

## REVIEW ARTICLE

Dan Sperber and Deirdre Wilson, *Relevance, Communication and Cognition*. Basil Blackwell, Oxford, 1986. Pp. vi + 279, £27.50 (cloth), £8.50 (paperback).

PIETER A.M. SEUREN

### THE SELF-STYLING OF RELEVANCE THEORY

This book deals with an important problem area of psycholinguistics and, generally, the study of language and cognition: its central theme is the gap that exists between linguistically provided information and fully integrated comprehension. The problem of filling that gap has proved immense, and so far the sciences that try to contribute to an understanding of the processes involved have not been able to do more than nibble at the edges.

In general terms, the problem amounts to something like the following. As has often been observed, for an utterance to make sense in a communicative situation it must 'have a point': it must contribute something new to some concern of the moment. The strict linguistic meaning of the utterance is very frequently insufficient to achieve the goal of fully integrated comprehension: one can 'understand' an utterance and yet fail to see its point. In such a case one is entitled to say 'I don't see what you mean'. One might say that for an utterance to 'have a point', to link up with some concern of the moment, is for that utterance to be *relevant*. Only if the relevance of an utterance is grasped is there full comprehension. Schematically speaking one can say that there is a *relevance function*  $R$  which takes as input pairs  $\langle u, C \rangle$  of utterances and 'concerns', and yields as output integrated interpretations. The empirical and theoretical problem is then to make  $R$  explicit, i.e., to provide an analysis of what is involved in the 'linking up' of an utterance  $u$  to some concern  $C$ , and to specify what 'fully integrated comprehension' amounts to, or, in other words, what is meant by 'the point' of an utterance. We can now say that an utterance  $u$  is *relevant* with respect to a concern  $C$  just in case there is a value for  $\langle u, C \rangle$  in  $R$ .

There is, furthermore, an expectation on the part of any hearer that an utterance will be relevant, – there is a 'presumption of good sense'. If an utterance fails to be relevant in a given  $C$ , then a hearer will start a search for some other  $C$  in which the utterance is relevant. Full comprehension is, therefore, conditional on the selection of a suitable  $C$ , which must also be identical with the  $C$  in which the speaker planned his utterance. The major questions in this whole complex are: 'What makes an utterance relevant in a given  $C$ ?', and: 'What makes a hearer decide whether a given  $C$  is the one intended by the speaker?'. These questions have so far remained without an

answer, and Sperber and Wilson (henceforth SW) are to be commended for focussing the attention on them.

Beyond that, unfortunately, there is little SW are to be commended for. In spite of the rather grandiose claims ('a new approach to the study of human communication' (p.vii), 'the foundation for a unified theory of cognitive science' (cover blurb)), and despite the appearance of formal rigour, a closer inspection soon reveals that no foundations are laid at all for cognitive science, that the definitions are almost always imprecise and sometimes circular, that the procedures proposed or suggested are incoherent or unclear. In short, there is a great deal of quasi-formal window dressing; at crucial points in what should be the formal analysis SW fall back on a level of phenomenological impressionism. No model gets off the ground at all.

It would be easy, and not totally unjustified, to be summarily dismissive about this book. Yet I will discuss it in detail, mainly to warn against a creeping tendency, manifest in pragmatic writings these days, not to apply normal standards of precision and scholarship but make do with quasi-theories and quasi-solutions. This book has inherited much of that practice.

An additional factor is the history of the book. It was preceded by a paper, of the same authors, in Smith (1982), as well as by numerous presentations at conferences. Observations regarding the insufficient formal backing of the proposals made were invariably countered with references to the present book, where the necessary formal analyses would be made available (cp. SW 1982:72: 'In Sperber and Wilson (forthcoming) we provide a characterization of such a model. Here we shall assume the problem solved'.). Now, however, we see that the book contains hardly more (attempts at) formalism than SW (1982), and the practice of showing by example what should be shown by analysis and theory is simply continued, but on a larger scale. The pertinent criticisms voiced in Smith (1982) by Gazdar & Good, Moore, Wilks and Clark do not seem to have been either heeded or countered.

Although the book claims to lay the foundation for a unified theory of cognitive science, it does not present itself in the context of existing cognitive science but as a revision of Gricean pragmatics. The relevant psycholinguistic literature on inferencing, frame constraints, prototypes, etc., as factors in securing relevance for communicative utterances, is poorly represented. Although a fair number of publications from this area are mentioned in the bibliography, only passing reference is made to them in the actual text, and many important titles are missing altogether. Grice, on the other hand, looms large in the text. The book clearly continues the lines set out by Grice. In fact, the authors claim that all Grice's conversational maxims can be replaced by the single maxim 'be relevant'. A Gricean perspective, properly developed, could be very useful in cognitive science, where experimenters all too often suffer from theoretical myopia. This book, however, offers nothing remotely like a properly developed Gricean perspective, and it is more likely to confuse experimenters than to enlighten them.

There is no systematic survey in the book of the known means by which

relevance is achieved, i.e., by which listeners select appropriate 'concerns' and speakers enable listeners to do so. Despite the large number of examples discussed, the array of possible devices remains limited. In principle, no other relevance-boosting devices are dealt with than frame-based inferences and pure inferencing, with some literary devices lumped together under the name 'metaphor' and loosely mentioned in the last chapter. Yet it is known that more relevance-boosting devices are used in communication than just these.

A particularly deplorable gap in this respect is the total neglect of the role of presuppositions. There is a certain body of perfectly accessible literature where presuppositions are presented as systematic properties of sentences. A presupposition ensures that information necessary for the interpretation of its carrier sentence is stored in the mental representation of the discourse preceding the utterance of the carrier sentence (e.g. Isard 1975, Karttunen 1974, Stalnaker 1978, McCawley 1979, Reichgelt 1982, Shadbolt 1983, Seuren 1985, Fauconnier 1985). Sometimes the presupposition will already be represented in the discourse representation because it has been uttered as a separate utterance. But, perhaps more often, it will be supplied post hoc, on account of it being a systematic sentence property (so that competent speakers of the language 'know' what to supply). This process is variously called 'accommodation' or 'backward suppletion'. Take, for example, the following exchange:

- (1) A: Why does Harry get so inflamed when he sees the pope on TV?  
 B: He has renounced catholicism.

