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## Discourse coherence and theory of relevance: Stumbling blocks in search of a unified theory<sup>☆</sup>

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### Abstract

Contrary to Sperber and Wilson (1986), I argue that relevance cannot be the only principle that governs human communication. It can by no means replace current accounts of discourse coherence (e.g., Grice, 1975; van Dijk, 1977; Giora, 1985a,b, 1988), since it is neither necessary nor sufficient for text well-formedness. I show that, although a discourse may be relevant to an individual, interacting with her/his set of assumptions at a small cost, this discourse may nevertheless be judged as incoherent by the very same individual. And vice versa: A discourse may be judged as coherent by an individual and yet be S&W irrelevant to her/him. If one of the goals of a pragmatic theory is to account for speakers' intuitions, Sperber and Wilson's relevance theory is deficient in this respect. It cannot account for speakers' intuitions as to coherence and degrees of coherence.

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And to feel that the light is a rabbit-light  
In which everything is meant for you  
And nothing need be explained ...

The grass is full  
and full of yourself. The trees around are for you,  
The whole of the wideness of night is for you,  
A self that touches all edges,

(Wallace Stevens, *A rabbit as king of the ghosts*)

### 1. Introduction

There are a number of notions of relevance prevalent in the literature: One views relevance as a relation between a set of propositions and a discourse-topic (hence-

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forth The Relevance Requirement). This notion is crucial for definitions of discourse coherence and well-formedness of communication. While this notion is implicit in Grice's (1975) maxim of Relation, it has been made more explicit in e.g., Strawson (1964), Reinhart (1980, 1981), Brown and Yule (1983), and Giora (1985a,b,c). Another notion of relevance defines it in terms of efficiency, roughly, as "usefulness with regard to the conversational goals" (Berg, 1991: 412). In terms of yet another approach, relevance is a layered notion made up of semantic, pragmatic, and semantico-pragmatic aspects (Dascal, 1977). A more recent notion of relevance is Sperber and Wilson's (1986) (henceforth S&W). It is defined in terms of (focus of) attention (see also van Dijk, 1979):<sup>1</sup> Relevant information is that information which is worth the hearer's attention (henceforth S&W relevance):

"The assumption is that human cognition is relevance-oriented: we pay attention only to information that seems relevant to us. Now every act of communication starts out as a request for attention. As a result it creates an expectation of relevance ... .

Relevance is defined in terms of contextual effect and processing effort. Contextual effects are achieved when newly-presented information interacts with a context of existing assumptions. The greater the contextual effects, the greater the relevance ... The smaller the processing effort, the greater the relevance." (Smith and Wilson, 1992: 4–5)<sup>2</sup>

S&W, then, postulate a hearer's relevance as a single principle which guides human communication. Hearers will pay attention only to information that seems relevant to them, i.e., information that enriches their set of assumptions at a reasonably small cost.

"[H]earers are equipped with a single, very general criterion for evaluating interpretations ... [T]his criterion is powerful enough to exclude all but at the most a single possible interpretation, so that the hearer is entitled to assume that the first interpretation that meets the criterion is the only one." (Smith and Wilson, 1992: 4)

In what follows I will try to query the viability of S&W's claim that a single notion of S&W relevance can explain human communication.<sup>3</sup> In particular, I will try to show that S&W relevance theory cannot dispense with current discourse coherence accounts, which they claim are derived from their notion of relevance. Though a single principled theory might be desirable, S&W's theory of relevance is insufficient.

<sup>1</sup> For a similar distinction see also Gorayska and Lindsay (1993: 312).

<sup>2</sup> S&W's relevance notion is akin to Kasher's rationality principle (1976, 1982). Kasher motivates Grice's maxims by arguing that they follow from a rationality "most effective, least effort" principle: "Given a desired end, one is to choose that action which most effectively, and at least cost, attains that end, *ceteris paribus*" (Kasher, 1982: 32). Regarding the (cooperative) speaker, she has to observe the principle to the best of her judgement. Regarding the (cooperative) hearer, where there is no evidence to the contrary, he must apply this principle by assuming the speaker is rational.

<sup>3</sup> For a similar view see Sadock (1986), Mey and Talbot (1988) and Levinson (1989).

## 2. S&W's notion of context

As a preliminary, I would like to query the notion of context proposed by S&W (1986). S&W's main contribution in this respect is the alternative they propose for the traditional view of context as given prior to the act of communication. The key notion here is the choice or selection of context(s). S&W (1986: 137–140) assume that processing new information involves selecting an adequate set of background assumptions which constitute the context. For any piece of new information many different sets of assumptions from different sources might be selected as context. However, the organization of long term memory in terms of 'frame', 'scenario' or 'prototype' oriented categories, and the mental activity the hearer is currently engaged in constrain the choice of context(s). What determines the choice of a context is the search for S&W relevance. The context which will most effectively, that is at the least cost, combine with the newly presented assumption to yield maximal contextual effects, is the appropriate one.

