



*papers in  
linguistics*

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published by LINGUISTIC RESEARCH, Inc.

july 1971

**4:1**

## SOME OBSERVATIONS ON FACTIVITY

Lauri Karttunen

The University of Texas at Austin

0. There is a class of verbs that are commonly called 'factive' verbs. This group includes words such as those in (1).

## (1) With Sentential Subjects

is { tragic  
significant  
relevant  
odd }

bothers  
matters  
makes sense

## With Sentential Objects

forget (that)  
regret  
resent  
realize  
make clear  
find out  
discover  
see  
notice

There is a general agreement that factive verbs involve presuppositions, although it seems that nobody quite understands what we mean by the term 'presupposition'.<sup>1</sup> According to the standard analysis, which was first presented by Paul and Carol Kiparsky (1968), a sentence with a factive predicate is said to presuppose the truth of its complement sentence. This goes for affirmative and negative assertions as well as for questions and imperatives. For instance, all the examples in (2) presuppose (3).

- (2) (a) Bill regrets that Sheila is no longer young  
(b) Bill doesn't regret that Sheila is no longer young  
(c) Does Bill regret that Sheila is no longer young?
- (3) Sheila is no longer young.

I will discuss three types of anomalies that present serious problems for the standard analysis of factivity. First, I will show that it is not always possible to analyze factive

sentences in the manner suggested in (4), that is, to think of the presupposition as something that can be neatly separated from the main sentence.

(4) ASSERTION: Bill regrets that Sheila is no longer young.

PRESUPPOSITION: Sheila is no longer young.

Secondly, I will show that the main verb does not alone determine whether the complement is actually presupposed to be true. The mood of the main sentence and the type of the complement also have to be taken into account. Finally, I will demonstrate that the class of factive verbs is less uniform than is usually believed. They do not all meet the same criteria for factivity.

1. Consider the example in (5). What does it presuppose?

(5) Some senators regret that they voted for the SST.

Let us assume that the logical form of (5) is as given in (6).<sup>2</sup>

(6) For some senators  $x$ ,  $x$  regrets that  $x$  voted for the SST.

The important fact about (5), which is evident in (6), is that the complement of regret by itself does not constitute a proposition. In (6), the complement of regret is the phrase ' $x$  voted for the SST', which contains a variable bound by a quantifier that is located outside the complement structure. Without the quantifier, the phrase ' $x$  voted for the SST' is not a proposition. It is not something that can be true or false. Therefore, it makes no sense to say that (5) presupposes the truth of its complement. We cannot analyze (5) in the manner suggested above in (4), that is, to give a semantic representation like (7), which consists of two separate parts, 'assertion' and presupposition'.

(7) ASSERTION: For some senators  $x$ ,  $x$  regrets that  $\underline{x}$  voted for the SST.

PRESUPPOSITION:  $\underline{x}$  voted for the SST.

We can illustrate the problem that this poses for the analysis of factive verbs with an example from arithmetic. Any statement such as ' $4 = \sqrt{16}$ ' or ' $(\exists x)x = \sqrt{16}$ ' is a proposition which can be believed, asserted, doubted, etc. On the other hand, equations like ' $\sqrt{16} = x$ ', where  $x$  is a free variable, are not propositions. The analysis in (7) makes as little sense as an assertion that the unsolved equation ' $\sqrt{16} = \underline{x}$ ' is true.

What, then, is the presupposition of (5)? One might suggest that (7) be augmented by repeating the same quantifier twice, once in the assertion and another time the presupposition. Instead of (7), we could have (8) as the semantic representation of (5).

(8) ASSERTION: For some senators  $x$ ,  $x$  regrets that  $\underline{x}$  voted for the SST.

PRESUPPOSITION: For some senators  $x$ ,  $\underline{x}$  voted for the SST.

However, this leads to the question whether the example in (9) has the same presupposition as (5).

(9) Some senators regret that some senators voted for the SST.

The corresponding, putative semantic representation for (9) is given in (10).

(10) ASSERTION: For some senators  $y$ ,  $y$  regrets that, for some senators  $x$ ,  $\underline{x}$  voted for the SST.

PRESUPPOSITION: For some senators  $x$ ,  $\underline{x}$  voted for the SST.

It is certainly true that, if either (5) or (9) is true, then some senators must have voted for the SST, but it is mistaken to suggest, as I have done in (8) and (10), that their "presuppositions" are identical. This can be seen by comparing (5') and (9') below.

(5') Some senators, perhaps even Yarborough, regret that they voted for the SST.