B's reply entails presuppositionally that Harry had been a catholic before. This entailment is singled out by the listener (though the heuristics of this process is not systematically understood), and immediately supplied post hoc in the discourse representation (if it wasn't represented there already). Now the discourse representation will contain more than just the representations of the two sentences given in (1), since it has the extra representation of 'Harry was a catholic before', which is a further, solid, element in the inferential process needed to make B's reply relevant. There must be available, moreover, background information that the pope is the head of the Catholic Church and some generalizations, e.g. that people who renounce a faith often turn into rabid enemies. SW may disagree with this discourse-connected notion of presupposition, but then, given their explicit concern with contextual phenomena, their readers expect an argument explaining SW's position. As it is, however, presuppositions are not mentioned at all in this context. Whatever little there is on presuppositions (pp. 202-217) deals with 'presuppositional effects' of emphatically or contrastively accented constituents of sentences (and that in SW's usual loose and inconsequential way).<sup>1</sup>

Backward suppletion is widely discussed in the psycholinguistic literature in connection with background knowledge (e.g. Haviland & Clark 1974, Clark & Haviland 1977, Sanford & Garrod 1981:129, Brown & Yule

1983:234-247). Often just backward suppletion of a presupposition is not sufficient for full comprehension of the relevance of an utterance in a given context: further elements are needed, and these are often retrieved from what is known as 'background knowledge'. In (2a), for example, background knowledge will provide the implicit connection between the car and the driver. In (2b), however, no background knowledge can be presumed to provide a link between John and his upper wheel, or to specify what an 'upper wheel' could be, or what it could be to start it, or why lifting it would help, or even what had to be helped:

- (2) a. The car stopped. The driver got out.  
 b. John came barging into the room. His upper wheel, however, wouldn't start, and he was unable to lift it.

In both cases an existential presupposition ('there was a driver', 'there was an upper wheel') is among those supplied post hoc, but only in (2a) does background knowledge complete the picture. Other types of presuppositions do the same job, however. Thus, in (3) the presupposition associated with *not...either* provokes the presupposition that something else, besides the cup, didn't hold. From A's question it can be inferred that the 'something else' was the vase. Some further (background) knowledge is, however, still required for a listener to comprehend what is going on: there must be a little history of putting or gluing together the vase and the cup in the same, deficient, manner:

- (3) A: How come that vase broke? I only touched it lightly.  
 B: The cup didn't hold either.

Another device to achieve relevance is the identification of discourse entities despite differing descriptions, a stylistic device often used by journalists:

- (4) Yesterday a Swiss banker was arrested at Heathrow Airport. The 53-year old bachelor declared that he had come to Britain to kidnap the Queen.

Then, the selection of the correct reading, in a context, of a *polysemous* item seems guided by considerations of relevance. This applies not only to the 'classical' cases of polysemy, such as (5a, b), but also to more far-fetched cases such as (5c, d) (discussed, e.g., in Brown & Yule 1983:210-214):

- (5) a. The school is away on an outing today. (i.e., the people involved)  
 b. Look, the school is on fire! (i.e., the building)  
 c. Plato is on the bottom shelf. (i.e., the works by Plato)  
 d. The ham sandwich has just left. (i.e., the person who ordered it)

The list of relevance-boosting devices could easily be extended. The point is,

however, that it would have been useful if SW had done this in their book. As it is, they concentrate on frame-based and pure inferencing, in mutual interaction. A prime example is found on pp. 121-2:

- (6) *Flag-seller*: Would you like to buy a flag for the Royal National Lifeboat Institution?  
*Passer-by*: No thanks, I always spend my holidays with my sister in Birmingham.

By itself, the reason given by the passer-by is hardly sufficient for his negative reply. However, conjoined with a few extra premises, like those in (7a-e), a conclusion can be reached that is a sufficient ground for the refusal. These extra premises, however, must be retrieved from background knowledge, or just invented in order to achieve a coherent pattern:

- (7) a. Birmingham is inland.  
 b. The Royal National Lifeboat Institution is a charity.  
 c. Buying a flag is one way of subscribing to a charity.  
 d. Someone who spends his holidays inlands has no need of the services of the Royal National Lifeboat Institution.  
 e. Someone who has no need of the services of a charity cannot be expected to subscribe to that charity.

*ERGO*: The passer-by cannot be expected to subscribe to the Royal National Lifeboat Institution.

Nothing is said on the problems involved in the heuristics of such extra premises, or on the probability of the whole scenario (once an interlocutor is branded as 'weird', there is no limit to the possible hypotheses of what he thinks makes his utterances relevant).

Inadequate treatment of the literature and uneven handling of topics would be excusable if the book contained exciting new ideas opening new vistas. Unfortunately, however, this is not the case. Let us have a more detailed look at the text.

Chapter 1, 'Communication', sets the pragmatic stage. It is a lengthy exposé of the well-known fact that linguistic messages underdetermine full comprehension. This well-known fact is presented in the well-known format of top-down processes meeting bottom-up processes somewhere in the middle, but it is not presented in this terminology (which, apparently, smacks too much of cognitive science and too little of pragmatics). SW have a 'code model' (bottom-up) and an 'inferential model' (top-down), and they set up strawmen who supposedly maintain that the one or the other model has exclusive rights. Unfortunately, some names of real men are attached to the straw figures (e.g. Grice is said to represent the inferential model), and these real men thus see their views distorted. The unsurprising conclusion is (p.27)

that 'a coding-decoding process is subservient to a Gricean inferential process'.

It must be said in SW's defence that, in reaching this conclusion, they stress certain features of communicative processes that are well worth stressing in the context of cognitive science, such as the unimportance of the 'mutual knowledge paradox' (pp.15-21), or the importance of the recognition of communicative intentions (p.25). Yet the overall result is poor. After a great deal of terminological prancing (about what is 'manifest', 'known', 'assumed', etc.), the chapter ends (p.63) with a heavy-footed definition of what the authors call 'ostensive-inferential communication':

*'Ostensive-inferential communication: the communicator produces a stimulus which makes it mutually manifest to communicator and audience that the communicator intends, by means of this stimulus, to make manifest or more manifest to the audience a set of assumptions {I}.'*

(Note that '{I}' does not stand for a set with the set I as its only member, but actually denotes the set containing the members of I. I shall not follow this unnecessarily confusing notation, and use 'I' to refer to SW's 'set of assumptions'. Only in quotations will the SW-notation be maintained.)

