

# ***It-Clefts, Informativeness, and Logical Form: Radical Pragmatics (Revised Standard Version)***

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## **1. THE STANDARD VERSION OF RADICAL PRAGMATICS AND THE STANDARD OBJECTIONS**

The following is an elementary fact: Sentences with the same truth conditions, as in (1), can have different logical forms, as in (2).

- (1) a. *It's done.*  
b. *It's done, and if it's done it's done.*
- (2) a.  $p$   
b.  $p \ \& \ (p \rightarrow p)$

Obviously, in a broad sense, (1a) and (1b) differ in meaning. Sentence (1a) could be an answer to the question (3a) in a way that (1b) could not, whereas (1b) would be a natural response to (3b), though (1a) would not.

- (3) a. *Have you done it yet?*  
 b. *Oh dear, I wish I hadn't done that.*

The redundancies of (1b) that are due to its logical form (2b) create distinct conversational implicatures (Grice, 1975, p. 52). Conversational implicatures, we shall argue, are defined on the level of semantic representation (logical form).

Grice's program in "Logic and Conversation" is conservative with respect to semantic representation and with respect to the postulation of different senses for expressions. For example, the divergence between the "meanings" of the logical connectives and the words *not*, *and*, *or*, *if* . . . *then*, *all*, *some* was held to be a difference in their USE rather than in their contributions to the TRUTH CONDITIONS of the sentences containing them. Semantics turns truth-conditional and wears a comfortably familiar face—first-order quantification theory and extensions thereof.

A Standard Radical Pragmatics view might have argued that "what is said (asserted)" in (4a) is the same as in (4b); their truth conditions would be said to be the same.

- (4) a. *It was John that Mary kissed.*  
 b. *Mary kissed John.*  
 c. *Mary kissed someone.*  
 d. *It wasn't John that Mary kissed.*

But (4a) exhibits presuppositional behavior that (4b) does not, namely, the preservation of the inference to (4c) under denial and questioning of (4a). Standard Radical Pragmatics would claim that (4a) entails (4c), but its negation (4d) does not. Sentence (4d) would be said to be an external negation (Allwood, 1972; Atlas, 1975a; Gazdar, 1976, 1977, 1979; Kempson, 1975, 1977; for qualifications see Atlas, 1975b, 1977, 1978). An internal negation understanding would be a GENERALIZED CONVERSATIONAL IMPLICATUM of a use of (4d). What Allwood (1972), Atlas (1975a, 1975b), Fogelin (1967), Grice (1961), Harnish (1976), Kempson (1975), and O'Hair (1969) intended was a conversational implicatum that in this chapter we will derive from a Principle of Informativeness. In a sense to be explained, the implicatum is the product of an INFERENCE TO THE pragmatically BEST INTERPRETATION. From the relevant internal negation understanding of (4d), it follows that Mary kissed someone, that is, (4c) follows.

The general hypothesis for presupposition is the obvious generalization. Whenever "presuppositions" occur—for example, those associated with proper names and descriptions, clefts, aspectual verbs, pseudo-clefts, iteratives, quantifiers, etc.—the propositions should be considered an entailment of the affirmative sentence and part of or entailed by a gen-

eralized conversational implicatum of saying the negative sentence. Sentences that give rise to presuppositions should on this analysis differ from their corresponding presuppositionless sentences at least in logical form if not also in truth conditions.

There are different sorts of objections to this kind of pragmatic theory. The first has been to challenge the division of labor in the theory: Affirmative sentences normally have entailments; external negations have generalized conversational implicata. It seems to us that the data do indicate a difference in behavior between affirmative and negative sentences. As an example, Gazdar (1979, pp. 199–213) has noted the cancelation behavior in (5).

- (5) John  $\left\{ \begin{array}{l} ? \text{ has} \\ \text{hasn't} \end{array} \right\}$  stopped beating his wife because, in fact, he never beat her at all.

Of this difference between affirmative and negative sentences Gazdar writes that it had “not been discussed by proponents of pragmatic theories of presupposition, because they had had no way to explain [it] [1979, p. 120].” And he goes on to say, correctly, that it “can be readily explained if we allow the factive to entail its complement [p. 121].” At the time that Gazdar originally wrote those lines a pragmatic theory appeared that met his demands. It was argued by Atlas (1975a, pp. 42–44) that affirmative factive sentences entail their complements and that the negative sentence does not entail, but its use does implicate, the complement. Gazdar (1976, 1977, pp. 126–127) expresses skepticism that such a Gricean explanation could be adequate.

Gazdar (1977, p. 127) complains that the negative sentence *John hasn't stopped beating his wife* is said to “presuppose” *John has been beating his wife* and to deny *John is no longer beating his wife* but that no Gricean argument EXPLAINS why those two sentences play just those pragmatic roles. (The sentences “seem, a priori [*sic*], equally informative, newsworthy, relevant, etc. to whatever discourse . . . might be contributed to [p. 127].”) The analogous complaint for *know* would be that *John doesn't know that Caesar crossed the Rubicon in 44 B.C.* is said to presuppose *Caesar crossed the Rubicon in 44 B.C.* and to deny *John warrantably believes that Caesar crossed the Rubicon in 44 B.C.* but that no Gricean argument EXPLAINS why those two sentences play just those pragmatic roles.

The reply, to abbreviate the account in Atlas 1975a, is that the negative sentence, whose logical form is taken to be an external negation, is relatively uninformative. To “presuppose” the truth of *Caesar crossed the Rubicon in 44 B.C.* is to understand a stronger claim by the negative sen-

tence, one that asserts John's ignorance. The stronger claim is a **COMPETING INTERPRETATION** of the negative sentence, as (independently of a special context) no other English sentence both literally and more perspicuously can be used to express that claim (see the maxim of Manner in Grice, 1975, p. 46). If the conversation is **ABOUT** John's epistemic state, our Principle of Informativeness will lead the hearer to understand the speaker's utterance in the expected way. Thus the negative sentence is understood as a particular internal negation, an instance of what is a generalized implicature from external to an internal negation. Which internal negation is implicated, when there is a choice to make, obviously depends on what the sentence is understood to be "about," that is, on what the sentence is understood to "presuppose," and on what the sentence is understood to be saying about it—on considerations, vaguely, of relevance. A lovely piece of verbal play illustrating the way in which background can shift focus and presupposition is discussed by Atlas 1975b. The datum is taken from Tom Stoppard's play *Jumpers*, Act II.

- (6) Archie: *Ah!—I knew there was something!—McFee's dead.*  
 George: *What?!!*  
 Archie: *Shot himself this morning, in the park, in a plastic bag.*  
 George: *My God! Why?*  
 Archie: *It's hard to say. He was always tidy.*  
 George: *But to shoot himself. . . .*  
 Archie: *Oh, he could be very violent, you know. . . .*

The second problem is the projection problem, the problem of how the presuppositions of a sentence depend upon the presuppositions of its parts. If presuppositions have projectional behavior distinct from that of conversational implicata, then *prima facie* they are different. On the other hand, if we can show that their behavior is the same, this obstacle to the reduction of presupposition to generalized conversational implicature can be removed.

Sentence (7a) scalar-implicates (7b):

- (7) a. *John has three children.*  
 b. *John has no more than three children.*

But when a speaker asserts the conjunction of (7b) and (7a), as in (8), he does not implicate (7b).

- (8) *John has no more than three children, and in fact he has three.*

The same behavior is observed in the traditional cases of presupposition in conjunctions, as is well known (see Karttunen, 1973).

Sentence (9a) implicates (9b):

- (9) a. *Some of the boys went to the party.*  
 b. *Not all of the boys went to the party.*

When a speaker asserts a conditional sentence (10), he does not implicate (9b).

- (10) *Some of the boys went to the party, if not all.*

The same behavior is observed in the traditional cases of presuppositions in conditional sentences.

Finally, when a speaker asserts a disjunction such as

- (11) *All of the boys went or some did.*

in which saying the second disjunct alone implicates *Not all of the boys went* and the negation of the first disjunct entails the implicatum, we observe that the speaker does not implicate *Not all of the boys went*. The same behavior is observed in the traditional cases of presuppositions in disjunctions.

The "filtering" of implicata seems to occur in compound sentences in the same way that filtering of presupposition occurs. In these cases at least the projection properties are no bar to the pragmatic reduction of presupposition to generalized conversational implicature. On the other hand we do not want to deny that there may be some conventional element in presupposition. It is relevant that we reduce presuppositions to GENERALIZED conversational implicature, not to particularized ones. The generalized implicature is "conventional" in the sense that it is not calculated at each occasion of use of a sentence. There is a (defeasible) shared assumption that the implicata obtain in the context unless they are explicitly suspended or canceled (see Harnish, 1976, p. 353). Conversational inferences may well have degrees of conventionalization. (For a philosophical analysis, see Lewis, 1969; for linguistic discussion, see Brown and Levinson, 1978).

Obviously we do not believe that these few remarks dispose of the projection problem. Gazdar (1979) uses his distinctions between potential clausal implicatures, scalar implicatures, and presuppositions to state conditions under which one ranks above the other: Potential presuppositions are not actual presuppositions unless they are consistent with actual scalar implicata; potential scalar implicata are not actual scalar implicata unless they are consistent with actual clausal implicata; and potential clausal implicata are not actual unless they are consistent with the propositions representing the context in which the sentence is uttered and (roughly) the proposition representing the sentence itself. To say whether potential generalized conversational implicata can be substituted for po-

tential presuppositions in Gazdar's projection rules, and with what restrictions on the class of implicata and with what modifications of the rules, requires an exhaustive investigation, which we shall certainly not attempt here.

If projection properties will not distinguish presupposition from implicature, perhaps cancelation will. Karttunen and Peters (1977) note that the apparently factive "judgment" verbs like *criticize* and *forgive* allow overt denial of their associated suppositions in a way that factives like *realize* do not. Compare (12) and (13) and (14).

- (12) *John criticized Rick for farting, although he was in fact quite innocent.*
- (13) *John forgave Rick for farting, although in fact it was Mart who farted.*
- (14) *?John realized that Rick had farted, although in fact he hadn't.*

Karttunen and Peters claim that the suppositions associated with "judgment" verbs are not presuppositions ("conventional implicatures" in their unfortunate terminology) but generalized conversational implicata. However, given that in general "judgment" verbs and factives have identical projection properties and in so many ways behave alike (e.g., under negation, questioning, and in conditionals), the claim is tantamount to an admission that the devices of conversational implicature can account for all the characteristic features of presuppositional phenomena (see Rogers, 1978; Rogers and Gazdar, 1978).

It may well be that cancelation facts like these will in the long run turn out to be the crucial tests for the adequacy of presuppositional theories. The implicatural reductionist will have to find a motivated way of claiming that "judgment" verbs do not entail their complements in affirmative sentences, unlike true factives. An obvious starting point is to note that such verbs are in fact verbs of saying (Rogers, 1978) and that such verbs do not entail their complements.

The data for clefts, factives, and definite descriptions commit the implicatural reductionist to the claim that the affirmative sentences entail "presuppositions" and that saying the negative sentences implicates them. It is worth observing that a Radical Pragmatics theory is not committed to entailment. It may well be that uses of affirmative sentences themselves implicate the propositions. Gazdar (1976; 1977, p. 124) notes two examples where the "presuppositions" are not entailed. Sentences (15a) and (16a) "presuppose" (15b) and (16b); they do not entail them.

- (15) a. *Golda Meir will sack Moshe Dayan before she goes to Cuba.*  
b. *Golda Meir will go to Cuba.*

- (16) a. *Perseus is more of a hero than Bellerophon.*  
 b. *Bellerophon is a hero.*

We shall not attempt an analysis of *before* or of comparative constructions. We merely mention one example (17) where affirmative and negative sentences both have implicata.

- (17) a. *The day is warm.*  
 b. *The day isn't warm.*  
 c. *The day is not hot.*

We must briefly mention lexical items, for example, *again*, *too*, *even*, *only*, whose SOLE content is taken by Wilson (1975) to be presuppositional. If these items have the properties Wilson attributes to them, our Radical Pragmatics program is in difficulty. For if an item has no conventional semantic content, it is difficult to see from what one would derive conversational implicata. However, in (18) we would argue that (18a) entails (18c) whereas saying (18b) implicates it.

- (18) a. *John went to church again.*  
 b. *John didn't go to church again.*  
 c. *John went to church before.*

This analysis explains the data in (19) and (20).

- (19) *?John went to church again and in fact he never went before.*  
 (20) *John didn't go to church again, and in fact he never went before.*

But one might argue instead that the contents of *again*, *etc.* are CONVENTIONALLY (in Grice's sense) rather than conversationally implicated.

In the case of a word like *but* (see Wilson 1975), it is difficult to see how any other account of the difference between *and* and *but* might be given. Nonetheless, the choice between conventional and conversational implicata is a significant one. Levinson (1978) has argued that conventional implicatures form a distinct category with specific projection properties and other defining characteristics, so the reanalysis of some putative presuppositions as conventional implicata is a substantive, and not merely a terminological, issue.

Current views, as, for example, in Gazdar 1979 and Karttunen and Peters 1979, suggest that presuppositions are attached in a conventional way to aspects of surface structure. This intuition is attributable in part (see Grice, 1975, 1978; Horn, 1973) to the difficulty in distinguishing conventional from generalized conversational implicatures and in part to the fact that sentences with identical truth conditions can have quite distinct logical forms, which serve to trigger distinct conversational implicata.

The examples and arguments normally offered against a Radical Pragmatic theory do not seem to us to be as destructive as some have thought.

## 2. TRUTH AND LOGICAL FORM

When Paul Grice introduces implicating, he does so by contrast with saying or asserting. A speaker *S* implicates that *q* to a hearer *H* if (a) *S* says that *p*; (b) *S* does not say that *q*; and (c) *S* implies, suggests, means, etc. that *q* by saying that *p* (Grice, 1975, p. 43). And Grice adds, "In the sense in which I am using the word *say*, I intend what someone has said to be closely related to the conventional meaning of the words (the sentence) he has uttered [1975, p. 44]." What is implicated is not part of what is said, nor is it entailed by what is said, but the hearer's knowledge of what is said, which includes the SENSE of the sentence, is necessary for the hearer's coming to know what the speaker implicated. Since Frege first proposed it, philosophers have found it natural to identify the SENSE of a declarative sentence with its TRUTH CONDITIONS. Linguists recently have followed suit, taking the SEMANTIC REPRESENTATIONS to be LOGICAL FORMS (see Kempson, 1977, Chapter 3). As some seemingly plausible arguments against Radical Pragmatics in recent discussions rest on a curious view of the roles of logical form and truth conditions, we shall first assemble some "philosophical reminders" about the notions of truth and logical form.

Our interest in the logical form of a sentence of a natural language is foremost an interest in the entailment (or logical consequence) relation into which the sentence enters. We want to know what is a logical consequence of it and what it is a logical consequence of. But more, we want to know why these entailments hold, and a logical theory is an answer to that question. Typically we think of a logical form as a formula in first-order quantification theory, but this is not our only logical theory. So what logical form a sentence has depends on what logical theory is chosen. The theory has a formal language (a syntax) into which we paraphrase our sentence; it also has a particular interpretation (a semantics). The logical form of an English sentence is relative to the formal language of the theory and to its interpretation.

Logical theories being what they are, they may be used to give the truth conditions of an English sentence in a perspicuous manner. Logical theory isolates very general features of sentences upon which entailments can be seen to depend—their semantically significant structure—and represents them in a canonical notation, for example, by the logical constants, predicates, and variables of quantification theory. To the extent



that one's linguistic competence consists in one's grasp of deductive relations among sentences, paraphrase into the canonical notation represents the content of that competence in a perspicuous fashion. Likewise, to the extent that one's knowledge of the meaning of a sentence consists in one's grasp of its sense (its truth conditions), paraphrase into the canonical notation represents the meaning of the sentence in a perspicuous fashion (see Strawson, 1974; Quine, 1977).

