

ORDERED ENTAILMENTS: AN ALTERNATIVE TO PRESUPPOSITIONAL THEORIES

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In the last few years, the theoretical status of presuppositions has become increasingly unclear. On the one hand, those who want to distinguish semantics from pragmatics have generally concluded that there can be no coherent semantic account of presuppositions. On the other hand, attempts to explain presuppositional phenomena on the basis of purely pragmatic rules, with no appeal to semantic presuppositions, have largely failed. What remains is an undeniable set of facts about presuppositional behavior, which are very amenable to observation and classification, but which seem to resist satisfactory explanation in any well established framework. In this chapter we propose a new framework and a new approach. The new framework is, surprisingly, semantic; the new approach involves a series of novel claims about the nature of semantic description. Given these, a natural solution to the presupposition problem follows automatically.

1. THE PRESUPPOSITION PROBLEM

Most theories of presupposition, whether semantic or pragmatic, have been responses to a range of judgments which are instantly com-

elling.¹ For example, the following sentences seem to convey the same information, but to convey it in different ways:

(1) *It is Peter who is married to Sarah.*

(2) *It is Sarah that Peter is married to.*

Both (1) and (2) entail (3a) and (3b), in the sense that if (1) or (2) is true, (3a) and (3b) must also be true:

(3) a. *Someone is married to Sarah.*

b. *Peter is married to someone.*

More generally, any proposition entailed by (1) is entailed by (2), and vice versa. However, someone who asserts (1) is felt to have taken (3a), but not (3b), for granted, whereas someone who asserts (2) is felt to have taken (3b), but not (3a), for granted. This difference between (1) and (2) is normally preserved under denial and questioning: Thus someone who denies or questions (1) will normally be seen as taking (3a) for granted, while someone who denies or questions (2) will be seen as taking (3b) for granted. There is a very wide range of similar, well established facts.

These facts are problematic for those who advocate a standard truth-conditional semantics, recognizing only a single formal type of truth condition or entailment. For these people, since (1) and (2) have exactly the same set of entailments, they must be treated as semantically identical. But if they are semantically identical, there can be no semantic basis for the obvious differences in behavior of (1) and (2) under assertion, questioning or denial. These differences, for standard truth-conditional semanticists, must therefore have a purely pragmatic explanation. Many attempts have been made to provide such purely pragmatic accounts, mainly within a Gricean framework.² However, although certain aspects of presuppositional behavior do seem to have some suitable account in Gricean terms, we do not believe that any GENERAL account of presuppositional behavior can be formulated exclusively in these terms.

Someone who believes that presuppositions can be identified with Gricean conversational implicatures would have to show that (1) and

¹ The Fregean presuppositions advocated by Katz (1972, Sections 4-2, 8-4) concern a much narrower range of facts. Although we shall maintain that a linguistic ordering of entailments should replace all presuppositional devices, the weaker claim that linguistic ordering as described here should complement rather than replace Frégean conditions of referentiality would still be quite substantial.

² An excellent treatment is given in Gazdar (1976).

denials of (1), for example, conversationally implicate (3a) and not (3b), whereas (2) and denials of (2) implicate (3b) and not (3a). 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.³ As long as (1) and (2) 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 (1) and (2), which are not only truth-conditional 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 (1) and (2) can never be attributed to Gricean conversational implicatures.

A different problem confronts those who want to account for presuppositional behavior in terms of Gricean conventional implicatures.⁴ In the first place, the status of conventional implicatures seems just as unclear as that of presuppositions themselves. If they are treated as part of semantics, then they will have to have the same formal properties as semantic presuppositions, since they will be used to predict the same range of behavior: They will then be subject to all the criticisms leveled against the semantic presuppositional approach. Moreover, conventional implicatures as Grice defined them were not truth conditions at all, being logically independent of the truth of the sentence which carried them. It is hard to see how the obvious truth-conditional properties of semantic presuppositions could be explained in terms of Gricean conventional implicatures. On the other hand, if they are treated as purely pragmatic, we are left with no explanation at all of why they exist. Conversational implicatures are squarely based on undeniable pragmatic considerations (relevance, informativeness, and so on). Conventional implicatures cannot be traced back to independent pragmatic principles in this way. It seems, then, that to claim that pragmatic presuppositions are really conventional implicatures involves no more than a change in terminology, with no resulting clarification of their status. The same seems to be true of pragmatic approaches in terms of appropriateness conditions on utterances, as has been amply demonstrated elsewhere.⁵

³ See Grice (1975).

⁴ See for example Karttunen and Peters (1975).

⁵ See Wilson (1975b).

Failing a purely pragmatic account of the differences in presuppositional behavior of sentences such as (1) and (2), one is naturally led to consider whether these sentences do not perhaps, after all, differ in their semantics, and whether the standard truth-conditional approach to semantics should not be rejected. For those who want to provide a semantic account of the differences between (1) and (2), there has long seemed no alternative but to set up a new type of truth condition, formally distinct from standard entailments, and to distinguish (1) and (2) on the basis of these two different formal types of truth condition. Thus, (1) could be treated as entailing (3b) but presupposing (3a), while (2) could be treated as entailing (3a) but presupposing (3b). The formal differences between presuppositions and entailments—for example that presuppositions were preserved under questioning and negation while entailments were not—could then be used to explain the pragmatic differences between (1) and (2). Exactly parallel considerations would lead to the setting up of semantic presuppositional analyses in a very wide range of well known cases.

