then have a close relation to pragmatic notions of what is *given* or assumed in discourse.) For example, there seems to be an intuition that what a sentence is about is indicated by its grammatical structure; and that this has some relation to its logical structure. In simple sentences what a sentence is about seems to coincide with the logical subject: thus *Mary slept* would be about Mary. We might now try and regiment our logical forms for complex sentences so that what such sentences are about coincides with their logical subjects. Such a line leads to quite

complex logical forms, and yet these do seem to capture some intuitions about the significant semantic structure of sentences. For example, the logical form hypothesized for the cleft sentence (215) can be argued on detailed semantic and pragmatic grounds to be (216):

(215) It was John that Mary kissed
(216) $\lambda x(x = \text{John})\ (\gamma x\text{Kiss}(\text{Mary}, x))$

We have made use here of two complex logical devices: **lambda-extraction**, which can be used to construct complex properties (Allwood, Andersson & Dahl, 1977: 155) and the **group-** or **gamma-operator**, which constructs collective terms, so that $\gamma x\text{A}(x)$ reads 'a group of individuals x that have the property A'. Thus (216) as a whole reads 'A group kissed by Mary has the property of being identical to John'. The logical subject is thus 'A group kissed by Mary', and this is what the sentence is *about*; this corresponds to the surface structure clause (*one*(*s*)) *that Mary kissed*. Such a logical form will entail that Mary kissed someone, and that Mary kissed John, but it does not have exactly the same truth conditions as the unclefted *Mary kissed John* (since it entails that Mary kissed just John).

We now invoke a general pragmatic principle: if a sentence is about t, then the existence or actuality of t can be assumed to be non-controversial or given, unless there are specific indications or assumptions to the contrary. The cleft sentence (215) is about its logical subject in (216): those kissed by Mary. This logical subject is responsible for the entailment 'Mary kissed someone'. For positive cleft sentences we now have the following account: such sentences entail their alleged presuppositions, but since these propositions are derived from what the sentence is about, and are thus assumed to be given, they will normally not be the main point expressed by asserting such sentences.

For the negative cleft, as in (217):

(217) It wasn't John that Mary kissed

the account would run as follows. The logical form of (217) is (218), where negation is (as generally in natural languages) external or wide-scope.[29] Such logical forms with wide-scope negation are not

[29] This is the normal assumption made by *radical pragmatics*, i.e. the attempt to maximally simplify semantics by developing pragmatics (see Cole, 1981). However, rather more complex approaches to negation may in fact be required – see Atlas, 1977, 1979.

very informative: the logical form of (217) merely states that (215) is not the case, without indicating how it fails to be true. However, there is again a general pragmatic principle, the **principle of informativeness** (discussed in Chapter 3), which legitimates the interpretation of wide-scope negation as narrow-scope or predicate negation. The utterance of (217) with the logical form (218) will therefore have the preferred interpretation indicated in (219):

(218) $\sim (\lambda x(x = \text{John})(\gamma x\text{Kiss}(\text{Mary}, x)))$
i.e. 'It is not the case that a group that Mary kissed has the property of being identical to John'

(219) $\lambda x(x \neq \text{John})(\gamma x\text{Kiss}(\text{Mary}, x))$
i.e. 'A group that Mary kissed has the property of not being identical to John'

Once again, then, the statement will be about its logical subject, 'one(s) who Mary kissed' (in general, if F(a) is about a, $\sim$ F(a) is about a). Now since saying (217) implicates (219), and (219) has the logical subject outside the scope of negation, the implicature (219) entails that Mary kissed someone. So, in the negative cleft, the proposition that Mary kissed someone will be entailed by an implicature, and thus itself implicated. Moreover, it is the logical subject (what the sentence is about) that is responsible for this implicature, so the proposition 'Mary kissed someone' will once again be assumed to be given.

An approach of this sort is meant to have general application, along the following lines. First we motivate the setting up of complex logical forms by making them responsible for capturing aspects of significant semantic structure. Then we examine how these enriched semantic representations interact with pragmatic principles of interpretation, not only of Grice's sort, but of a sort that actually add information to the semantic content of the sentence (e.g. the principle of informativeness). Here we look for general processes: for example, the relation between logical subjects, 'aboutness', and a preferred interpretation in which what a sentence is about can be presumed. The hope is that by enriching both semantic representations and pragmatic principles in this way, they will interact in a more intimate manner, and that this interaction will be seen to be responsible in a systematic way for the apparently *ad hoc* inferences called presuppositions.

There is one immediate objection to any such reduction of pre-

supposition to entailment and implicature: unlike conversational implicatures, presuppositions appear to be **detachable** in Grice's sense (see 3.1 and 3.2.1). That is, whereas in the case of implicatures it is generally impossible to find another way to say the same thing that lacks the same implicatures, in the case of presuppositions the inferences seem to be attached directly to certain aspects of the surface form of linguistic expressions – e.g. to the cleft construction itself.

