

The purpose of this paper is to explore some aspects of the phenomena of presupposition, in order to determine how presuppositions should be treated in a theory of grammar which has as a goal an account of meaning. The exploration is rather speculative, since so few of the phenomena involved are at all understood; hence I present no formalism. I assume a previous understanding of the term "presupposition" as it has been discussed by Iakoff (1969), Fraser (1969), Fillmore (1969), Horn (1969) and others. I discuss some lexical items and constructions which have presuppositions associated with them, attempting to interpret the data and draw some conclusions and speculations from it.

I take up first the verb know. This verb has associated with it the speaker's presupposition that the complement of the verb is true, when that complement is a "that-clause". This is demonstrated in examples (1) through (4):

- (1) John thinks Mary is here, but he's wrong.
- (2) ?John knows Mary is here, but he's wrong.
- (3) I think John is here, but I might be wrong.
- (4) ?I know John is here, but I might be wrong.

(1) and (3) are well-formed, but (2) and (4) contain a contradiction at some level.¹ The presuppositions remain the same under negation:

- (5) Harry knows { Nixon
 ?Humphrey } is president.
- (6) Harry doesn't know { Nixon
 ?Humphrey } is president.

in both (5) and (6), the speaker presupposes that Nixon is in fact president. Furthermore, the speaker takes this presupposition to be true at the time the sentence is uttered--the time of the performative.² In other words, the time of the "act" of presupposing is simultaneous with the time of the "act" of performing the utterance (hereinafter " t_0 "). This can be seen by considering the following hypothetical situation. Suppose in November it is announced by the government, the press, and so on, that Humphrey was won the election. If somebody asks me "Do you know that Humphrey has been elected?" I can quite felicitously and correctly answer, "Yes, I know Humphrey has been elected." And if I ask the same question of Harry and he answers that he knows that Humphrey was elected, I can report this by "Harry knows that Humphrey was elected." But if in December it is announced that the November announcements were a hoax, and that Nixon was really elected, I cannot report my November state of mind by (7).

- (7) ?I used to know that Humphrey won, but now I know that Nixon did.

And if Harry has not heard about the hoax, and is still operating

under the misapprehension that Humphrey won, he can still say (8).

(8) I know that Humphrey won.

But I cannot report this by (9) or (10):

(9) ?Harry knows that Humphrey won.

(10) ?Harry knows that Humphrey won, but {he's wrong.
Nixon really did.

There is also a construction which involves certain presuppositions. This construction, which I shall call "counterfactual conditional" consists of if plus a subjunctive clause, as illustrated in (11):

(11) If Germany had won the war, half of us wouldn't be here.

The presupposition involved is that the complement of if is in fact not true. This is illustrated in (12) and (13),

(12) ?If Daley were Mayor of Chicago, we'd be in trouble.

(13) ?If Chicago were in Illinois, taxes would be high downstate.

which are anomalous given the present state of Chicago. On the other hand, (14) and (15) are well formed,

(14) If Daley weren't Mayor of Chicago, it would be a better place.

(15) If Chicago weren't in Illinois, the state wouldn't have so many people.

since the proposition embodied by the first clause is in fact false. The second clause of this type of construction seems also to involve a negative presupposition, as illustrated in (16),

(16) ?If Germany had invaded England, England would have won the war.

which is anomalous, given the presupposition that England won, even though the first clause is not anomalous, since Germany did not in fact invade England. This same point is illustrated in (17) through (19):

(17) Nixon has two arms.

(18) ?If Nixon had been born in Texas, he would have two arms.

(19) ?If Kennedy had never been president, Arthur Schlesinger would be alive today.

And this property seems to pass the negation test, if in fact (20).

(20) ?It is not true that if Germany had invaded England, England would have won the war.

is the proper negation of (16).

At this point I wish to make a short digression. Note that if is not necessarily connected with a negative presupposition. The presupposition in the sentences above is connected with the subjunctive form of the main verb of the complement, rather than with the if. Without the subjunctive verb form, if involves no

presupposition about the truth value of the clause following it, as illustrated in the difference between (21) and (22).