The term 'assumptions' is briefly defined on p.2:

*'By assumptions we mean thoughts treated by the individual as representations of the actual world (as opposed to fictions, desires, or representations of representations).'*

The use of this term in this chapter (pp. 58-60), as well as its further discussion in chapter 2, reinforces the impression that 'assumption' stands roughly for what others call 'proposition believed to be true'. This being so, one wonders whether ostensive-inferential communication excludes questions, commands, and other non-assertive speech acts. SW are not explicit on this. What transpires is that the linguistic element ('coded communication') only serves 'as a means of strengthening ostensive-inferential communication'. So let us sober up and simply say that 'ostensive-inferential communication' is communication tout court, and 'coded communication' isn't communication at all but only the linguistic element in it. Communication is a difficult enough notion as it is. We do not need to make it more difficult.

And this is precisely what SW do. Let us see what can be meant by the word 'manifest' occurring several times in the definition quoted. For this we must go back to p.39, where we read the following characterizations:

- (a) 'A fact is *manifest* to an individual at a given time if and only if he is capable at that time of representing it mentally and accepting its representation as true or probably true'.
- (b) 'To be manifest, then, is to be perceptible or inferable'.

We thus infer that 'manifest' is a predicate that applies to (probably) true facts which are within the mental reach, by perception or by inference, of the subject to whom they are manifest. It is thus a predicate that applies to what is in the world, not to what is in the processing mind. Then, surprisingly, we read:

- (c) 'We want to elaborate the notion of what is manifest in two ways: first, we want to extend it from facts to all assumptions; and second, we want to distinguish degrees of manifestness'.
- (d) 'An assumption, then, is manifest in a cognitive environment if the environment provides sufficient evidence for its adoption, and as we all know, mistaken assumptions are sometimes very well evidenced.'

From this we gather that the predicate 'manifest' applies also to mental entities, such as assumptions (thoughts believed to be true). Manifest assumptions are now assumptions with sufficient grounding in available facts (manifest facts, presumably). That is, one cannot be held responsible if a manifest assumption turns out to be false. So why not say: 'justified assumptions'? One begins to wonder if the term 'manifest' is not made ambiguous by all this, since one can hardly say that justified thoughts are 'perceptible or inferable' (quote b), these being world predicates, and not mental predicates.

Our powers of comprehension are stretched even more on the next page (p.40), where the following gem appears:

- (e) 'Our notion of what is manifest to an individual is clearly weaker than the notion of what is actually known or assumed. A fact can be manifest without being known: all the individual's actual assumptions are manifest to him, but many more assumptions which he has not actually made are manifest to him too.'

Remember that assumptions are 'thoughts treated by the individual as representations of the actual world'. (p.2). So now we are saddled with thoughts that are manifest to an individual but do not actually occur, or assumptions that he has not actually made but are yet manifest to him. My most charitable interpretation is that what SW wish to regard as manifest assumptions are *possible* justified assumptions as well as justified assumptions *actually made*.

Let us now revert to the definition quoted from p.63. One is struck first by the condition that the communicator must, by producing a stimulus, make it 'mutually manifest' to himself and the audience that he intends to make (more) manifest to the audience a set of assumptions I. According to pp. 41-2 this means that the speaker must make it clear to his audience that he originated 'the stimulus'. One wonders if this entails that an utterance whose utterer's identity is unknown will thereby not fall under the definition of ostensive-inferential communication, even though 'Your house is on fire!' will be highly relevant no matter who said it. Then, what is meant by 'make (more) manifest' a set of (possible or actually made) assumptions I? One gathers that the speaker must be taken to try to make I (more) justified for the

listener. More simply, he must try to convince his hearer (or reinforce his hearer's conviction) of the truth of what he intends to say. This, anyway, is the best one can make of this amazing definitional maze.

If this is what the authors wish to convey they are wrong. Besides missing non-assertive communicative speech acts, they also miss those assertive speech acts where the speaker does not try to convince at all and yet clearly communicates, with relevance and all. A speaker can say to his hearer 'You are wrong', knowing full well that so far from convincing his hearer he will make him more obstinate and even angry. And that may precisely be his intention. Generally, one can put forward an assertion and preface it with 'I am not trying to convince you, but....', without contradiction or paradox of any kind. What is going on in communication is something quite different, and much more to do with speech acts and the concomitant commitments. In rough outline one can say that a speaker who utters an assertion commits himself to the truth of that assertion to the extent that he is serious (and he thus incurs all the social and legal consequences that follow from this commitment). Since one may expect that serious people will not assume responsibilities too lightly, there is often some authority attached to assertions uttered, depending very much on who made the assertion, and when. For an analysis of the relevance factor in communication what counts is the commitment, not the authority.

Chapter 2, 'Inference', is devoted to the inferential element in comprehension: the fact that tacit premises often have to be invoked in order to show the relevance of an utterance (often a reply). SW hold that such inferential chains are formal deductive procedures, and not some 'loose form of inferencing' (p.70, quoted from Brown & Yule 1983:34). This is perhaps so, though plausibility-based and default procedures cannot be ruled out. In any case, SW's formalist position makes it all the more necessary, if not to set out criteria for the proper selection of tacit premises (which has proved too hard for everyone so far), anyway to specify the formalism, not only in terms of the computations performed, but also, as much as possible, in terms of actual cognitive functioning. From p.71 onwards, the chapter is devoted to the latter task. As regards the computations, an appeal is made, sensibly, to standard first order logic. This logic, however, as SW also quite rightly observe, is not ideally suited for natural language purposes: it is too poor, and it sometimes goes against the grain. So they propose to complement it a bit by adding degrees of certainty (and thus degrees of reliability of entailments) and some extra 'rules' based on what is 'normally' the case. And here SW make rather a mess of things.

The unit of computation, in SW's conception, is not a formulaic rendering of a proposition but of an assumption, which can be held under varying degrees of strength or certainty. It is clearly the authors' intention to present the logical apparatus in a cognitive setting. The build-up of this presentation is as follows. A distinction is made (p.71) between peripheral (modular) cognitive processes and central processes (much as in Fodor 1983). The logic



belongs in the latter, and it receives 'conceptual representations' more or less as raw material from the modular channels. 'A conceptual representation is both a mental state and a brain state' (p.72). In both qualities it can have non-logical properties: 'As a mental state it can have such non-logical properties as being happy or sad' (note that the *representation* is said to be potentially happy or sad!). 'As a brain state it can have such non-logical properties as being located in a certain brain at a certain time for a certain duration. Let us abstract away from all these non-logical properties, and call the remaining logical properties of a conceptual representation its *logical form*' (ib.). One might now think that a logical form is both a partial mental state and a partial brain state. But no, 'A logical form is a well-formed formula', we read four lines down the page. And to one's mounting amazement the text goes on:

'A logical form is *propositional* if it is semantically complete and therefore capable of being true or false, and *non-propositional* otherwise. A formal example of a non-propositional logical form is a predicate calculus formula containing a free variable: this may be syntactically well-formed without being fully propositional. A psychological example of a non-propositional logical form is the sense of a sentence. Given that 'she' and 'it' in (2) below do not correspond to definite concepts, but merely mark an unoccupied space where a concept might go, sentence (2) is neither true [n]or false:

(2) She carried it in her hand.'