However, according to S&W, one does not come to processing new information with a 'blank mind'. Rather, one keeps in mind the assumptions s/he has just been processing. At the start of each deductive process, the memory of the deductive device contains an initial set of assumptions. This immediately given context can be extended in different directions. In the case of verbal communication, the comprehender may have to include in the context not only the interpretation of the immediately preceding utterance, but also the interpretation of utterances occurring earlier in the exchange.

As much as the choice of context(s) is an appealing idea, the fact that particularly the initial context is not constrained is problematic. Since anything can be contained in the initial context, and since no particular organization is required at this stage, the result of choosing the appropriate context for a new informative item (that will yield contextual effects at least cost) may be an incoherent discourse.

An analysis of S&W's examples brought to bear on the notion of 'relevance in context' will illustrate the point:

- (1) "[A]n assumption is relevant in a context to the extent that its contextual effects in this context are large.  
[A]n assumption is relevant in a context to the extent that the effort required to process it in this context is small." (S&W, 1986: 125)

To examine these conditions for relevance in a context, S&W examine the amount of contextual implications, weighed against the processing effort, a number of assumptions (e.g., (3), (4), (7) below) recover in a certain context. To do that, they first construct the context (2) below (S&W, 1986: 125):

- (2a) "People who are getting married should consult a doctor about possible hereditary risks to their children.  
(2b) Two people both of whom have thalassemia should be warned against having children.

(2c) Susan has thalassemia.”

Given the above context, S&W claim that (3) and (4) below vary in the amount of contextual effects they have in this context:

(3) Susan, who has thalassemia, is getting married to Bill.

(4) Bill, who has thalassemia, is getting married to Susan.

S&W contend that while both (3) and (4) share the contextual implication in (5), (4) has an additional contextual implication (6):

(5) Susan and Bill should consult a doctor about possible hereditary risks to their children.

(6) Susan and Bill should be warned against having children.

Were contexts indeed given, this would be an adequate analysis. However, since contexts, we are told, are not given, but are rather chosen and determined by the search for S&W relevance (S&W, 1986: 141), an alternative analysis is required. Such analysis will show that both (3) and (4) are equally S&W relevant.

To render (3) S&W relevant, the context needed to be searched for is smaller than that needed to render (4) S&W relevant. To render (3) S&W relevant, assumption (2b) should not be evoked. (2b) provides information that is of no use, and might indeed be a distraction. Thus, only (2a) and (2c) should be chosen upon processing (3). However, this is not true of (4). On processing (4), (2b) should be added to the context. (4) then, is not more relevant than (3) as S&W tried to show. Though (4) has more contextual implications than (3), it is also more effort consuming, necessitating the expansion of the context.

The same procedure (of extending the context) may apply to render inappropriate a discourse such as (7) S&W relevant. S&W (1986: 127) claim that (4) is more relevant than (7), since they share the same amount of contextual implications in the context of (2), while (7) requires more effort, because the extra information in (7) is completely unrelated to the given context and, consequently, has no contextual effect whatsoever:

(4) Bill, who has thalassemia, is getting married to Susan.

(7) Bill, who has thalassemia, is getting married to Susan, and 1976 was a great year for French wines.

However, since contexts are searched for, it is possible to extend the context so as to render (7) relevant. Suppose the speaker and hearer of (7) have just heard that their neighbor bought them a 1976 bottle of French wine. “Our neighbor bought us a 1976 bottle of French wine” is therefore an accessible assumption which is contained in the initial context and can be effortlessly added to the context. This extended context renders (7) equally S&W relevant to the context as (4) is. Though it requires more processing effort than (4), it also has more contextual effects. In

spite of its S&W relevance, (7) is an incoherent text. The hearer must be left puzzled as to how the two propositions in (7) are related to each other (rather than to a context).

Note that the ill-formedness of (7) has nothing to do with the fact that it is made up of conjoined utterances. The claim that conjunctions are presumed to have S&W relevance over and above each of the conjuncts (see Blakemore, 1987: 120) does not hold for juxtaposed sentences (Carston, 1993: 42).<sup>4</sup> The discourse in (7.1) is equally ill-formed, though it is not made up of conjoined sentences:

(7.1) Bill, who has thalassemia, is getting married to Susan. Both he and Susan told me that 1976 was a great year for French wines.