- (21) If the sun is out right now, it's time to get up.
- (22) If the sun were out right now, it would be time to get up.

The modality and aspect of the second clause are determined by that of the first clause, as shown in (23) and (24).

- (23)?*If the sun is out right now, it would be time to get up.
- (24)?*If the sun were out right now, it's time to get up.

But since does involve a presupposition about its complement; namely, that it is true. Since works like factive verbs in this respect. This is shown in (25) through (28).

- (25) Since the sun is out right now, it's time to get up.
- (26)?*Since the sun is out right now, it would be time to get up.
- (27)?*Since the sun were out right now, it's time to get up.
- (28)?*Since the sun were out right now, it would be time to get up.

The point I wish to bring out about these sentences is the following: any theory of grammar will have to deal with these facts, at least in ruling out (26) through (28) as ill-formed. In a theory in which semantic representation is the deepest representation, presupposition will have to be represented. Thus no statement about co-occurrence between since and the verb-form of its complement would have to be made in the lexicon. Only its factivity (a semantic property) need be stated. The ill-formedness of sentences like these would follow naturally from the fact that such sentences involve contradictory presuppositions. However, in a theory with a separate interpretive semantic component, one is forced into a position that seems to me uncomfortable. A theory of this type would be faced with specifying both the factivity of since and its range of possible surface structure complements, or else with claiming that sentences like (26) through (28) are grammatically well-formed and only semantically anomalous. Both these alternatives are, it seems to me, undesirable ones. The first involves stating twice what is actually a single fact. Any appeal to redundancy rules to handle the problem would be entirely ad hoc. The second alternative is an equally uncomfortable one, since judgements of grammaticality are, after all, intuitive, introspective decisions. And it seems to me that (26) through (28) are as grossly ungrammatical as are sentences with mis-ordered constituents, wrong complementizer, or violation of deep- or surface-structure constraints.

Returning to know, counterfactual conditionals, and their relation to presupposition, let us consider how presuppositions are to be treated in a theory which purports to deal with semantics. For this purpose, I set up two straw men. The first is that the presuppositional properties of lexical items are stated in the lexicon. Thus for instance there would be associated with verbs like

know, realize, regret, etc., statements of the form "speaker presupposes that complement is true when complement is of form X". Let us call this straw man the "lexical hypothesis". The second straw man is concerned with the relation between a sentence and the set of presuppositions associated with it. This hypothesis, which I shall call the "cumulative hypothesis", is that there is one set of presuppositions which hold for the entire sentence. This hypothesis can be viewed in three essentially equivalent ways. Dynamically, it can be viewed in two: interpretively or predictively. Interpretively, one goes through the entire sentence, looking for items like know and constructions like the counterfactual conditional, deriving the presupposition involved with each, with the entire set thus accumulated as the set of presuppositions for the entire sentence. Predictively, given the set of presuppositions, the choice of lexical items and constructions would be predicted. Thus given the presupposition that S_i is true, insertion of know with S_i as complement would be blocked. Statically, given the set of presuppositions and the set of verbs and constructions within the sentence, incompatible combinations--presupposition S_i and item or construction anywhere within the sentence involving presupposition $\text{Not}(S_i)$ --would cause the sentence to be thrown out.³

I will attempt to destroy the cumulative hypothesis first, then return to the lexical hypothesis.

That the cumulative hypothesis is incorrect becomes fairly obvious when factive verbs and counterfactual conditionals come together, as in (29) and (30).

- (29) If John had been here, I would have known {it.
 {that he was.
- (30) If John were here now, I would know {it.
 {that he was here.

If in these sentences we associate with the know construction the presupposition that John was/is here and with the first clause the presupposition that John wasn't/isn't here, and if all presuppositions hold at the highest level of the sentence, then these two sentences each have contradictory presuppositions. Similarly, the verb regret involves a presupposition that its complement is true, as in (31) through (34).