The usual thing to say is, of course, that when in a formula all variables are bound then, given an interpretation, it expresses a proposition. Needless to say, SW are entitled to vary their terminology, but then one may expect a minimum of coherence. What, for example, do SW mean by 'concept'? Their use of this term leads to considerable confusion, as will appear below when we come to p. 85 of the book. Do they mean that a sentence like '*The woman carried the bag in her hand*' corresponds to a 'complete' logical form, as opposed to the analogous sentence with pronouns? Yet, without an interpretation this isn't true or false either. Or do they mean that definite terms, pronominal or lexical, need an interpretation for their sentence to have a truth-value? A marriage of logic and cognition is very much needed, in cognitive science as well as in semantics and pragmatics. But it will have to be based on something better than faint echoes of elementary logic teaching mixed with loose psychology.

Then comes the next step: logical forms (propositional ones, one presumes) are mentally entertained under different propositional attitudes, including one of justified belief (p.73), in which case we have assumptions. The justified belief operator is assumed to be 'prewired into the very architecture of the mind' and need, therefore, not be explicitly expressed by means of a linguistic element (p.74). Propositions under this operator are called 'factual assumptions'. No reasons are given for this prewiring assumption. Yet SW continue to speculate:

'Conceivably, the attitude of desire might parallel the attitude of belief in having its own basic memory store or storage format. This would mean that desire, like belief, was prewired into the architecture of the human cognitive system'. (ib.)

No criteria are given by which one could decide whether or not an operator of propositional attitude is 'basic' in this sense, and one is left in the dark about the deeper grounds for SW's assumption that, besides belief, 'desire is the only other plausible case' of basic storage (ib.).

In section 3 of this chapter SW allow for different degrees of confidence with regard to the 'factual assumptions' arrived at in the preceding pages. The degree of confidence is taken to be determined by the degree of confirmation, 'a term taken from a relatively undeveloped branch of logic' (p.76). The degree of confirmation of an assumption is not represented by an absolute value on an index, but relatively, in comparison with other assumptions. Inferences are stronger to the extent that the premises are more justifiably believed, i.e., better confirmed.

Assumptions are also taken to be derivable from assumptions in virtue of fixed schemata. Thus (pp.82-3), one will assume that when an assumption of the form 'if P then Q' is encoded for transmission, the hearer will weakly infer 'if not-P then not-Q', and also 'if Q, then Q because P'. Such formation of assumptions is considered 'standard'. An example is:

- (8)    a. If Fido is pleased, then he wags his tail.  
        b. If Fido is not pleased, then he does not wag his tail.  
        c. If Fido wags his tail, then he does so because he is pleased.

Given (8a), one 'standardly' weakly infers, according to SW, (8b) and (8c). The strength of this conclusion, however, depends solely on the example. A little experimenting soon shows that such weak inferences, though real for some cases, are absent in others. SW's term 'standard' thus seems arbitrary as long as no argument is given why (8) is 'standard' but, e.g., (9a-f) are not:

- (9)    a. If Fido wags his tail, he is pleased.  
        b. If Harry is asleep, he is alive.  
        c. If Harry has eaten, he has eaten a mango.  
        d. If Harry has a donkey, he beats it.  
        e. If Harry is back, he has been away.  
        f. If Harry has been away, he is back.

One notes that in some of these cases the 'weak inferences' in question are absurd, while in other cases they are not weak but so solid as to be trivial. The interesting question is, of course, *why* some conditionals tend to invite such inferences while others don't, and others again impose them as strong inferences. But this question is, typically, not mooted.

It appears that the notion of graded strength through confirmation serves

two purposes in the context of this book. First, the strength of 'the set of assumptions' which, according to the definition of 'ostensive-inferential communication', is to be made 'manifest or more manifest to the audience', is supposed to be inherited by the assumptions acquired by the hearer. In simpler terms, in SW's view a successful communicator convinces his hearer of the truth of his own assumptions to precisely the degree of strength with which he himself entertains them. He transfers his own degree of certainty to his audience. And secondly, as one gathers from p.103, the notion of relevance is to be defined or approximated in terms of the quality of confirmation of the premises of some inferred assumption: 'the relevance of new information to an individual is to be assessed in terms of the improvements it brings to his representation of the world'.

The sections 4 ('Deductive rules and concepts') and 5 ('The deductive device') do, in a way, the opposite of the sections 2 and 3. Whereas the two preceding sections aimed at enlarging the scope of cognitive logic with regard to standard logic by the addition of degrees of certainty and extra pragmatic rules, these sections want to show that cognitive logic is in some respects more restricted than standard logic. And again, the general point of view is both correct and well-known. The point here is that the standard notion of *entailment* is far too wide for the purpose of cognitive theory. Only some of the standard forms of entailment are psychologically natural, or, as SW say, spontaneous. Their problem, in these two sections, is 'to restrict the class of [logical] implications that could in principle be computed by the human deductive device' (p.103). This problem is, of course, both real and well-known.

SW's solution goes, in principle, as follows. They first introduce a new notion of 'concept' (p.85):

'It seems reasonable to regard logical forms, and in particular the propositional forms of assumptions, as composed of smaller constituents to whose presence and structural arrangements the deductive rules are sensitive. These constituents we will call *concepts*. An assumption, then, is a structured set of concepts'.

Note that, according to this definition, variables, for example, are concepts.

Then, 'each concept ... appears as an address in memory, a heading under which various types of information can be stored and retrieved' (p.86). This information 'falls into three distinct types: logical, encyclopaedic and lexical' (ib.). We thus have logical, encyclopaedic and lexical entries for concepts. Then:

'A logical entry consists of a set of deductive rules, each formally describing a set of input and output assumptions (!): that is, a set of premises and conclusions. Our first substantive claim is that the only deductive rules which can appear in the logical entry of a given concept are *elimination rules* for that concept. That is, they apply only to sets of premises in which there is a specified occurrence of that concept, and yield only conclusions from which that occurrence has been removed'. (ib.)

