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ABSTRACT

Conjunctions (e.g., "if, and, so") appear in varied contexts and are associated with a wide range of interpretations. The theoretical options concerning the lexical specifications of these items are: (1) multiplicity of senses; and (2) restricted senses augmented by conversational implicatures. It is proposed here that the latter position is more applicable. Attention is confined to one possible interpretation with which such conjunctions may be associated: causality. It is argued that causality is a major reasoning principle that interacts with some versions of inference maxims (following H. P. Grice's theory of implicature) to yield the desired interpretation. This account also provides an explanation for a range of additional instances where implicit causal relations hold and will shed light on the convergence, in a variety of languages, of readings involving causality with those associated with addition, conditionality, and temporality, among others. Contains 28 references. (MSE)

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**CONJUNCTION AND CAUSALITY: PRAGMATICS  
AND THE LEXICON**

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## CONJUNCTION AND CAUSALITY: PRAGMATICS AND THE LEXICON

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### ABSTRACT

The Gricean maxims or their proper alternates are claimed to constitute necessary but not sufficient properties of an overall theory of interpretation. To make the correct predictions, the theory seems to require reference not just to the Gricean-like inference maxims but also to some basic reasoning primitives not derivable from any variant of the Cooperative Principle. Causality is argued to constitute such a cognitive primitive. The interaction between this reasoning principle and the Gricean inferencing maxims is shown to account in a non-ad-hoc fashion for instances of implicit causality as well as cases where conjunctions like *if*, *and*, *so* involve causal interpretations. The lexical specifications of such conjunctions are, consequently, considerably simplified. The adoption of this hypothesis provides a non-arbitrary account for the systematic convergence across languages of readings involving causality with those associated with addition, conditionality, and temporality and the claim is made with respect to second language instruction that the existence of such interpretation heuristics significantly facilitates the learning process of certain lexical items.

### INTRODUCTION

Conjunctions like *and*, *if*, *so* have been known to appear in a variety of contexts and to be associated with a wide range of interpretations. Thus, *and*, for example, has been observed to occur in instances like the following where temporality, circumstantiality, causality and the like are involved:

- (1) I went to the store and bought some whisky.
- (2) He died and they buried him.
- (3) Mary went to the concert and Bill stayed at home.

- (4) There was a fire and I called the fire department.
- (5) They failed the exam and did not get accepted to school.

The theoretical options available concerning the lexical specifications of these items are (a) multiplicity of senses and (b) restricted senses augmented by conversational implicatures. Arguments have been adduced for both these positions, the latter option gaining more ground with our growing understanding of the Gricean implicatures.<sup>1</sup> In this paper I will side with the minimalists and provide additional arguments for the fewer senses position alongside the machinery for adopting it. I will restrict my attention to one possible interpretation with which such conjunctions may be associated, i.e., causality. It will be argued that causality is a major reasoning principle which interacts with some version of the Gricean inferencing maxims to yield the desired interpretation. The account proposed will also provide an explanation for a range of additional instances where implicit causal relations hold and will shed light on the convergence in a variety of languages of readings involving causality with those associated with addition, conditionality and temporality, among others. It will be claimed in this context with respect to the proposed interpretation heuristics will considerably facilitate the learning process of the relevant "meanings" of the lexical items in question.

## BACKGROUND

Following Grice's (1975) theory of implicature, it is now widely believed that comprehension involves not only the recovery of the propositional content of a given utterance and its intended implications in the context in which it was uttered, but also the presumption that the speaker has tried to conform to some general standards of verbal communication. The standards proposed by Grice involve his Cooperative Principle (CP) and the maxims of conversation, including Quantity, Quality, Relation, and Manner, all of which are used as a guide to the intended interpretation. Since the CP and the various maxims were formulated rather loosely, attempts were made at their reformulation or modification. In this context, we can regard the neo-Gricean approaches evident in Dascal's (1977), Horn's (1984), Leech's (1983) and Levinson's (1987) contributions, inter alia, which specify a variety of alternative principles. Alongside the different modifications, there are at least two major attempts at reducing the number and variety of principles and subsuming them under a single, general

principle from which the others follow. Under this category we will find Sperber and Wilson's (1986) cognitively oriented Relevance theory and Kasher's (1976, 1982, 1987) socially oriented Rationality principle.<sup>2</sup> In this paper I will assume that some variant of the CP, be it of the neo-Gricean or of the reductionist type, constitutes a necessary but not a sufficient property of an overall theory of interpretation. For such a theory to make the correct predictions, I would claim, it would need to refer not just to the Gricean-like reference principles, such as causality and temporality, which are not derivable from any variant of the CP. As I intimated above, in the present context, I will concentrate on causality. The interaction between the reasoning principles and the Gricean-like inferencing maxims (in whatever guise) will be shown to account in a non-ad-hoc fashion for a variety of instances involving implicit causal relations across languages.