- (31) I regret that I missed the Republican convention.
(32) I regretted that I missed the Republican convention.
(33) I don't regret that I missed the Republican convention.
(34) I didn't regret that I missed the Republican convention.
(35) If I had missed the convention, I { would have regretted it.
would regret it.

But in (35), the cumulative hypothesis would derive contradictory presuppositions. Clearly this hypothesis is wrong, since (35) does not in fact involve contradictory presuppositions in the way that (7), (12), and (13) do. But if it is incorrect, how are presuppositions to be handled? I propose that the key to the problem lies in what Lakoff has called "world-creating" verbs (Lakoff 1968). These verbs define new sets of presuppositions which hold within their spheres⁴, without contradicting presuppositions defined by higher verbs. But they do not do this by blocking all presuppositions. This fact is illustrated in (36) through (41).

- (36) ?I dreamed that nobody but me knew that Nixon was a woman.
- (37) ?I dreamed that I regretted being German.
- (38) ?I dreamed that the present king of France was bald.
- (39) ?I wish the present king of France were bald.
- (40) I dreamed that Panini was here too.
- (41) ?If the present king of France were bald, he'd buy a wig.

In (36) I (the speaker) still presuppose that Nixon is in fact a woman, in (37) that I am in fact German, in (38) and (39) that there is in fact presently a king of France, in (40) that someone (besides Panini) is here, and in (41) again that there is presently a king of France. Thus the effect of world-creating verbs is not that they are totally opaque to presuppositions. Rather, they operate in such a fashion that the "worlds" the "create" are precisely like (i.e., have the same presuppositions as) the world created by the next higher world-creating (WC) verb (in (36) through (41) the presuppositions associate with the performative), unless otherwise stated. What I mean by this is shown in (42) through (47).

- (42) I dreamed that Nixon was a woman and nobody knew it but me.
- (43) I dreamed that I was German and (that I) regretted it.
- (44) I dreamed that there was presently a king of France and that he was bald.
- (45) I wish that there were presently a king of France and (that) he were bald.
- (46) I dreamed that Harry was here and (that) Panini was here too.
- (47) If there were presently a king of France and he were bald, he'd buy a wig.

In (42), I am not presupposing at t_0 that Nixon is a woman. Similarly, in (43) through (47), I do not presuppose at t_0 what I presuppose in the corresponding sentences in (36) through (41).

Speaking in somewhat metaphoric terms (at this point no better way suggests itself) the presuppositions of the sentence flow down the tree. But there are certain verbs which can block this flow by defining a new set of presuppositions which consists of the down-flowing set plus changes overtly defined within the sphere of this lower WC verb. The new set of presuppositions holds in the sphere of this verb in the same manner unless changed again by a lower WC verb. As a demonstration of the way presuppositions flow downward, consider (38)

(38) ?I dreamed that the present king of France was bald.
as opposed to (44)

- (44) I dreamed that there was presently a king of France and (that) he was bald.

where I don't presuppose at t_0 that there is presently a king of France; rather, the first complement of dream in (44) acts as presupposition for the second, but it acts as presupposition only within the sphere of dream. Further, consider (48).

- (48) I dreamed that there was presently a king of France, and that Harry dreamed that there was a horse with two heads, and that the two-headed horse belonged to the present king of France.

The occurrence of "there was presently a king of France" under the first dream acts as presupposition for the complement of the second dream. The last phrase "present king of France" takes as presupposition the first complement immediately above its dream. In (48), the speaker of the sentence does not presuppose at t_0 that there is presently a king of France. But in (49):

- (49) I dreamed that Harry dreamed that the two-headed horse belonged to the present king of France.

where the "higher" dream does not supply a presupposition for the occurrence of the definite determiner in the "lower" dream, the speaker does presuppose at t_0 that there is presently a king of France. Similarly, in (49) the speaker presupposes at t_0 both the existence of a king of France and a two-headed horse.