In the last few years, the semantic approach to presuppositions has been severely, and in our view justifiably, criticized. We do not intend to review these criticisms here.⁶ However, one obvious point against the semantic presuppositional approach is that it does not seem well equipped to handle the fact that (4), in which (1) occurs embedded, shares most of the presuppositional characteristics of (1):

(4) *Bob says it is Peter who is married to Sarah.*

As with (1), someone who asserts, questions or denies (4) will generally be taken as assuming (3a), rather than asserting, questioning or denying it himself. Yet the formal properties of semantic presuppositions are such that (3a) cannot be treated as a semantic presupposition of (4) without making grossly false predictions about the truth conditions for sentences conveying reported speech. In particular, if (3a) turns out to be false, none of the predicted effects of semantic presupposition failure would follow. Thus, even apart from the internal incoherence of the semantic presuppositional approach, it can never account for the presuppositional behavior of sentences like (4).⁷

The issue is now clear. There is no denying the existence of what

⁶ See for example Wilson (1975a), Kempson (1975), Karttunen (1973), and Boër and Lycan (1976).

⁷ Karttunen (1973) treats *say* as a plug, blocking off the presuppositions of its complement. This treatment provides no explanation for the obvious presuppositional behavior of sentences like (4), behavior which is also extremely hard to account for on Gricean lines.

we have been calling presuppositional behavior, and no denying the fact that it needs to be explained. But there seems to be no entirely satisfactory explanation for this behavior, either in semantic or in pragmatic terms. The existence of presuppositional behavior is unsatisfactory: Its theoretical status is increasingly puzzling.

We will argue that there is a semantic explanation after all.⁸ It seems that presuppositional behavior cannot be explained by postulating two different TYPES of truth condition: presuppositions and entailments. However, before concluding that sentences with the same truth conditions must therefore be semantically identical, we should investigate another possible source of semantic differences. Semantic differences might result, not from differences in TYPES of truth condition, but from differences in the organization of truth conditions of a SINGLE formal type. This is not a possibility that has generally been considered. It is usually assumed that the entailments of a sentence constitute an unordered set (or that any ordering the set may have—for example, a logically determined one—is semantically irrelevant) and that the semantic representation of a sentence either just is that set of entailments or is a logical form which would specify it. We shall try to show, on the contrary, that the entailments of a sentence constitute an ORDERED (or partially ordered) set, with considerable internal structure.⁹ On the basis of this internal structure, we think we can distinguish, for a given utterance, those entailments which are centrally important, or focalized, from those which are peripheral, and, among the focalized ones, those which are in the foreground of attention from those which are in the background. Using these linguistically determined distinctions we can predict a wide range of facts about the pragmatic behavior of utterances. Thus, if semantics is done along the lines we suggest, we think we can provide a satisfactory semantically based solution to most of the problems presuppositional theories were intended—but failed—to solve.

2. PRELIMINARY REMARKS ON LINGUISTIC ORDERING

In this section, we give an intuitive characterization of the kind of facts that might be best understood in terms of a claim that entail-

⁸ Semantic in the sense that it is part of grammar and concerns meaning. Katz (1972) would call it stylistic or rhetorical; no substantive issue need be involved here.

⁹ This possibility was first put forward in Wilson (1970). A development was attempted in Sperber (1975).

ments are linguistically ordered. In doing this, we shall make two assumptions: one semantic, the other pragmatic.

On the semantic level we assume that the basis for semantic description is provided by a standard truth-conditional approach: An adequate semantic description will specify or give a means of specifying all the entailments (in the case of a declarative, truth conditions) of the sentence being described. Thus, among the entailments of (5) will be (6a)–(6f):

- (5) *Bill's father writes books.*
- (6) a. *Bill exists.*
 b. *Bill has a father.*
 c. *Someone writes books.*
 d. *A parent of Bill's writes books.*
 e. *Someone's father does something.*
 f. *Someone does something.*

Someone who asserts (5) will, logically speaking, commit himself to the truth of all of (6a)–(6f), and all other such entailments of (5).

On the pragmatic level, we shall assume that a crucial part of understanding an utterance consists in establishing its relevance as intended by the speaker. This will involve computing the (nontrivial) consequences that follow when it is added to the set of previously held assumptions. Here only shared assumptions are taken into account.¹⁰ Clearly, not all the entailments of an utterance contribute equally to establishing its relevance. For instance, (7) entails both (8a) and (8b), but under circumstances that are fairly easy to grasp, (8b) would carry the main consequences and give the whole utterance most of its relevance:

- (7) *There's a funny smell—your coat's on fire!*
- (8) a. *There is a funny smell.*
 b. *Your coat is on fire.*

The interpretation of an utterance will thus involve some method of picking out and bringing to the forefront of attention the pragmatically most important entailments, on which the general relevance of the utterance depends.

An assumption we shall not take for granted, but rather wish to prepose and develop, is that a speaker may use linguistic means to indi-

¹⁰ For detailed discussion of the notion of relevance, and an attempted definition, see Sperber and Wilson (forthcoming).

cate the pragmatically most important entailments of his utterance. More precisely, he may place them in the foreground of the ordered set of entailments carried by his utterance. The general line of argument for this claim is that truth-conditionally equivalent sentences such as (1) and (2) will in fact be given different pragmatic interpretations in the same circumstances, or will be appropriate to different circumstances. As we have shown, this fact cannot be accounted for either in purely pragmatic terms or purely truth-conditional terms. It suggests a non-truth-conditional dimension to semantic description. The way that we propose to introduce this dimension is as follows: A sentence will be analyzed semantically into a set of entailments; simultaneously, the syntactic, lexical or phonological form of the sentence will impose an ordering on these entailments. Thus sentences like (1) and (2), which differ in their linguistic form, may also differ in the degrees of importance they assign to their common set of entailments, marking different members of this set as semantically the most salient.