In order to block texts such as (7) or (7.1), S&W have to assume that at least the context – the set of accessible assumptions – must be constrained by coherence conditions. Thus, instead of considering Relevance relations to a discourse-topic in the text, S&W will have to assume such relatedness between assumptions in the context. This might occasionally allow for a well-formed discourse, which should then be viewed as the by-product of the well-formedness of the context. However, while they admit such contextual structures (e.g., in terms of ‘schemas’ or ‘prototypes’) only as far as long-term memory is concerned (S&W, 1986: 138), the initial context is not considered constrained by semantic relations, and rightly so. The result is, therefore, the possibility of ill-formed discourses such as (7) and (7.1) above.<sup>5</sup>

An alternative answer to the question as to how a context is determined comes from Murray (ms.). Murray examines what intuitively would count as the appropriate context versus what would count as an inappropriate context, but which would nevertheless be as highly accessible. She shows that what guides the choice of the appropriate context is what interlocutors consider most ‘important’ to them – what

<sup>4</sup> To show that for conjoined, or for that matter, for any two juxtaposed utterances, to have S&W relevance over and above each of them individually does not guarantee coherence, consider the following text segment (discussed in Giora, 1985a). The text is made up of pairs of utterances, each of which has S&W relevance over and above each of the individual adjacent utterances, yet altogether they do not make up a coherent text:

(a) Ronit is never home nowadays because she lives near school. (b) School, you know, is the center of the kids social life. (c) Uri has missed school a lot this year. (d) He never showed up at tennis, either.

The adjacent segments (a–b), (b–c) and (c–d) each achieve S&W relevance beyond their individual utterances. (a–b) may have ‘Ronit’s social life is hectic’ as a contextual implication recovered at a small cost. (b–c) may have ‘Uri’s social life is poor’ as a contextual implication. (c–d) may have ‘Uri’s education is deficient’. In Giora (1985a) I argued that coherence is not a linear property of the text. The existence of coherence or even S&W relevance relation between adjacent sentences will not necessarily result in establishing coherence relation for the whole text (for a different view see Blakemore, 1988: 241; Jucker, 1993). Rather, coherence relations obtain between a set of propositions and a governing discourse topic proposition (see Giora, 1985a,b and section 3 below).

<sup>5</sup> For further discussion concerning the status of context consider Gibbs (1987) and references therein. Gibbs argues that speakers and hearers must coordinate what they mutually know. Mutual knowledge is not only a result of comprehension, i.e., the search for S&W relevance, but a prerequisite for it as well.

'matters' to them, 'interests' or 'concerns' them. 'Importance' or 'interest' need not be cost effective, but rather Relevant to a discourse-topic: "[The] question that [the interlocutors] care about deeply and intensely, even though its cognitive consequences are small ... is almost what every line of their argument is relevant to, it is what the whole discourse is *about*" (ibid.).

In sum, the search for S&W relevance, for obtaining "as great a contextual effect as possible for as small as possible a processing effort" (S&W, 1986: 141–142), may not be the only factor determining the choice of context. As shown here, it may result in rendering a newly introduced piece of information S&W relevant but incoherent. A hearer might have accessible context(s) for the processing of (7) or (7.1) above (which will allow him to obtain as great a contextual effect as possible for as small cost as possible). However, it seems quite safe to contend that he may still find (7) and (7.1) undesirable or inappropriate (compared to, e.g., (4)).

The inappropriateness, yet S&W relevance of (7) and (7.1) suggests that, contrary to S&W's assumption, speakers do not have intuitions about S&W relevance, but they do about discourse coherence. Furthermore, such possible dissociation between coherence and S&W relevance refutes S&W's claim that the notion of discourse coherence can be dispensed with. S&W's argument is that we do not need an independent notion of discourse coherence (e.g., Grice's discourse theory), since everything follows from the quest for S&W relevance. However, the S&W relevance but incoherence of (7)–(7.1) suggests that coherence is not a derivative notion.

### 3. Discourse well-formedness

I would like now to further substantiate my claim that S&W's notion of relevance cannot be an alternative to current discourse theories, since it cannot account for the well-formedness of texts. Specifically, I will show that a stretch of discourse may be S&W relevant to an individual but incoherent (similarly to the examples above), and vice versa, it may be S&W irrelevant to an individual but coherent. To be able to weigh S&W's relevance theory against an alternative theory of discourse coherence, consider the categorial conditions for discourse well-formedness I formulated in previous work:

- (8) An informative discourse is well-formed if and only if it
- (a) conforms to the Relevance Requirement in that all its propositions are conceived of as related to a discourse-topic proposition. The discourse-topic is a generalization, preferably made explicit, and placed in the beginning of the discourse. It functions as a reference point relative to which all incoming propositions are assessed and stored (as specified in Giora, 1985a,b, following Grice, 1975),
- and
- (b) conforms to the Graded Informativeness Condition which requires that each proposition be more (or at least not less) informative than the one that precedes it in relation to the discourse-topic. A message is considered informa-

tive to the extent that it has properties unshared by the previous proposition, which, in turn, allow it to reduce possibilities by half (as specified in Giora, 1988, following Grice, 1975, and along the lines suggested by Shannon, 1951; Attneave, 1959; among others),

and

(c) marks any deviation from Relevance and Graded Informativeness by an explicit marker e.g., ‘by the way’, ‘after all’ (cf. Giora, 1985a; Ariel, 1985, 1988).

The conditions of discourse well-formedness are derived from more general constraints on storage of general knowledge in memory. A well-formed informative text is organized like a Roschian, prototype-oriented category. The internal structure of a prototype-oriented category (e.g., the class of birds) is graded (cf. Rosch, 1973). It is stored relative to the least informative member in the set, and is ordered informatively from the least to the most informative member. Likewise, a well-formed informative text evolves gradually from the least to the most informative message (Giora, 1985b, 1988). It begins with a generalization and becomes more informative as the text proceeds.

It has been shown (e.g., Giora, 1985b) that texts which conform to the above conditions are the easiest to process. Any deviation requires extra processing and is judged by speakers as less natural (e.g., Giora, 1988). Along the lines suggested by Grice (1975), overt violations of the requirements are intended to be recognized and trigger the generation of implicatures. They are aimed at achieving special effects or products and are more difficult to process (Giora, 1990, 1993). In contrast, unintended violations constitute anomalies. For an illustration of the graded structure of an informative text, consider the following discourse:

(9) It has often occurred in the history of science that an important discovery was come upon by chance. A scientist looking into one matter unexpectedly came upon another which was far more important than the one he was looking into. Penicillin is a result of such a discovery.

The text in (9) begins with a generalization which presents the set of properties shared by all the propositions in the text: Scientific (i), chance (ii), discovery (iii) of some importance (iv). The second proposition shares this set but adds another property – the relative importance of the scientific chance discovery (v). The third proposition repeats all the aforementioned properties while adding another one – the discovery of penicillin (vi). The mention of the discovery of penicillin is a specific instance of the discovery of important scientific chance discoveries. This mention eliminates other alternatives that could be included in the category at this point. The text thus proceeds along the informativeness axis, from the least to the most informative message in the set, conforming to the Informativeness Requirement. At the same time, each of its propositions repeats information mentioned in the discourse-topic presented in the beginning, thereby conforming to the Relevance Requirement.

Below I will examine the explanatory power of both S&W relevance theory and the theory of discourse coherence proposed above.

### *3.1. S&W relevance and The Relevance Requirement*

#### *3.1.1. Text comprehension is a discourse-topic oriented activity*

If it is the case that the quest for S&W relevance is the only principle that governs human communication, this suggests that being S&W relevant is both sufficient and necessary for discourse well-formedness. Coherence defined in terms of relatedness to a discourse-topic (e.g., van Dijk, 1977; Giora, 1985a,b and (8a) above), must be a derivative notion only.

To test this, consider again occasions where being coherent conflicts with being S&W relevant. For instance, S&W's relevance theory cannot account for the fact that discourse-topics are better stated than assumed, even when they are entirely uninformative (i.e., are S&W irrelevant, since they are present in the context and do not affect the strength of the existing assumptions). Note the following episode:

At one point, it was obvious to my students and to me that I would start my lecture stating that I was leaving the university soon, and hence would propose a make-up-lecture timetable. However, even though I knew they knew I was going to discuss this topic upon the beginning of the lecture, that is, even though this topic was highly accessible to them, I could not (I would suggest because of constraints of discourse well-formedness) start in medias res. I had to start by stating my discourse-topic, marking it as old information, though (as required by (8c) above): "As you well know, I am leaving soon, etc.". Only then could I discuss the details that ensue. Though in terms of S&W relevance theory this mention of the discourse-topic is S&W irrelevant (cf. (12a) below) – it would not even function as a reminder, being fresh in the minds of my audience – it was nevertheless necessary to establish it for considerations of coherence. This, then, is an instance that attests that S&W relevance theory is insufficient to account for discourse well-formedness: A discourse may be S&W irrelevant, but coherent and acceptable.

The coherence of this discourse, however, can be accounted for in terms of conforming to the Relevance Requirement ((8a) above). This condition requires that the discourse-topic be stated and presented in discourse-initial position, and then elaborated on.