### IMPLICIT CAUSALITY

The following sequences display implicit causal relations between their various sub-components:

- (6) A: Are you coming to my party?  
B: No. I have an exam tomorrow.
- (7) She's not at home. I can't see her car.
- (8) There was a fire (./and) I called the fire department.
- (9) The road was icy and she slipped.
- (10) (10)Persuaded by our optimism, he gladly contributed time and money to the scheme. (From Quirk et al. 1985:1121)
- (11) John, knowing that his wife was expecting, started to take a course on baby care. (Quirk *et al.*, 1985: 1123)
- (12) People who eat too much get sick.
- (13) If you don't get enough exercise, you get sick.

An account of the causal interpretation evident in such cases has traditionally involved a Gricean treatment. Hence, it was conceived of as an implicature. This is naturally the case in instances where there is no lexical connective between the two segments in question. A similar account was considered for instances involving conjunctions such as *and*. The alternative account attributing multiplicity of senses to such lexical connectives has also been entertained. These accounts consider 'and then and 'and as a result of' as additional senses of *and* alongside its 'plus' sense.<sup>3</sup>

The various accounts differ in what they consider criterial for proper inclusion within the semantics of the lexical items at hand. The view

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that attributes conversational implicature status to such so-called "causal suggestions" accords prime importance to their cancellability. Following Grice (1975) and Karttunen and Peters (1979) cancellability of a given sense serves as an indicator that the sense in question is only implicated and does not constitute part of the (truth conditional) semantic content of the item under investigation.<sup>4</sup> Thus the lack of contradiction in the following sequence where the potential causal connection in (c) is explicitly denied (in (d)) is used to argue that causality is not an inherent part of the meaning (of(c)) but rather conversationally implicated in the appropriate context, e.g., (15):

- (14) (a) Last night when we went to the party, it was pretty cold.  
 (b) We put on our warmest coats and started on foot. (c) The road was icy and Susan slipped. (d) But she did not slip because of the ice on the road; she was wearing these high heeled boots and she couldn't maintain her balance very well.
- (15) (a) Last night when we went to the party, it was raining heavily. (b) The road was very icy and Susan slipped. (c) She can't maintain her balance on icy roads.

However, the view that considers the connectives at hand (possibly multiply) ambiguous regards the inclusion of causality within the scope of logical operators (as in (16) (following)) as criterial, making 'causality' a distinct sense of this lexical item. Consider:

- (16) If the old king had died of a heart attack and a republic was declared, then Sam will be happy; but if a republic was declared and the king died of a heart attack, then Sam will be unhappy. (Adapted from Cohen, 1971)

The causal interpretation is clearly in the domain of the conditional and hence, according to this approach, it constitutes an additional meaning of the coordinating conjunction *and*. This, however, is not the only theoretical alternative, in the existing state-of-affairs. Under the assumption that there were pragmatically determined aspects of propositional content (advanced by Wilson and Sperber (1981) and developed by Carston (1984) and Blakemore (1987)<sup>5</sup> these causal suggestions need not be considered part of the semantics of the lexical items in question, even if they are affected by logical operators. Rather, they could be conceived of as pragmatically determined aspects of propositional content. Accordingly, considerations of cancellability seem to outweigh those of the scope of logical operators, and we can still maintain the thesis concerning the implicature nature of the causal reading of the coordinating conjunction on the one hand and its effect on truth conditionality, on the other. A unitary account

of the semantics of the connective at hand is thus available: *and* mean '+', 'addition.'

The question of the causal interpretation requires elucidation at this point. It appears to be the case that irrespective of the treatment, whether causality is properly conceived of as part of the semantics of *and* or only as implicated in the appropriate context, no account can *predict* the causal interpretation; it does not follow from anything. It is simply a fact that it is an available reading. Within the Gricean maxims treatment, Causality would probably end up being an instance of the maxim of Relation, establishing the required relatedness between the propositions in question. Still, it is not clear exactly how the addressee would come up with this particular instantiation of Relevance rather than any other one. Sperber and Wilson's Relevance theory could accommodate such causal interpretations effectively, only if an appeal were made to scripts, frames or scenarios (Minsky, 1977, and Schank and Abelson, 1977) and stored encyclopaedic Knowledge, where similar interchanges have been recorded. The question would then be how speakers are supposed to pull out the relevant script involving causality in the case at hand without going over an abundance of non-fitting scripts, where going through a considerable amount of material involves more processing and hence, by Sperber and Wilson's criterion, reduces relevance. Accordingly, the theory of Relevance would make the wrong predications attributing a low value in terms of degree of relevance to an intuitively highly relevant relation.