As a case where syntactic differences affect the linguistic ordering of entailments, consider the following. A speaker who wants to express two logically independent propositions may express them as two syntactically independent (or coordinate) main clauses, or as a main-clause–subordinate-clause structure. If he chooses the syntactically independent structure, as in (7) or (9), it is obvious that, linguistically speaking, both propositions entailed by his utterance are equally important. If in the end one is considered more relevant than the other, it will be for purely pragmatic reasons, and with no linguistic guidance on the part of the speaker. However, when the same two propositions are expressed, one as a main clause and the other as a subordinate clause, as in (10), there are clearly perceivable differences in the order of importance assigned to them:

(9) *I admire Bergstrom, and I have invited him to give the opening address.*

(10) *I have invited Bergstrom, who I admire, to give the opening address.*

Both (9) and (10) entail (11a) and (11b):

- (11) a. *I admire Bergstrom.*
 b. *I have invited Bergstrom to give the opening address.*

In (9), (11a) and (11b) are both expressed as main clauses, which suggests that each has a pragmatic importance of its own. No pragmatic

difference between (11a) and (11b) is linguistically determined. In (10), however, (11a) is expressed as a subordinate clause and (11b) as a main clause. This syntactic difference is automatically interpreted as suggesting a pragmatic difference in the importance of the two entailments: (11a) is ordered lower than (11b). This in turn suggests that the most relevant part of the content of (10) lies in (11b). Note that this pragmatic difference, although perfectly noticeable, is too slight to be accounted for in presuppositional terms: A questioning or denial of (10) could well involve a questioning or denial of (11a). A presuppositional theory establishes only two levels of conditions associated with a given utterance. Examples such as (10) tend to show that there is an indefinite number of levels of prominence among the entailments of a sentence, depending on its complexity, and that even if presuppositional theories were justified, they would still have to be complemented by some subtler ordering device.

A similar, and if anything stronger, effect is achieved when a logically independent entailment is expressed by a phrase rather than a main clause, as illustrated in the following pairs:

- (12) *This book is boring, and it is expensive.*
 (13) *This boring book is expensive.*
 (14) *This is a beautiful tree, and Herb has planted it.*
 (15) *Herb has planted this beautiful tree.*

Because of their syntactic form, (12) and (14) are naturally interpreted as if the speaker was trying to make two separate but equal pragmatic points, one for each main clause. In (13) and (15) two separate points can still be discerned, but the one expressed as a phrase is clearly subordinate to the one expressed as a main clause.

It can be seen from cases (9)–(15) that syntactic form may impose an ordering on two logically independent entailments. What is the effect of syntactic form upon entailments that are logically ordered, in the sense that one entails the other? Consider the following:

- (16) *Peter is married, and he is married to Sarah.*
 (17) *Peter is married to Sarah.*
 (18) *It is Sarah that Peter is married to.* [= (2)]

All three of these entail (19a) and (19b), and (19a) itself entails (19b):

- (19) a. *Peter is married to Sarah.*
 b. *Peter is married to someone.* [= (3b)]

Sentence (16) expresses the two logically related entailments given in (19) as two coordinate clauses. Someone who utters it thus suggests that (19a) has some relevance of its own, and that the information that (19b) contains over and above (19a) also has some relevance of its own. In other words, in (16) the syntactic form cancels the pragmatic effect that the logical ordering between (19a) and (19b) might otherwise have had.

In the case of (17), its syntactic form does not strictly determine its pragmatically most important point. Yet on a preferred interpretation of (17), (19a) would be taken for granted, and the fact that it is Sarah rather than someone else that Peter is married to would be the relevant part of its content. On this interpretation, (19b) would be in the background, as suggested by the logical ordering. However, this is not the only possible interpretation, and the relevant part of its content might in the appropriate circumstances be that Peter is the one, or that marriage is the relationship: The syntactic form suggests no more than an order of preference among these interpretations.

In (18), on the other hand, the syntactic form compellingly indicates that (19b) is to be taken for granted, and that the relevance of the utterance lies in the information conveyed by (19a) over and above (19b). Thus, in the case of logically ordered entailments, syntactic form may cancel, confirm or strengthen this logical ordering, and determine certain aspects of its pragmatic interpretation. As before, we find that an entailment directly expressed by a main clause will tend to be ordered above one expressed by a subordinate clause. A similar or stronger effect will be achieved when an entailment is expressed by a phrase as opposed to a clause, as in (20):

(20) *Peter's spouse is Sarah.*

Note again that in (16)–(18) and (20), (19b) is placed in four different positions on some intuitively grasped ordering scale, a fact which could hardly be accounted for in terms of a simple distinction between two levels: entailments and presuppositions. Syntactic form appears as a subtle means of imposing an order on the entailments carried by a sentence.

Lexical choice, on the other hand, can be a means of NOT ordering entailments. Compare the following:

(21) *Mike killed the man; he did so willfully and illegally.*

(22) *Mike, who killed the man, did so willfully and illegally.*

(23) *Mike willfully and illegally killed the man.*

(24) *Mike murdered the man.*

All of these entail (25a) and (25b):

(25) a. *Mike killed the man.*

b. *Mike acted willfully and illegally.*

As we have already seen, both these entailments will be prominent in (21). Example (25a) will be ordered below (25b) in (22), and above it in (23). In (24), where both entailments are determined by the same lexical item, pragmatic considerations may give more importance to one or the other; for general empirical reasons (25a) is likely to be more relevant, but this need by no means always be the case. We would like to argue that when two logically independent entailments such as (25a) and (25b) are determined by the same lexical item, whatever pragmatic difference they may occasionally or regularly present will be due to strictly pragmatic reasons: No linguistic ordering ever takes place between such entailments, and neither of them is brought into special prominence. Obviously there is room for conflicting intuitions on this point: It has often been argued that part of the meaning of certain lexical items such as *bachelor* and *spinster*, or *regret* and *realize*, determines not an entailment but a presupposition. Strong evidence for such a view would be given, on a presuppositional account, by a pair of words where the presupposition determined by one would be the entailment determined by the other, and vice versa; on a linguistic ordering account, by a pair of truth-conditionally equivalent words having reverse effects in terms of suggested pragmatic importance of entailments. The fact that (to our knowledge) there is no such pair of words is evidence for the view that when two logically independent entailments are determined by the meaning of a single lexical item, no linguistic guidance is given as to which, if any, is pragmatically the more important.¹¹ Conversely, expressing by a phrase, as in (23), or a subordinate clause, as in (22), a meaning that could be expressed by a single lexical item is a way of suggesting linguistically