(9') Some senators, perhaps even Yarborough, regret that some senators voted for the SST.

As you can see here, from (5') one can infer, not only that senators voted for the project, but in particular that Yarbo was among them. More generally, whatever individual senator variable  $x$  ranges over in the assertion part of (8), it must be the case that they all voted for the SST. This fact is not represented in (8), and cannot be represented at all unless asserted main sentence and the presupposed complement are bound by the same quantifier.<sup>3</sup> But this brings us back to (7). If the complement contains a variable which is bound by an outer quantifier, the complement does not constitute a proposition itself. Consequently, it cannot be a presupposition for the sentence as a whole, in the usual sense of this term. This standard phrase can only account for the simplest cases, such as the examples in (2), where the complement really is an independent proposition.

What is, then, the correct way to describe the semantic properties of regret and other factives? The best proposal that I can offer is to set up pairs of axioms - 'meaning postulates', as Carnap (1947) calls them - such as (11). This is similar to what I have suggested earlier for the so-called 'implicative' verbs (Karttunen, 1970a, b).

- (11) (a)  $(\forall x)(\forall s)[ \text{regret}(x, s) \triangleright s ]$   
 (b)  $(\forall x)(\forall s)[ \sim \text{regret}(x, s) \triangleright s ]$

Where  $x$  ranges over persons and  $s$  ranges over sentences and predicables, such as ' $x$  voted for the SST'.

The connective ' $\triangleright$ ' stands for a semantic relation that is defined as follows:

$P \triangleright Q$  if and only if, whenever it is true that  $P$ , it is true that  $Q$ .

That is, ' $\triangleright$ ' stands for the term 'implies', as used by J. L. Austin (1962) and Karttunen (1970a, b, c), 'necessitates', as used by B. C. Van Fraassen (1968), and 'semi-entails', as used by George Lakoff and Peter Railton (forthcoming). The symbol ' $\triangleright$ ' is due to Lakoff.

What (11) says is the following. Take any statement that is obtained by replacing the variable s by some sentence or predicable, say, 'x voted for the SST', and by replacing the variable x by some individual constant a. In any situation where the resulting sentence, 'a regrets that a voted for the SST', is true, it is also true that a voted for the SST. Consequently, (11) yields the correct inference that, in spite of their differences, whenever either (5) or (9) is true, it is true that some senators voted for the SST.

Consider now examples like (12).

- (12) Any senator who regrets that he voted for the SST  
is a fool.

It is not at all counterintuitive to regard (12) as true even if it should happen to be the case that there are no such senators. The logical form of (12) is usually assumed to be something like (13).<sup>4</sup>

- (13) Any senator, if he regrets that he voted for the  
SST, is a fool.

Since (13) does not actually assert of any group of senators that they are regretting anything, my proposal above would predict that (12) has no presupposition that involves the complement sentence. Nevertheless, it is intuitively quite obvious that whoever utters (12) commits himself to the view that there are some senators who voted for the project, although there need not be anybody who is regretting it. Some additional principle is clearly needed.

I would like to suggest the following. Although a conditional construction, such as we have in (13), does not assert the truth of its antecedent, it "con conversationally implies" that it is at least logically possible for the antecedent to turn out to be true for some senators.<sup>5</sup> That is, I claim that (13) conversationally implies the truth of (14).

- (14) For some senators  $x$ , it is possible that  $x$  regret that  $x$  voted for the SST.

As you can see by contemplating (14) for a while, if it is possible that some senators regret having voted for the SST, then it must be true that they actually voted for it. This observation indicates that the meaning postulates in (11) should be strengthened to (11') below by inserting 'M', the possibility operator, in front of regret in (11a) and in front of the negation sign in (11b).<sup>6</sup>

- (11') (a)  $(\forall x)(\forall s)[M(\text{regret}(x, s)) \supset s]$   
 (b)  $(\forall x)(\forall s)[M(\neg \text{regret}(x, s)) \supset s]$   
 Where 'M' = 'it is possible that'

The mere possibility that the antecedent is true implies the consequent. By this reasoning, (12) yields the same inference as (5) and (9) earlier, although more steps are involved in its derivation.

2. I will now turn to other difficulties with the standard analysis of factive verbs. Consider examples like (15).

- (15) (a) That his bride is not a virgin bothers Harry.  
 (b) His bride's not being a virgin bothers Harry.

There is no difference between that complements and poss-ing complements in the indicative mood. Both of the examples in (15) presuppose that Harry's bride is not a virgin. However, in the subjunctive mood there is a difference. That complements require truth in the actual world but poss-ing complements may be used with the understanding that they are fictitious. (16a) presupposes that Harry's bride is in fact a virgin, (16b) does not have this presupposition.