It is an elementary but sometimes curiously ignored fact that two sentences that are logically equivalent can have different logical forms. To take a trivial example, let the logical form of *A* be  $p \ \& \ q$  and the logical form of *B* be  $q \ \& \ p$ . These are different, provably equivalent logical forms that individually represent the truth conditions of *A* and *B*. The logical equivalence shows us that necessarily *A* is true if and only if *B* is true.

But it is only when we INTERPRET the language of our logical theory that it can even begin to make sense to say that *A* and *B* have the SAME truth conditions. For example, let *V* be a "universal" set of elements and interpret the formula *p* as a subset  $P \subseteq V$ , the set of elements in *V* for which *p* holds, and likewise for *q*. Interpret  $p \ \& \ q$  as  $P \cap Q$ , and  $q \ \& \ p$  as  $Q \cap P$ , the set-theoretical intersections of *P* and *Q* and of *Q* and *P*. Elementary set theory shows that  $P \cap Q = Q \cap P$ . So the "meanings" of  $p \ \& \ q$  and  $q \ \& \ p$  UNDER THIS INTERPRETATION are the same. We can stipulate that sentences *X* and *Y* in language *L* have the "same" truth conditions if and only if the representations of their truth conditions in the semantical metalanguage *ML* have the same interpretation. Relative to the interpretation of our example, *A* and *B* will have the "same" truth conditions. But it is ONLY with respect to an interpretation of our metalanguage that the claim that object-language sentences have the "same" truth conditions can make sense. The mere fact that  $\models p \ \& \ q \leftrightarrow q \ \& \ p$  does not itself imply any such claim. So much for "philosophical reminders." Clarity about such matters will help locate fallacies in arguments that we must now discuss (see Dana Scott, 1970b).

### 3. CLEFTS AND A CRITICISM OF RADICAL PRAGMATICS

It has been asserted by Deirdre Wilson and Dan Sperber that Sentences (21a) and (22a) convey the same information in different ways.

- (21) a. *It is Peter who is married to Sarah.*  
       b. *It is not Peter who is married to Sarah.*  
       c. *Is it Peter who is married to Sarah?*

- (22) a. *It is Sarah that Peter is married to.*  
 b. *It is not Sarah that Peter is married to.*  
 c. *Is it Sarah that Peter is married to?*

In particular they claim that the classes of logical consequences of (21a) and (22a) are identical, and so those who adopt standard truth-conditional semantics must take the sentences to be "semantically identical" (Wilson and Sperber, 1979, p. 300). Of course (21a) and (22a) differ in an important respect. Whether the content of (21a) is asserted in (21a), denied in (21b), or questioned in (21c), in each case (23) but not (24) would be assented to.

(23) *Someone is married to Sarah.*

(24) *Peter is married to someone.*

Mutatis mutandis, whether the content of (22a) is asserted in (22a), denied in (22b), or questioned in (22c), in each case (24) but not (23) would be assented to. And this difference obtains despite the fact that (21a) and (22a) each entail (23) and (24), and in general, despite the "semantical identity" of (21a) and (22a) in truth-conditional semantics.

Anyone who takes this line, argue Wilson and Sperber, must take the observed differences between (21) and (22) to be purely pragmatic. It is then natural to seek an account modeled on Paul Grice's analysis of rational cooperation in conversation. Given that in "saying" (21a), (21b), or (21c) a speaker does not "say" but implies, suggests, or means (23), the "presupposition" of (23) by (21) might be best explained as an "implicatum." Wilson and Sperber argue:

Someone who believes that presuppositions can be identified with Gricean conversational implicatures would have to show that [21a] and denials of [21a] . . . conversationally implicate [23] and not [24], whereas [22a] and denials of [22a] implicate [24] and not [23]. A conversational implicature in turn depends on the *prima facie* violation of one of Grice's conversational maxims concerning relevance, informativeness, brevity, and ease of comprehension. As long as [21a] and [22a] are treated as semantically identical, it is hard to see how they could bring about different violations of the maxims of relevance and informativeness. Indeed, for Grice, two semantically identical sentences must always give rise to identical conversational implicatures unless they differ rather dramatically in length or ease of comprehension, so that they differ in their violations of the two other maxims concerning brevity and perspicuity. There is no such difference between [21a] and [22a], which are not only truth-functional equivalents, but are also built on the same syntactic pattern, and contain the same lexical items. It seems, then, that the obvious pragmatic differences between [21a] and [22a] can never be attributed to Gricean conversational implicatures [pp. 300–301].

Although the argument that we have just quoted seems sensible and plausible, it suffers several defects. First, in Grice's view it is a necessary

condition on conversational implicature (generalized or particular) that it be cancelable without anomaly. Because (23) is ENTAILED by (21a), (23) is not cancelable. A Gricean reduction of presupposition to implicature ought NOT to claim that saying (21a) implicates (23). One representative such theory (Atlas, 1975a, 1975b) makes no such claim. It claims only that (21a) entails (23). Such theories can and do claim that saying (21b) implicates (23) but not (24), that saying (22b) implicates (24) but not (23). If such implicatures were Gricean conversational implicatures in a narrow sense, they would arise solely from the FLOUTING of Grice's maxims. Implicatures that turn on infringements of Grice's maxims and perhaps on additional, similar principles can be termed *conversational implicatures* in a broad sense. Gricean theories need not and do not restrict their resources to Grice's formulations. One of the aims of this chapter is to formulate a pragmatic principle of informativeness distinct from the maxims of Grice's theory (see Section 10). Versions of such a principle have been employed by Grice (1961), Harnish (1972, 1976), and Atlas (1975a, 1975b) to explain the use of disjunctions, conjunction reduced sentences, and negations respectively. It was thought that the principle was a component, a combination, or a consequence of the maxims and argument forms canonized by Grice (1961, 1967, 1975, 1978). It is our contention that the practice, but not, regrettably, the theory, in these accounts points toward a different conclusion. Our principle of informativeness will be incompatible with standard applications of Grice's first maxim of Quantity ("Make your contribution as informative as is required for the current purposes of the exchange"). Thus we hold that, contrary to Wilson and Sperber's account of Gricean Radical Pragmatics, a pragmatic theory claims neither that saying (21a) implicates (23) nor that conversational implicature, broadly conceived, relies solely on the maxims described by Grice, or even on pragmatic arguments compatible with the standard inferences employing those maxims.

The third defect in the Wilson-Sperber criticism rests upon their understanding of the role of truth conditions in a Radical Pragmatics. Because Wilson and Sperber claim that (21a) and (22a) are the same logically, the same lexically, and the same syntactically, it seems to them that the NONDETACHABILITY of conversational implicature implies that (21a) and (22a) should be the same pragmatically. Because the sentences are not pragmatically the same, Wilson and Sperber conclude that a Gricean account cannot be correct. Of course it is true that (21a) and (22a) are provably equivalent if it is assumed that each spouse is monogamous. It is true that the sentences contain the same lexical items. It is even true that they have the same surface syntactic form: *It is N that S*. But a Radical Pragmatics rejects the claims that logical equivalence implies semantical identity and that surface grammar alone determines implicatures.

Wilson and Sperber refer to the pragmatic theory of Gazdar (1979) as a typical example. It is therefore worth recalling his discussion of the appropriate level of analysis for implicatures. The examples in question are Horn's (1972) scalar implicatures (e.g., *It's not the case that John possibly won the poetry prize* implicates *John probably won the poetry prize*). Gazdar (1979) writes

It is both in the spirit of Grice's program and in the interests of economy to read these non-conventional inferences from the semantic representation. Presumably, at such a level a set of expressions such as {*perhaps, maybe, possibly*} will be represented by just one item for the reading they have in common. To read off [potential] conversational [implicatures] from the actual LEXICAL ITEMS given in the surface structure would be tantamount to treating them as conventional implicatures, besides which the [Horn] scales would require redundant listing of synonymous items. To read off [potential implicatures] from the semantic interpretation (i.e. the proposition it expresses) [N.B. not the semantic representation] would be impossible, since many different sentences can express a given proposition and many of these will not contain the scalar item and thus not carry the [potential implicature]. . . . Two disjunctive sentences having the same truth-conditions (i.e. expressing the same proposition) carry different [potential implicatures]. [The sentences are *John did it* or *Mary did it* and *John did it* or *Mary did it* or *both of them did it*.] In what follows I shall assume that [potential implicatures] derive from the sentences of a semantic representation. . . . The notion of semantic representation necessary (e.g. to cope with the disjunctive examples just mentioned) is a bit more "surfacey," or less abstract, than that hypothesized by generative semanticists. Logically equivalent sentences are not required to have the same semantic representation, but only the same semantic interpretation [pp.56-57].

To amplify Gazdar's last comment: The formulae in the language of semantic representation are given an interpretation. In his case a set of possible worlds, that is, a proposition in the sense of modal logic, is assigned to each closed formula. Because logically equivalent formulae are true in just the same possible worlds, they are interpreted as the same proposition. Gazdar properly distinguishes among English sentences, semantic representations of English sentences, and semantic interpretations of semantic representations of English sentences.

The relevant level of analysis for explaining implicature is the level of semantic representation. If two English sentences have logically equivalent semantic representations, they do NOT necessarily have the SAME semantic representations; by the convention we discussed in Section 2 they may be said to have the same semantic interpretation, but what is relevant to the calculation of implicature is the semantic representation. Although it may be acceptable to call the proposition associated with a sentence its INTENSION (Carnap), it is just a mistake to treat the proposition as its SENSE (Frege) (see Dana Scott, 1970a). Logically equivalent sentences have the same intension; they do not necessarily have the same sense.

The nondetachability of implicature is a matter of sense, not a matter of intension. If by "semantical identity" Wilson and Sperber mean SAME-NESS OF INTENSION, what they say about (21a) and (22a) is true but irrelevant; if by "semantical identity" they mean SAMENESS OF SENSE, what they say is relevant but false.

It is one thing to show that a particular Radical Pragmatics account makes claims contrary to the ones Wilson and Sperber impute to it. It is another to provide a principled defense of the claims of the account. There are, of course, reasons why implicatures are understood as dependent on the SENSES of sentences.

#### 4. IMPLICATURES AND LOGICAL FORMS

First, there are the evident problems in explaining the implicatures deriving from ambiguous sentences. For example the sentence *All of the arrows didn't hit the target* will have two senses, one given by (25) and the other by (26).

(25)  $\neg \forall x(\text{Arrow}(x) \rightarrow \text{Hit}(x, \text{the target}))$

(26)  $\forall x(\text{Arrow}(x) \rightarrow \neg \text{Hit}(x, \text{the target}))$

We may paraphrase (25) by *Not all of the arrows hit the target*. Saying a sentence with the truth conditions of (25) will implicate *Some of the arrows hit the target*, but the use of a sentence with the truth conditions of (26) will not have this implicatum. If implicata were derived from surface structure alone, no sense could be made of these data.

Second, there are the problems in explaining the implicata from different but related sentences. The use of Sentences (27) and (28) will implicate (29).

(27) *Mart or Adam signed up for ceramics.*

(28) *Mart signed up for ceramics or Adam signed up for ceramics.*

- (29) a. *Mart may have signed up for ceramics.*  
 b. *Mart may not have signed up for ceramics.*  
 c. *Adam may have signed up for ceramics.*  
 d. *Adam may not have signed up for ceramics.*

Similarly, the use of Sentences (30) and (31) will implicate (32).

(30) *Rick believes that John studied philosophy.*

(31) *Rick believes John to have studied philosophy.*

- (32) a. *John may have studied philosophy.*  
 b. *John may not have studied philosophy.*

It would seem ad hoc and redundant for a theory separately to explain the implicata derived from the pairs (27)–(28) and (30)–(31). An explanation employing a single semantic representation for each pair would be more satisfactory (see Gazdar, 1979, pp. 57–61).

Third, as Gazdar mentions in the passage quoted earlier, implicata dependent upon lexical meaning are derivable from classes of (more or less) synonymous items. For example, the uses of the sentences *Perhaps A*, *Maybe A*, and one sense of *Possibly A* will all implicate a sentence *Possibly not A*. A unified explanation would appeal to one underlying representation for the various sentences. In addition, if implicata were associated with the individual words in the surface structures by some linguistic rule, the difference between an explanation through CONVERSATIONAL implicature and through CONVENTIONAL implicature would be difficult to make out.

Wilson and Sperber assume that the proper object is the proposition, a reification of truth conditions as a class of logically equivalent formulae or as a set of possible worlds—what Gazdar calls “semantic interpretation.” This indelicate view is supported by the incautious formulations of some philosophers and logicians. For example, Max Cresswell (1978) has written that language “becomes a rule-governed device for putting into the mind of another a representation of the same set of possible worlds which is in the mind of the speaker [p. 26].” (Unfortunately it is never clear just what representation it is.) The sentences (33) and (34) will be interpreted as the same proposition.

- (33) *A square has four sides.*  
 (34) *Boys are boys.*

Though patently they have different implicata in various contexts, it would seem difficult to explain in what this difference consists if the sentences express the same proposition and the implicata depend on the proposition rather than the sense or meaning. Of course the same difficulty arises for necessarily false sentences such as the following:

- (35) *In class Ingrid is always there and not there.*  
 (36) *Caesar both won the war and lost it.*

Gazdar (1979, p. 136) has pointed out that (37) has the same truth conditions as (38), yet only saying the former implicates an exclusive disjunction understanding of an utterance of the sentence.

- (37) *John did it or Mary did it.*

(38) *John did it or Mary did it or both of them did it.*

He has also suggested that (39) and (40) have the same truth conditions.

(39) *Some of the students were there.*

(40) *Some, if not all, of the students were there.*

His suggestion relies on an analysis of the latter sentence as

(41) *If not all of the students were there, some of the students were there,*

on the identification of *If A then B* with  $p \rightarrow q$ , and on the ENTAILMENT of (39) by (42):

(42) *All of the students were there.*

because of the presence of the definite description *the students*. He properly observes that saying Sentence (39) implicates (43):

(43) *Not all of the students were there,*

an implicatum suspended in Sentence (40).

Our examples have been maxim of Quantity implicatures. Quality implicatures for metaphorical sentences offer the familiar difficulties if the implicata are to derive from propositions. Sentences (44) and (45) are necessarily false, and so have the null intension, but obviously will yield different implicata.

(44) *You are the cream in my coffee.*

(45) *Carter is a fox.*

In Grice's example of a flout of the maxim of Relation (relevance), given in (46), McY is understood to implicate that McX's remark should not be discussed and that McX has committed a faux pas.

(46) McX: *Mrs. Z is an old bag.*

McY: *The weather has been quite delightful this summer, hasn't it?*

Unless McX's remark contains an idiom, it might be seen to require a Quality implicature prior to the Relation implicature, for McX's remark is like (45).

An intermediate case would be (47):

(47) McX: *If Mrs. Z is not a harridan, then I'm a monkey's uncle.*

McY: *The weather. . . .*

and the out-and-out insult might be (48):

- (48) McX: *Mrs. Z is an old vixen.*  
 McY: *The weather. . . .*

As these flouts are only loosely tied to linguistic forms, such examples can hardly settle the dispute whether implicata depend on sense rather than on propositions.

Flouts of the submaxims of Manner "Be brief" and "Be orderly" at least seem to present no special difficulties for the "sense" view. Flouts of the submaxims "Avoid obscurity" and "Avoid ambiguity" obviously in different ways do, or at least could, depend upon surface structure. This is absolutely no surprise, and we are willing to let the matter rest there.

## 5. THE SEMANTICS AND PRAGMATICS OF CLEFTS: A UNIFIED THEORY?

Linguists who recognize that sentences may have the same truth conditions but different semantic representations have suggested that the semantic representations of (49a), (49b), and (49c) are (50a), (50b), and (50c), respectively (see, e.g., Gazdar, 1979, pp. 124–125).<sup>1</sup>

- (49) a. *Sam wants Fido.*  
 b. *What Sam wants is Fido.*  
 c. *It is Sam who wants Fido.*
- (50) a. *Wants (Sam, Fido)*  
 b.  $\lambda x(\text{Wants}(\text{Sam}, x))(\text{Fido})$   
 c.  $\lambda x(\text{Wants}(x, \text{Fido}))(\text{Sam})$

But with normal sentence stress on the last word of (49a), *Fido* has UNMARKED INFORMATION FOCUS (Halliday, 1967), which is consistent with the general convention that old information precedes new information. Similarly the pseudo-cleft (49b) conforms to this convention. The "focus" (Chomsky, 1972) of (49b) is *Fido*; its "presupposition" is *Sam wants something*. The same analysis would give for (49c) the "focus" *Sam* and the "presupposition" *Something wants Fido*. In other words the cleft rhetorically parallel to the pseudo-cleft and the simple sentence is not (49c), as Gazdar and the order of items in surface structure seem to suggest, but (51), which contravenes the convention that old information precede new information. Gazdar's logical form for (51) would be (52).

