

## Causality and Context Dependence

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### 1. Introduction

Throughout the history of human thought **Causality** has occupied a central position in learning, thinking, rational behaviour and scientific investigation. Attempts by philosophers to derive the notion of causality from more basic concepts such as counterfactuality have been most problematic.<sup>1</sup> Likewise, the question whether causality is part of nature and exists independently of human reasoning or whether it is superimposed by man as a result of a particular interpretation of "constant conjunction" has been debated extensively.<sup>2</sup> Irrespective of its status as basic or derived, as man-made or as occurring in nature, causality is clearly a significant conceptual building block in human cognition and perception in general.<sup>3</sup> As such, and given its various linguistic realizations across languages, it would be instructive to examine it with respect to the question of the relationship between linguistic and conceptual representations. In this paper I will survey several linguistic realizations of causality in a variety of languages in order to bring out its linguistic prevalence and hence its relevance in addressing the issue at hand, and I will examine instances where there is no overt linguistic manifestation of causality but which seem to involve causal interpretations nevertheless. These latter cases will be used in arguing for the conceptual independence of causality from its linguistic manifestations. The argument will be made that the linguistic realization of causality is a reflection of the cognitive and perceptual prominence of this notion. The question will then be raised concerning the prototypicality of causality as a basic cognitive category particularly with respect to the issue of the relation between conceptual and linguistic representations. I will conclude with a discussion of the contextual dependence of causality in natural language interpretation.

### 2. Linguistic realizations of causality

#### 2.1. Lexicon

##### 2.1.1 Lexical items

There are numerous lexical expressions of causal relations in a large variety of languages.<sup>4</sup> A non-exhaustive list would include:

English conjunctions and adverbials such as: because, since (in its non-temporal sense), for, as, so, then, consequently, why, adjectival or verbal expressions as: due to, owing to, following from,

French; puisque, parce que, car, alors, pourquoi,

German; denn, weil, so, dann, folglich, warum,

Hebrew: kevan, biglal, ekev, beSel, yaan ki, ki, mexamat, lama

Polish: bo, zato ze, pSesto, ponyevaS,

to list only a sample.

In addition, conditional conjunctions in these languages are often interpreted as indicating causality. Such is the case with English: if, French: si, German: wenn, Hebrew im, Polish: yak and gdibe. Likewise, temporal adverbials and conjunctions frequently involve causal readings. This is the case

in English: when, then, once, French: quand, German: da, als, Hebrew: az, and Polish: kede. The dictionary specifications of these lexical items often involve more than one sense and causality is listed as one of them. Thus, in the case of the conditional conjunctions, causality may be specified as one of the senses alongside conditionality, and in the case of temporal adverbials or conjunctions, causality may be mentioned as a likely additional sense. Alongside more or less explicit indicators of causality in the languages under examination, a variety of coordinating conjunctions in these languages, such as English: and, French: et, German: und, Hebrew: ve, and Polish: i, are sometimes specified as conveying a causal sense in addition to their conjunctive function. The question of the correct semantic characterization of the different senses of these expressions is clearly theory-bound. Thus, whether the coordinating conjunctions are regarded as involving semantic causality and hence as exhibiting inherent ambiguity or whether the causal interpretation in the case of these conjunctions is to be considered the result of systematic pragmatically determined principles, depends on the optimal division of labour between semantics and pragmatics in the particular theory of meaning espoused.<sup>5</sup> Still, it is instructive to realize that the variety of instances involving causality appear in the different languages alongside expressions characteristically associated with temporality, conditionality, surrounding circumstances and mere coordination. This co-occurrence of senses appears to be non-incident and seems to suggest that a generalization predicting the interpretive regularities is required. A conceptually oriented linguistic theory ought to take cognizance of these facts and ultimately explain them. An account deriving the various interpretive options from overall pragmatic principles would appear promising in light of recent developments in pragmatics.

### 2.1.2. Lexical decomposition and implicit causality

The concept of causality is used meta-linguistically in the domain of lexical decomposition in a variety of linguistic theories. Decomposing lexical items (in particular verbal expressions) in terms of their meaning subconstituents reveals that causality is regarded as an atomic predicate. Thus, various studies of so-called causatives involved regarding such verbs as: kill, slice, amuse, surprise, feed, as consisting of a causal subcomponent, presumably in the form of a basic meaning predicate 'CAUSE'.<sup>6</sup> In addition, a variety of unrelated languages display systematic morphological realizations of causative verb patterns e.g. the Hebrew hifil pattern 'cause to do/to be' with instances like hirkid 'made dance', hirciz 'made angry', hicxik 'made laugh'. Evidence from potential lexical gaps and children's errors corroborate the productivity and psychological reality of such patterns.<sup>7</sup> Explicit morphological realizations of causality also occur in languages like English with certain affixes, as en occurring both as a prefix in enslave, or endanger, and as a suffix in lengthen or strengthen. Other such causative affixes are: ify as in simplify or amplify, ize in symbolize, or legalize, dis in disassociate, or disarm and ate in chlorinate.