That discourse-topics are better stated than not has been established empirically. Dooling and Lachman (1971) and Garrod and Sanford (1977) showed that providing information about the discourse-topic at the beginning of the text activates the related schema or general knowledge which allows incoming information to be integrated more easily. Giora (1985b) showed that discourses with a discourse-topic proposition in initial position are read significantly faster than identical discourses with discourse-topic mention in final position. Bransford and Johnson (1972) showed that in certain cases, comprehension of texts is impossible without discourse-topic mention in initial position (e.g., in the title). George et al. (1994) too demonstrated that discourse comprehension is a discourse-topic oriented activity. Subjects recalled titled discourses better than untitled ones (see also Bransford and

Johnson, 1972), and they searched for the discourse-topic proposition in the beginning of the text. They further found that words in the untitled paragraphs elicited greater N400 amplitude than words in the titled paragraphs. N400 is the component of event related brain potential. It increases in response to unexpected words in a sentence (e.g., Kutas and Hillyard, 1982). Here it was shown to be sensitive to discourse incoherence as well. Absence of a discourse-topic (e.g., a title) affects N400.

Further support for the hypothesis that discourse comprehension is a discourse-topic oriented activity comes from studies by Gernsbacher and her associates (Gernsbacher, 1985, 1990; Gernsbacher et al., 1989, and Gernsbacher and Hargreaves, 1988). According to Gernsbacher and her colleagues, the primary goal of language comprehension is the building of cognitive structures – a coherent mental representation of the information being processed. Gernsbacher and her colleagues show that building a coherent, mental structure starts with laying a foundation for that mental structure. Laying the foundation, both within discourses and within sentences, is effort consuming. The first word, picture, or sentence takes longer to process than subsequent information. However, first mention is rather advantageous. After comprehension, the first item, in our case, the first clause or sentence in a discourse, is considerably easier to access than subsequent information. This advantageous cognitive status allows subsequent information to be mapped onto the first clause. Indeed, after comprehenders lay the foundation, they develop their mental structures by mapping subsequent information onto the first clause. If incoming information does not cohere, comprehenders shift and initiate a new substructure.

That discourse-topics play a crucial role in text comprehension has also been shown by Hough (1990) and Schneiderman et al. (1992). Hough demonstrated that right hemisphere damaged patients have more difficulties than other patients and normal subjects comprehending narratives whose discourse-topic sentences are shifted to the end of the narrative. Schneiderman and her colleagues have established that the presence of a discourse-topic proposition facilitates text comprehension for left hemisphere damaged and non-hemisphere damaged individuals. Moreover, right hemisphere damaged patients do not benefit from its presence.

Schneiderman and her colleagues suggest that this deficit (and others)<sup>6</sup> of right hemisphere damaged individuals does not result from an inability to render information S&W relevant, so to speak. It has been shown that such individuals can, in fact, integrate newly presented information with their set of existing assumptions. For example, in retelling stories, they use information presented in the narrative and integrate it into their own personal experience and world knowledge. Schneiderman et al

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<sup>6</sup> There is evidence from aphasia literature which suggests that discourse comprehension depends on the right hemisphere (e.g., Joannette et al., 1990; Molloy et al., 1990; Chiarello, 1988). While left hemisphere damaged aphasics with intact hemisphere functioning are able to benefit from thematic information in the discourse topic (e.g., Engel-Ortelieb, 1981; Cannito et al., 1986; Huber, 1989), right hemisphere damaged individuals are impaired in their ability to utilize such information (e.g., Brownell et al., 1986; Beeman, 1993; Hough, 1990). They are unable to distinguish between salient and trivial information, between normal and deviant discourses, or see the main point or moral of a story.

prefer to interpret this deficit as stemming from a more general impairment in formulating macrostructure.

This difference between right brain damaged and left and non-brain damaged individuals attests to the independence of various discourse functions. In particular, the physiological, or rather, the neurological autonomy of Relevance to a discourse-topic and S&W relevance supports the view proposed here that the functions of discourse-topics and discourse coherence are not dependent on or derived from S&W relevance.

### 3.1.2. Degrees of coherence and the Relevance requirement

To further examine coherence-based versus S&W relevance-based approaches, consider S&W relevant, but incoherent discourses (and see again (7), and (7.1) above). Examples (10) and (11) show that S&W's relevance theory cannot predict the ill-formedness of the (a) versions as opposed to the better-formedness of the (b) versions. (10a) is S&W relevant in one context, i.e., the one containing the set of assumptions the reader must have about Ida's husband, since it may yield contextual implications at a small cost. Nevertheless it is incoherent (even if we ignore the repetitions and inconsistency which may affect coherence). Alternatively, it is easy to imagine a complementary text (e.g., (10b)) which constitutes a minimal pair with it and is as S&W relevant, but more coherent:

- (10a) This first time she was married her husband came from Montana. He was the kind that when he was not alone he would look thoughtful. He was the kind that knew that in Montana there are mountains and mountains have snow on them. He had not lived in Montana. He would leave Montana. He had to marry Ida and he was thoughtful. (Taken from *Ida* by Gertrude Stein)
- (10b) This first time she was married her husband came from Montana. He was the kind who loved to be alone and thoughtful. He was the kind who loved mountains, and wanted to live on them. He loved Montana. But he had to marry Ida and leave Montana.