The set of verbs which have this property of defining new sets of presuppositions seems to be just the set of "world-creating" verbs. And as far as I can see, the set of verbs which do not have this property is precisely the set of so-called "factive" verbs, in that factives are totally transparent to downcoming presuppositions. The set of presuppositions created by the next highest world-creating verb (or the unuttered presuppositions of the sentence at large) hold in the sphere of a factive verb, and cannot be changed. Thus straw man #1 is destroyed, since we need not to associate with know a statement such as "the speaker presupposes X", but rather, we need only to note whether it is world-creating or not, and then a look at the tree will tell us which presuppositions extend down into the sphere of know.

Now notice that each of the propositions within the sphere of a world-creating verb acts as a presupposition for each following proposition within that sphere. Thus the choice of the term "presupposition" is a good one insofar as left-to-right order is concerned. As a demonstration of this, consider (50) through (53):

- (50) ?I dreamed that nobody but me knew that Nixon was a woman and he was (a woman).

- (51) ?I dreamed that I regretted being German and I was German.

- (52) ?I dreamed that the present king of France was bald and there was presently a king of France.

- (53) ?I dreamed that Bill was here too and Harry was here.

in comparison with their earlier counterparts in (42) through (46). There is something wrong with these sentences. In (53), if "Harry was here" is the presupposition that determines the occurrence of too in "Bill was here too"⁵, then the two clauses are in the wrong order. The same factor of misordering is involved in the anomalousness of (50) through (52). And precisely the same relations hold between the complement of the performative of the sentence and the unuttered presuppositions associated with the sentence. This is

illustrated in (54) through (62):

- (54) John is here too.
- (55) John is here, and Harry is here too.
- (56) *John is here too, and Harry is here.
- (57) Harry lives in Chicago, and Mike lives in Chicago too.
- (58) *Harry lives in Chicago, and Mike lives in Chicago too.
- (59) Mike has a cat_i and the cat_i is black.
- (60) ?Mike has the cat_i and a cat_i is black.
- (61) ?The cat_i is black and Mike has a cat_i.
- (62) The cat is black.

The too in (54) has as presupposition something of the form "somebody is here." The relationship between this presupposition and (54) is precisely the same as the relationship between the two conjuncts in (55). This relationship crucially involves left-to-right ordering, both in the correct placement of too after the second conjunct, as shown by the anomalousness of (56), and in certain phenomena of stress, as in (57) and (58). In sentences of this type, if the predicate of the left conjunct implies (in the speaker's mind) the predicate of the second, then the second predicate is de-stressed, as in (57). And this rule works only left-to-right, as shown by the anomalousness of (58). If the de-stressing of (54) by its presupposition is to be accounted for by the same rule that de-stresses the second conjunct of (57) on the basis of the first conjunct, then the presupposition must be represented to the left of the entire sentence. The same is true of the presuppositions associated with the use of the definite determiner; for co-referential noun phrases any occurrence of a with the noun phrase must precede all occurrences of the with it, as shown in (59) through (61). Then, for maximum generality, the presupposition involved in the use of the, as in (62), must be to the left.

There are three important points here which bear on the representation of presupposition relative to the sentence. First, the time of the highest (unuttered) presuppositions is the time of the utterance, that is, the time of the highest performative, as demonstrated by the election anecdote. Second, the complements within the sphere of a world-creating verb act as presuppositions for the complements of other verbs within the sphere of the world-creating verb. And these uttered complements bear precisely the same relationship to each other left-to-right and to lower complements as do the unuttered presuppositions of the sentence to the assertion under the performative. These relationships are structurally defined within a sentence, as can be seen by comparing (63), (64), and (65).