¹¹ The one pair standardly cited in the literature is *accuse*–*criticize*, one of which would presuppose that an action was bad and assert that a certain person had done it, the other of which would make the reverse presupposition and assertion (see Fillmore, 1972). Although detailed discussion of the meanings of these words would take us out of our way, we do not believe that anything like this account can be maintained; indeed, it would be surprising if it COULD be maintained, since we should then expect to find large numbers of similar pairs making use of the same possibilities of lexical contrast, and this expectation is not borne out at all. For further remarks on factive and other lexically determined entailments, see pages 320–321.

that some aspects of this meaning are more important than others. Expressing each aspect by a main clause, as in (21), is a way of suggesting linguistically that each aspect is pragmatically important in its own right.

This approach would explain both why it is sometimes appropriate to spell out one's meaning, as in (21)–(23), and why it is sometimes most inappropriate, as in (27) compared to the truth-conditionally equivalent (26)¹²:

(26) *My God, the baby has just fallen down the stairs!*

(27) *My God, the baby has just fallen down the series of steps for passing from one level to another!*

The complex clausal phrase of (27) in lieu of *stairs* in (26) should be interpreted as a suggestion that some aspects of the meaning of *stairs* should have special attention paid to them, a most incongruous suggestion in the context.

Notice, incidentally, that this approach would render useless the Gricean maxim of brevity: A pragmatic concern for relevance, combined with a linguistic ordering used to indicate the most relevant entailments, would make cases such as (27) violations of a (somewhat revised) maxim of relevance; it would also, and correctly we think, predict that examples such as (21)–(23) need not violate any maxim or carry any conversational implicature although, given their truth-conditional equivalence to the much shorter (24), they would certainly violate any maxim of brevity.

It might be tempting at this stage to propose a generalization and claim that the position occupied by a given entailment in an ordering of entailments depends on which kind of syntactic constituent determines this entailment: whether a main clause, a subordinate clause, a clausal phrase, a simple phrase, or a simple lexical item. These types of determinants would correspond, in that order, to lower and lower orderings.¹³

¹² This pair of sentences was first used in Chomsky (1966) to make a similar point about the pragmatic nonequivalence of synonyms.

¹³ One might also incorporate into this generalization the effects of free deletion rules, contrasting (i) and (ii):

(i) *Bill picked up the book and read something from it.*

(ii) *Bill picked up the book and read \emptyset from it.*

Example (i), unlike (ii), might be seen as an invitation to speculate about exactly what Bill read from the book. By providing for differences in the ordering of entailments between (i) and (ii), one might make it possible to account for such pragmatic differences.

However, while some such principle might clearly be used to make a wide range of correct predictions about the linguistic ordering of entailments and consequent presuppositional behavior, there are reasons for not adopting it. The most important is that the syntactic and lexical aspects of ordering either correspond to those predicted by phonological stress or are overridden by them: This suggests that syntax and lexicon affect the semantic ordering not directly, but through their interaction with stress assignment.

That stress, when contrastive, can override any syntactic or lexical effect is shown by (28a)–(28d):

- (28)
- a. *BILL'S father writes books.*
 - b. *Bill's FATHER writes books.*
 - c. *Bill's father WRITES books.*
 - d. *Bill's father writes BOOKS.*

Although these sentences all entail the same set of propositions, they each draw attention to different members of this set; in our terms, they order them differently. For instance, though all four sentences entail that someone's father writes books, the only sentence where this proposition plays a direct part in interpretation is (28a), where it exhibits standard presuppositional behavior. Similarly, all four sentences entail that Bill's father does something regarding books, but only in (28c) does this entailment play a direct part in the interpretation; and so on. Since these examples differ neither syntactically nor lexically, it is clear that we need some ordering principle sensitive to stress. In

In fact, the effects of free deletion rules are often of considerable pragmatic significance. Thus, though (iii) is semantically related to (iv), it would normally be interpreted as conveying (v):

- (iii) *Socrates picked up the hemlock and drank \emptyset .*
- (iv) *Socretes picked up the hemlock and drank something.*
- (v) *Socrates picked up the hemlock and drank it.*

One might argue that the effect of free deletion is to induce very low ordering of the propositions containing the deleted element, and go on to argue that low ordered propositions will be interpreted as pragmatically irrelevant. There are two ways that pragmatic irrelevance can arise: either because the content of the propositions concerned is essentially trivial, as in (ii), or because it is recoverable from the context, as in (iii). Another type of recoverability from context is, of course, in the case of propositions already known to the hearer. Thus, assigning a low order to a given proposition in the semantic analysis of a sentence can have a number of quite different, though related, pragmatic effects.

Section 3 we propose such a principle: As will be seen, most of the ordering predictions made on the basis of syntactic and lexical considerations follow automatically from this new principle which we hope, when fully explicated, might turn out to be adequate on its own.