Occasionally, entries may be empty (p.92). In particular, 'proper names and other concepts [can] be seen as having an empty logical entry' (ib.). Apart from elimination rules, there are also *introduction rules*: 'a rule whose output assumption contains every concept contained in its input assumption(s), and at least one further concept' (p.96). These rules 'are *never* used in the spontaneous processing of information' (p.97). The conclusion is that 'non-trivial' (the new name for 'spontaneous') logical implications are defined as follows (p.97):

*'Non-trivial logical implication*

A set of assumptions {P} *logically and non-trivially implies* an assumption Q if and only if, when {P} is the set of initial theses in a derivation involving only elimination rules, Q belongs to the final theses'.

Among the many questions arising in connection with this definition, one is of immediate urgency: what are 'final theses?' For the answer we must go back to p.95:

'Deductions proceed as follows. A set of assumptions which will constitute the axioms, or initial theses, of the deduction are placed in the memory of the device. It reads each of these assumptions, accesses the logical entries of each of its constituent concepts, applies any rule whose structural description is satisfied by that assumption, and writes the resulting assumption down in its memory as a derived thesis. Where a rule provides descriptions of two input assumptions, the device checks to see whether it has in memory an appropriate pair of assumptions; if so, it writes the output assumption down in its memory as a derived thesis. The process applies to all initial and derived theses until no further deduction is possible'.

It thus appears that 'the set of final theses' consists of those 'assumptions' that allow for no further logical deduction. In the light of the foregoing this can only mean that such 'assumptions' consist exclusively of 'concepts' whose logical entries are empty.

It is not difficult to see that this is mere fumbling. The 'definition' of non-trivial logical implication (or: cognitive entailment) is clearly to be taken to require, as a necessary and sufficient condition, that for all token occurrences where P functions as the set of initial theses (in a derivation involving only elimination rules), Q is one of the 'final theses'. This has the undesirable consequence that the 'derived theses' are not cognitively entailed by P, though they can be made part of some R cognitively entailing Q. But, more seriously, we do not know what the set of 'final theses' looks like, since we have no idea of the set of 'concepts' with empty logical entries (all we know is that 'proper names and other concepts' belong to this class).

Furthermore, SW's 'substantive claim' that only elimination rules can figure in cognitive deductions is open to serious doubt. One would not wish to exclude, for example, the inference of 'Someone escaped from prison' from 'John escaped from prison'. This would be '*John-elimination*' (cp. p.90). But *John*, being a proper name, has an empty logic box and hence no rule to back

up this elimination. Nor would one wish to exclude, e.g., the inference of 'Someone really existing escaped from prison' from 'The murderer escaped from prison'. Elimination of *the murderer* (existential generalization) would give 'Someone escaped from prison', but this does not suffice to get actual existence of that someone. That entailment hinges on the fact that the predicate *escape* is extensional with respect to its subject (every constant subject term of *escape* must refer to an actually existing entity for the proposition with *escape* as its highest predicate to be true). The predicate *imaginary*, for example, is not extensional with respect to its subject: if I say truthfully 'The murderer is imaginary', then elimination of *the murderer* may give 'Someone is imaginary', but actual existence for this someone is not derivable. This means that entailments of actual existence, though no doubt natural and cognitively real, cannot be secured by means of an elimination rule.

Another stumbling block is the rule of *and*-introduction. SW maintain (pp. 98-9) that this rule plays no role in natural inferencing. This is clearly counterintuitive. Suppose, in some context, Bennie must not be left alone in the house because he will immediately start making costly calls to his girl friend in Hawaii. You are responsible for the telephone bill and I am telling you that Bennie is at home. But you think your son Jimmy is at home as well, though nobody else is. Then I let on that Jimmy has left for a good long game of snooker with the boys. Would you not now realize that Bennie is at home *and* nobody else is there? SW themselves consider the following argument against their position that *and*-introduction does not occur in cognition. They let their imaginary opponent say (p.98):(a) *modus ponens* is a natural form of entailment, and (b) *and*-introduction occurs in *modus ponens* arguments of the following format:

$$(10) \quad \begin{array}{l} (P \wedge Q) \supset R \\ P \\ Q \end{array} \left. \vphantom{\begin{array}{l} (P \wedge Q) \supset R \\ P \\ Q \end{array}} \right\} \neg P \wedge Q \text{ (and-introduction)}$$


---

*ergo*: R

SW reply that the conclusion R can be reached without *and*-introduction as follows:

$$(11) \quad \begin{array}{l} (P \wedge Q) \supset R \\ P \end{array}$$


---

*ergo*: Q  $\supset$  R

$$\quad \quad \quad Q$$


---

*ergo*: R

This is correct, but it must be noted that, if the deductive procedure is syntactic, the equivalence is required of  $(P \wedge Q) \supset R$  and  $P \supset (Q \supset R)$ , whence *modus ponens* gives  $Q \supset R$ . In order to get this equivalence other than just elimination rules are required. Note that SW, apparently, do have in mind *syntactic* logical derivation: 'The device we envisage is an automaton with a memory and the ability to read, write and erase logical forms . . . '(pp. 94-5). But if the derivation given in (11) is done semantically, it still remains true that (11) is a great deal more complex than (10). This is admitted by SW (p.99), which means that in their view cognition goes for the more complex procedures, surely a most unattractive position. For similar comments see Gazdar & Good (1982: 89-20).

Meanwhile the question of the criteria by which natural cognitive entailments can be singled out from the total set of logically valid entailments remains unsolved. Moreover, the logical apparatus that is postulated fails to satisfy even the mildest criteria that apply to a logical system. SW claim (p.103) that what they 'have done is merely place an upper bound on the set of implications that could in principle be derived from a given set of assumptions', thereby referring, apparently, to their claim that the set of 'final theses' derivable from a finite set of premises is finite. But, as we have seen, the concept of 'final thesis' is as yet without any filling in its logical entry.

We are gradually getting closer, or so SW attempt to make us think, to the main target of the book, the characterization of the notion of relevance. The next station on this tortuous and longwinded path is the notion of *contextual implication*, introduced on p.107. I shall paraphrase the rather turgid text as faithfully as possible, stressing the relevant points.