- (16) (a) That his bride is not a virgin would bother Harry if he knew about it. (\*Luckily she is a virgin.)

- (16) (b) His bride's not being a virgin would bother Harry, if he knew about it. (Luckily she is a virgin.)

(16b) is non-committal as to whether the girl is a virgin, it does not even presuppose that Harry has a bride yet. The suggestion that easily comes to mind is that examples like (16b) are to be analyzed as subjunctive conditionals. The logical form of (16b) would be as in (17).

- (17) If Harry's bride were not a virgin, then, if he knew about it, it would bother him.

The rest of the explanation goes as follows. In (17), we are invited to consider a possible world which differs from the actual one in the respect that Harry has a bride who is not a virgin. The consequent part of the embedded conditional, 'it would bother him', is to be interpreted in this hypothetical state of affairs; it does not matter if the presupposition is not satisfied in the actual world.

One can actually use (16a) in the same way by first building up a hypothetical context, in which the truth of 'Harry's bride is not a virgin' is explicitly postulated, as shown in (18).

- (18) Suppose that Harry has a bride and that she is not a virgin. That his bride is not a virgin would bother Harry if he knew about it.

It thus seems that the only significant difference between poss-ing and that complements is that the poss-ing constructions themselves may represent the antecedent of a subjunctive conditional and thus introduce a hypothetical situation while that clauses cannot function in the same way. This solution has the advantage that it saves us from having to regard the verb bother as a factive verb in (16a) but as a non-factive verb in (16b).

Certain nominalizations apparently should also be analyzed in the same way. Note that the two examples in



(19) stand in the same relation to each other as the corresponding poss-ing constructions in (15b) and (16b).

(19) (a) Bill's death is tragic.

(b) Bill's death would be tragic.

(19a) presupposes that Bill has actually died but, in (19b), what superficially looks like the same nominalization introduces a hypothetical state of affairs. (19b) is understood in the same manner as (20).

(20) If Bill were to die, it would be tragic.

There is some further evidence for this analysis. Note that (19b) and (21) are interpreted quite differently.

(21) Bill's wife would be furious.

(21) differs from (19b) in two important respects. Under a reasonable interpretation, (21) presupposes that Bill has a wife, although (19b) does not presuppose that Bill's death has taken place. Secondly, unlike (19b), (21) is somehow elliptic. To be fully interpretable, it needs some accompanying subjunctive if-clause, e.g. "Bill's wife would be furious, if she knew about his mistress". Without some additional context, one wouldn't be able to understand under what conditions Bill's wife would be furious. On the other hand, (19b) is fully interpretable as it stands; it needs no accompanying if-clause. This observation supports the view that (19b) actually represents the underlying subjunctive conditional in (20), whose antecedent clause is nominalized into a noun phrase.

3. The last problem that I will discuss concerns the criteria for factivity, which are usually taken for granted. Whatever a sentence with a factive predicate presupposes, the presupposition ought to remain no matter whether the main sentence is a negative assertion, an interrogative

sentence, or the antecedent of a conditional construction. For most of the verbs listed in (1) this is true. It is clear that all the examples in (22) presuppose that John had not told the truth.

- (22) (a)  $\left. \begin{array}{l} \text{regret} \\ \text{realize} \\ \text{discover} \end{array} \right\}$  John didn't that he had not told  
 (b) the truth.  
 (c)

The only circumstance in which the examples would not carry along a commitment to the view that John had not told the truth is a case where the assertions in (22) are uttered as an emphatic denial of somebody else's previous assertion. That is, one might say something like (23)

- (23) John DIDN'T regret that he had not told the truth.  
 How could he have done that when he knew that what he had said was true?

If we leave examples of this sort out of consideration, there are no problems with negative assertions.<sup>7</sup> All of the verbs listed in (1) meet this test for factivity. However, it seems that, in questions, some of the verbs behave differently. Consider the examples in (24).

- (24) (a)  $\left. \begin{array}{l} \text{regret} \\ \text{realize} \\ \text{discover} \end{array} \right\}$  Did you that you had not told the  
 (b) truth?  
 (c)

Most of my informants agree that with regret as the main verb, and possibly also with realize, the question in (24) commits the speaker to the view that the addressee has not told the truth. However, (24c) can also be understood as a sincere request for information. The speaker is not sure about the truth of the complement and is prepared to accept the addressee's discovery as a fact. In addition to the verb discover, verbs like find out, and see differ from the other factive verbs in this respect. In questions, they permit both a factive and non-factive interpretation.