3. VARIABLE SUBSTITUTION, STRESS, AND THE ORDERING OF ENTAILMENTS

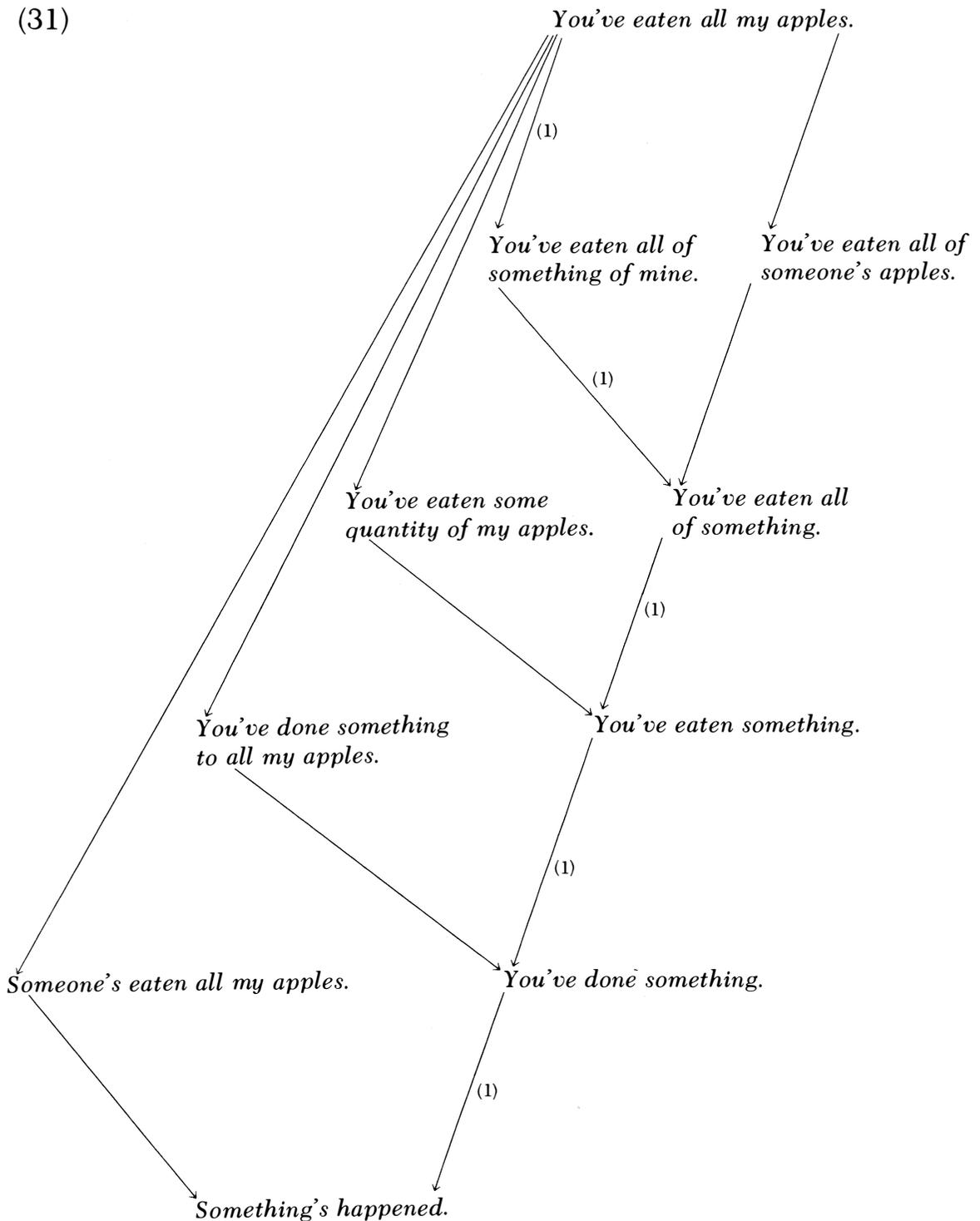
Among the set of entailments carried by a given sentence, there is a subset in which we are interested. For (29), this subset is listed in (30a)–(30j):

- (29) *You've eaten all my apples.*
- (30) a. *You've eaten all my apples.*
 b. *You've eaten all someone's apples.*
 c. *You've eaten all of something.*
 d. *You've eaten something.*
 e. *You've done something.*
 f. *You've done something to all my apples.*
 g. *You've eaten some quantity of my apples.*
 h. *You've eaten all of something of mine.*
 i. *Someone's eaten all my apples.*
 j. *Something's happened.*

The list in (30) by no means exhausts the entailments of (29): For example, it includes no lexically determined entailments. However, those listed in (30) have two interesting properties. First, they possess a logical structure: Each either entails, or is entailed by, one or more other members of the set. This logical structure is brought out in diagram (31) overleaf, where downward arrows link entailing sentences with the sentences they entail, and thus each downward path through the diagram (31) defines a series in which each sentence entails its successor and is entailed by its predecessor.

The second interesting property of the entailments listed in (30) is that each of them is the result of substituting a variable (represented here for convenience by an indefinite phrase: *someone*, *something*, *do something*) for a particular syntactic constituent in (29), and that all such truth preserving substitutions have been listed in (30). Thus (30b), for example, is the result of substituting a variable for the determiner *my*; (30d) is the result of substituting a variable for the NP *all my apples*; (30e) of substituting a variable for the VP *eaten all my apples*; (30f) of substituting a variable for the verb *eaten*, and so on.

(31)



For each of the entailments in (30), then, there is a particular surface syntactic constituent to which it is linked by variable substitution. The possibility of such links was first noticed by Chomsky (1972), to whom we are heavily indebted for this aspect of our treatment.

Notice that an explication of such a variable-substitution mechanism would raise nontrivial questions regarding the domain of the

variables. For instance, simply substituting a variable *someone* for the NP *no one* in (32) would yield (33), which is not entailed by (32) but rather contradicts it:

(32) *He saw no one.*

(33) *He saw someone.*

However, the issue thus raised relates closely to the interpretation of interrogatives. An interrogative such as (34) is often described as presupposing (33) and expressing a request for the actual value of the variable *someone*:

(34) *Who did he see?*

The fact that (32) is a possible answer to (34) belies that description and suggests that the domain of the variable to be substituted for *no one* in (32) is the very domain of possible answers to (34). More generally, for each constituent in a sentence there is an associated question to which this constituent provides an answer, and an associated variable which, by substitution, determines an entailment which is also involved in the interpretation of the question. Thus, explicating the variable-substitution mechanism which we are positing need raise no question not already raised independently, and may even shed light on some such questions. Pending an explication, we have chosen not to formalize our account in terms of the existential variables of the predicate calculus, which would be misleading in the light of (32)–(34).