A set of premises  $PR$  can, for pragmatic reasons, be split up into two mutually exclusive subsets  $P$  and  $C$ .  $C$  represents 'old' knowledge, i.e. (to the extent that the text is clear on this) either encyclopaedic knowledge or knowledge already processed (p.107).  $P$  represents 'new' knowledge or information, i.e., 'assumptions derived from perception or linguistic decoding' (ib.). When such a split is made,  $P$  is said to be *contextualized in C*. A *contextual implication* is an entailment  $q$  from  $PR$ , such that neither  $P$  alone nor  $C$  alone entails  $q$ , and only natural cognitive deductive processes are involved. The entailment  $q$  as well as the information that was new until a moment ago have now been processed and pass into what will be  $C$  for any possible new  $P$ . The addition of  $q$  to the store of old information is called a *contextual effect* (pp.108-9).

No definition is given of the notion of 'contextual effect'. The reader must make do with 'the intuitive idea' that 'to modify and improve a context is to have some effect on that context', whereby he is given to understand that the modification must be both related to old information and new (p.109). 'Intuitively', again, 'there should be two more types of contextual effect. On the one hand, new information may provide further evidence for, and therefore strengthen, old assumptions; or it may provide evidence against, and perhaps lead to the abandonment of, old assumptions' (ib.). The latter occurs

(p.114) 'when there is a contradiction between new and old information'. In such cases the weaker of the two contradictory assumptions will be abandoned.<sup>2</sup>

As regards the 'strengthening' effects, it is not made clear whether relatedness to old information is sufficient for the title of contextual effect, or whether there must also be actual strengthening, and certainly no weakening. In the latter interpretation, a conjunction of the form:

(12) Stocks in New York are plummeting, but oil prices are rising.

should have a second conjunct without contextual effect even though it is related to the first conjunct. The criterion of relatedness is not elaborated, so that one must rely on one's intuition in applying it. Or it should be that a new utterance is considered relevant when it, together with *some* body of background knowledge, gives rise to a contextual implication. But even this charitable interpretation does not help much. For there will be few utterances that fail to give rise to some inference together with *some* background knowledge. But most of these SW will want to rule out as irrelevant, as indeed we would.

So what is needed is some further criterion of *relevant* background knowledge. The same applies to cases of contradiction: often enough a new utterance will be logically incompatible with *some* bit of existing knowledge, but, of course, that will not suffice to make it relevant in any desired sense of the term. SW discuss the question of 'context location' at length (pp. 132-142), but, as we shall see, in vain.

The concept of relevance is then, finally, defined in chapter 3. The definition proceeds in stages. On p.122 we read:

*'Relevance'*

An assumption is relevant in a context if and only if it has some contextual effect in that context'.

SW then take up three pages of text to explain that this is a gradable notion, since the expression 'some contextual effect' allows for degrees. Unaccountably, the definition is then extended with an extra condition to do with the principle of minimal effort. The result is found on p. 125:

*'Relevance'*

*Extent condition 1:* an assumption is relevant in a context to the extent that its contextual effects in this context are large.

*Extent condition 2:* an assumption is relevant in a context to the extent that the effort required to process it in this context is small.'

Given this undeserving formal workmanship it will come as no surprise that it is easy to present examples with awkward consequences. We have already considered example (12): if strengthening is a condition, the second conjunct

is not relevant, and if mere relatedness is a condition then we are left without any definition. Or take the well-known joke of the man eating in a restaurant and exclaiming:

(13) Waiter, there is a dead fly in my soup.

Whereupon the waiter quips:

(14) I know, sir, it's the heat that kills them.

Clearly, the waiter's reply is irrelevant here, but it is highly relevant in a very different situation where the 'concern' is about what killed the fly. SW's analysis provides no way of making this distinction, since the union of whatever concern parameters make (14) relevant and whatever such parameters would make a really relevant reply relevant makes them both relevant. Clark (1982:127), in his critique of Sperber & Wilson (1982), makes the same point: 'Surprisingly, the principle of relevance is mute on a crucial point about relevance itself: relevance with respect to what?'

As regards the 'extent condition 2', which claims that smaller processing effort corresponds with greater relevance, the reader is referred to the thorough discussion of this point by Gazdar & Good (1982: 92-98), who show that (a) so little is known about cognitive 'processing cost' that any claim in this direction is, in fact, empirically vacuous, and (b) any such relation of inverse proportionality, no matter the empirical content of the notion of 'processing cost', will clash with natural intuitions and thus become implausible.

It should be noted that SW insist (p.119) that they

'are not trying to define the ordinary English word 'relevance'. 'Relevance' is a fuzzy term, used differently by different people, or by the same people at different times. It does not have a translation in every human language. There is no reason to think that a proper semantic analysis of the English word 'relevance' would also characterize a concept of scientific psychology. We do believe, though, that .... there is an important psychological property – a property of mental processes – which the ordinary notion of relevance roughly approximates, and which it is therefore appropriate to call relevance too, using the term now in a technical sense. What we are trying to do is . . . to define *relevance* as a useful theoretical concept.'

Useful theoretical concepts, however, are useful, among other reasons, because they fit into a deductively ordered set of theoretical statements or hypotheses yielding 'theorems' which, upon interpretation, reflect possible facts. If intuitions of relevance are not the factual basis required, what are? Normally speaking, one would expect that the theoretical analysis of the concept of relevance is meant as an explicitation of the intuitive notion. But if the intuitive notion is said *not* to be the object of investigation (though



perhaps vaguely related), then one is entitled to know what is the intended empirical basis for the intended 'theoretical concept' of relevance.