- (63) ?Harry said [Bill dreamed [that there was a unicorn under his bed, but there wasn't.]_S]_S
- (64) Harry said [[Bill dreamed that there was a unicorn under his bed]_S [but there wasn't.]_S]_S
- (65) [Harry said Bill dreamed that there was a unicorn under his bed]_S [but there wasn't.]_S

Third, to properly capture several generalizations, in particular, the ones about stress, too, and the occurrence of a and the in their positions relative to each other, these presuppositions should be to the left of the performative. These three facts, it seems to me,

militerate against any analysis in which presuppositions are merely hanging in some semantic limbo somewhere. Rather, the facts show that the relationship between unuttered presuppositions and the sentence with which they are associated is exactly the same as that between a left-conjoined sentence and the conjuncts which follow it. By all indications, presuppositions are somehow conjoined to the left of the performative. As to the nature of this conjoining, I can only offer a hypothesis: that conjoined to the left of the performative is an abstract verb of supposition, with many attributes of a performative. The t_0 presuppositions, those holding at the level of the performative, are the complements of this abstract verb of supposition. And, as a matter of fact, there are overt performatives of supposition. The most obvious one is suppose. This verb has the illocutionary force of a performative in the sense of Austin (1965). When one says "I suppose that Nixon is a nerd" or "Let us suppose that Humphrey had won" one thereby supposes, and the supposition functions as presupposition for subsequent sentences. Even in what looks like an imperative form, suppose is really a performative, as in (66) through (68).

- (66) Suppose Levi $\left\{ \begin{smallmatrix} \text{is} \\ \text{were} \end{smallmatrix} \right\}$ intelligent.
 (67) ?Suppose Levi $\left\{ \begin{smallmatrix} \text{is} \\ \text{were} \end{smallmatrix} \right\}$ intelligent, or I'll expel you.
 (68) ?Suppose Levi $\left\{ \begin{smallmatrix} \text{is} \\ \text{were} \end{smallmatrix} \right\}$ intelligent, and I'll re-admit you.

If I say (66) to you, there's something wrong with answering "no". And (67) and (68) are gibberish.⁶

So far I have presented observations on phenomena of presupposition, and tried to point out the direction an adequate analysis of presupposition must take. In the remainder of this paper I shall very briefly pose some questions raised by the consideration of presupposition.

Just as the performative and its associate presuppositions are an "anchor point" for purposes of various kinds of reference-- the time reference of tense markers is defined relative to the time of the utterance, first and second person are defined relative to the subject and indirect object of the performative, "here" is defined relative to the location of the subject of the performative--so they also define an anchor point for "worlds" as discussed above; the performative complex defines not only "I", "you", "this time" and "this place", but also "this world". This suggests the possibility that tense (this time other time) might be analyzed in terms of this world/other world. Such an analysis might explain the otherwise mysterious fact that so many languages use one or another past tense (or combinations of past and future) to mark propositions about other worlds; for example, the counterfactual conditional in English and several other languages. In other words, the performative complex defines "this (present) world", and worlds other than the one so defined are marked by (non-present) tense markers. Certainly it is not nearly this simple, but such an approach might yield interesting results.⁸

This suggests an analysis of the meaning of "if X, Y" as "in the world W_1 in which X, Y". If X is in the subjunctive, then W_1 is presupposed by the speaker to be non-identical to the world defined by the performative. If X is not in the subjunctive, the

speaker makes no presupposition about the identity or non-identity of the two worlds. Troublesome (but not in principle impossible) for this analysis are sentences like (69),

(69) If I were smarter than I am, I'd get a job at IBM.

which of course cannot be analyzed as "in the world in which 'I am smarter than I am' is true,..." Rather, the comparison is between two worlds which both exist for the speaker in some way: the "real" world of the performative and a hypothetical world. Thus a closer approximation to the proper interpretation is "in the world in which I am smarter than I am in this world,..." Obviously, one cannot compare two different worlds unless one first presupposes that they are different. This accounts for the anomalous character of (70) and (71).

(70) *If I'm smarter (now) than I am, I $\begin{Bmatrix} \text{will} \\ \text{would} \end{Bmatrix}$ get a job at IBM.

(71) *Since I'm smarter than I am, I $\begin{Bmatrix} \text{will} \\ \text{would} \end{Bmatrix}$ get a job at IBM.