<sup>1</sup> For a discussion of  $\lambda$ -abstraction, see Rudolf Carnap, *Introduction to Symbolic Logic and Its Applications*, W. H. Meyer and J. Wilkinson (trans.), New York: Dover, 1958, pp. 129–131.



(51) *It is Fido that Sam wants.*

(52)  $\lambda x(\text{Wants}(\text{Sam}, x))(\text{Fido})$

The "focus" of (49b) and of (51) is *Fido*; the "presupposition" of (49b) and of (51) is *Sam wants something*. In Gazdar's logical forms for clefts and pseudo-clefts, the "focus" corresponds to the logical subject; the "presupposition" corresponds to the logical predicate. And the logical form of the pseudo-cleft *What Sam wants is Fido* is identical to that of the cleft *It is Fido that Sam wants*, that is, (50b) = (52).

We take it that a sentence with contrastive stress *Sam wants Fido* has *Sam* as "focus" and *Something wants Fido* as "presupposition." So the contrastively stressed (53) rhetorically parallels (49c) and (54). The Gazdar logical form for the latter two is (50c).

(53) *Sam wants Fido.*

(50a)  $\text{Wants}(\text{Sam}, \text{Fido})$

(49c) *It is Sam who wants Fido.*

(54) *Who wants Fido is Sam.*

(50c)  $\lambda x(\text{Wants}(x, \text{Fido}))(\text{Sam})$

Similarly the normally stressed sentence (49a) and the contrastively stressed (55) parallel (51) and (49b). The Gazdar logical form for the latter two is (50b).

(49a) *Sam wants Fido.*

(55) *Sam wants Fido.*

(50a)  $\text{Wants}(\text{Sam}, \text{Fido})$

(51) *It is Fido that Sam wants.*

(49b) *What Sam wants is Fido.*

(50b)  $\lambda x(\text{Wants}(\text{Sam}, x))(\text{Fido})$

If one were to assume that (56) parallels (57), one might also assume that (49c) parallels (49a).

(56) *It was John who went.*

(57) *John went.*

(49c) *It is Sam who wants Fido.*

(50c)  $\lambda x(\text{Wants}(x, \text{Fido}))(\text{Sam})$

(49a) *Sam wants Fido.*

(50a) *Wants(Sam,Fido)*

But as we have just seen, Sentences (49a) and (49c) are not parallel at all. The order of items in the surface structures of (49c) and (49a) is misleading. Misled by surface structure one might assume that the "logical subject" of both sentences is *Sam*. On this assumption, in (49c) the "focus" corresponds to the logical subject. But in the normally stressed simple sentence (49a) the normal "focus" is *Fido*; the "focus" there does NOT correspond to the logical subject. We shall be guided by "focus" rather than by surface order. We reject the suggestion that Sentence (56) pairs with the normally stressed (57); it pairs with the contrastively stressed (58).<sup>2</sup>

(58) *John went.*

We believe that the identification of logical subject and "focus" in (49c) is just as mistaken as the same identification in the normally stressed (49a) would be. It seems to us that the semantic representations offered by Gazdar and others fail to make the semantic and pragmatic data COHERE. One of our aims in this chapter is to sketch an account that will unify the semantics and pragmatics, in a way to be expounded in what follows. But before proceeding with that discussion, we must consider another account of the semantics of clefts. (For discussion of the pragmatics of clefts, see Prince, 1978.)

## 6. A RECENT DESCRIPTION OF CLEFTS

On Halvorsen's (1978) view clefts differ from their corresponding simple sentences in their "conventional implicatures." Sentence (59b) has the same truth conditions as (59a), and so make the same assertion or express the same proposition, but, unlike (59a), (59b) "conventionally implicates" (59c) and something approximating (59d).

- (59) a. *Mary kissed John.*  
       b. *It was John that Mary kissed.*  
       c. *Mary kissed someone.*  
       d. *There is only one person Mary kissed.*

<sup>2</sup> Independently Halvorsen (1978, p. 6) has argued against Akmajian (1970) that *It was himself that John wanted Mary to describe* pairs with *John wanted Mary to describe himself*, not with *\*John wanted Mary to describe himself*.

Sentence (60b) has the same truth conditions as (60a), but (60b) "conventionally implicates" (60c) and (60d).

- (60) a. *Mary didn't kiss John.*  
 b. *It wasn't John that Mary kissed.*  
 c. *Mary kissed someone.*  
 d. *There is only one person Mary kissed.*

And, analogously, the content of (61b) is the same as (61a), but (61b) "conventionally implicates" (61c) and (61d).

- (61) a. *Did Mary kiss John?*  
 b. *Was it John that Mary kissed?*  
 c. *Mary kissed someone.*  
 d. *There is only one person Mary kissed.*

The "conventional implicata" of a sentence, for example of (59b), are preserved under negation, as in (60b), and under questioning, as in (61b). This distinguishes "conventional implicata" from entailment. Halvorsen remarks that (59b) entails (59c), but obviously (60b) does not entail (60c) [= (59c)]. He also claims that (62b) has the same truth conditions as (62a) but "conventionally implicates" (62c) and (62d), and that (63b) has the same truth conditions as (63a) but "conventionally implicates" (63c) and (63d).

- (62) a. *Mary didn't kiss John.*  
 b. *It was John that Mary didn't kiss.*  
 c. *There is someone that Mary didn't kiss.*  
 d. *There is only one person Mary didn't kiss.*
- (63) a. *Mary kissed John.*  
 b. *It wasn't John that Mary didn't kiss.*  
 c. *There is someone that Mary didn't kiss.*  
 d. *There is only one person Mary didn't kiss.*

Obviously this implies that (59b) *It was John that Mary kissed* is logically equivalent to (63b) *It wasn't John that Mary didn't kiss*, both asserting *Mary kissed John*, and that (60b) *It wasn't John that Mary kissed* is logically equivalent to (62b) *It was John that Mary didn't kiss*, both asserting *Mary didn't kiss John*.

This review is incomplete unless something is said about Halvorsen's, actually Karttunen and Peters's (1979), notion of "conventional implicature." Halvorsen's paradigm is *manage*: Sentence (64a) "conventionally implicates" (64b) and asserts (64c).

- (64) a. *John managed to write a paper.*  
 b. *It is difficult (for John) to write a paper.*  
 c. *John wrote a paper.*

The CONVENTIONAL MEANING of an utterance depends on both the assertion made and the "conventional implicature" conveyed. As noted earlier, the "conventional implicature," like an old-fashioned presupposition and unlike an entailment, is preserved under negation and questioning.

As "conventional implicatures" are part of the meaning of the sentence uttered, an assertion having a "conventional implicature" conjoined with an explicit denial of the implicature is contradictory (Halvorsen, 1978, p. 12), or logically contradictory and/or "internally infelicitous" (Sadock, 1978, pp. 290, 292). It is standardly necessary for felicitous utterance that "conventional implicatures" constitute part of the common ground between speaker and hearer (Halvorsen 1978, pp. 16–17; Sadock, 1978, p. 292).

This conception of "conventional implicatures" derives largely from Karttunen and Peters (1979). It must be remarked that this conception departs from Grice's original one, which was intended to be distinct from presupposition. Grice's (1961) paradigm *She was poor but she was honest* implied some contrast between (her) poverty and (her) honesty, but nothing that was asserted (said—in Grice's sense) carried that implicature. By contrast Grice took it that presuppositions were carried by what was said. Because Grice's discussion of conventional implicature has been so sketchy, his other examples being *therefore* and *moreover* (Grice, 1968), philosophers have been tentative in their treatment of his idea. Linguists have been less cautious, and, we believe, often incorrect in their interpretation of Grice.

For example, Grice (1961) described the implicature in *She was poor but she was honest* as detachable (from what is asserted) by uttering *She is poor and she is honest*, and as (in some sense) cancelable, in that *She is poor but she is honest, though of course I do not mean to imply that there is any contrast between poverty and honesty* is a peculiar but nonetheless noncontradictory and intelligible way of conveying that she was poor and honest. In the same essay Grice thought that presuppositions were nondetachable and noncancelable (not negated without contradicting the original assertion). Conversational implicatures were nondetachable but cancelable.

Despite the recognition, originally by Grice, that nondetachability will not distinguish entailment from conversational implicature, there seems to have been no parallel recognition that noncancelability will not distinguish entailment from what linguists are currently calling "conventional implicature." On this LINGUISTIC conception of a "conventional implicature"

ture," "conventional implicature" are detachable (from what is asserted) and noncancelable. But noncancelability is NOT a SUFFICIENT test for "conventional implicature." (For an apparent use of the sufficiency test, see Sadock, 1978, p. 292.)

For example, Halvorsen notes that (59b) entails (59c) but claims that (59b) also "conventionally implicates" (59c).

(59b) *It was John that Mary kissed.*

(59c) *Mary kissed someone.*

The grounds for that claim cannot be just the unacceptability of (65); entailment suffices to explain that.

(65) *?It was John that Mary kissed—and Mary kissed no one.*

Halvorsen (1978, p. 14) offers the following argument. In his paradigm for "conventional implicature," *John managed to write a paper*, he observes that (66b) follows from (66a), but (66c) does not.

(66) a. *I just discovered that John managed to write a paper.*

b. *I just discovered that John wrote a paper.*

c. *I just discovered that it is difficult (for John) to write a paper.*

He asserts that (67c) does not follow from (67a).

(67) a. *I just discovered that it was John that Mary kissed.*

b. *I just discovered that Mary kissed John.*

c. *I just discovered that Mary kissed someone.*

So he concludes that (59c) is "conventionally implicated" by (59b). Contrary to Halvorsen's assertion, it seems to us that (67c) does follow from (67a) in the same way that (67b) does. Halvorsen's argument is unsound.

Halvorsen offers two further observations. Relying on the invariance of "conventional implicature" under negation and questioning, he finds Sentences (68) and (69) unacceptable.

(68) *?It wasn't John that Mary kissed—she didn't kiss anybody.*

(69) *?I know that Mary didn't kiss anybody, but was it John that Mary kissed?*

In the case of the question, once again the test does not distinguish between "conventional implicature" and entailments of semantic content. In the case of the negative sentence, there is a critical worry and a controversy over the adequacy of the test.

Suppose *It wasn't John that Mary kissed* were AMBIGUOUS between a sentence (exclusion) and a predicate (choice) negation. On the predicate

negation reading the sentence in (68) is contradictory and unacceptable; on the sentence negation reading it is consistent and acceptable. But on a predicate negation reading, it would appear that *It wasn't John that Mary kissed* ENTAILS *Mary kissed someone*. (If the latter is not true, neither is the former. But if the former is not true, this does not mean that *It was John that Mary kissed* is true if Mary kissed no one. These readings are contraries, not contradictories.) The entailment explains the unacceptability.

If this counterargument is to be defeated, some defense of the univocality of the sentence must be undertaken and some proposal as to its semantic representation be made. Halvorsen claims that its propositional content is *Mary didn't kiss John*. But on Halvorsen's view meaning is split between propositional content and "conventional implicature," and as Sentence (70) is acceptable, the propositional content will not yield the unacceptable (68).

(70) *Mary didn't kiss John—she didn't kiss anybody.*

Obviously, the existential sentence *Mary kissed someone* will yield the unacceptable contradiction. But what we want to know is whether that sentence is "conventionally implicated" or entailed by *It wasn't John that Mary kissed*. What Halvorsen needs to prove is that the choice is just between "conventional implicature" and entailment and that there is no entailment.

The mere unacceptability of (68) does not make that case unless it is ASSUMED that noncancelability is a sufficient test for "conventional implicature". Alternatively, the case may be made if it is ASSUMED that, as the truth-conditional component of the meaning of *It wasn't John that Mary kissed* is *Mary didn't kiss John*, and that cannot account for the unacceptability of Sentence (68), it must be the non-truth-conditional component of the meaning that does. That component must be, or entail, some proposition that contradicts *Mary didn't kiss anybody*. The simplest solution would be that the component is *Mary kissed someone*. And BY DEFINITION "conventional implicata" are non-truth-conditional components of literal meaning. Thus *Mary kissed someone*, it would be concluded, is a "conventional implicatum" of *It wasn't John that Mary kissed*.

In defense of the view that the truth-conditional components of *It wasn't John that Mary kissed* and *It was John that Mary kissed* are *Mary didn't kiss John* and *Mary kissed John*, Halvorsen (1978) claims that "it cannot be true that *It was John that Mary kissed* [sic] unless it is also true that *Mary kissed John* [sic], and vice versa [p. 14]" which is to say that necessarily one is true if and only if the other is true, that is,  $\Box(Tr(A) \leftrightarrow Tr(B))$ . If our language is bivalent (i.e., every statement is either true or

false), this formula is equivalent to ' $\Box(A \leftrightarrow B)$ ';  $A$  and  $B$  are necessarily equivalent. But if the language is not bivalent, there will be some sentences at which some valuation is not defined. Even if  $A$  and  $B$  are both true for all the same valuations, and so have the same TRUTH conditions, they need not be false for all the same valuations, and so need not have the same FALSITY conditions. If expressing the same proposition means that  $\Box(A \leftrightarrow B)$ , that is, ' $(A \leftrightarrow B)$ ' is true for every valuation, and if ' $(A \leftrightarrow B)$ ' is true in a valuation if and only if either  $A$  and  $B$  have values in  $\{0,1\}$  and their values are equal or neither has a value, then in a nonbivalent language where  $\Box(Tr(A) \leftrightarrow Tr(B))$  it is possible that there is a valuation at which  $B$  is false and at which  $A$  has no value. In that case  $A$  and  $B$  do not express the same proposition.

In a language in which semantically anomalous utterances have no truth-value, Halvorsen's claim about the TRUTH conditions, even if it were correct, would not show that the sentences express the same proposition. He has not shown that in such a language (e.g., ours?) the sentence *It was John that Mary kissed* is necessarily equivalent to *Mary kissed John*. But even if he had succeeded in showing this, there are difficulties.

Suppose it is common ground and true that Mary kissed no one. Then *Mary didn't kiss John* is true. Thus what according to Halvorsen is asserted in *It wasn't John that Mary kissed* is true. However, what is "conventionally implicated" is *Mary kissed someone*, and this "conventional implicatum" is not compatible with this context. As the felicitousness of an utterance in a context requires the compatibility of its "conventional implicata" with the context, the sentence *It wasn't John that Mary kissed* is in this context used to assert a truth, but its use is necessarily infelicitous.

The sentence *Mary kissed no one and it wasn't John that Mary kissed* would be even more peculiar. It would be true but "internally infelicitous" (which is the term Sadock [1978, p. 292] uses for contradictions arising from the "non-truth-conditional" component of meaning). Now a sense of reality is as useful in logic as it is in zoology. The suggestion that a sentence is self-contradictory because of features of its meaning and yet still true is sufficiently grotesque that one ought to ask whether a better theory can be found. The argument leading to this grotesquerie requires that *Mary didn't kiss John* ENTAIL *It wasn't John that Mary kissed*. This is a premise well worth doubting. In fact, we shall reject it. No cogent argument or convincing datum has been offered in its favor. (The view is popular nonetheless; cf. Halvorsen, 1978; Prince, 1978; Wilson and Sperber, 1979.)