In view of these difficulties, I would like to advance the following proposal: it seems to be a fact of human reasoning that we may perceive and relate states of affairs causally.<sup>6</sup> I would thus like to conjecture that Causality constitutes a basic reasoning principle against which we check and appeal to which is made in attempts to establish relatedness between propositions. The following factors lend credence to the hypothesis concerning the centrality of causality in the context at hand: (a) causal interpretations are available in a variety of distinct constructions where no lexical clues are evident (cf. 6-13 above); (b) there are different instantiations of implicit causality across languages; (c) causality has been claimed to fulfil a critical function in the development of human reasoning in general (cf. Piaget, 1930) and it is therefore reasonable to assume that it is functional in the current context as well and (d) Philosophers have attempted to derive causality from more basic principles and have encountered what are currently regarded as considerable difficulties (cf. fn. 6). Causality may thus best be analyzed for the present purposes as a primitive or basic building block in the human cognitive capacity.<sup>7</sup>

Naturally, the number of such basic reasoning principles to which an appeal will be made in the process of interpretation would be minimal. Causality and perhaps also Temporality would be likely candidates. The adoption of this treatment will account automatically for the option of a causal interpretation in

instances where the nature of the relationship between the propositions under investigation is semantically underspecified. I will now consider the status of such basic reasoning mechanisms in our overall theory of interpretation.

## CAUSALITY AND CONTEXT SELECTION

### Search Heuristics

Accounts of interpretation make crucial reference to stored knowledge, as one variety of information that has to be accessible for full comprehension. Models of Knowledge representation abound.<sup>8</sup> Irrespective of the particular model espoused, however, we can reasonably assume that all of them would have to make use of search heuristics, factors affecting the retrieval and activation of the various entities in store. Without such search mechanisms the processing of information would be most inefficient. In fact, it seems that no Gricean account, of whatever variety, could handle such interpretations without an efficient context selection mechanism. In particular, theories of Relevance of the Sperber and Wilson type, where the presumption of Relevance guides efficient context selection, would be inconceivable or non-consequential. I would thus propose that such basic reasoning principles as establishing causal relations constitute part of the retrieval mechanisms in the search process for the appropriate entities within our Knowledge base. As such, it could function also in explicating the type of text coherence that would maximize relevance. Granting such prominence to Causality as a reasoning principle and hence as an inferencing device seems to account in a natural way for the near automatic inference of causality in a variety of instances where no explicit lexical marker of causality occurs. Processing would be considerably more effective, once causality is explicitly mentioned as part of the search mechanism or as an instance of coherence. Consequently, sets of intuitively highly relevant described states-of-affairs exhibiting causal relations will count as relevant also in the Sperber and Wilson sense, since processing effort would be reduced significantly. There will be no need to scan a variety of non-fitting scripts, or to assign a distinct type of coherence until we come across the causal interpretation. Note that no extra machinery is required if this heuristics is adopted. It is a well-known fact about human reasoning that it utilizes causality as a basic tool. The current proposal thus amounts to making a more extensive use of Causality. Incidentally, an alternative conception of Relevance, e.g., Dascal (1977) and Kasher (1976, 1982, 1987), where it is made up of minor principles, would regard causality as one such subpart, i.e., one instantiation of Relevance.

### Speculations.

I would like to entertain two speculations concerning the type of theory of interpretation proposed here and our overall model of linguistic competence. Under the assumption that we can distinguish linguistic from nonlinguistic pragmatic factors (cf. for example, Ariel (1990)) I would like to propose the adoption within linguistics pragmatics of a Sperber and Wilson type Relevance theory, and to argue that the socially oriented Rationality-like principles (a' a1 Kasher) constitute part of the extra-linguistic pragmatic component. (The prediction would then be that it would be applicable elsewhere in human interaction, as indeed it is.) The reasoning principles such as Causality, or Temporality would clearly be part of our general cognitive capacities (located in the central system). Interpretation would thus involve both linguistic as well as nonlinguistic pragmatic factors and relevance theory of the type advanced by Sperber and Wilson could be argued to be located within the strictly linguistically oriented pragmatic factors. The interaction between the central system and the particularly linguistic component that seems to be essential for interpretation would thus appear to challenge the concept of a module as informationally encapsulated (cf. Fodor, 1983).