Introducing some terminology, we shall call the set of entailments linked to surface structure by variable substitution the **GRAMMATICALLY SPECIFIED ENTAILMENTS**, or **FOCAL RANGE**, of a sentence. Thus the grammatically specified entailments of (29) are listed in (30), and their internal logical structure is shown in (31).

Our first substantive claim is that the only entailments of a sentence to which attention can be drawn as a direct effect of linguistic form are grammatically specified entailments. To make this claim more explicit, let us further define a notion of direct entailment. A grammatically specified entailment *P* **DIRECTLY ENTAILS** its entailment *Q* iff there is no other grammatically specified entailment *R* which is entailed by *P* and which entails *Q*. Our claim is that if two grammatically specified entailments are both directly entailed by a third—as, for instance, (30b) and (30g) are both directly entailed by (30a)—their relative order (and therefore their suggested pragmatic importance relative to each other) is a function of linguistic form; whereas if two grammatically **UN**specified entailments are both directly entailed by

the same grammatically specified entailment, there can be no linguistically determined order between them, and if they differ in pragmatic importance, it must be for purely pragmatic reasons.

Our second substantive claim is that when a sentence is uttered on a given occasion, only a subset of its focal range is considered in establishing its relevance, and that an order of preference among possible subsets is determined by stress assignment. To make this claim more explicit, we define for each stressed item in the sentence a series of possible FOCI: Any syntactic constituent containing the stressed item is a possible focus. Thus in (35) the focus associated with the stressed item *apples* may be either the N *apples*, the NP *my apples*, the NP *all my apples*, the VP *eaten all my apples*, or the sentence as a whole:

(35) *You've eaten all my APPLES.*

Variable substitution on each of these constituents will yield the series of entailments linked by the downward arrows labeled (1) in (31). As already noted, this series has an internal logical structure, each member entailing its successor and being entailed by its predecessor. We shall call this series the FOCAL SCALE associated with the stressed item *apples* in (35). More technically, the possible focal scales in a focal range are its maximal, strictly ordered subsets. We claim that the pragmatic interpretation of a simple sentence normally involves the selection of a single focal scale, and that the stress pattern determines an order of preference among possible focal scales (in an obvious way), so that the focal scale just listed for (35) will be its preferred scale when it is uttered with normal stress. Further, it seems that in the case of contrastive stress, the scale associated with that stress is not preferred but rather prescribed. If pragmatic considerations should override this linguistic indication, with the result that the relevance of the utterance is established on the basis of a grammatically specified entailment not included in the prescribed focal scale, a highly perceptible infelicity will occur.

Each focal scale is compatible with a number of possible choices of focus. The actual association of a given focus with that focal scale will determine a partition of the scale into two distinct subsets, which we claim play different and complementary roles in the interpretation of utterances. Suppose for instance that we choose as focal scale for (35) the one determined by the stressed item *apples*, and as focus the NP *all my apples*. By variable substitution on the focused NP we obtain entailment (30d): *You've eaten something*. We shall call the entailment obtained from a sentence by variable substitution on its focus the FIRST BACKGROUND ENTAILMENT, or for short and when no confu-

sion would arise, the BACKGROUND of the sentence with that focus: Thus (30d) is the background of (35) with focus *all my apples*; and the background will vary as the choice of focus changes. The proposition or propositions above the background on the focal scale—the set of propositions in the scale which entail the background—we shall call the FOREGROUND. Briefly, we claim that whatever information the foreground contains that is not also contained in the background will determine the relevance of the utterance. This claim will be developed in the next section. However, even this brief characterization of the role of focus in determining a background and a foreground is enough to suggest a fourth substantive claim: that the distinction between normal and contrastive stress affects the choice of focus. For instance, if (35) is assigned normal sentence stress, with the heaviest stress falling on the noun *apples*, it seems that the hearer is steered towards selection of one of the larger possible constituents as focus: essentially the largest NP, or the VP, or even the S. On the other hand, use of heavy or contrastive stress on *apples* seems to steer the hearer towards selection of one of the *smaller* possible constituents as focus: in this case the noun *apples* or the NP *my apples*. Here again, contrastive stress seems to be generally more compelling in its effects than normal stress.

To conclude this section: The assumption, following Chomsky (1972), that there is a variable-substitution mechanism based on surface constituent structure yields a series of conceptual distinctions and empirical hypotheses which we shall examine more closely in the next section. Grammatically specified entailments, generated by variable substitution, are set apart from other entailments, and may turn out to play a different and more important role in interpretation. The set of these grammatically specified entailments—the focal range—has an internal logical structure, a partial ordering which may turn out to be given a pragmatic interpretation. Strictly ordered focal scales can be naturally defined over the focal range; they can further be associated with stressed minimal constituents. It may turn out that the interpretation of utterances involves the selection of a focal scale, and that the stress pattern determines an order of preference among alternative scales. Each surface constituent can be chosen as focus and can, together with the variable-substitution mechanism, determine a partition of a focal scale into a foreground and a background, which may turn out to play different roles in interpretation. The nature of the stress—contrastive or normal—may contribute to the selection of the focus. In other words, a rather simple initial assumption has a wide range of consequences which are well worth investigating. In particu-

lar, this assumption provides a means by which sentences with the same propositional content may be distinguished semantically, a preliminary condition for a satisfactory treatment of presuppositional behavior.