The coherence difference between (10a) and (10b) is not accountable in terms of number of contextual effects weighed against processing effort. While both discourses may be equally S&W relevant, they nevertheless differ drastically in terms of coherence: (10b) is more coherent than (10a). Note further, that, though (10a) is the less coherent version, it can be considered a lot more S&W relevant than (10b), because it is more poetic and consequently has contextual (i.e., poetic) effects. However, if a comprehender finds (10a) more difficult to process than (10b), the aesthetic effects (e.g., stylistic novelty) offset the extra effort invested, and turn (10a) and (10b) similar in terms of S&W relevance, but still distinct in terms of coherence.

S&W relevance, then, cannot account for the coherence difference between (10a) and (10b). However, it is easily explainable in terms of the discourse coherence theory proposed above. (10b) is more coherent because it conforms to the Relevance Requirement ((8a) above). Unlike (10a), all its propositions are related to a generalization that governs the given set. They are interpretable as being about a certain dis-

course-topic, e.g., ‘What Ida’s husband had to give up upon marrying her’.<sup>7</sup> (10a) however, does not lend itself to such a summarization that will subsume all or most of its propositions (cf. Giora, 1985b, and Giora and Shen, 1994, on how discourse-topics are derived).

At this stage, S&W might argue that processing a relatively incoherent text is more effort consuming than processing a coherent one. But this on its own need not render the text less S&W relevant, since such extra processing may be offset by a greater amount of contextual effects (e.g., (10a)). The notion of S&W relevance on its own, defined in terms of the number of contextual effects and the processing effort required in obtaining them, cannot then account for discourse coherence.

Consider, further, another instance of coherence difference (between (11a) and (11b) below) which cannot be accounted for in terms of S&W relevance. The segment in (11b) was judged as more coherent or appropriate than (11a) by 20 speakers. Still, both share the same contextual implications and require the same processing effort. However, while in (11b) the last proposition starts a new paragraph, since it introduces a new discourse-topic (the chance discovery of penicillin), in (11a), which is not segmented, this proposition is not Relevant (cf. (8a) above): it is not related to the given discourse-topic (‘The importance of scientific chance discoveries’) introduced at the beginning of the paragraph:

(11a) It has often occurred in the history of science that an important discovery was come upon by chance. A scientist looking into one matter, unexpectedly came upon another which was far more important than the one he was looking into. Penicillin is a result of such a discovery. Penicillin was accidentally discovered by Fleming in 1928 ...

(11b) It has often occurred in the history of science that an important discovery was come upon by chance. A scientist looking into one matter, unexpectedly came upon another which was far more important than the one he was looking into. Penicillin is a result of such a discovery.

Penicillin was accidentally discovered by Fleming in 1928 ...

Thus, while S&W cannot account for the lower coherence of (11a), or for the motivation for the segmentation which renders it more coherent in (11b), these are explainable in terms of the discourse theory proposed here. ‘The accidental discovery of penicillin’ constitutes a new discourse-topic, which motivates formal segmentation. Though it shares some properties with the discourse-topic of the first segment, it nevertheless adds too much new information to be included in that segment (see also Giora, 1983a,b, 1988). Thus, apart from the quest for information, there is that requirement for relatedness (termed Relevance to a discourse-topic, cf. (8a) above), which curbs the search for as great a contextual effect as possible (see Grice,

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<sup>7</sup> Note that the discourse topic need not be made explicit in the text. It is enough that it can be generated (cf. (8a) above).

1975, and Giora, 1988, on how the Relevance Requirement constrains the Informativeness Requirement).

On various occasions, proponents of S&W relevance theory (e.g., Blakemore, 1987; Blass, 1990) made the claim that the frequent occurrence of (relatively) incoherent but S&W relevant discourses attests that speakers and hearers are not necessarily constrained by the search for coherence. This claim is not problematic for a coherence-based theory. A coherence-based theory endeavors to account for and make explicit speakers' intuitions as to the well-formedness of discourses. It does not assume that coherence is the only principle that governs human communication.