It was once remarked of Herbert Spencer that his idea of tragedy was the murder of a beautiful theory by an ugly fact. Halvorsen's defense of

his claim that *It was John that Mary kissed* "conventionally implicates" *Mary kissed someone* relies heavily on the unacceptability of *It wasn't John that Mary kissed—she didn't kiss anybody*. Consider the variant *It certainly wasn't John that Mary kissed—in fact Mary didn't kiss anyone*. Here is the ugly fact: There is nothing wrong with these sentences. The existential "implicatum" (presupposition) is cancelable, which shows that it is not a "conventional implicatum" and not a direct consequence of the meanings of the words or the sentence. We do not need to argue that cancelability proves that the "implicatum" is conversational to see that it cannot be "conventional."

Sadock (1978, pp. 292–293) may well be right that cancelability does not discriminate between cases of privative ambiguity and cases of univocality plus conversational implicature.<sup>3</sup> Although discussions of the Radical Pragmatics position (e.g., Allwood, 1972; Atlas, 1975a, 1975b; Kempson, 1975; Sadock, 1975; Thomason, 1973, 1977; Wilson, 1975) have focused on the univocality of negative presuppositional sentences and the utility of appeals to conversational implicature, Radical Pragmatics has not relied upon the cancelability test to prove DIRECTLY its account of negative presuppositional sentences. It has used it to refute the alternatives: entailment, semantical presupposition, and "conventional implicature," and to refute the claim that the negative SENTENCE is univocally a choice negation. It then offers itself as the best remaining account. Classical versions of Radical Pragmatics adopt the view that *not* is univocal and identifies it with exclusion negation (e.g., Allwood, 1972; Kempson, 1975; Gazdar, 1976, 1979) or with a nonclassical, nonspecific negation (e.g., Atlas, 1975a, 1975b, 1977).<sup>4</sup>

The other "conventional implicature" of clefts that Halvorsen discusses, namely, the exhaustiveness implicature, is for Halvorsen an admittedly troublesome feature. Whereas Sentence (71a) is acceptable, (71b) is unhappy. The suggestion that (71c) "conventionally implicates" (71d) confronts two difficulties, the first pointed out by Halvorsen.

- (71) a. *Mary kissed John, among others.*  
 b. *?It was John that Mary kissed, among others.*  
 c. *It was John that Mary kissed.*  
 d. *John was the only person that Mary kissed.*  
 e. *Mary kissed only one person.*

<sup>3</sup> Privative ambiguities have also created controversy over some tests discriminating between ambiguity and generality/nonspecificity. See Zwicky and Sadock (1975) and Atlas (1977).

<sup>4</sup> For an important survey of negation, see Horn (1978a, 1978b).



"Conventional implicature" would require that (72) "conventionally implicate" (71d).

(72) *Was it John that Mary kissed?*

But that would mean that the question "conventionally implicates" that its answer is *yes*. An analogous difficulty arises in the negative sentence (73) "conventionally implicating" (71d).

(73) *It wasn't John that Mary kissed.*

For what it asserts, on Halvorsen's view, namely, *Mary didn't kiss John*, and what it "conventionally implicates" according to his first suggestion, namely, *John was the only person that Mary kissed*, are contradictory. Necessarily if (73) were true, it would be "internally infelicitous." It would be impossible for it to be both true and felicitous.

Halvorsen then suggests that (71c) "conventionally implicates" (71e). He notices, however, that (74) by parity of reasoning ought to "conventionally implicate" (75).

(74) *Was it John and Rick that Mary kissed?*

(75) *Mary kissed only two persons.*

If so, as he observes, the answer (76) should be infelicitous, as Halvorsen (1978, p. 2) in effect claims earlier in his essay. But it is not. Furthermore (77) should also be infelicitous, but it is not.

(76) *No, she kissed John, Rick, and Mart.*

(77) *No, she kissed only John.*

Consistent with his view of the "implicatum" of (74), Halvorsen could have claimed that *no* is a special "contradictory negation" that blocks the "implicature" in the discourse. (For a suggestion of this kind, see Karttunen and Peters, 1979; for a rejoinder see Atlas, 1980.) Such an explanation is *prima facie* much less plausible for the evident cancelability of the "implicatum" in the negative sentence (78).

(78) *It wasn't John that Mary kissed—it was Mart and Rick.*

If *Mary kissed only one person* (or for that matter *Mary kissed at most one person*) were "conventionally implicated" by *It wasn't John that Mary kissed*, Sentence (78) would be anomalous. It is not; the negative sentence does not have these so-called "conventional implicata."

On the basis of his mistaken semantic claims, Halvorsen offers a Montaguvian formalization of clefts. He adapts Thomason (1976) and Kart-

tunen and Peters (1979) to this end. The meaning of an expression is given by a three-tuple consisting of a representation of its contribution to truth conditions (extension expression), a representation of its "conventional implicata" (implicature expression), and an expression that allows the grammar to plug, filter, or flush the implicata of the parts to yield the implicata of the whole expression (heritage expression). A formalization of *It is John that Mary kisses* would be approximately as in (79)

- (79) a. *It is John that Mary kisses.*  
 b. Extension expression  
 $Kiss^e(m, j)$   
 c. Existential "implicatum"  
 $(\exists x)Kiss^e(m, x)$   
 d. Exhaustiveness "implicatum"  
 $(\exists x)(\forall y)(Kiss^e(m, y) \rightarrow x = y)$

and a formalization of *It isn't John that Mary kisses* would be approximately as in (80).

- (80) a. *It isn't John that Mary kisses.*  
 b. Extension expression  
 $\neg Kiss^e(m, j)$   
 c. Existential "implicature"  
 $(\exists x)Kiss^e(m, x)$   
 d. Exhaustiveness "implicature"  
 $(\exists x)(\forall y)(Kiss^e(m, y) \rightarrow x = y)$

The "implicature" expressions in (c) and (d) constitute two of the conjuncts in the implicature expression for the sentence. From various passages in Halvorsen (1978, pp. 54, 79), it is clear that he takes the formulae in (d) to say that there is one and only one person that Mary kisses. The EXHAUSTIVENESS "implicatum" is described as a UNIQUENESS implicatum. A problem in the formalization is that (d) merely says that some  $x$  is such that all non- $x$ s are not kissed by Mary. Queries about the range of ' $x$ ' aside, this exhaustiveness condition does not entail that there is one and only one individual that Mary kisses. In general,  $(\exists x)(\forall y)(A(y) \rightarrow y = x) \not\models \exists! x A(x)$ . Halvorsen's formula is instead a boundedness implicatum that says that there is AT MOST one individual kissed by Mary. The existential and the boundedness "implicata" taken together are equivalent to the uniqueness "implicatum."

This small distinction matters. If the focus constituent gives rise to a uniqueness "implicatum," as Halvorsen apparently believes but incorrectly formulates, the existential "implicatum" of the presupposition constituent is redundant. The latter would be entailed by the former. On the

other hand, if the focus constituent gives rise to a boundedness "implicatum," the existential "implicatum" is not redundant. The two views make different predictions about the data.

On the first view, Halvorsen's intended view, (81) is predicted to be infelicitous. It is compatible with the second view that the discourse be felicitous, which in fact it is.

- (81) a. McX: *Was it Mart and Rick that Mary kissed?*  
       McY: *She kissed only John.*  
       b. *It wasn't Mart and Rick that Mary kissed—she kissed only John.*

Similarly, on Halvorsen's view, (82) is predicted to be infelicitous. It might be compatible with the second view that (82) be felicitous, which in fact it is.

- (82) a. McX: *Was it John that Mary kissed?*  
       McY: *She didn't kiss anybody.*  
       b. *It wasn't John that Mary kissed—she didn't kiss anybody.*

If felicitousness is to be possible on the second view, we cannot conjoin the boundedness and existential "implicata," which together would entail the uniqueness condition *Mary kissed (exactly) one person*. The "implicata" would themselves have to be preferentially ordered by the syntactic form of the sentence. The "implicatum" of the (main clause) focus constituent is preferred to the "implicatum" of the (subordinate clause) pre-supposition constituent. Thus on the second view *Mary kissed at most one individual* is ranked above *Mary kissed someone*. The response *Mary didn't kiss anybody* is logically compatible with the preferred "implicatum," and so the discourse is felicitous, even though the response is incompatible with the less preferred "implicatum."

Analogous connections between entailments and surface syntax were discussed by Chomsky (1972) and have been exploited by Wilson and Sperber (1979). Neither "implicatum" is what Wilson and Sperber call a GRAMMATICALLY SPECIFIED ENTAILMENT OF THE SENTENCE (GSE). The sentence "directly entails" (Wilson and Sperber, 1979, p. 313) the GSE *It was someone that Mary kissed*, which is the FIRST BACKGROUND ENTAILMENT (Wilson and Sperber, 1979, p. 314) because it arises by existential closure of the open sentence *It was x that Mary kissed*, where a variable has been substituted for the focus constituent of the sentence. On Halvorsen's view this BACKGROUND is logically equivalent to his "implicatum" *Mary kissed someone*. Halvorsen's uniqueness "implicatum" *Mary kissed (exactly) one person* is not identical to any GSE, nor is the boundedness condition *Mary kissed at most one person* identical to any

GSE. GSEs must be linked to surface structure by substitution of existentially quantified variables for syntactic constituents. And, of the sentences that Halvorsen takes as equivalent to his "implicata," namely, *It was someone that Mary kissed* and *It was (exactly) one person that Mary kissed*, only the former is a GSE. On his view the latter is not an entailment of *It was John that Mary kissed*.

Nonetheless the uniqueness condition does entail the background. This would place it on par with what Wilson and Sperber (1979, p. 315) call THE FOREGROUND. Their foreground consists only of the GSEs that entail the background of a sentence. As the uniqueness condition is not a GSE, it cannot be in their foreground. Propositions in the foreground are given a pragmatic interpretation by Wilson and Sperber. If  $A$  and  $B$  are in the foreground and  $A \models B$ ,  $A$  is "more relevant" than  $B$  to "the point" of the utterance, to that content the sentence contains over and above its background. The background and its entailments are presuppositional in their behavior. According to Wilson and Sperber (1979, pp. 317–319) they are preserved under denial or questioning. Incompatibility between the presumptions of a context and the background propositions of an assertion leads to its infelicity. A proposition that entails the background, that is entailed by the sentence uttered, and that is not a GSE of the sentence uttered may be part of "the point" of an utterance, but "there is no LINGUISTIC indication that [it] should be . . . (Wilson and Sperber, 1979, pp. 318–319)." Such a proposition, on Wilson and Sperber's view, need exhibit no presuppositional behavior; it can be questioned and denied without infelicity.

According to Halvorsen the uniqueness condition is a "conventional implicatum" (presupposition). As it is "conventional," it depends on the meanings of the words and the syntax of the sentence giving rise to it. If it were, contrary to Halvorsen's view, an entailment of the sentence, it would be a proposition of the sort characterized in the previous paragraph. It would be entailed by the sentence uttered; it would entail the background; it would not be a GSE of the sentence uttered. Since it is a "conventional implicatum" for Halvorsen, it must exhibit presuppositional behavior. According to Wilson and Sperber, on the other hand, it can exhibit assertoric, nonpresuppositional behavior. It can be denied or questioned without making the original utterance infelicitous. On Halvorsen's view, if it is denied, the original sentence cannot be felicitously asserted.

Shall we resolve this contradiction by simply saying that in fact the uniqueness condition is NOT an entailment? Suppose it were a conventional implicatum (in Grice's original sense). It would be part of the

“meaning” of the utterance. One could quite plausibly argue that Wilson and Sperber’s conclusion could be expanded to include conventional implicata (in Grice’s sense) that have the properties required by their argument. Then their theory would more adequately describe the behavior of the sentence. On the other hand, suppose it were a presupposition—“conventional implicatum” (in Halvorsen’s sense). It is not part of Wilson and Sperber’s background propositions. Their theory of linguistically ordered entailments, which has as its aim a semantically based explanation of presuppositional behavior, would manifestly fail to explain a crucial case of presupposition. Halvorsen’s theory would more adequately describe the behavior of the sentence. The status of the uniqueness condition is therefore a crucial test of rival theories.

For the sake of argument we suggested earlier that it might prove useful in explaining the felicitousness of (81) and (82) to split the uniqueness condition into its component parts. We hypothesized an effect of superficial syntactic form: the preferential ranking of the (main clause) uniqueness implication above the (subordinate clause) existential implication of *It was John that Mary kissed*. Further, we hypothesized that it was the relative strength of the preferred uniqueness condition with respect to the existential condition (i.e., of the boundedness condition *Mary kissed at most one person*) that was essential in determining the felicitousness of (81) and (82). But consider the following:

- (83) a. McX: *Was it John that Mary kissed?*  
           McY: *She kissed Mart and Rick.*  
       b. *It wasn’t John that Mary kissed—she kissed*  
           *Mart and Rick.*

These examples are felicitous, which suggests that *It wasn’t John that Mary kissed* has no boundedness presupposition *Mary kissed at most one person*. Halvorsen (1978, p. 16) considers examples like (83) but fails to draw the obvious conclusion. The conclusion he does draw is that *Was it John and Rick that Mary kissed?* has a “conventional exhaustiveness implicatum” *Mary kissed  $n$  persons* for NO PARTICULAR VALUE of  $n$  ( $n$  is an integer such that  $1 \leq n$ )! The charitable interpretation of this remark is that the sentence’s “conventional exhaustiveness implicatum” is *Mary kissed some number of persons*. But that, of course, is just to say *Mary kissed a person/people*. And that is to reject the idea that there is an exhaustiveness/uniqueness condition at all, for the condition has now become just the existential condition *Mary kissed someone*. In conclusion, THERE IS NO UNIQUENESS PRESUPPOSITION FOR CLEFTS. Instead, the affirmative sentence *It was John that Mary kissed*, but not the preferred

(choice negation) understanding of the negative sentence *It wasn't John that Mary kissed*, entails *Mary kissed (exactly) one person*.<sup>5</sup>

## 7. THE OPPOSING DESCRIPTIONS OF CLEFTS

Halvorsen's (1978) account makes the following claims:

1. *It was John that Mary kissed*
  - a. Expresses the same proposition as (is logically equivalent to) *Mary kissed John*
  - b. "Conventionally implicates" (presupposes) *Mary kissed someone*
  - c. "Conventionally implicates" (presupposes) *Mary kissed (exactly) one person*
  - d. Entails *Mary kissed someone*.
2. *It wasn't John that Mary kissed*
  - a. Expresses the same proposition as (is logically equivalent to) *Mary didn't kiss John*
  - b. "Conventionally implicates" (presupposes) *Mary kissed someone*
  - c. "Conventionally implicates" (presupposes) *Mary kissed (exactly) one person*.
3. *It was John that Mary didn't kiss*
  - a. Expresses the same proposition as (is logically equivalent to) *Mary didn't kiss John*
  - b. "Conventionally implicates" (presupposes) *There is someone Mary didn't kiss*

<sup>5</sup> Wilson and Sperber account for the behavior of the uniqueness sentence better than Halvorsen. But negative sentences present a difficulty for their theory. The sentences (a) and (b) have the presupposition (c), but the first background entailment of (b) is (d), which entails (e).

- (a) *It was John that Mary kissed.*
- (b) *It wasn't John that Mary kissed.*
- (c) *Mary kissed someone.*
- (d) *There is someone such that it wasn't he that Mary kissed.*
- (e) *There is someone that Mary didn't kiss.*

The background (d) is not the presupposition (c). It is an explicit claim of the theory that background is preserved under denial or questioning (Wilson and Sperber, 1979, p. 317) and that background acts as a presupposition (Wilson and Sperber, 1979, p. 321). It would seem a little difficult to defend this claim in light of examples like this one.