When discussing SW's notions of 'ostensive-inferential communication' and of 'assumption', we concluded that the most probable interpretation of the hopelessly confused text was to attribute to SW the view that in communication a speaker tries to convince his hearer of the truth of what he says. More specifically, communication is successful to the extent that the speaker transfers his own degree of certainty to his audience. We have criticised this 'rhetorical' view of communication on the grounds that what counts in successful communication is the recognition on the part of the hearer of the kind and degree of *commitment* the speaker intends to take on, and not at all whether, in the case of assertions, the hearer allows himself to be actually *convinced* by the speaker. Such a view centers too much on assertions, and it is empirically inadequate. On p. 103 SW go even further. There they claim that communication is helped, not just by a transfer of degree of conviction, but also by the *actual truth* of what is asserted: 'the relevance of new information to an individual is to be assessed in terms of the improvements it brings to his representation of the world'. This claim is repeated on p. 108 and on p. 114. On p. 116 SW mix the rhetorical with the commitment view of communication:

'In verbal communication, the hearer is generally led to accept an assumption as true or probably true on the basis of a guarantee given by the speaker. Part of the hearer's task is to find out which assumptions the speaker is guaranteeing as true. Our hypothesis is that the hearer is guided by the principle of relevance in carrying out this task. He expects the information the speaker intended to convey, when processed in the context the speaker expected it to be contextualized in, to be relevant: that is, to have substantial contextual effect, at a low processing cost. Thus, if the hearer assumes (91),

(91) The speaker intends to assert *P*

and *P* turns out to be relevant in the expected way, assumption (91) is strengthened; moreover, if the hearer trusts the speaker to be truthful, assumption *P* is strengthened too. If *P* turns [out] to be relevant in the expected way only when assumption *Q* is added to the context, then assumption (92) is strengthened:

(92) The speaker intends the hearer to assume *Q*

and again, if the hearer trusts the speaker, then assumption *Q* is strengthened'.

The first thing that strikes the reader is, of course, the disarmingly candid statement that strengthening is a result of relevance, and not the other way around, as the definitions want it to be. But the point here is that this quotation is confused in that it makes the degree to which the hearer trusts the speaker play a systematic role. It is trivially true that a speaker's convincing power covaries with his authority and with the hearer's pre-existing knowledge. It is true that relevance guides interpretation. It is likewise true that the reconstruction of a relevant context or inference itself helps determining whether an interpretation is correct: a fitting hypothesis may be circular, it confirms itself by its fit. But the trustworthiness of the speaker does not, in general, play a role in spotting the correct interpretation of an utterance. The truth or falsity of *P* in SW's (91) is generally irrelevant, and it matters not a

whit whether *P* is strengthened or not. What may matter, for a correct interpretation, is whether SW's (92) is true, but then, whether or not *Q* is 'strengthened' is nothing to do with the process of comprehension. Furthermore, (92) fails as a general condition. The general condition is more like 'the truth of (91) depends on the assumption that the speaker assumes *Q*'. But SW throw everything into one bag.

What effects this can have is illustrated by an example that they themselves provide. Let us look again at the little episode of the flag-seller and the passer-by, described in (6) and (7) above (pp. 121-2 of the book). A crucial premise for the conclusion is (7e): 'someone who has no need of the services of a charity cannot be expected to subscribe to that charity'. Hopefully, this is not part of the background knowledge of anyone interpreting the passer-by's refusal to contribute. As SW themselves say (p. 121), 'the hearer must be able to supply' the premises, and in this case this means that he must hypothesize, or if you like 'assume', that this is a premise in the passer-by's mind. On this hypothesis the passer-by's utterance makes some sense. But now one wonders if (7e) should be considered 'old' or 'new' information. It can hardly be old, for the hearer that is, since the flag-selling hearer is not likely to sell flags if he thinks (7e) is true. If it is new, one wonders how it can be regarded as an 'improvement . . . to his representations of the world' (p. 103). Clearly, (7e) itself plays no part in the hearer's world representation, but the fact that the speaker apparently assumes (7e) is important for a correct interpretation of the speaker's refusal to contribute. SW fail to make this distinction and thus get entangled in absurdities.

For example, if (7e) is relevant in SW's sense (or at least in terms of their definitions to the extent that these are interpretable), it must not be 'eliminated' in favour of the hearer's own conviction to the contrary. Yet, his well-established conviction that charities are worth contributing to for other than purely egotistical reasons will no doubt prevail. Despite this, he interprets the passer-by's reply correctly. In fact, his correct interpretation (always assuming that the interpretation as sketched by SW is the one that took place) depends on the 'assumption' (7e) in so far as he must 'assume' that the speaker 'assumes' (7e). SW cross metaborders unawares: they fail to distinguish, for a proposition *p*, between taking *p* as true, and taking *p* as believed to be true by an interlocutor. Yet *p* has a very different status in one case and in the other.

A problem that has been touched upon but not dealt with is that of the selection of the proper context or set of background assumptions. Wilks (1986) points out that the answer provided by SW in their 1982 paper makes the definition of relevance circular. In 1982 SW stated that 'the search for the interpretation on which an utterance will be most relevant involves a search for the context which will make this interpretation possible. In other words, determination of the context is not a prerequisite to the comprehension process, but a part of it' (p. 76). Wilks replies (1986:273) that this makes nonsense of the condition, quoted above ('extent condition 2'): 'an assump-

tion is relevant in a context to the extent that the effort required to process it in this context is small'. For if the determination of the context C for an assumption A is part of the processing of A, then the relevance of A may involve a search for a suitable C, so that A is relevant, but it makes no sense to speak of the relevance of A in C.' The objection seems valid, and one would have expected SW to do something about this point (e.g. by dropping 'extent condition 2', which would have been a wise move anyway in view of Gazdar & Good's critique mentioned above): Wilks' point, though published as late as 1986, has been known to the authors since 1982.

Yet, as we have seen, the offending condition has not been removed or remedied in the 1986 version under review, and, after some searching in the verbose text, one discovers that the circularity has not been removed either. The selection of the proper context, in which some 'assumption' to be processed is relevant, is still part of the processing of that assumption, as it was in 1982. On pp.137-8 we read:

'We assume that a crucial step in the processing of new information, and in particular of verbally communicated information, is to combine it with an adequately selected set of background assumptions - which then constitutes the context - in the memory of the deductive device'.

One would now, naturally, wish to be instructed as to the meaning of the expression 'adequately selected'. And, after a great deal of dodging, SW finally inform us (p.141): 'Our answer is that the selection of a particular context is determined by the search for relevance'. So nothing has changed. The problem has only been tucked away in a larger amount of text. The problem is, as it was before, mainly located in the search for a suitable context, or, as we called it at the outset, 'concern'. And there is nothing in the book under review that has brought this problem nearer to a solution.

There is thus hardly any justification for the regular use of the term 'relevance theory', from p.130 onwards. What SW have offered comes nowhere near the status of a theory. The use of this term is an improper appropriation of prestige.