### 3.2. *S&W relevance and The Informativeness Requirement*

Given S&W's theory of relevance, two types of information are rendered S&W irrelevant:

- (12a) Newly presented information, which already forms part of the context and does not affect even the strength of existing assumptions. Such information "is therefore entirely uninformative and a fortiori, irrelevant." (S&W, 1986: 121)
- (12b) Entirely new information that does not interact with existing assumptions to yield contextual effects and will only be costly upon processing. (ibid.: 48)

Note that such a quantitative notion is akin to the Gricean requirement for informativeness (for a similar view see Gazdar and Good, 1982; Ziv, 1988; Berg, 1991). I have proposed to account for informativeness in terms of the probability of an assumption (see Giora, 1988, and (8b) above). An assumption is informative relative to the number of options it reduces. The greater the number of possibilities reduced, the more improbable and hence, informative the assumption. To be considered informative, an assumption must at least reduce options by half. This suggests that two assumptions, which might have the same number of (un)costly contextual effects, may nevertheless differ in amount of informativeness. Various contextual implications may reduce a different amount of possibilities. As an illustration, consider (13a) and its counterpart (13b):

- (13a) She was gay exactly the same way. She was never tired of being gay that way. She had learned many little ways to use in being gay. Very many were telling about using other ways in being gay. She was gay enough, she was always gay exactly the same way, she was always learning things to use in being gay, she was telling about using other ways in being gay, she was telling about learning other ways in being gay, she was learning other ways in being gay, she would be using other ways in being gay, she would always be gay in the same way, when Georgine Skeene was there not so long each day as when Georgine Skeene was away. (Taken from *Miss Furr and Miss Skeene* by Gertrude Stein)
- (13b) She thought she would always be gay in the same way, when Georgine Skeene was there as well as when Georgine Skeene was away. But when Georgine Skeene was away for as long as a whole day, she could no longer be gay. She

would pretend being gay, she would try being gay, but at the end of the day she was no longer gay. She was waiting for Georgine Skeene to be back at the end of the day so that she would be gay once again.

(13a) seems almost uninformative. However, a close inspection will reveal that each assumption adds a certain amount of information, and therefore extends the context set of assumptions. For instance, the first sentence opens up possibilities such as ‘the circumstances under which the protagonist would not be as gay’, or ‘unpredictable circumstances under which she would nevertheless go on being gay’, etc. The next sentence, however, does not reduce any such possibilities. Rather, it strengthens an already given assumption by repeating it, adding only a small amount of new information: ‘never tired of being gay’. Similarly, the following sentence, while repeating given assumptions, adds some new information (‘learned many little ways in being gay’) which nevertheless does not reduce possible options and so forth. (Only the last sentence seems to contribute a greater amount of information, which reduces options by half). The addition of such small amounts of information may result in contextual effects. However, it will not render the text informative enough. In this sense of informativeness, but not in S&W relevance, this passage differs from the more coherent text in (13b).

In (13b), each sentence reduces by half the possibilities given rise to by the previous sentence. While the first sentence suggests that the protagonist would either go on being gay or stop being gay, the second sentence reduces these possibilities by half by implementing one. Having read the second sentence, there is a chance that something might change, as well as the possibility that nothing will change. The implementation of one of these possibilities by the following sentence reduces the possibility of the other, thereby rendering the text informative, and so forth. Unlike (13a), (13b) evolves gradually along the informativeness axis, reducing possibilities by half, thereby obeying the Graded Informativeness Requirement (cf. (8b) above). Its relative well-formedness, then, does not follow from S&W relevance. Neither does the relative ill-formedness of (13a). While (13a) does not differ from (13b) in number of contextual effects (weighed against processing effort), the amount of informativeness of each assumption is different. In (13a), each assumption is highly probable, and does not reduce possibilities by half. By contrast, in (13b) each assumption is informative, since it reduces possibilities by half. S&W’s relevance theory, then, cannot predict or account for the difference between (13a) and (13b).

Ironically, according to S&W, (13a) may be considered even more relevant than (13b). Unlike (13b), it yields extra contextual effects. Its repetitiveness renders it poetic (for how repetitions achieve S&W relevance see S&W, 1986: 220–221; Blakemore, 1992; Jucker, 1994<sup>8</sup>). So, while (13a) is more S&W relevant than (13b), it is much less coherent. The very device (breach of the Graded Informativeness Requirement) which renders (13b) relatively incoherent, renders it more S&W relevant.

<sup>8</sup> On how poetic devices such as repetitions, analogies and irony impair discourse comprehension consider Giora (1990, 1993, 1995), Giora et al. (1996).

vant. The S&W relevance of the above discourses, then, masks differences in amount of informativeness and consequently, in degree of coherence. It cannot account for our intuitions concerning the coherence difference between the two (supposedly equally S&W relevant) discourses.