- c. "Conventionally implicates" (presupposes) *There is (exactly) one person Mary didn't kiss*
- d. Entails *There is someone Mary didn't kiss.*
- 4. *It wasn't John that Mary didn't kiss*
  - a. Expresses the same proposition as (is logically equivalent to) *Mary kissed John*
  - b. "Conventionally implicates" (presupposes) *There is someone Mary didn't kiss*
  - c. "Conventionally implicates" (presupposes) *There is (exactly) one person Mary didn't kiss.*

We propose that in fact a theory of clefts must account for the following observations:

- I. *It was John that Mary kissed*
  - a. Entails *Mary kissed John*; the latter does not entail the former
  - b. Entails *Mary kissed someone*
  - c. Entails but does not "presuppose" *Mary kissed (exactly) one person.*
- II. *It wasn't John that Mary kissed*
  - a. Entails *Mary didn't kiss John*; the latter does not entail the former
  - b. "Presupposes" or its use implicates *Mary kissed someone*
  - c. Does not "presuppose" *Mary kissed (exactly) one person.*
- III. *It was John that Mary didn't kiss*
  - a. Entails *Mary didn't kiss John*; the latter does not entail the former
  - b. Entails *There is someone Mary didn't kiss*
  - c. Entails but does not "presuppose" *There is (exactly) one person Mary didn't kiss.*
- IV. *It wasn't John that Mary didn't kiss*
  - a. Entails *Mary kissed John*; the latter does not entail the former
  - b. "Presupposes" or its use implicates *There is someone Mary didn't kiss*
  - c. Does not "presuppose" *There is (exactly) one person Mary didn't kiss.*

A Radical Pragmatics theory must account for both the semantics (the entailments) and the pragmatics (the "presuppositions" or implicata) of sentences in a coherent way. Before we can proceed with our study of clefts, we must reconsider a Standard Version of Radical Pragmatics.

## 8. NEGATION AND IMPLICATURE: A PROBLEM FOR THE STANDARD VERSION OF RADICAL PRAGMATICS

A Standard Version of Radical Pragmatics holds that the meaning of natural language negation is unambiguously that of an exclusion/wide-scope/sentential/external negation and that the usually preferred interpretation as a choice/narrow-scope/predicate/internal negation is pragmatically induced. This view has assumed that the internal negation interpretation could be explained by a straightforward account on Gricean lines. The argument involved has been assumed to be an application of Grice's first maxim of Quantity ("Make your contribution as informative as is required for the current purposes of the exchange") that would induce a more informative interpretation of "what is said." For example, there seems to be a natural parallel between saying (84) and communicating the more informative proposition (85) and saying (86) and communicating the more informative (87).

(84) *John has three children.*

(85) *John has three children and no more than three children.*

(86) *The king of France is not bald.*

(87) *There is a king of France and he is nonbald.*

The inference whereby (84) is used to communicate (85) by GENERALIZED CONVERSATIONAL IMPLICATURE has been much discussed (Horn, 1972; Gazdar, 1976, 1977, 1979). The parallel suggested that a similar account might be given for the negative sentences. However, closer inspection indicates that the parallelism between the implicatures induced by scalar items and those induced by negation is illusory. The apparent parallelism exists merely because the conjunction of any implicatum, however arrived at, with the logical consequences of "what is said" will typically be more informative than those consequences alone.<sup>6</sup>

In the case of scalar categories, we may construct an ordering of items that meets at least this condition: For an appropriately defined class of sentences, any sentence containing the *i*th term of the ordering will entail a sentence like the original except for "containing" the *i* + 1st term of the

<sup>6</sup> We assume that "what is implicated" is not a logical consequence of "what is said." Here informativeness is narrowly understood so as to satisfy the condition that if *p* is more informative than *q*, *q* does not entail *p*, and *p* is neither logically true nor logically false. See Atlas (1975a, 1975b), Harnish (1976, p. 362, n. 46), O'Hair (1969), Quine and Ullian (1978, p. 68), Smokler (1966).



ordering at one occurrence of the *i*th term in the original sentence. Such an ordering we will call a HORN SCALE. (We ignore several complexities; see Gazdar, 1979, pp. 55–58.) For example, consider the Horn scales in (88).

- (88) a. (. . . , *n*, *n* – 1, . . . , *four*, *three*, *two*, *one*)  
 b. (*necessarily*, *possibly*)  
 c. (*all*, *most*, *many*, *some*, *few*)  
 d. (*know*, *believe*)  
 e. (*must*, *should*, *may*)  
 f. (*and*, *or*)

Sentences employing scalar words have generalized conversational implicatures of these sorts:

1. If a speaker asserts a sentence containing a later, “weaker” term in the scale, for example, *A(three)*, *A(possibly)*, *A(some)*, he implicates the falsity of the “stronger” scalar variants, for example, the falsity of *A(four)*, of *A(necessarily)*, and of *A(all)*.
2. If a speaker asserts the negation of a sentence containing an earlier, “stronger” term in the scale, for example, *not-A(four)*, *not-A(necessarily)*, *not-A(all)*, he implicates a “weaker” variant, for example, *A(three)*, *A(possibly)*, *A(some)*.

The explanation of the first sort of scalar implicature involves Grice’s first maxim of Quantity and the maxims of Quality. If a speaker is in a position to assert that John has five children, he should not say that John has three children; if he does assert the latter, he may be taken to be in no position to assert a stronger statement, for example, *John has five children*, and, in conformity with a consequence of the maxim of Quality—namely, “Do not say what you do not know”—be taken not to know whether John has five children. Thus from the fact that the speaker has NOT asserted the stronger variant it will be inferred that he does not know whether the stronger variant is true. Gazdar (1979) argues that in the case of Horn scales, it will be inferred that the speaker knows that the stronger variant is false.

If a similar explanation were to be give for ordinary negation, we should posit a logical scale (89) where internal

- (89) ( $\sim A$ ,  $\neg A$ )

negation  $\sim A$  precedes external negation  $\neg A$ . Then there should be two scalar implicatures: (a) if a speaker asserts an external negation, he implicates the falsity of the internal negation; (b) if a speaker asserts the negation of an internal negation, he implicates the external negation. Thus it is

predicted that the external negation understanding of (86) will pragmatically imply (90) and (91).

- (86) *The king of France is not bald.*
- (90) *The speaker does not know that there is a king of France and that he is non-bald.*
- (91) *The speaker knows that it is not the case that there is a king of France and that he is non-bald.*

Of course, what should be pragmatically implied is (92).

- (92) *The speaker knows that there is a king of France and that he is non-bald.*

One response to the conflict between the pragmatic implications would be to abandon the Gricean claim that the literal meaning of negation in English is that of external negation. A recent account of negation introduces an updated version of the traditional scope distinction and identifies ordinary negation with internal negation (Karttunen and Peters, 1979), but it has been argued that this suggestion has serious defects (Atlas, 1980). An alternative account argues that the literal meaning of natural language negation is neither an internal negation nor an external negation (Atlas, 1975a, 1975b, 1977, 1978, 1979). But no matter whether classical or non-classical semantics is preferable, it will still be necessary to find a pragmatic principle, different from the one involved in scalar implicatures, that will offer an account of the inference from (86) to (87). An obvious problem to be solved is the conflict between such inferences and the typical Gricean arguments involving the maxim of Quantity, that is, the conflict between the inferences from (86) to (91) and from (86) to (92). The difference between the scalar expressions and ordinary negation that we have described is a general difference between kinds of pragmatic inference for two classes of expressions. The Gricean Inference from Quantity accounts for one class but not for the other.

We are concerned with the pragmatic principles that could be used to explain how and why what is conveyed or communicated by an utterance is more definite or more precise than the literal/conventional meaning of the sentence uttered. For convenience in exposition, we will follow Grice (1961, 1967, 1975; 1978) in identifying "what is said" with the sense of THE SENTENCE, that is, with a logical form or other semantic representation. Where we intend to refer to those inferences falling under maxims of conversation we shall speak of CONVERSATIONAL IMPLICATURES.<sup>7</sup> The

<sup>7</sup> Grice uses "conversational implicature" in the narrow sense for inferences from floutings of the maxims.

conjunction of "what is said" with "what is implicated" will be "what is communicated," the meaning a speaker conveys. We are interested in data in which "what is said" is augmented by generalized implicatures so that "what is communicated" is standardly more informative than "what is said." Here are familiar examples in which the (b) sentences are implicata of saying the (a) sentences (Gazdar, 1979, Chapter 3; Horn, 1972, 1973; Grice, 1961, 1967, 1975).

- (93) a. *Some of the boys are at the party.*  
 b<sub>1</sub>. *Not all of the boys are at the party.*
- (94) a. *Paul may be in his office.*  
 b<sub>1</sub>. *Paul may not be in his office.*
- (95) a. *Morton has three children.*  
 b<sub>1</sub>. *Morton has no more than three children.*
- (96) a. *Not all of the boys are at the party.*  
 b<sub>1</sub>. *Some of the boys are at the party.*
- (97) a. *Rick is a philosopher or a poet.*  
 b<sub>1</sub>. *Rick is not both a philosopher and a poet.*  
 b<sub>2</sub>. 

{	<i>Rick may be a philosopher.</i>
	<i>Rick may not be a philosopher.</i>
	<i>Rick may be a poet.</i>
	<i>Rich may not be a poet.</i>
}	
- (98) a. *If John is at home, the phonograph will be on.*  
 b<sub>1</sub>. 

{	<i>John may be at home.</i>
	<i>John may not be at home.</i>
	<i>The phonograph may be on.</i>
	<i>The phonograph may not be on.</i>
}	
- (99) a. *It's not the case that Rick is both a philosopher and a poet.*  
 b<sub>1</sub>. *Rick is either a philosopher or a poet.*
- (100) a. *Marjorie believes that Babette is a Phi Beta Kappa.*  
 b<sub>1</sub>. *Marjorie does not know that Babette is a Phi Beta Kappa.*  
 b<sub>2</sub>. 

{	<i>Babette may be a Phi Beta Kappa.</i>
	<i>Babette may not be a Phi Beta Kappa.</i>
}	

These implicata limit "what is said" by shrinking the range of possible states of affairs associated with "what is said" to a smaller range of those states of affairs associated with "what is communicated." "What is communicated" is MORE DEFINITE than "what is said." We shall argue that

these more definite propositions are derivable by the Gricean Inference from Quantity.

Other implicata enrich "what is said" by reshaping the range of the possible states of affairs associated with "what is said" to a narrower range of possible states of affairs associated with "what is communicated." "What is communicated" is MORE PRECISE than "what is said." Some examples follow.

- (101) a. *If you mow the lawn, I'll give you five dollars.*  
       b<sub>1</sub>. *If you don't mow the lawn, I won't give you five dollars.*
- (102) a. *Mart turned the switch and the motor started.*  
       b<sub>1</sub>. *First Mart turned the switch and then the motor started.*  
       b<sub>2</sub>. *Mart's turning the switch indirectly caused the motor's starting.*  
       b<sub>3</sub>. *Mart's turning the switch directly caused the motor's starting.*
- (103) a. *Kurt went to the store and bought some wine.*  
       b<sub>1</sub>. *Kurt went to the store in order to buy some wine.*
- (104) a. *Mart and David moved the cabinet.*  
       b<sub>1</sub>. *Mart and David moved the cabinet together.*
- (105) a. *Mikael ate the cake.*  
       b<sub>1</sub>. *Mikael ate the whole cake.*
- (106) a. *Eve ate the apples.*  
       b<sub>1</sub>. *Eve ate all the apples.*
- (107) a. *The baby cried and the mother picked it up.*  
       b<sub>1</sub>. *The baby cried and the mother of the baby picked it up.*
- (108) a. *It was a vase made of bronze and on the base of the vessel was the maker's mark.*  
       b<sub>1</sub>. *It was a vase made of bronze and on the base of the vase was the maker's mark.*
- (109) a. *Mikael said "Hello" to the secretary and then he smiled.*  
       b<sub>1</sub>. *Mikael said "Hello" to the (female) secretary and then he (Mikael) smiled.*
- (110) a. *Do you know the time?*  
       b<sub>1</sub>. *If you know the time, please tell me what it is.*
- (111) a. *The president of Princeton does not have a Ph.D. in rolfging.*  
       b<sub>1</sub>. *There is a president of Princeton.*

- (112) a. *Pythagoras did not regret that he never tasted soybeans.*  
b<sub>1</sub>. *Pythagoras never tasted soybeans.*
- (113) a. *It's not HP sauce that Grice adores.*  
b<sub>1</sub>. *Grice adores something.*
- (114) a. *Maybe it's HP sauce that Grice adores.*  
b<sub>1</sub>. *Grice adores something.*
- (115) a. *Peter says that it is HP sauce that Grice adores.*  
b<sub>1</sub>. *Grice adores something.*
- (116) a. *If the president of Princeton has a Ph.D. in rolfing, at least he'll know how to pummel the faculty.*  
b<sub>1</sub>. *There is a president of Princeton.*

Clearly this is a heterogeneous class of examples. They have been discussed under many distinct rubrics, for example, (101) under *CONDITIONAL PERFECTION* (Geis and Zwicky, 1971), (103) under *CONJUNCTION REDUCTION* (Schmerling, 1975), (107) under *MEMBERSHIP CATEGORIZATION DEVICES* (Sacks, 1972), (108) under *DEFINITE REFERENCE* (Hawkins, 1975, 1978) and *BRIDGING INFERENCES* (Clark and Haviland 1977), (110) under *INDIRECT SPEECH ACTS* (Heringer 1976; Searle 1975), and (111)–(116) under *PRESUPPOSITION*. We shall argue that there is a general principle that licenses an inference from “what is said” to the *MORE PRECISE* content of “what is communicated” even though the particular ways in which the more precise proposition is selected may differ from case to case. We are interested in understanding the character of this Inference from Informativeness. But first we shall discuss the Gricean Inference from Quantity.

## 9. THE INFERENCE FROM QUANTITY AND ITS LIMITATIONS

The implicata in (93)–(100) are derivable essentially by appeal to Grice's first maxim of Quantity, namely, “Make your contribution as informative as is required for the current purposes of the exchange.” A prototypical Gricean argument for this class of implicatures goes as follows (Grice, 1975):

- (117) a. The speaker *S* has said *p*.  
b. There is a proposition *q*, related to *p* by virtue of entailing *p* and/or by being more informative than *p*, which it would be de-

sirable to convey in view of the current purposes of the exchange. (Here there is reference to the maxim of Relation "Be relevant.")

- c. Proposition *q* can be expressed as briefly as *p*, so *S* did not say *p* rather than *q* simply in order to be brief, that is, to conform to a maxim of Manner.
- d. So *S* must intend the hearer to infer *not-q* or at least *It's not the case that S knows that q*, for if *S* knew that *q*, he would have infringed the first maxim of Quantity by uttering *p*.
- e. Therefore, saying *p* implicates *not-q* or at least *It's not the case that S knows that q*.

Various versions of this argument have been rehearsed by Gazdar (1979), Harnish (1976), and Horn (1972). Schema (117) will suffice to represent these various arguments. For purposes of our discussion, the salient feature of such an argument is its derivation of implicata from what is NOT said. Given that there is available an expression of roughly equal length that is logically stronger and/or more informative, the failure to employ the stronger expression conveys that the speaker is not in a position to employ it. The inference will always result in a delimitation of what has been said, in a MORE DEFINITE proposition being conveyed.

The argument relies crucially on the existence of equally brief expressions that can be ordered in a Horn scale of relative informativeness. When the items in the scale are elements in a semantic field, and where alternatives are psychologically salient, then the stronger inference to *The speaker knows that the more informative alternatives do not obtain* is licensed. These are the well-known scalar implicatures illustrated in (93b<sub>1</sub>), (94b<sub>1</sub>), (97b<sub>1</sub>), (100b<sub>1</sub>) and formalized by Gazdar (1979, pp. 58–59) relying partly on the work of Horn (1972).<sup>8</sup>

In other cases the assertion of *p* will implicate that the speaker is not in a position to assert a stronger, more informative statement *q*. Instead of an inference from *p* to *S knows that not-q* as in the scalar cases, there is an inference from *p* to *S does not know that q* and so to *It's compatible with what S knows that q* and to *It's compatible with what S knows that not-q*.

<sup>8</sup> It seems to have been assumed in the literature that only Horn scales give rise to these strong implicatures. Other types of cases exhibit the same behavior. The implicatum of *Jane's skirt is blue* (Harnish, 1976) is not *The speaker doesn't know whether the skirt is any other color* but rather *The speaker knows that the skirt is not any other color*. Similarly to say *Jones is a doctor* is to imply *The speaker knows that Jones is not (e.g.) an architect* rather than *The speaker does not know whether Jones is an architect*. It may be sufficient that a set of lexical items be "about" the same domain and provide presumptively exclusive alternatives of equal saliency in order for the stronger implicata to obtain.