In conditionals, the verbs that lose their factivity certainly also include realize. Consider the examples in (25).

- (25) (a)  $\left\{ \begin{array}{l} \text{regret} \\ \text{realize} \\ \text{discover} \end{array} \right\}$  later that I have not told  
 (b) If I  $\left\{ \begin{array}{l} \text{realize} \\ \text{discover} \end{array} \right\}$   
 (c) the truth, I will confess it to everyone.

In uttering (25b) and (25c) one is not making a confession. With realize and discover as predicate, one only admits that there is a possibility that one has not told the truth, but one does not concede anything more than that. With regret as the main verb, the first clause of (25) contains an admission that the complement is true.

As I suggested earlier in connection with the examples in (13) and (14), it seems that a conditional sentence conversationally implies that, in the view of the speaker, it is at least possible for the antecedent to turn out to be true. By this analysis, the examples in (25) conversationally imply the corresponding sentences in (26).

- (26) (a)  $\left\{ \begin{array}{l} \text{regret} \\ \text{realize} \\ \text{discover} \end{array} \right\}$  later  
 (b) It is possible that I will  $\left\{ \begin{array}{l} \text{realize} \\ \text{discover} \end{array} \right\}$   
 (c) that I have not told the truth.

Given (11'), the stronger pair of meaning postulates for regret, it is clear that from (26a) one can infer the truth of the complement. Since there is no such necessary relationship in (26b) and (26c), the corresponding stronger meaning postulates for realize and discover would fail. From the fact that it is possible that I may discover something I cannot conclude that this something is in fact the case. However, for regret, forget, resent, and all the factives that take sentential subjects this kind of reasoning is

valid. The meaning postulates for discover, realize, find out, see, notice, and other similar verbs - call them 'semi-factives' - have to be of the weaker form given in (11).<sup>8</sup>

- (11) (a)  $(\forall x)(\forall s)[\text{discover}(x, s) \triangleright s]$  semi-factive  
 (b)  $(\forall x)(\forall s)[\sim\text{discover}(x, s) \triangleright s]$  verb
- (11') (a)  $(\forall x)(\forall s)[M(\text{regret}(x, s)) \triangleright s]$  factive  
 (b)  $(\forall x)(\forall s)[M(\sim\text{regret}(x, s)) \triangleright s]$  verb

Furthermore, we have to assume that both the questions in (24) and the conditionals in (25) conversationally imply the corresponding possibility statements in (26). Note that, in simple affirmative or negative assertions, such as we have in (22), either type of meaning postulates would suffice for all factive verbs since, in this case, (11) and (11') ultimately yield the same inference.<sup>9</sup> It is probably for this reason that the difference between the two groups of factives has gone undetected for so long.

4. I believe that, in this paper, I have established the following three points. First of all, examples that involve quantifiers show that it is not always possible to present the presupposition of a sentence as something separate from the sentence itself. The analysis that I have proposed, in terms of meaning postulates, is similar to what I have suggested earlier for the so-called 'implicative' verbs. Secondly, it must be recognized that poss-ing complements and that complements behave differently in subjunctive sentences.<sup>10</sup> The former type may be used to introduce a hypothetical state of affairs, and what is presupposed there need not hold in the surrounding context. Finally, there are at least two distinct types of factive verbs, factives and semi-factives, that differ from each other in contexts that involve certain modal operators, although they are not distinct in simple negative or affirmative assertions.

## FOOTNOTES

\*This is a slightly revised version of a paper that was presented at the 45th Annual Meeting of the Linguistic Society of America in Washington, D.C., Dec. 29, 1970. It was supported in part by the 1970 Advanced Research Seminar in Mathematical Linguistics, sponsored by the NSF through a grant to the Center for Advanced Study in the Behavioral Sciences, Stanford, and in part by Linguistics Research Center under a grant for Theoretical Study Effort of High Quality Machine Translation (AF Grant No. F30602-70-C-0129). I would like to thank Barbara Hall Partee for her helpful comments on the original version of the paper.

<sup>1</sup> See Wall 1970 and the references given there.

<sup>2</sup> Here I beg the question of what the relation between 'logical form' and 'underlying syntactic representation' is.

<sup>3</sup> I believe that first examples of this sort were pointed out by George Lakoff (1970, footnote 8 on p. 132). He regarded them as a possible argument for having presuppositions included in the underlying syntactic representation of the sentence.