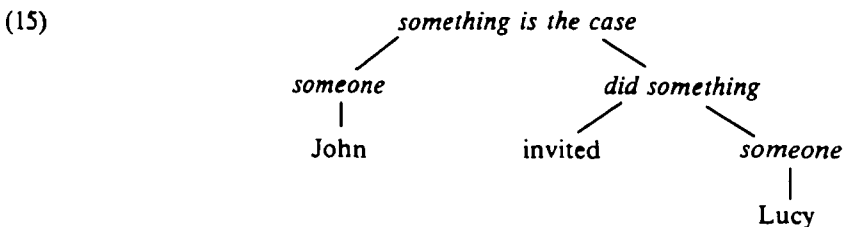
The last chapter (Aspects of verbal communication) is mainly a loose collection of thoughts on the nature of communication and its relation with language, on implicatures, and on literary and stylistic aspects of communication. (Presuppositions, as we said earlier, are treated under 'style'). There is little of interest to be found in these pages, and I shall refrain from comment on all issues but one: at the beginning of the chapter SW present some, largely philosophical, ideas about the relation between language and communication. On p.172 we read: 'Languages are indispensable not for communication, but for information processing; this is their essential function'. One would have thought that information processing is anyhow indispensable for any kind of communication, so that, if language is necessary for information processing, it is likewise for communication, necessity being a transitive

relation. On p.174 SW make their meaning a little clearer: 'Language is not a necessary *medium* for communication: non-coded communication exists' (italics mine). A communicating device must have 'an internal language', and therefore, SW conclude, the essential function of language is not its use in verbal communication but to make information processing possible. Thus, on p.173:

'Our point is precisely that the property of being a grammar-governed representational system and the property of being used for communication are not systematically linked. They are found together in the odd case of human natural languages, just as the property of being an olfactory organ and the property of being a prehensile organ, though not systematically linked in nature, happen to be found together in the odd case of the elephant's trunk'.

One hears echoes here of Chomsky's ramblings, in the late '60s and the early '70s, on the same subject. There is a simple confusion, here, between overt languages, with their grammars and their lexicons, as they exist in the world, on the one hand, and internal computational and representational systems on the other. SW prefer to call such internal computational systems likewise 'languages', like computer 'languages'. But nothing shows that this is not a metaphor. In any case, it is reasonable to surmise that actual, overt languages are highly functional for human communication: in what way other than by the use of grammar-governed and lexically elaborated representational systems would communication be possible about the extraordinarily wide range of topics that humans can and do communicate about? In the internal systems we find a coupling of representational and computational functions. In the actual languages of the world we find a coupling of representational and communicative functions. In neither case is the coupling 'odd'. On the contrary, it is not difficult to argue that in both cases the couplings are highly functional.

It would be a pity not to mention one last gem, found on pp. 205-6. Here SW discuss the sentence 'John invited Lucy', and assign it the 'logical form':



Not surprisingly, SW fail to enlighten their readers on the logic in terms of which (15) can be used for deductions.

## NOTES

1. It is tempting to think that this is an implicit admission of the failure of Wilson's attempt (1975) at giving a pragmatic account of presupposition.
2. This is different from all or most existing theories of acceptable discourse construction, where contradiction, if spotted, leads to unacceptability of the discourse. (See, e.g., Van der Sandt 1982; in press).

Nijmegen University  
 Philosophy Institute  
 P.O. Box 9108  
 6500 HK Nijmegen - Holland

## REFERENCES

- Brown, G., and G. Yule 1983: *Discourse Analysis*. Cambridge University Press, Cambridge.
- Clark, H.H. 1982: The relevance of common ground: comments on Sperber and Wilson's paper. In: Smith (ed.), 124-127.
- Clark, H.H. and S. Haviland 1977: Comprehension and the given-new contract. In: R. Freedle (ed.), *Discourse Production and Comprehension*. Ablex, Norwood, N.J.: 1-40.
- Fauconnier, G. 1985: *Mental Spaces. Aspects of Meaning Construction in Natural Language*. MIT Press, Cambridge, Mass.
- Fodor, J.A. 1983: *The Modularity of Mind*. MIT Press, Cambridge, Mass.
- Gazdar, G. and D. Good 1982: On a notion of relevance. Comments on Sperber and Wilson's paper. In: Smith (ed.): 88-100.
- Haviland, S. and H.H. Clark 1974: What's new? Acquiring new information as a process in comprehension. *Journal of Verbal Learning and Verbal Behavior* 13: 512-521.
- Isard, St. 1975: Changing the context. In: E. Keenan (ed.), *Formal Semantics of Natural Language*. Cambridge University Press, Cambridge: 287-296.
- Karttunen, L. 1974: Presupposition and linguistic context. *Theoretical Linguistics* 1: 181-194.
- McCawley, J.D. 1979: Presupposition and discourse structure. In: Ch.-K. Oh & D.A. Dinneen (eds.), *Presupposition*. (= Syntax and Semantics Vol. 11) Academic Press, New York-San Francisco-London: 371-388.
- Moore, T. 1982: Comments on Sperber and Wilson's paper. In: Smith (ed.), 111-112.
- Reichgelt, H. 1982: Mental models and discourse. *Journal of Semantics* 1: 371-386.
- Sanford, A.J. and S.C. Garrod 1981: *Understanding Written Language. Explorations in Comprehension beyond the Sentence*. Wiley & Sons, Chichester.
- Seuren, P.A.M. 1985: *Discourse Semantics*. Blackwell, Oxford.
- Shadboit, N. 1983: Processing reference. *Journal of Semantics* 2: 63-98.
- Smith, N.V. (ed.) 1982: *Mutual Knowledge*. Academic Press, London.
- Sperber, D. and D. Wilson, 1982: Mutual knowledge and relevance in theories of comprehension. In: Smith (ed.), 61-85.
- Stalnaker, R. 1978: Assertion. In: P. Cole (ed.), *Pragmatics*. (=Syntax and Semantics Vol.9) Academic Press, New York-San Francisco-London: 315-332.
- Van der Sandt, R.A. 1982: *Kontekst en Presuppositie. Een studie van het projektieprobleem en de presuppositionele eigenschappen van de logische konnektieven*. Ph.D. thesis, Nijmegen University.
- Van der Sandt, R.A. in press: *Context and Presupposition*. Croom Helm, London.
- Wilks, Y. 1982: Comments on Sperber and Wilson's paper. In: Smith (ed.), 113-117.
- Wilks, Y. 1986: Relevance and beliefs. In: T. Myers, K. Brown & B. McGonigle (eds.), *Reasoning and Discourse Processes*. Academic Press, London: 265-289.
- Wilson, D. 1975: *Presuppositions and Non-Truth-Conditional Semantics*. Academic Press, London.