The examination of the discourses in (10)–(13) suggests that the mechanism of obtaining as great a contextual effect for as small a processing effort does not take into account the relative coherence of the various discourse structures. While in (10a) the poetic effect results from the violation of the Relevance Requirement, in (13a) it is the breach of the Graded Informativeness Requirement that accounts for its incoherence. However, because both discourses achieve S&W relevance, their relative incoherence or the type of incoherence is masked and fosters an illusion of equivalence.

#### 4. S&W relevance and attention

Recall that for S&W, relevance is a quantitative notion. Comprehenders will pay attention to information that will yield as many contextual effects as possible at as small a cost as possible. However, some behavior cannot be accounted for in terms of effect versus cost only. Consider an occasion on which hearers will most probably stop paying attention to highly S&W relevant information because a more important, even though less S&W relevant message may attract their attention. An elaboration of an episode cited in Smith and Wilson's (1992: 5) will serve to illustrate the point:

“[S]uppose that someone walks into an important lecture and says:  
(14) Ladies and gentlemen, I have to tell you that the building's on fire.”

This “interruption” (sic p. 5) is obviously S&W relevant to the audience, since it has contextual implications in the given context. However, it is not necessarily more S&W relevant than the lecturer's current contribution. Given S&W's quantitative notion of relevance, it is quite possible that the lecturer's current utterance, in the context of her talk, may achieve a greater amount of S&W relevance than the utterance in (14). Nevertheless, there is no doubt that this more S&W relevant contribution will be abandoned for the sake of the new and less S&W relevant information. Obviously, the attractiveness of this utterance has nothing to do with its amount of uncostly contextual effects, but with its specific content, importance, or quality. A contextual implication that has to do with life and death is worth a thousand, less fatally laden ones. What this example suggests is that a quantitative notion of relevance will not suffice. We need another explanation for why people would pay attention to one type of stimulus rather than to another in terms of its content.<sup>9</sup> Or, take for instance, S&W's example (15), cited in Blass (1990: 22). The utterance in (15b)

<sup>9</sup> For a discussion of a similar example see Jucker (1992: 83).

lends itself to two interpretations; both, according to Blass, are consistent with the principle of S&W relevance, though one (the mention of Susan's assertion) is more coherent than the other (the speaker's assertion). Yet the incoherence of the latter does not rule out its use:

(15a) What did Susan say?

(15b) You have dropped your purse.

Blass concludes that speakers and hearers are not constrained by the search for coherence. However, a close inspection of the less coherent interpretation will reveal that neither are interlocutors constrained by the search for S&W relevance. The less coherent interpretation is also less S&W relevant. The change of discourse-topic which renders it less coherent also requires extra processing (e.g., Gernsbacher, 1990), such that is not necessarily offset by a rich array of contextual effects. Both interpretations may be equally rich in contextual effects. The cost, however, may vary. Would it be safe to assume that the hearer will nevertheless recover the less relevant interpretation and bend down to pick up her purse, at the cost of ignoring the more S&W relevant interpretation, or even at the cost of making a fool of herself, exposing her misunderstanding?

Speakers and hearers may have other goals than just enriching their cognitive environment or that of their addressees. Saving one's life or retrieving one's lost possession seem more important than being S&W relevant (see also Murray, ms.).

## 5. Conclusions

I have shown that S&W relevance cannot be the only principle that governs human communication. Speakers and hearers are not constrained only by the search for relevance. In addition, coherence considerations constrain communication and play a major role in discourse structuring and understanding. If one of the goals of a pragmatic theory is to account for speakers' intuitions, S&W's relevance theory fails to account for speakers' intuitions as to coherence. On certain occasions, it cannot distinguish coherence from incoherence or degrees of coherence.

S&W's assumption that coherence is derived from S&W relevance is untenable. Although a discourse may be S&W relevant to an individual interacting with her/his set of assumptions at a small cost, this discourse may nevertheless be judged as incoherent by the same individual. And vice versa: A discourse may be judged as coherent by an individual and yet be S&W irrelevant to her/him. S&W's notion of relevance cannot account for discourse coherence because, being a theory of attention, it allows for both information that is essential for a coherent discourse and information that interferes with coherent discourse to be defined as S&W relevant – as worth the hearer's attention. S&W's relevance theory is therefore not an alternative to current discourse theories. Clearly, it cannot dispense with either Relevance (e.g., Grice, 1975; Giora, 1985b) or Informativeness (e.g., Grice, 1975; Giora, 1988) Requirements.

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