Some of these cases have been formalized by Gazdar (1979, p. 59) as CLAUSAL IMPLICATURES. These will arise when a compound sentence *p* has a constituent sentence *q* such that *p* entails neither *q* nor *not-q* and, on Gazdar's theory, presupposes neither as well. As there is usually a similar assertion that would entail *q*, or its negation, the speaker is presumed not to know whether *q* is true or whether *q* is false. This theory accounts for (97b<sub>2</sub>), (98b<sub>1</sub>), and (100b<sub>3</sub>).<sup>9</sup>

The implicata of (101)–(116) are not derivable by the Inference from Quantity. Indeed, the Inference from Quantity yields results inconsistent with the data of (101)–(116). For example, saying (101a) intuitively implicates (101b<sub>1</sub>) and thus communicates the conjunction of (101a) and (101b<sub>1</sub>), given in (101c).

- (101) a. *I'll give you five dollars if you mow the lawn.*  
       b<sub>1</sub>. *If you don't mow the lawn, I won't give you five dollars.*  
       c. *I'll give you five dollars if, and only if, you mow the lawn.*

But by the first maxim of Quantity, the speaker should have said the stronger sentence (101c). As the speaker has not said (101c), the hearer must be intended to infer its denial. Therefore, according to the Inference from Quantity, (101a) implicates either its own falsehood or the falsehood of its intuitive implicatum (101b<sub>1</sub>). Saying (101a) cannot implicate (101b<sub>1</sub>) through an Inference from Quantity, but there is an implicature nonetheless.<sup>10</sup> We must explain the data by appeal to another form of argument, one that yields interpretations that supplement "what is said" by positing that "what is meant" is a stronger proposition compatible both with presumptions in the context and with "what is said."

<sup>9</sup> The data of (96) and (99) seem to require a more elaborate theory (q.v. Horn, 1972). It is tempting to suggest that *not all* derives from an underlying *some are not* and *none* derives from an underlying *all are not*. Then by the usual scalar implicature, saying *not all* (i.e., *some are not*) implicates *not all are not* (i.e., *not none*), which is equivalent to *some*. Thus the pragmatic quantity scale, ordering "deeper" or otherwise "designated" readings, motivates a particular hypothesis about syntactic/semantic representations. We shall not discuss this hypothesis here. A more "surfacey" alternative would be the positing of scales of items: (*impossible, improbable/unlikely, . . .*), (*none/no, . . . not all, . . .*).

<sup>10</sup> Sentence (101b<sub>1</sub>) is only an implicatum; not all conditionals convey a biconditional, indicating the defeasibility of the inference. Compare

- (a) *I have a key in my pocket if the door is locked.*  
 (b) *I have a key in my pocket if, and only if, the door is locked.*

Sentence (b) is not implicated by saying (a) because (b) is incompatible with noncontroversial background presumptions and so is blocked, a mechanism formalized in Gazdar 1979.

## 10. THE INFERENCE FROM INFORMATIVENESS

It seems that at least three notions may enter into intuitive judgments that *A* is more informative than *B*: (a) the set of logical consequences of *B* is contained in the set of logical consequences of *A*; (b) the set of sentences incompatible with *B* (its potential falsifiers) is contained in the set of sentences incompatible with *A*; (c) what *B* is "about" is contained in (is a part of) what *A* is "about." These notions are semantical; they do not reflect the relativity of the informational content of an utterance to the context in which it is uttered. Yet it is also a basic intuition that the information an utterance gives an addressee depends in part on what he already knows, believes, presumes, or takes for granted, in short, on what is normally left unsaid.

We believe that there will prove to be some explanatory value in a theory embodying in some form the following propositions:

### Maxims of Relativity

1. Do not say what you believe to be highly noncontroversial, that is, to be entailed by the presumptions of the common ground.
2. Take what you hear to be lowly noncontroversial, that is, consistent with the presumptions of the common ground.

### Conventions of Noncontroversiality (among which are)

1. **Convention of Intension (Common Knowledge):** The obtaining of stereotypical relations among individuals is noncontroversial.
2. **Convention of Extension (Exportation):**  
If *A* is "about" *t*, then
  - a. If '*t*' is a singular term, ' $\exists x(x = t)$ ' is noncontroversial<sup>11</sup>
  - b. If '*t*' denotes a set, ' $\exists x(x \in t)$ ' is noncontroversial
  - c. If '*t*' denotes a state of affairs or a proposition, '*t* is actual' and '*t* is true' are noncontroversial.

### Principle of Informativeness

Suppose a speaker *S* addresses a sentence *A* to a hearer *H* in a context *K*. If *H* has *n* COMPETING interpretations *A*<sup>1</sup>, *A*<sup>2</sup>, . . . , *A*<sup>*n*</sup> of *A* in

<sup>11</sup> Gazdar (1977) dismisses a similar idea. He writes, "Naturally one can add to Grice's maxims, perhaps along the lines of: Assume referents exist unless you know they don't, but then one can always invent no less unreasonable sounding conversational maxims to deal with any example at all [p. 127]." The resemblance between our suggestion and Gazdar's straw man is only superficial. We do not conceive the Convention of Extension as a "maxim" of conversation at all. It is part of a theory of background presumption, of noncontroversiality. Its role is emphatically not that of a conversational maxim. Its acceptability will rest upon its value within such a theory of background presumption and upon its contribution to our theory as a whole.



the context  $K$  with information contents  $\text{INF}(A^{u_1}), \text{INF}(A^{u_2}), \dots, \text{INF}(A^{u_n})$ , and  $G_A$  is the set of propositions that are noncontroversial in  $K$ , then the "best" interpretation  $A^{u^*}$  of  $A$  for  $H$  is the most informative proposition among the competing interpretations that is consistent with the common ground.<sup>12</sup>

Let  $A^{u^*}$  be  $A^{u_j}$  for the least  $j$ ,  $1 \leq j \leq n$ , such that  $\text{INF}(A^{u_j} + G_A) = \max \text{INF}(A^{u_i} + G_A)$ ,  $1 \leq i \leq n$ .<sup>13</sup>

The sentence  $A$  will tend to convey the pragmatic content  $\text{PRON}(A)$  to the hearer  $H$ :  $\text{PRON}(A) = \text{INF}(A^{u^*} + G_{A^{u^*}})$  where  $G_{A^{u^*}}$  is the set of propositions that are noncontroversial in the context and that are "about" what  $A^{u^*}$  is "about."<sup>14</sup>

If a predicate  $Q$  is semantically nonspecific with respect to predicates  $P_i$ ,  $1 \leq i \leq n$ , but for some  $j$ ,  $1 \leq j \leq n$ ,  $P_j$  is stereotypical of  $Q$ s, then in saying ' $Q$ ' a speaker will convey ' $P_j$ ' in accordance with the second maxim of Relativity and the Convention of Intension. This is illustrated by Sentences (109a) and (118a)–(120a), which communicate (109b<sub>1</sub>) and (118b)–(120b), generalized implicata that are more informative than "what is said."

- (118) a. *The secretary smiled.*  
b. *The female secretary smiled.*
- (119) a. *John had a drink.*  
b. *John had an alcoholic drink.*
- (120) a. *John was reading a book.*  
b. *John was reading a non-dictionary.*

The standard application of Grice's first maxim of Quantity does not ex-

<sup>12</sup> The notion of "competing interpretations" is left as a primitive notion in this formulation of our theory. It is a complex function of the literal meaning of the sentence uttered, stress, tone, etc. The context will enter to fix reference, etc.

<sup>13</sup> Two explications of the qualitative concept of a statement's informational content have long been familiar to philosophers: they were proposed by Sir Karl Popper (1959), by Rudolf Carnap (1942), Carnap and Bar-Hillel (1952), John Kemeny (1953), and by Carl Hempel (1960). The first explication identifies the informational content of a statement with the set of its logical consequences, that is,  $\text{IN}(A) = \{B: A \models B\}$ . The second identifies the content with the set of possible falsifiers of the statement, descriptions of possible states of affairs incompatible with it, i.e.  $\text{CON}(A) = \{B: B \models \neg A\}$ . The two views are subsumed under one notion of "semantic content" in Carnap and Bar-Hillel (1953–1954) and a quantitative concept introduced. A Popperian notion related to the falsification content is that which a statement is "about". The Carnapian definition given by Smokler (1966) restricts  $\models$  somewhat (see Smokler, 1966, pp. 207, 210).

<sup>14</sup> We shall say more about *about*.

plain the data. On Grice's view a speaker should tailor the form of his utterances to what he thinks his hearer's needs or interests in the conversation might be. If a specification would enable the hearer to satisfy his needs or interests, there is a presumption that the speaker should issue such a specification in his utterance. If the speaker fails to be specific, it is assumed that he cannot be (Grice, 1975, p. 57). Thus it would be predicted that in saying (109a) or (118a)–(120a) a speaker would not implicate that the secretary was female, that the drink was alcoholic, that the book was not a dictionary.

Temporal, causal, and teleological relations between events are stereotypical in our "common sense" conceptual scheme. Thus (102)–(103) also fall under the maxim of Relativity and the Convention of Intension. The (a) sentences of (102)–(103) may be understood in several different ways. In any particular context of utterance, the chosen understanding results from an INFERENCE TO THE BEST INTERPRETATION, the understanding that best "fits" both the shared background presumptions in the context and the communicative intentions attributable to the speaker in light of "what he has said." We have formulated this notion of best interpretation in our Principle of Informativeness.

The Conventions of Noncontroversiality and the Principle of Informativeness also explain the presuppositional sentences (111a)–(116a). If (111a) is "about" the president of Princeton; (112a) is "about" Pythagoras's never tasting soybeans; (113a)–(115a) are "about" what Grice adores; (116a) is "about" the president of Princeton, then in accordance with the Convention of Extension, (111b<sub>1</sub>)–(116b<sub>1</sub>) are noncontroversial. By the Principle of Informativeness, (111b<sub>1</sub>)–(116b<sub>1</sub>) are in turn part of what (111a)–(116a) convey in the pragmatic content PRON for each sentence. These implicata are the traditional presuppositions, including the presupposition of the cleft (113a).

The semantic aspects of the intuitive notion of "aboutness" that we are employing have been in part explicated in Putnam (1958). Generalizing from a suggestion of Popper (1959) we shall say that if a statement *A* is "about" the set  $\mathcal{A}$  and a statement *B* is "about" the set  $\mathcal{B}$ , *A* is more informative than *B* if  $\mathcal{B}$  is properly contained in  $\mathcal{A}$  (Popper, 1959, p. 122). For example *All birds have wings* and *All crows have wings* are "about" birds and crows, respectively, but not "about" winged creatures, and the first statement is more informative than the second. On Putnam's explication of "aboutness," *A* is "about"  $\mathcal{S}$  if and only if *B* is "about"  $\mathcal{S}$  provided that *A* and *B* are logically equivalent. *All birds have wings* and *All crows have wings* are also "about" the nonwinged, as they are equivalent to *All nonwinged things are nonbirds* and *All nonwinged things are non-crows*. Thus the sentences may be taken to be "about" the set-theoretic

union of birds and the non-winged and "about" the set-theoretic union of crows and the nonwinged respectively. Because the former set properly contains the latter, by Popper's criterion *All birds have wings* is the more informative.

It is a feature of Putnam's account that a sentence and its negation are "about" the same thing and that ' $Fa$ ' is "about"  $\{a\}$ . A further feature of "aboutness" worthy of mention is its intentionality. This is indicated by the nonreferential occurrence of ' $t$ ' in ' $A$  is "about"  $t$ '. The sentence *All winged horses are unridable* is "about" winged horses; *All golden mountains are unclimbable* is "about" golden mountains. As sets these are identical, being the null set  $\emptyset$ . But *All winged horses are unridable* is not "about" golden mountains, nor is *All golden mountains are unclimbable* "about" winged horses. The inference from ' $A$  is "about"  $t$ ' to ' $\exists x(A$  is "about"  $x$ )' is an instance of an inference dubbed EXPORTATION by W. V. O. Quine (1956). Quine, in a happy choice of terminology, called his inference IMPLICATIVE, and so do we. However logically dubious our inference is, it is dubious in precisely the way exportation is dubious. Quine's classic example of exportation is that inference from *Ralph believes that Ortcutt is a spy* to *Ralph believes  $z$  ( $z$  is a spy) of Ortcutt*, from which it follows ( $\exists x$ ) (*Ralph believes  $z$  ( $z$  is a spy) of  $x$* ). Our need for ' $\exists x(A$  is "about"  $x$ )' is as pressing as the need Quine recognizes for relational statements of belief. By the Convention of Extension, the exported existential proposition is a matter of presumption in the context of utterance. The proposition does not need to be true; it merely needs to be taken for granted by the parties to the discourse. It is their propositional attitudes that affect how utterances in the context will be understood.

## 11. THE APPARENT CLASH BETWEEN GRICEAN MAXIMS AND OUR PRINCIPLE OF INFORMATIVENESS: ITS RESOLUTION

We have sketched how our maxims of Relativity, the Conventions of Noncontroversiality, and our Principle of Informativeness explain the data of (102), (103), (109), (111)–(120) that Gricean Inferences from Quantity will not explain. The Quantity implicata are inconsistent with the Informativeness implicata. Yet both forms of inference are needed for explanation of all the data. We must ask why speakers do not intuit contradictions when the Inferences from Quantity and from Informativeness produce propositions inconsistent with each other.

We have already discussed scalar implicatures. It was observed that internal and external negation might be considered a Horn scale ( $\sim A$ ,  $\neg A$ ).

By the Inference from Quantity, asserting  $\neg A$  implicates *not*  $\sim A$  in the same way that asserting ' $\exists x A(x)$ ' implicates '*not*  $\forall x A(x)$ '. This is an incorrect account of negation. Typically asserting  $\neg A$  implicates  $\sim A$ , which is the result of an Inference to the Best Interpretation of what the speaker said (by our Principle of Informativeness).

Again, the biconditional and conditional seem to form a Horn scale ( $A \leftrightarrow B, A \rightarrow B$ ). By the Inference from Quantity asserting  $A \rightarrow B$  implicates *not* ( $A \leftrightarrow B$ ). But this is incorrect. Typically asserting  $A \rightarrow B$  implicates  $A \leftrightarrow B$ .

Sentences like (102a) suggest a possible scale (*A because B, A and then B, A and B*). The Inference from Quantity yields that the assertion *A and B* implicates *not* (*A and then B*) and *not* (*A because B*). Again this is incorrect. If *A and B* is asserted in a context, it will be understood as the strongest proposition in the scale in light of the common ground, the apparent intentions of the speaker, and the literal meaning of the sentence uttered.

We wish to resolve these apparent clashes between the Gricean Inference from Quantity and our Inference from Informativeness. Our strategy is to argue that these cases are not scales properly so-called. If they are not, then there are no scalar implicatures of the sort just described, and so no clash between Informativeness and Quantity. Only Informativeness actually applies to these cases. In fact, there are natural and independently motivated restrictions to put on Horn scales. First, to constitute a genuine scale for the production of scalar implicatures, each item must be lexicalized to the same degree. Second, to constitute a genuine scale, each item in a position on the scale entails those in positions to its right, and all the items are "about" the same thing (Gazdar, 1979, pp. 57–58; 1977, pp. 72, 181). The first restriction will eliminate the Quantity implicatures incompatible with "negation strengthening" and with "conditional perfection." There is no scale ( $\sim A, \neg A$ ) because there is no free morpheme in English that standardly means the internal negation. There is no argument of the form "Since the speaker did not say *The king of France is nonbald*, he cannot mean it. And so he knows that it is false." Similarly, because there is no unitary lexeme in English like *if* that standardly means the same as *if and only if* (*iff* does not count), there is no Horn scale ( $A \leftrightarrow B, A \rightarrow B$ ). The second restriction will eliminate the Quantity implicatures incompatible with "conjunction buttressing." There is no Horn scale (*A because B, A and then B, A and B*), as *because* and *and then* introduce relations other than the kind the Horn scale is "about," the paradigm of which is logical conjunction.