In addition to the explicit morphological realizations of causality and alongside the lexical decomposition of verbal entities involving 'Cause' as an atomic predicate, there exist certain lexical collocations that seem to contain a causal meaning constituent as a relevant sub-component. These are evident in cases of compounding and premodification as in the instances of the English: viral pneumonia, electrical shock, malarial mosquitoes, tear gas inter alia. The examples are easily reproducible in the different languages whether as productive lexical processes or as frozen lexical

collocations.<sup>8</sup> The vast range of lexical manifestations of causality in language is coupled by a significant variety of structural expressions of this notion.

## 2.2. Structural realizations

### 2.2.1. Explicit manifestations

The following English sentence constitutes an instance of a particular structural expression of causality:

(1)a. I will have you arrested.

It expresses indirect causation. It is conceivable that there may be a large variety of periphrastic alternatives for the distinct structural options, differing in certain predictable semantic parameters, such as in the following, where volitionality and intentionality are evident:

(1)b. I will see to it that you get arrested.

(1)c. I will make sure that you are arrested.

(1)d. I will get you arrested.

In addition to such individual constructions, of which there may be a host in any given language, there are generalizations which seem to hold across languages concerning instances where causative verbs involve case and grammatical role assignment to the grammatical entities referring to the different participants. The relevant linguistic questions pertain to the potential doubling of either the direct or the indirect object, *inter alia*. Languages like French with examples of the following type show this phenomenon:

(2) Je ferai manger les pommes à Jean.

(3) Je ferai écrire une lettre au directeur par Jean.

Italian, German, Turkish, Hindi, Hebrew and a host of other languages have been studied in this context (cf. Shibatani (1976) for a sample of such early studies). In more recent theoretical frameworks causality is likely to be conceived of as part of the lexical redundancy specifications of particular lexical entities at some lexical conceptual level of representation (cf. Kamp (ms.) Jackendoff (1990) *inter alia*).

### 2.2.1. Implicit manifestations

Causality is evident in the interpretation of numerous sentences where clauses occur in conjunction with other clauses with no explicit linguistic markers of causality. Such are, for example, the relations that may obtain in many cases of non-finite clauses and the main clauses with which they co-occur, as in the case of English:

(4) Persuaded by our optimism, he gladly contributed time and money to the scheme.

(Quirk et al. 1985:1121)

(5) Being a nun, Julia spent much of her life in prayer and meditation.

Note that causality / temporality/ surrounding circumstances are available readings in many of these cases depending on the particular context, and recall the similarity in the range of interpretive options in the lexical cases discussed above (2.1.). This state of affairs seems to corroborate the non-incidental nature analysis of the cooccurrences at hand.

Additional implicit instances of causality are displayed by non-restrictive relative clauses specifying the reasons for the states-of-affairs mentioned in the main clauses, as in:

(6) John, who knew that his wife was expecting, started to take a course on baby care.

or by restrictive relative clauses modifying a generic class, as in:

(7)a. People who eat too much may get sick.

The class of people in (7a) is restricted in a manner which is not incidental; it is not the case that eating too much, the property which the relevant group of people share, is unrelated to that which is predicated of these people, getting sick. Rather, over-eating, the property which characterizes the members of the group, is interpreted as essentially determining that which is depicted in the main clause, namely, getting sick. The causal interpretation in the generic sentence in (7a) seems to be more strongly implicated than in the corresponding sentence (7b) (following) where the generic NP is replaced by a universally quantified NP:

(7) b. All the people who eat too much may get sick.

In (7b) the relative clause restricting the universally quantified NP may be construed as identifying a group of individuals who happen to share a given property. There is no implication of the characterization of the class as being criterial to that which is predicated of the individuals making up the class, although such an implication may happen to be relevant. A non-causal reading is thus considerably more likely in the case of the universally quantified NPs (such as in (7b)) than in the instances with generics (7a). The use of generics strongly suggests rule-governed generalizations. Restricting the genus, as in (7a), appears to trigger an understanding whereby the property determining the sub-genus is inherent, or at least principally motivated; the relevant class is, thus, characterized in non-incidental terms, by reference to the properties which are relevant to that which is asserted of it. An explanation of the particular realization of causality as the most appropriate instantiation of the generalization in the case at hand would constitute part of the overall account in terms of relevance of cases which are linguistically underspecified. Thus, I will argue, generics are not specified for the variety of logical relations that they can co-occur with (e.g. conditionals, causal relations, deductions) (cf. Ziv (1976)), rather, they are underspecified in this

respect and the full range of interpretations would be derivable from overall pragmatic principles, taking contextual considerations into account. A similar account will be adopted also for the instances of non-restrictive relative clauses and for additional instances of implicit causality.