4. PRAGMATIC INTERPRETATION

We have now provided a secure linguistic basis for the pragmatic rules to work on. A subset of the entailments of a sentence is grammatically specified and ordered. We propose that this ordering is pragmatically interpreted in terms of relevance: The higher ordered entailments are assumed to be the most relevant, to contain the point of the utterance. Of course this assumption may be falsified by the context, but then the utterance will be perceived as inappropriate or infelicitous (or, under certain conditions, as figurative).¹⁴

The specific proposal we want to make is the following. The general point of the utterance will be seen as lying in the increment of information which has to be added to the background to obtain the proposition as a whole. The point will be structured by the order of entailments in the foreground. The increment of information needed to obtain a foreground proposition from the one immediately below it in the scale will be a distinct part of the point. In other words, each proposition in the foreground will have to be more relevant (that is, bring about more consequences when added to shared assumptions) than the one immediately below it. Returning to (35), with focus *all my apples* and background (36):

(35) *You've eaten all my APPLES.*

(36) *You've eaten something.*

The general point of the utterance will be seen as lying not in the fact that you've eaten *something*, but in exactly what it is that you've eaten. In other words, the general point of (35) will be the same as the one (37) would normally have:

(37) *What you've eaten is all my apples.*

Furthermore, the foreground of (35) is composed of (38a)–(38c):

- (38)
- a. *You've eaten all my apples.*
 - b. *You've eaten all of something of mine.*
 - c. *You've eaten all of something.*

¹⁴ For further discussion, see Sperber and Wilson (forthcoming).

We claim that the general point of (35) is analyzable into three sub-parts, each relevant in its own right: the fact that what you've eaten was all of something, the fact that this something was something of mine, and that fact that this something of mine was apples. On the other hand, the fact that you've eaten all of somebody's apples is not a distinct, linguistically determined part of the point on this interpretation, although it would be if the stressed item determining the focal scale were *my* rather than *apples*, with the focus remaining the same—in this case (30b) would be in the focal scale and in the foreground.

With a different stress assignment and a different focus, the general point of the utterance would be completely different. Consider (39) with background (40):

(39) *YOU'VE eaten all my apples.*

(40) *Someone's eaten all my apples.*

Here the point of the utterance will be seen as lying in the increment of information which has to be added to (40) to obtain (39): not in the fact that someone's eaten all my apples, but in the fact that you're the one who has done it. In other words, (39) will be interpreted pragmatically as similar to (41):

(41) *The person who's eaten all my apples is you.*

Within this framework, the background of an utterance with a given focal scale and a given focus will exhibit typical presuppositional behavior. Without being relevant itself, it will be a necessary condition for establishing relevance. Without knowing that (40) is the background of (39), one will have no way of determining the increments of information in terms of which the intended point of the utterance is discovered. Also, in a typical presuppositional manner, the background propositions will normally be preserved under denial or questioning. Denying or questioning the background would amount to denying the relevance of the whole utterance. However, this notion of background differs from usual notions of presupposition in that it is both linguistically determined and not logically distinct from a standard entailment. Most previous accounts could achieve only one of these effects: If presuppositions were treated as having the formal properties of entailments, then they had to be seen as identifiable on a purely pragmatic basis, while if they were treated as linguistically determined, then they had to be seen as differing in formal properties from standard entailments.

Thus, at least where entailments in the focal scale are concerned, linguistic ordering provides an alternative to presuppositional

theories, whether semantic or pragmatic, in dealing with presuppositional behavior.

What predictions does our framework suggest or permit as regards entailments not included in the focal scale? In particular, how does it deal with grammatically unspecified entailments, which are of course the vast majority of the entailments of any given sentence? Depending on their logical relation to the foreground and background, entailments not included in the focal scale fall naturally into three categories: (a) those which are entailed by the background, (b) those which entail the background, (c) those which neither entail nor are entailed by the background. If these three categories turned out to exhibit different pragmatic potentialities, this would of course vindicate our proposed framework. And indeed they do seem to differ from each other in important respects.

Consider (42a)–(42c) as entailed by (35):

- (42) a. *You've eaten some fruit.*
 b. *You've swallowed something.*
 c. *Someone has eaten some apples.*

Example (42a) is an entailment of the first category: It entails the background (36), *You've eaten something*. Example (42b) is entailed by the background, and is thus in the second category, while (42c) neither entails nor is entailed by the background, and is therefore in the third category.

We would argue that these three entailments of (35) exhibit quite different pragmatic potentialities. Here we want to consider two different aspects of pragmatic behavior: first, what happens under normal interpretation, where speakers make correct estimations of the assumptions they share with their hearers; second, what happens under nonideal interpretation, where speakers' estimations about the assumptions they share with their hearers are incorrect.

Under normal interpretation, (42a) might, without inappropriateness or infelicity, contribute to the relevance of the utterance. Imagine for instance that the hearer is allergic to fruit; then (35) could quite naturally be uttered and stressed as indicated, and the grammatically unspecified entailment (42a) would play an obvious role in establishing its relevance. More generally, we want to claim that grammatically unspecified entailments which themselves entail the background may felicitously be involved in establishing the relevance of the utterance, as long as they are pragmatic reasons indicating their involvement. However, there is no LINGUISTIC indication that they should be so involved, nor are they linguistically ordered otherwise than through the

ordering of their directly entailing grammatically specified entailments. In other words, unspecified entailments which entail the background may be, but do not have to be, part of the point of an utterance.

It is for this reason that when the hearer in fact assumes that (42a) is NOT true, he can deny or question it without thereby denying or questioning the relevance or appropriateness of (35): What he will be denying or questioning is part of the point of (35), and it is this point that the hearer will be rejecting. In standard presuppositional terms, then, (42a) need exhibit no presuppositional behavior, and may naturally fall within the scope of denials or questionings of (35).