Of course there are further cases of apparent clash between Quantity and Informativeness. Saying *not* (*A and B*) seems to implicate *A or B*. Thus, saying *It's not the case that Rick is both a philosopher and a poet*

seems to implicate *Rick is either a philosopher or a poet*. The principle involved is the implication of the weakest item on the Horn scale by the denial of a strong one. The scale is (*and*, *or*). On the other hand, saying *It's not the case that Kurt went to the store and bought some wine* (colloquially, *Kurt didn't go to the store and buy some wine*) does not implicate *Kurt went to the store or he bought some wine*. The Inference from Informativeness results in "conjunction buttressing." *A and B* is informatively understood as *A in order to B*. The two actions described separately in *A* and in *B* are teleologically related as means to end. The sentence indicates one action under a complex description. The implicature from the saying of *not (A and B)* to *A or B* that implicates the possibility of independent alternatives cannot coherently arise. Indeed, saying *Kurt didn't go to the store and buy some wine* implicates *Kurt neither went to the store nor bought some wine*. So, for some *A, B*, saying *not (A and B)* implicates *not-A and not-B*.

However, for Gazdar (1979, p. 59) *not (A and B)* potentially clausal implicates, by appeal to Quantity, *It's possible for all the speaker knows that A* and *It's possible for all the speaker knows that B*. If the Inference from Informativeness yields *The speaker knows that not-A* and *The speaker knows that not-B* in cases like the one in question, Informativeness is inconsistent with Gazdar's rule.

A simplified version of that rule is phrased informally by Gazdar (1979, p. 60) as follows: *X* potentially clausal implicates that for all the speaker knows *Y*, and, for all the speaker knows, *not Y*, if and only if *Y* is a part of *X* but neither *Y* nor its negation is entailed by *X*. In our example *X* = *not (A and B)* and *Y* = *A*, where in the stereotypical course of things *A* is necessary for *B*. *A* is a part of *not (A and B)*, and neither *A* nor its negation is entailed by *not (A and B)*. Thus *not (A and B)* potentially clausal implicates *It's possible for all the speaker knows that A*. Apart from *Y* (or *not Y*) being entailed by (or being presupposed by) *X*, Gazdar's rule takes no semantic relations into account; in particular, no consideration is given to semantic relations between PARTS of *X*. But that relation is crucial to this example.

The same issues arise for potential scalar quantity implicatures. Saying *A or B* implicates *not (A and B)*. But if one says *Socrates is mortal or everyone is mortal*, which is equivalent to *Socrates is mortal*, does one thereby implicate *not (Socrates is mortal and everyone is mortal)*, which is equivalent to *not (everyone is mortal)*? The contexts in which one could appropriately employ *Socrates is mortal or everyone is mortal* may be a little odd; it is not as if it were a premise for an argument that continues *Socrates isn't mortal; therefore, everyone is mortal*. No such argument could possibly be sound, though it certainly has a valid form. The fact re-

mains that, whatever an appropriate context might be, use of a disjunctive sentence equivalent to *Socrates is mortal* is predicted to implicate a sentence equivalent to *Someone is not mortal* in the same way that use of *A or B* is predicted to implicate *but not both*. If it is not obviously false, it also is not obviously true that there is this implicature. We take it that it is an open question whether Gazdar's rules are adequate as they stand. Properly reformulated in light of the semantic relations between *A* and *B*, Gazdar's rules for the sentence *not (A and B)* may not yield scalar or clausal implicata that would contradict the implicata derived by the Principle of Informativeness. So it is an open question whether there is an irresolvable conflict between Quantity and Informativeness.

As our third class of examples in which Quantity and Informativeness apparently conflict, we discuss cases examined by Harnish (1976). When a speaker asserts (121) he implicates (122), and when a speaker asserts (123) he implicates (124).

- (121) *Russell wrote "Principia Mathematica"*.
- (122) *Only Russell wrote "Principia Mathematica"*.
- (123) *Russell and Whitehead wrote "Principia Mathematica"*.
- (124) *Russell and Whitehead jointly wrote "Principia Mathematica"*.

By Quantity we may infer that as the speaker of (121) failed to be specific where it would be informative and generally useful to be so, the speaker was in no position to assert (122). Yet this conclusion conflicts with a stereotypical relationship between books and authors, the NORM of "one author per book" (cf. Harnish's example *Leibniz and Newton invented the calculus*). Given that it is held, for example by Gazdar, that possible implicata inconsistent with background presumptions are defeated, it is plausible to analyze the defeat of the Quantity implicatum as one of this kind. However, incorrect Inferences from Quantity will not always be neutralized through the fortuitous intervention of contextual assumptions — the very ones that are employed in our Principle of Informativeness. Perhaps we will finally find a real clash between Gricean maxims and our Informativeness.

For example, there is a strong intuition that (125b), (126b), and (127b) are the preferred interpretations of (125a), (126a), and (127a).

- (125) a. *Mart and David moved the cabinet.*  
b. *They moved it together.*
- (126) a. *Mart and David bought a piano.*  
b. *They bought it together.*

- (127) a. *Mart and David went to San Francisco.*  
 b. *They went together.*

Harnish (1976, p. 328 ff.) argues, correctly we believe, that the (a) sentences are not ambiguous between "independent" and "cooperative" understandings. The preferred interpretation is implicated. Harnish (1976, p. 358 ff.) points out that it is not at all clear that the maxim of Quantity can explain this implicature. (He does not explicitly say what the Quantity implicature would be. The hearer might argue that the speaker is in no position to make a relevant "cooperative" claim, as he did not say *Mart and David bought a piano together*. Thus the hearer would infer the "independent" understanding of the sentence. However, he could also argue that because the speaker did not say *Mart and David bought pianos separately*, the speaker was in no position to make that claim. So the hearer understands him to mean the "cooperative" understanding of the sentence. The Quantity implicature is not well defined.) But Harnish proposes a Gricean submaxim of Manner, namely, in so far as possible, if objects *a, b, c, . . . F* together, put their names together when reporting this *F*-ing. This maxim is intended as one instance of a more general Grice-type maxim: Make your sayings mirror the world (Harnish, 1976, p. 359).

But such Gricean maxims and submaxims of Manner will not account for all the data. For example, the preferred interpretation of (128a) (e.g., in reply to *Who took a shower?* or in reply to *What did Mart and David do?*) is (128b) rather than (128c).

- (128) a. *Mart and David took a shower.*  
 b. *Mart and David took showers separately.*  
 c. *Mart and David took a shower together.*

In this example the "independent" interpretation is the preferred one. Sentence (128a) conveys (128b), and given our social norms, (128b) is predicted by the second maxim of Relativity, the Conventions of Noncontroversiality, and the Principle of Informativeness. The Inference to the Best Interpretation of the utterance (128a) yields the "independent" understanding (128b). Because the Quantity implicatures for (125)–(128) are not well defined, there is no clash between Quantity and Informativeness. And Manner is simply not a general explanation. We shall now sketch an account of the implicatures of (125)–(127).

The literal meaning of the sentence (126a) *Mart and David bought a piano* leaves it open whether there was one piano-buying or two. The usual implicature restricts the understanding to one. If the sentence is indeed a reduced form of *Mart bought a piano and David bought a piano*,

the literal meaning, under the assumption that this reduction preserves meaning, is predictable. The conjunction also leaves it open whether one or two pianos were bought. The same observation holds for *Mart bought a piano and so did David*, which requires identity of sense of the deleted constituent. Atlas (1977, pp. 329–330) argued that it would follow from the last sentence that David did what Mart did. The sentence requires sameness of action, but that does not determine whether one or two piano-buyings are involved unless the relevant criteria of identity of actions have been fixed. Given the meaning of the sentence, at least it is clear that the criteria cannot require that the action-token (as contrasted with action-type) be the same for David as for Mart. Thus the piano need not be one and the same.

The “independent” implicatum entails that the action-tokens are different. Normally this would mean that more than one piano were involved, but it is imaginable that in a short period of time Mart could buy and then sell a piano, which David then bought, perhaps from Mart himself. It would not be semantically unacceptable, and though unusual because incomplete it certainly would not be false, to describe that situation—one piano, two buyings—by (129a). We should represent such a situation, following Davidson (1967), by (129b). The normal case would be (129c).

- (129) a. *Mart and David bought a piano.*  
 b.  $\exists x \exists e \exists e' (\text{Piano}(x) \ \& \ \text{Buy}(m,x,e) \ \& \ \text{Buy}(d,x,e') \ \& \ e \neq e')$   
 c.  $\exists x \exists y \exists e \exists e' (\text{Piano}(x) \ \& \ \text{Piano}(y) \ \& \ x \neq y \ \& \ \text{Buy}(m,x,e) \ \& \ \text{Buy}(d,y,e') \ \& \ e \neq e')$   
 d.  $\exists x \exists e (\text{Piano}(x) \ \& \ \text{Buy}(m,x,e) \ \& \ \text{Buy}(d,x,e))$

By contrast the “cooperative” implicatum entails that the action-token (including the piano) is the same for David as for Mart. *Mart and David bought a piano* would then convey (129d). These implicata are not directly comparable—neither (129c) nor (129d) entails the other. Nonetheless we intuitively feel that the “cooperative” implicatum (129d) is more specific or precise, perhaps because it is in Popper’s sense a “riskier” proposition, more easily refuted. The fewer existential quantifiers there are in an affirmative sentence the more highly valued the sentence is. This is a case in which the relevant notion of information is that determined by the class of possible falsifiers of a proposition. Such a proposition is preferred as an interpretation by our Principle of Informativeness unless it contradicts our background Conventions of Noncontroversiality, as described in our Principle.

As examples of our fourth class of cases in which the Principle of Informativeness may clash with the maxim of Quantity, we consider sentences discussed by Grice (1975, p. 56).



- (130) a. *John is meeting a woman this evening.*  
b. *The person to be met is someone other than John's wife, mother, sister, or perhaps even a close platonic friend.*
- (131) a. *I broke a finger yesterday.*  
b. *The finger is mine.*

Grice argues plausibly that an Inference from Quantity will yield (130b) from (130a). The failure to use a more informative expression than the indefinite description *a woman* suggests that the speaker is in no position to provide a more specific description of the kind normally relevant. The reverse implicature in (131), which Grice mentions in passing, presents an explanatory difficulty for the Inference from Quantity. According to Quantity if the speaker meant his own finger, he should have said so. Because he did not, he is assumed not to be in the position to make that claim, that is, the finger was not his. But the negation of this proposition is actually implicated. Once again the explanation of the inference lies in what speakers take as stereotypical or conventional behavior. The use of the indefinite description *a finger* leaves it open whose finger was broken, but the speaker's breaking someone else's finger would be regrettable if unintentional and contrary to our social norms if intentional. As noted in the second maxim of Relativity, we are loathe to interpret the utterance so as to impute an abnormal or unnatural act unless there are specific indications to that effect. A similar explanation accounts for the implicature in (132).

- (132) a. *I lost a book yesterday.*  
b. *The book is mine.*

On the other hand Quantity implicatures seem in force in the following cases (133)–(135).<sup>15</sup>

- (133) a. *I slept on a boat last night.*  
b. *The boat is not mine.*
- (134) a. *I slept in a car last night.*  
b. *The car is not mine.*
- (135) a. *I found a ring yesterday.*  
b. *The ring is not mine.*

<sup>15</sup> Data in (132)–(135) are from Grice (1975, p. 56) and Harnish (1976, p. 350). Our intuitions differ from Harnish's on (133): he does not believe saying (133a) implicates (133b). Harnish provides no explanation of his data. We shall provide a partial explanation in what follows.

Quantity is part of an account of cooperative communicative behavior. Informativeness is part of an account of efficient communicative behavior. If one can communicate some specified proposition *p* by asserting a less specified proposition *q*, then in general it will be more efficient to assert *q* and let the hearer make his INFERENCE TO THE BEST INTERPRETATION (Atlas, 1975b). In light of the distinct roles of Grice's maxims and of the Principle of Informativeness, it is no surprise that conflict might be possible. For the class of indefinite descriptions just discussed, the upshot seems to be that where there is an implicature at all (not all indefinite descriptions yield them) Quantity takes precedence over Informativeness unless the result contradicts our background Conventions of Noncontroversiality. If that occurs, the Informativeness implicature is adopted. This is the first genuine case of clash between Quantity and Informativeness that we have discussed. It is resolved by a general preference for the Quantity implicature. After all, where the Quantity implicature may be employed appropriately, it is reasonable to do so on the grounds that speakers are being cooperative. In particular, it is reasonable to assume that they are being relevant, perspicuous, and thus informative in what they say. Speakers must share responsibility for successful uptake with their hearers.

## 12. THE LOGICAL FORM OF CLEFTS AND ITS EXPLANATORY VALUE

One attraction of Grice's views has always been its semantical conservatism. The Fregean notion that "sense" is truth conditions, the identification of a set of English expressions, which are frustratingly resistant to systematization, with the logical constants, which are our paradigm of semantic systematization, and the scrupulous adherence to a policy of austerity in positing senses have contributed to theoretical simplicity in our theory of language. Simplicity is indeed a virtue of theories; simple-mindedness is not. There has been a regrettable temptation to adopt a logical primitivism when theorizing about implicature. The canonical languages of our logical theories are constructed to achieve pellucidity, but a certain measure of complexity is compatible with, indeed on our view required by, a satisfactory use of truth-conditional semantics within a pragmatic theory.

Logical primitivism would take the familiar claim that (136) and (137) have the same truth conditions to imply (fallaciously) that (136) and (137) have the same logical form (138). A less primitive suggestion would give (136) the logical form (139).

(136) *It was John that Mary kissed.*

(137) *Mary kissed John.*

(138) *Kiss(Mary, John)*

(139)  $\lambda x(\text{Kiss}(\text{Mary}, x))(\text{John})$

In adopting a logical form we are locating the sentence in a network of entailment relations that is described by the particular logical theory we are employing. But we are also interested in hypothesizing logical forms that are EXPLANATORY, that account for entailment relations by exhibiting semantically significant structure in the sentence. Such an account will begin to explain how the relations between the parts of the sentence contribute to the meaning of the whole. It will illuminate the similarities and differences between related sentences. It will (on the standard view) provide the extensional sentence "meaning" upon which inferential mechanisms must operate to yield the understanding of an utterance. The assignment of logical form to a sentence is not only relative to the logical theory employed, it is relative to the comprehensive theory in which logical forms have an explanatory place. Indeed, even the pragmatic features of the sentence, its use in the language, can in principle bear on the assignment of logical form, especially if the resulting form increases the overall coherence and explanatory power of the theory.<sup>16</sup>

The logical forms in (138) and (139) are logically equivalent, but they are distinct: Whereas (138) has a primitive two-place predicate-symbol true of Mary and John, (139) has a complex one-place predicate-symbol true of John. Whereas (138) expresses a relation between Mary and John—it is "about" the pair (Mary, John)—(139) expresses a property of John; it is "about" him. And it is precisely here that the flaws of (139) become obvious.

If one recalls the semantical similarities between clefts and pseudo-clefts, the pseudo-cleft (140) will highlight the properties of (136).

(140) *What Mary kissed was John.*

This sentence is "about" what/whom Mary kissed, which is specified or identified as John. Likewise (136) is actually "about" whom Mary kissed, which is then specified or identified as John.

We expand our description of the behavior of clefts as follows (cf. Section 7):

<sup>16</sup> Our indebtedness to the writing and teaching of Donald Davidson shows itself here, as does our divergence from his views (cf. Davidson 1967, 1970).

- I. *It was John that Mary kissed*
  - a. Entails *Mary kissed John*; the latter does not entail the former
  - b. Entails *Mary kissed someone*
  - c. Entails but does not "presuppose" *Mary kissed (exactly) one person*
  - d. Is "about" what/whom Mary kissed.
- II. *It wasn't John that Mary kissed*
  - a. Entails *Mary didn't kiss John*; the latter does not entail the former
  - b. "Presupposes" or its use implicates *Mary kissed someone*
  - c. Does not "presuppose" *Mary kissed (exactly) one person*
  - d. Is "about" what/whom Mary kissed.