In fact, though, the difference is more apparent than real. Consider, for example, the verb *regret* which is claimed to have, as an arbitrary additional aspect of its meaning, the presupposition that its complement is true. If the presupposition was really detachable it ought to be possible to find different ways of making the same statement that lacked the presupposition in question. But this is not easy. Consider for example all the near-paraphrases in (220):

(220)
a. John regrets that he ate all the pudding
b. John is sorry that he ate all the pudding
c. John repents of having eaten all the pudding
d. John is unhappy that he ate all the pudding
e. John feels contrite about eating all the pudding
f. John feels penitent about eating all the pudding
g. John feels remorse about eating all the pudding

All of these, and all of their negative counterparts, continue to presuppose what the sentence with *regret* in it does, namely:

(221) John ate all the pudding

If readers now return to the list of presuppositional phenomena above, and armed with a thesaurus try to find paraphrases, they will discover that it is in fact very difficult to obtain expressions with similar meanings that lack the presuppositions in question. And where exceptionally they can be found, it may often be because the logical forms in question are in fact quite different enough to trigger distinct implicatures.

The reductionist could therefore claim that presuppositions share two very important features with conversational implicatures – namely defeasibility and non-detachability. The only major distinctive characteristic of presuppositions that remains is the projection problem, the behaviour of presuppositions in complex sentences. But this distinction too can easily be eroded, as some examples will

indicate. Firstly, survival under modal operators seems to be a feature shared by both presuppositions and implicatures. Thus (222) and (223), where the latter is (222) embedded under a modal, can share the same implicature (224):

(222) John has some of the tools
(223) It's possible that John has some of the tools
(224) (Speaker knows that) John has not got all of the tools

If we then turn to the most specific property of presupposition projection, namely filtering in conditionals and disjunctions, we find again that implicatures can mimic presuppositions. Consider, for example:

(225) John has some of the tools, if not all of them

where the consequent (= (222)) implicates (224) but the whole sentence does not have this implicature. But this is precisely the circumstance under which presuppositions are filtered, as indicated in the filtering condition in (137) above. Or consider (226):

(226) Either John has all of the tools, or he has some of them

where the second disjunct implicates (224) but the sentence as a whole lacks this implicature. But this is precisely the condition under which presuppositions are filtered in disjunctions too (see (138) above). So it really is far from clear that presuppositions are distinguished from conversational implicatures by their behaviour in compound and complex sentences.

The reductionist programme thus remains open. The main difficulties that remain are establishing sufficiently rich logical forms to trigger implicatures that will effectively model presuppositions, and some of the more esoteric parts of the projection problem. Recollect, for example, that Gazdar uses implicatures to cancel presuppositions and in this way obtains remarkably accurate predictions of presuppositional behaviour in complex sentences. How can the reductionist use the same apparatus, given that he would have to use implicatures to cancel implicatures? In fact it is possible in a very large range of cases to adapt Gazdar's mechanisms, allowing entailments to cancel implicatures and allowing implicatures due to higher constructions to cancel inconsistent implicatures that arise from embedded clauses. Thus in (227) the implicature from the embedded sentence (228) is (229):

(227) Some of the boys went to the party, if not all

(228) Some of the boys went to the party
(229) Not all of the boys went to the party

but this is cancelled – on this theory – because there is an inconsistent implicature from the matrix sentence, namely (230) due to the conditional construction:

(230) It is consistent with all the speaker knows that it is not the case that (229) is true

This principle of 'matrix wins' works extremely well for the majority of cases. It is too early to know whether or not this approach, or something similar, is ultimately viable.

4.5 Conclusions

We began this Chapter by noting that philosophical and linguistic treatments of presupposition deal with a very much narrower range of phenomena than are included within the ordinary language sense of the term. The general pragmatic effects of foregrounding and backgrounding information within a sentence can be achieved in many ways that are not presuppositional in this narrow sense, e.g. by changing word order, utilizing syntactic subordination, prosodic emphasis or the emphatic particles provided by many languages. There is considerable overlap, but no equivalence, between presuppositional accounts and accounts in terms of the **topic/comment** distinction (not reviewed in this book; see e.g. Clark & Haviland, 1977; Gundel, 1977; Foley & Van Valin, in press). Yet even within this narrow scope, we have shown that there are considerable problems to be overcome. Above all, if, as seems likely, presuppositions are not correctly treated as inferences associated with linguistic elements item-by-item in a non-predictable way, then at present we have no adequate theory at all. In that case, what we need is a theory that predicts presuppositions from the semantic specification of linguistic expressions. Such a theory would be an essentially hybrid account: presuppositions would not be *sui generis*, but rather the result of complex interactions between semantics and pragmatics. But to model such interactions we need to know considerably more about both the structure of semantic representations and the pragmatic principles that interact with them. We conclude that presupposition remains, ninety years after Frege's remarks on the subject, still only partially understood, and an important ground for the study of how semantics and pragmatics interact.