Just as entailments which entail the background are potential, but not necessary parts of the point of the utterance, entailments like (42b), which are entailed by the background, are potential, but not necessary parts of the effective presupposition. Example (42b) differs from the first background entailment (36) in that only the latter HAS to be considered in order to establish the intended point of the utterance. However, suppose that (42b) is false, or assumed by the hearer to be false. Denying or questioning it will amount to a denial or questioning of (36), and hence to a denial or questioning of the relevance or appropriateness of (35) itself. Thus under nonideal conditions, where speaker and hearer disagree about the truth of (42b), it will exhibit standard presuppositional behavior, while under normal conditions, where speaker and hearer agree that (42b) is true, it may, but need not, be actively considered in establishing the intended point of the utterance of (35).

Entailment (42c) behaves like neither (42a) nor (42b). Under normal conditions, it stays completely out of the picture in the interpretation of (35), contributing neither to the point nor to the background. If there are pragmatic reasons for considering it particularly relevant, either the preferred interpretation of (35) would have to be replaced by some other—for example that of (39)—or a high degree of infelicity would be perceived. In the case where (42c) is false, or believed by the hearer to be false, a denial of it (*Nobody has eaten any apples*) would constitute a very strong denial of (35), and would maybe suggest that it was infelicitous though not irrelevant. Generally, we claim that entailments which are neither entailed by, nor entail the background should normally play no part in the interpretation of an utterance; if they do, some infelicity, which may be intentional on stylistic grounds, may result; but it will not be the kind of inappropriateness caused by standard presupposition failure.

Using this framework, we can now provide solutions to two particular problems about presuppositional behavior that have often been

noted. The first is to do with the “presupposition cancelling” effects of heavy stress. Consider (43), for example, with background (44):

(43) *My BROTHER wants to meet you.*

(44) *Someone wants to meet you.*

Among the grammatically unspecified entailments of (43) will be (45):

(45) *I have a brother.*

Furthermore, (45) falls into the third category of entailments defined earlier: It neither entails nor is entailed by the background, and should therefore, under normal circumstances, contribute nothing to the interpretation of (43). However, notice also that (45) forms part of the increments of information which have to be added to the background (44) to obtain (43) itself, and thus, by our earlier definitions, might play some part in establishing the general relevance of (43). It cannot, of course, constitute the main point of (43): To utter (43) with the sole purpose of informing someone that one has a brother would clearly be infelicitous. Nonetheless, there are obvious circumstances in which it could be a subsidiary point (with slight figurative overtones), and because of this, as predicted by our framework, (45) should exhibit no presuppositional behavior with respect to (43).

On the other hand, consider (46), with background (47):

(46) *My brother wants to MEET you.*

(47) *My brother wants to do something.*

Sentence (46) still has (45) as a grammatically unspecified entailment, but this time (45) falls into the second category of entailments defined earlier: It is entailed by the background (47). It should thus be capable of exhibiting standard presuppositional behavior, as provided for by our definitions, and denying it would amount to denying the appropriateness of (46). More generally, then, we are predicting that existential “presuppositions” will lose their presuppositional qualities when they form part of the increments of information that have to be added to the background to obtain the foreground, and that heavy or contrastive stress will under the circumstances described contribute to this loss of presuppositional qualities.

The second problem we shall mention is one of even longer standing. Why is it that factive verbs are felt to presuppose, rather than assert their complements? In other words, why is someone who utters (48), with background (49), felt to have taken (50) for granted?

(48) *Susan regrets that she LEFT.*

(49) *Susan regrets something.*

(50) *Susan left.*

We have already dismissed one possible solution to this problem: In claiming that lexically determined entailments cannot be directly ordered, we have argued against any decision to account for the presuppositional qualities of factives by direct ordering of their entailments. Nonetheless, our present framework provides for these presuppositional qualities in the following way. Entailment (50), for example, is a grammatically unspecified entailment of (48), and falls into our third category of entailments: It neither entails, nor is entailed by, the background (49). We will thus predict that it should play no part in the normal interpretation of (48), and in particular that (48) could not be used to make the primary point that Susan left. It is for this reason that (50) is generally felt to be presupposed by someone who utters (48). Nonetheless, (50) also forms part of the increments of information that have to be added to the background to obtain (48) itself: It is thus in the same category of entailments as the existential entailment (45) with respect to (43). Under special circumstances, then, and again with slight figurative overtones, it could be used to make a subsidiary point in the utterance of (48). We are thus claiming that it does not behave like a standard presupposition, but that denying it will nonetheless amount to a denial of the appropriateness of (48).

In conclusion, the mechanism of variable substitution brings with it a distinction between five groups of entailments, which indeed behave differently in pragmatic interpretation:

1. Foreground entailments, each of which must be relevant in its own right
2. The first background entailment, which acts as a presupposition, and which is crucially used in establishing the point of the utterance
3. Entailments which themselves entail the background, which may be—but do not have to be—relevant in their own right
4. Entailments which are themselves entailed by the background, which may—but do not have to—exhibit presuppositional behavior
5. Entailments which neither entail nor are entailed by the background, which should not be involved in normal interpretation, and can be so involved only at the cost of some (possibly intentional) infelicity.

Furthermore, foreground and background entailments are ordered, while other entailments are indirectly ordered through the grammatically specified entailments that entail them, and an order of preference is given for alternative foreground–background pairs. All these complex distinctions which correspond to, and may account for, intuitively perceived differences follow naturally from quite simple initial assumptions which, we have claimed, may find an independent justification in the description of interrogatives. Clearly this theoretical framework, if valid, could account for a much wider range of linguistic and pragmatic facts than could presuppositional theories, with their simple, two-level distinction. It is possible, of course, that some facts naturally accountable for in a presuppositional framework cannot be accounted for in our terms; if this turned out to be true, then we would argue that our framework should at least complement presuppositional theories. However, since we are not aware of any such facts, we should like to make the stronger proposal that presuppositional theories should be abandoned, and replaced by the theory of ordered entailments that we have outlined here.¹⁵

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¹⁵ For a general account of many of the issues raised in this chapter, see Sperber and Wilson (forthcoming).

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