The logical forms (138) and (139), and their negations, obviously cannot satisfy these conditions. Is there any logical form that will meet ALL these conditions and in the process yield the correct pragmatic inferences in the Revised Standard Version? The answer, of course, is yes. It is just a more complex logical form than is typically suggested.

The correct logical form for (141a) *It was John that Mary kissed* involves  $\lambda$ -abstraction (Carnap, 1958, pp. 129–131) to formulate a complex one-place predicate-symbol and our COLLECTION OPERATOR  $\gamma$  to formulate a singular term.<sup>17</sup> The logical form (141b) of (141a) has precisely the properties described in (I). It may be paraphrased in English by (141c).

<sup>17</sup> If  $\bar{x}A(x) = \{a\}$ , that is, the extension of ' $A(x)$ ' is just one object  $a$ , Hilbert's (1927) term ' $\epsilon xA(x)$ ' designates the descriptum of ' $\bar{x}A(x)$ '. If the extension of ' $A(x)$ ' is larger,  $\epsilon$  is a choice function; ' $\epsilon xA(x)$ ' designates SOME ONE of the individuals in the extension (but we do not know which). The expression ' $\epsilon xA(x)$ ' may be paraphrased by *an  $x$  such that if anything has  $A$ ,  $x$  has  $A$* . The basic axioms governing the use of the term are  $\vdash \exists xA(x) \leftrightarrow A(\epsilon xA(x))$  and  $\vdash \forall xA(x) \leftrightarrow A(\epsilon x \neg A(x))$ . Thus the selection operator allows one to make a statement the force of which is PURELY existential while employing a designating singular term.

Paul Ziff, Jaakko Hintikka, and independently Jay Atlas have remarked on the need for  $\epsilon$ -terms in giving the logical forms for sentences of a natural language. Ziff and Hintikka noted it for coreference phenomena, as in *John wants to catch a fish and eat it for supper* (Hintikka, 1973). Atlas (1972) makes the first systematic use of the  $\epsilon$ -term within Donald Davidson's program of giving a theory of truth for English; the problem was to characterize the circumstances in which *I met the man who wrote "Lolita"*; therefore, *the man I met wrote "Lolita"* would be an acceptable inference. Once again, the heart of the matter is coreference—the coreference of event-terms.

The indeterminateness of Hilbert's  $\epsilon$ -term makes it attractive to some, e.g., R. M. Martin (1979:214), as a paraphrase of indefinite plural noun phrases. Though we are in agreement with Martin's suggestions in some respects, his claim that Hilbert's  $\epsilon$ -term, that is, the selection description, correctly formalizes indefinite plural noun phrases seems to us mistaken. It also seems incorrect to define contextually the  $\epsilon$ -term as Martin (1958, p. 55; 1979, p. 214) does. Attributing the definition to Frederic B. Fitch, Martin (1958) contextually defines the  $\epsilon$ -term by: ' $B(\epsilon xA(x))$ ' is defined as ' $\exists xA(x) \ \& \ \forall x(A(x) \rightarrow B(x))$ '. The second conjunct of the

- (141) a. *It was John that Mary kissed.*  
 b.  $\lambda x(x = \text{John})(\gamma x \text{Kiss}(\text{Mary}, x))$   
 c. *A group of individuals kissed by Mary is identical to John.*

The advantages of this semantic representation are manifold. First, it explains the data in (I). It is easy to see that the entailment relation is as claimed in (Ia), as  $\lambda x(x = \text{John})(\gamma x A(x)) \models A(\text{John})$ , but  $A(\text{John}) \not\models \lambda x(x = \text{John})(\gamma x A(x))$ . Condition (Ib) then follows immediately from (Ia). It is easy to prove that  $\lambda x(x = \text{John})(\gamma x A(x)) \models E! \lambda x A(x)$ , so part of (Ic) is explained. It may be worth remarking on the reasons for this entailment.

The formula ' $\lambda x(x = \text{John})(\gamma x A(x))$ ' is definitionally equivalent to ' $\exists x A(x) \ \& \ \forall y(A(y) \rightarrow y = \text{John})$ ', from which ' $\exists x A(x) \ \& \ \exists x \forall y(A(y) \rightarrow$

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definiens seems too inclusive to be an accurate analysis of the definiendum. (For discussion of the  $\epsilon$ -term, see Leisenring (1969).) But the condition in the definiens does capture an important concept in mathematics and in linguistics of which we can make use in the analysis of collective terms and so of clefts. Just as the  $\epsilon$ -operator attaches to a formula A to produce an individual term ' $\epsilon x A(x)$ ', so our  $\gamma$ -operator attaches to a formula A to produce a collective term ' $\gamma x A(x)$ '. By a collective term we mean one that denotes a group. For example, the plural noun phrase *the boys* may be used as a collective term in *The boys* (collectively, that is, a group of boys) *are at the party*; the sentence is true if and only if there are boys and every boy (in the group) is at the party. We contextually define ' $B(\gamma x A(x))$ ' as ' $\exists x A(x) \ \& \ \forall x(A(x) \rightarrow B(x))$ '.

The  $\gamma$ -operator is indifferent to the distinction between singular and plural; ' $\gamma x A(x)$ ' is consistent with both singular 'the A' and plural 'the As' and so captures a linguistic feature of collective nouns. Collective nouns in English are sometimes grammatically plural, for example, *cattle*, *clergy*, sometimes grammatically singular, for example, *furniture*, and sometimes either, for example, *family*.

A collective noun can designate a group collectively, and so behave as a denoting term, or designate a group distributively, for example, (in the U.S.) *The Administration, who have . . . , are . . .*; (in the U.K.) *The Government, who have . . . , are . . .*; plural count nouns, like *The boys* in our example above, which can mimic the behavior of collective nouns. Martin's definiens, which we accept as roughly correct for ' $\gamma x A(x)$ ', though not for ' $\epsilon x A(x)$ ', captures the distributive use of the collective term in the truth-conditions for sentences containing it.

It is also linguistically possible for a collective noun, and so even for plural count nouns, to designate a group of one as well as a more normal group of more than one. It is a virtue of our  $\gamma$ -operator that it allows this possibility. The cleft sentence *It was John that Mary kissed* is "about" the collectivity, not excluding a group of one, that Mary kissed. It can easily be demonstrated that the logical form for clefts that employs our  $\gamma$ -operator explains precisely those characteristics of clefts that we have argued are properly attributable to them.

There is one final observation supporting formalization of collectivity by our  $\gamma$ -operator. Collective nouns like *flock*, *herd*, *library*, *forest*, and *group* can act as "sortal classifiers" when attached to count nouns, for example, *flock of sheep*. And it has been claimed that "sortal classifiers" have properties in common with determiners (Lyons 1977, p. 464). If so, there is a suggestive analogy between a determiner like *the* and a "sortal classifier" like *group*. Likewise, there is an analogy between the  $\epsilon$ -operator and our  $\gamma$ -operator, which we have exploited.

$y = x$ )<sup>1</sup> follows immediately—that is, *Mary kissed (exactly) one person*. The sentence *Mary kissed someone* follows from the contribution of *that Mary kissed* to *It was John that Mary kissed*. But the proposition *Mary kissed (exactly) one person* follows because of the CONTINGENT fact that the specification in the (surface) main-clause focus constituent of *It was John that Mary kissed* lists but one item, namely, John. That “asserted” fact adds *Mary kissed (at most) one person* to the “presupposed” *Mary kissed someone* to give *Mary kissed (exactly) one person*.

The felicitousness of the discourse (142)

(142) McX: *Was it Mart and Rick that Mary kissed?*

McY: *She kissed only John.*

which was inexplicable to Halvorsen, is explained without the machinery of “ordered implications” (cf. Wilson and Sperber, 1979) that we sketched in Section 6. What is being contradicted is not a “presupposition” but an assertion, and there is no problem of felicitousness.

Furthermore, the fact that lists can be of any finite length receives a natural accomodation. Lists are sequences (or vectors), and can be the values of individual variables. The expression *kiss* can be treated as a “multigrade” predicate *Kiss*, so a sequence of any length (including infinite length) can be one of its arguments. The sentence schema *It was  $N_1, N_2, \dots, N_{i-1}$ , and  $N_i$  that Mary kissed* specifies a sequence  $[s_a]_{a=1}^i$  of  $i$  terms where  $s_a = N_a$ . The logical form is  $\lambda x(x = [s_a]_{a=1}^i)(\gamma x \text{Kiss}(m, x))$  with  $x$  ranging over  $i$ -term sequences of individuals. If we wish to accomodate ANY number of terms, we may let sequences be infinite and identify the subsequence  $[s_a]_{a=1}^i, s_a = N_a$ , with the sequence  $[t_a]_{a=1}^\infty$  such that  $t_a = s_a, a = 1, 2, \dots, i$  and  $t_a = \mathcal{D}, i + 1 \leq a$ , where  $\mathcal{D}$  is the domain of individuals.

The logical form preserves the intuition that the cleft is a property rather than relation statement. In so doing it shows that it is “about” its logical subject, removing the incoherence between the semantics and pragmatics noted in Section 5; thus it explains datum (Id). It is “about” what/whom Mary kissed, that is, “about”  $\gamma x \text{Kiss}(\text{Mary}, x)$ .<sup>18</sup>

<sup>18</sup> If the reader still believes in a uniqueness implicature, so that he believes that (Ic) should read “‘presupposes’ *Mary kissed (exactly) one person*” he can be satisfied by the logical form  $\lambda x(x = \text{John})(\lambda x \text{Kiss}(\text{Mary}, x))$ . The logically equivalent form  $\lambda x. \text{Kiss}(\text{Mary}, x) = \text{John}$  resembles an underlying syntactic structure adopted for clefts by Harries-Delisle (Contrastive emphasis and cleft sentences. In J. H. Greenberg *et al.* (Eds.) *Universals of Human Language, Volume 4: Syntax*, Stanford: Stanford University Press, 1978, pp. 419–486). Harries-Delisle produces syntactical arguments to show that the underlying structure of the “equational sentence” *The one whom Mary kissed is John* also underlies *It was John that Mary kissed*, where *the one* is a neutral head noun marked for person (third) and in English at least for number and for humanness. Logically the sentence is rec-

Radical Pragmatics posits the external negation (143b) for the negative sentence (143a). The Revised Standard Version of Radical Pragmatics, by the Principle of Informativeness, yields as a generalized conversational implicature of (143a) the internal negation (143c).

- (143) a. It wasn't John that Mary kissed.  
 b.  $\neg \lambda x(x = \text{John})(\gamma x \text{Kiss}(\text{Mary}, x))$   
 c.  $\lambda x(x \neq \text{John})(\gamma x \text{Kiss}(\text{Mary}, x))$

On either understanding of (143a), (IIc) is explained. Condition (IIc) is explained as the implicature (143c) does not entail *Mary kissed (exactly) one person*. This completes the explanation of (Ic). The implicature (143c) entails, so (143a) implicates, *Mary kissed someone*. Thus (IIb) is explained. And finally, the implicature (143c) entails *Mary didn't kiss John*, but the converse is not the case. So (IIa) is explained.

In Section 6 we discussed the peculiarity of Halvorsen's and Sadock's analysis of *Mary kissed no one and it wasn't John that Mary kissed*, a sentence that was allegedly true but "internally" infelicitous (self-contradictory). Radical Pragmatics predicts that on the literal understanding of (143a) it is true and, because the implicature is canceled, felicitous, even if redundant. On the conveyed understanding (143a) is false and "odd" because straightforwardly contradictory. (These truth-values are determined by the assumption in the case that *Mary kissed no one* is true.) These theoretical descriptions of the behavior of *Mary kissed no one and it wasn't John that Mary kissed* seem empirically adequate and pleasantly nonparadoxical.

In general, with the qualifications that Jay Atlas has consistently made about the Radical Pragmatics treatment of negation, which strikes him as another instance of logical primitivism, the Radical Pragmatics view is a coherent and empirically adequate account of the entailment and "pre-suppositional" behavior of cleft sentences.<sup>19</sup>

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ognized to involve identity, but grammatically the underlying structure is subject/predicate, and there are various complications about the occurrence of the copula in the underlying structure. Our work begins from roughly the same semantic intuitions, but refines and supports a logical analysis by semantic and pragmatic rather than syntactic data. It is now reassuring to discover syntactical arguments in support of an underlying structure whose basic features at least approximate those of the logical form that we have posited. Critical assessment of Harries-Delisle's arguments we must leave to syntacticians.

<sup>19</sup> Atlas (1975a, 1975b, 1977) argued that negation was univocal; that it was general/non-specific rather than ambiguous. He also suggested how a Radical Pragmatics theory could accept an identification of negation in English with the external negation in ordinary logic, namely, by giving up the identification of external negation with the "literal meaning" of a sentence. Instead the theory would rest content with describing the understandings of utterances, and for the sake of theoretical simplicity make the external negation the "unmarked" case (see Atlas, 1979).

### 13. THE INTERACTION OF SEMANTICS AND PRAGMATICS

Within the philosophy of language and linguistic theory over the last decade, there have been attempts to investigate the relationship between semantics and pragmatics, to map a boundary between the two domains, and to understand the mechanics of their interaction. The aim of this chapter has been to exemplify one approach through which our understanding might be improved and to make evident the explanatory power of such an approach. A benefit for linguistics is the retrieval of the hope, now largely and prematurely abandoned, that the phenomena known as "presupposition" can be reduced to matters of entailment on the one hand and nonconventional conversational inferences on the other. The ingredients making this hope viable are (a) a refinement of the role of logical form and (b) the formulation of general principles of conversational inference.

The original intuition that we have tried to explicate is that there is significant semantic structure, explicable by logical form, over and beyond truth conditions. This structure meshes closely with pragmatic principles to produce informative, defeasible implicata. There were two problems. First, we needed to find some independent condition on logical forms that express the same truth conditions. This condition would distinguish a semantic representation of an English sentence from another logically equivalent to it. Second, we needed to make explicit that in fact there are two crosscutting pragmatic principles governing informativeness, not simply a hodgepodge of conflicting inferences. No doubt our formulations can and will be improved. Our aim here has been to show that, contrary to most expectation, progress can be made towards a coherent, explanatory theory.

The successful development of our approach would have several benefits. The one that we have focused on here is the reduction of some well-known presuppositional phenomena to matters of semantic structure interacting intimately with pragmatic principles of the sort used for a serious philosophical purpose by H. Paul Grice. Alternative theories treat presupposition as irreducible, a special species of conventional, non-truth-conditional inference that requires specific lexical items and syntactic structures to be associated with the inferences. This is accomplished not by rule but item by item (Gazdar, 1979; Karttunen and Peters, 1979). On our theory a few general principles will explain a wide range of data. Apart from the strength and simplicity of theory thereby achieved, our account attempts to answer to the intuition that presuppositions arise in part because of the semantic structure of the sentences yielding them, but



it avoids the incoherencies of accounts of "semantic presupposition" (Atlas, 1975a, 1975b; Boer and Lycan, 1976; Gazdar, 1976, 1977, 1979; Karttunen, 1973; Kempson, 1975; Wilson, 1975; Atlas, 1977).

One example of a simplification attributable to a more delicate use of logical form is the unification of the presuppositional behavior of clefts, factives, and definite descriptions, as illustrated in (144).

- (144) a. *It was John that Mary kissed.*  
 b.  $\lambda x(Gx)(\gamma xFx)$   
 c. *Mikael knows that California is exciting.*  
 d.  $K(m, \iota P(P = \wedge A \ \& \ Tr(P)))$   
 e. *The prince of Wales is clever.*  
 f.  $G(\iota xFx)$

But whatever the success of this semantic and pragmatic reduction, the issues raised here bear on how the relation between semantics and pragmatics should be construed: what the relationship between truth conditions, implicata, and logical forms is; what conditions of adequacy (e.g., predicting "aboutness" and reading off implicata) semantic representations should satisfy. These problems are central to a theory of meaning, especially since sole reliance upon a theory of truth and logical form manifestly fails, as has been argued by Atlas (1978, 1979). Classical semantics is inadequately explanatory, in either its extensional or intensional varieties.

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