But there are data which show that the analysis I have proposed is not adequate for all purposes; namely, data which show that presuppositions other than those of the speaker are crucially relevant in describing the operation of rules sensitive to coreference. For example, suppose that during a game on Sunday, Ernie Banks, who is very modest, is beamed and suffers a severe case of amnesia. He is taken to a hospital where I, a doctor, treat him. He doesn't know who he is, and I don't tell him, even though I know that he's Ernie Banks. On Monday, he reads a week-old newspaper describing the heroics of Ernie Banks. He decides that Ernie Banks is the best baseball player in the country, and wants him to leave Chicago and go to St. Louis, to play for the Cardinals. How can I, the doctor, report this? Even though I presuppose coreference for the purpose of rules like Equi-NP deletion and Reflexivization, Ernie Banks does not. Hence (72) through (76) are not accurate reports (varying mysteriously in acceptability).

(72) ?Ernie Banks considers himself the best player in the country.

(73) *Ernie Banks wants to go to St. Louis.

(74) *Ernie Banks would like to play for the Cardinals.

(75) ?Ernie Banks thinks he's an outstanding player.

(76) ?Ernie Banks thinks he should leave Chicago.

One further horror: although the pronominalization examples are nearly acceptable (or at least not as bad as the other two types), suppose in the hospital Ernie Banks learns to play again and comes to think he plays better than the Ernie Banks he read about. In this case pronominalization is equally bad, as in (77).

(77) *Ernie Banks thinks he's a better player than he is.

Problems like this lead to questions about the relationship between presupposition and referential opacity.

Finally, there are important questions about the nature of the property which defines world-creating verbs. Is this property a consequence of other semantic properties? Or are there semantic mini-

mal pairs, two predicates differing only in this property? There is tenuous evidence for both possibilities. Since and if seem to be a minimal pair in this sense. But sentences like (78) and (79) seem to show that world-creating properties are a consequence of semantic complexes, rather than lexical properties. Realize as a stative verb, as in (78), is factive, but as an inchoative, as in (79), it is not.

(78) ?I dreamed that nobody but me realized that Nixon was a woman.

(79) I dreamed that I suddenly realized that Nixon was a woman.

Clearly I have raised many more questions than I have answered, and the answers I have offered will no doubt need extensive modification. But the necessarily speculative nature of this paper does not, I hope, obscure the fact that an understanding of presupposition is the key to many totally mysterious phenomena of language.

FOOTNOTES

1. When the sentence is uttered with neutral stress. When know is stressed, there is a mysterious change in meaning.
2. For a discussion of the notion "performative", see Austin (1965). For an illustration of (and evidence for) the treatment of performatives in generative grammar, see Ross (1968).
3. At subsequent points in this paper I use terminology which for the most part reflects the "interpretive" viewpoint. This implies nothing more than that I consider this viewpoint better for expository purposes.
4. I hesitate to use the term scope, since it is not yet clear how the domain of WC verbs is defined. It is clear that structural relations are relevant (cf. examples (48), (49), (63) through (65)), but the sphere of WC verbs can extend across sentence boundaries. For example,

(i) I dreamed I was in Chicago. The weather was warm.

 is ambiguous as to whether the second sentence is part of the dream, or a description of the environment in which the event of dreaming occurred.
5. This point is based on the analysis of too/either proposed by Green (1969).
6. Hopefully a fuller understanding of presupposition would account for the following mysterious data:
 - (ii) Suppose Schlesinger is intelligent.
 - (iii) Suppose Schlesinger were intelligent.
 - (iv) Let's suppose Schlesinger is intelligent.
 - (v) Let's suppose Schlesinger were intelligent.
 - (vi) I suppose Schlesinger is intelligent.
 - (vii)**I suppose Schlesinger were intelligent.

7. It remains to be seen whether the same type of arguments presented by Ross in support of performative analysis can be found to support the hypothesis I offered above of an abstract verb of supposition conjoined to the performative. I would hazard a guess that such arguments can be constructed.

8. I would speculate further that such apparently exotic phenomena as the "witnessed/non-witnessed" distinction (marked by certain combinations of tense and aspect) in, for example, Bulgarian and Georgian, might be better analyzed in terms of presupposition.

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