<sup>4</sup> See Geach 1962 (p. 112) for further discussion.

<sup>5</sup> I have borrowed the notion 'con conversationally implies' from H. P. Grice's yet unpublished work on Logic and Conversation, although I am not quite sure that I am using the term in the sense intended by Grice. Whether the term is appropriate is not so important as long as the observation itself is correct. In natural language, it seems inconceivable that anyone could sincerely make a statement of the form 'If A then B' in the indicative mood unless he was willing to grant the truth of 'It is possible that A'.

<sup>6</sup> The meaning postulates discussed in (11') should, of course, be conceived of as a special case of two general rules that do not mention any individual verb. For example, (11'a) is a special case of ' $(\forall v)(\forall x)(\forall s)[M(v(x, s)) \supset s]$ '. The class of verbs that the variable  $v$  ranges over includes forget, resent, and many other factive verbs in addition to regret.

<sup>7</sup> The best proposal that I know of for accounting for such emphatic denials of previous claims is to analyze them as in (i) below.

- (i) It is not true that John regretted that he had not told the truth.

In three-valued logic, from 'it is not true that A' one cannot conclude either one of the following: 'it is possible that A' or 'it is possible that  $\neg A$ '. Therefore, (i) yields no inference about the truth of the complement of regret. This analysis is in full agreement with the observation that there is no contradiction in (23).

<sup>8</sup> Note that the stronger type of meaning postulate in (11') is required, not only for true factives, but also in other cases where it is customary to speak of presuppositions. For example, one must be able to infer (ii) from (i), (iv) from (iii), and (vi) from (v).

- (i) It is possible that the present king of France is bald.  
 (ii) Presently, France is ruled by a king.  
 (iii) John may have stopped beating his wife.  
 (iv) John has been beating his wife.  
 (v) It is possible that only Muriel voted for Hubert.  
 (vi) Muriel voted for Hubert.

This indicates that the relation 'presupposes' should be defined as in (vii).

- (vii) A presupposes B if and only if  
 $M(A) \triangleright B$  and  $M(\neg A) \triangleright B$ .

<sup>9</sup> In case of (11'), this involves making use of the axiom ' $p \triangleright Mp$ ', that is, if something is in fact the case, then it is possible.

<sup>10</sup> Note that for-to complements belong to the same class with poss-ing complements. As Robert Wilkinson (personal communication) has pointed out to me, for-to complements may also be interpreted as fictitious whenever the main sentence is in the subjunctive mood. The relation between (i) and (ii) is the same as between (15b) and (16b).

- (i) For Bill to have said that is very significant.
- (ii) For Bill to say that would be very significant.

That is, (i) presupposes (iii); (ii) is non-committal with respect to (iv).

- (iii) Bill has said that.
- (iv) Bill will say that.

If the complement of (ii) is taken to be fictitious, (ii) should be analyzed as (v).

- (v) If Bill were to say that, it would be very significant.

Under the factive interpretation of the complement, (ii) is elliptic; it requires some other accompanying if-clause.

## BIBLIOGRAPHY

- Austin, J. L. 1962. How To Do Things With Words. New York: Oxford University Press.
- Carnap, Rudolf. 1947. Meaning and Necessity. Chicago, Ill.: The University of Chicago Press.
- Van Fraassen, B. C. 'Presupposition, Implication, and Self-Reference.' Journal of Philosophy, vol. 65., pp. 136-152.
- Geach, Peter Thomas. 1968. Reference and Generality. An Examination of Some Medieval and Modern Theories. Emended Edition. Ithaca, N.Y.: Cornell University Press.
- Karttunen, Lauri. 1970a. 'Implicative Verbs.' To appear in Language.
- 1970b. 'On the Semantics of Complement Sentences.' in Papers From the Sixth Regional Meeting. Chicago Linguistic Society. Chicago, Illinois.
- 1970c. 'The Logic of English Predicate Complement Constructions.' Unpublished paper.
- Kiparsky, Paul and Carol. 1968. 'Fact.' To appear in Recent Advances in Linguistics, ed. by Bierwisch and Heidolph. The Hague: Mouton and Co.
- Lakoff, George. 1970. Linguistics and Natural Logic. Studies in Generative Semantics, No. 1. Phonetics Laboratory. The University of Michigan. [To appear in Synthèse.]
- and Railton, Peter. (forthcoming) 'Some Types of Presupposition and Entailment in Natural Language.' Manuscript.
- Wall, Robert E. 1970. 'On the Notion "Presupposition of a Sentence".' Paper presented at the 1970 Winter LSA Meeting.