The second comment concerns the option of distinguishing between formal and substantive inferencing principles. The Gricean like maxims in some version of the Sperber and Wilson type Relevance and the Kasher type Rationality would constitute formal inferencing maxims while the specific reasoning principles (e.g., Causality, Temporality) would constitute substantive cognitive principles. The interaction of the formal principles of inference with the specific substantive maxims would yield the desired interpretation.

### CONJUNCTION: PRACTICAL IMPLICATIONS

The suggestion concerning the centrality of causality as a reasoning principle which is functional in interpretation is corroborated by the variety of languages which turn out to display the same range of conjunctions of the addition, condition or temporality type where causality is implicated, and at the same time this proposal makes it possible to predict that this range would be characteristic of the next language we come across, all other things being equal.<sup>9</sup> Thus, I would conjecture that an addition conjunction used as a cohesive device in a given language would be exceptional to be restricted such that the propositions that it would coordinate could never, in principle, be related causally.<sup>10</sup> The unmarked case would then be for those coordinating conjunctions that are not particularly restricted to possess the potential to relate causally related propositions. This state of affairs bears some obvious practical implications for

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second language instruction. The relevant cases would involve instances in a variety of languages where causality is not explicitly stated lexically but is, rather, "implicated" using conjunctions of the addition, condition or temporal variety. The claim would be that the same mechanism would be functional in all these instances and the prediction would be that the conjunctions need not be specified for a variety of senses, rather a unique addition, condition or the relevant type of temporality would be explicitly stated for the language learner. The inferential step concerning causality will be automatically followed, and need not be specified. Hence, French, *et*, German *und*, Polish [*ij*] and Hebrew [*ve*], for example, will predictably display properties akin to the English *and*.

In conclusion, I would like to emphasize that the adoption of the proposed conception of interpretation as involving the interaction between some version of the Gricean implicatures with general reasoning principles of which causality is one, allows us to make certain theoretical predictions with respect to lexical specifications in a variety of languages, as well as to be functional in accounts of second language instruction.

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#### THE AUTHOR

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#### NOTES

<sup>1</sup> See Posner (1980) for a discussion of these positions.

<sup>2</sup> Cf. Ziv (1988) for a discussion of these reductionist approaches and the claim that neither is sufficient as it is. Incidentally, Green (1990) independently attributes the Gricean maxims to a rationality principle, as well. However, Rationality is defined in somewhat different terms Kasher and by Green.

<sup>3</sup> Dictionaries vary as to the number of senses they attribute to such lexical items as *and*. Not surprisingly, the same variety of senses appears in

characterizations of French *et*, German *und*, Polish [i], and Hebrew [ve], inter alia. Thus we find 'addition,' 'contrast,' temporality, conditionality, and causality in the specifications of the possible senses of these lexical items.

<sup>4</sup> In fact, non-detachability and variability are mentioned as additional tests in this context. However, these two are considerably harder to apply than the cancellability test. I will, therefore, restrict my tests to cancellability.

<sup>5</sup> Posner's (1980) solution may be interpreted along similar lines.

<sup>6</sup> According to this prominence to causality as a basic reasoning principle, I do not wish to imply that causality is well defined. In fact, despite its centrality in human thought, attempts at characterizing causality are fraught with problems (cf. Anderson and Belnap (1975)).

<sup>7</sup> Note that it is immaterial in the present context whether Hume's position concerning the 'constant conjunction' nature of causality is correct. Whether Causality occurs in the real world or whether it is merely the imposition of the human intellect upon constant conjunction of events in the world, it is clearly a fact about human cognition that causality is a major reasoning principle.

<sup>8</sup> Cf. Johnson-Laird and Wason (1977), Posner (1989) and Lycan (1990) and references therein for some characterizations of certain relevant factors.

<sup>9</sup> The high incidence across languages of co-occurrences of temporal and causal connectives as in English *since*, German *wenn*, French *quand*, and Hebrew [az] constitutes further corroboration. In this context we may also count the historical link between current causal conjunctions and their temporal ancestors, as in the case of German *weil*, which ceased to function temporally and *wahrend* replaced it.

<sup>10</sup> For a discussion of explicit and implicit cohesive devices see Halliday and Hasan (1976).

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