A particularly interesting example in the context of implicit causality is provided by the use of attributive and conversationally relevant (in the sense of Kronfeld (1989)) reading of definite descriptions such as in:

(8) The winner of this race will get the prize.

The affinity of such cases to those where restrictive relatives specify the conditions under which the statement in the main clause will hold true is evident. The winner as winner will get the prize. Here too the causal interpretation would seem to be derivable from the same overall pragmatic principles to be specified below.

The above instances of clauses co-occurring with other clauses display a characteristic semantic open-endedness which gives rise to temporal, circumstantial and causal interpretations, depending on the particular contextual assumptions. This open-endedness is evident also in cases where no linguistic marks of conjunction, whether subordinate or coordinate occur, as in the paratactic cases of:

(9) John insulted Mary; she cried for half an hour.

where the most natural interpretation of the relationship between the two events involves causality.<sup>9</sup>

### 2.3. Modifications of Speech Acts

Yet another instantiation of causality in language involves cases where the cause in question is attributed to the speech act as in the following:

(10) She is not here, because I don't see her car.

In (10) there is an explicit indication of causal relationship, yet the relation holds not between the clauses in the sentence, but rather the causal statement is provided as the rationale for the statement in the other clause, the reason for expressing the opinion that "She is not here". In modifying the speech act in the first clause, the subordinate reason clause supplies the justification or basis for the particular view expressed. Interpreting the two clauses as related causally would result in absurdity. It cannot be the case, under normal assumptions, that anybody's not being here follows in some systematic manner from my not being able to see their car. So causality may modify illocutionary acts.

It is evident, then, that explicit lexical specification of causality, as in the case of (10), does not provide the only relevant clue to the understanding of sentences containing causal relations. The interpretation in a given case clearly involves knowledge of the world. It is by virtue of the fact that we know that the literal meaning is non-sensical, namely, the reason provided in the subordinate

clause in (10) cannot possibly modify the state-of-affairs described in the main clause in this sentence, that we resort to a relevant logical interpretation, that is, the reason clause modifies the illocutionary act, supplying the rationale for the statement in the main clause.

#### 2.4. Deduction - evidence for causality

Sentences of the following type exhibit deductions on the part of the speaker, which, in turn, are based on causal perceptions of states - of - affairs.

(11) Jim must be very rich, if he spends so much on women.

(12) Children who read Chaucer with no difficulty, must be extremely intelligent.

The conclusion the speaker draws about Jim and about the children is based on the fact that he knows that normally it is the case that to spend money a person has to have money, and that reading Chaucer has a prerequisite in the case of children - being intelligent. So causality is involved in the speaker's deduction. In fact this is an instance of reversed causality, since it is clear that a person does not become rich by spending money on women ( he may become poor as a result), rather, he can spend the money, because he is rich. Here too, as in the case of modifications of speech acts (2.3 above), the particular causal interpretation is contingent upon our knowledge of the world. Such utterances abound in argumentation in general and are clearly indicative of the prominence of causality in human reasoning.

#### 3. Interpreting implicit causality

An account of the interpretation of causality in the cases where there is no explicit causality markers would seem to argue for the conceptual independence of causality from its linguistic realization. The consequences of assuming all instances of causal interpretations to be linguistically motivated would be very costly and would make the wrong predictions. Accordingly, we would have to attribute a causal sense to all the relevant conjunctions and adverbials alongside their additional non-causal meanings, thereby multiplying the semantics of a variety of such lexical items in the different languages under examination and making the causal reading in these cases arbitrary. That is, causality in the various cases would not follow from anything; it would, rather, be just as likely or just as unlikely for related entities in different languages not to display the same semantic distribution of senses.<sup>10</sup> Likewise, we would have to posit an abstract causality meaning component 'CAUSE' for the variety of instances where there is no trace of any linguistically relevant entity to which the causal interpretation could be attributed. Such linguistic "reconstruction" of causality, assuming some ellipsis to have taken place in the course of the derivation to eliminate overt manifestation of the causal sub-component, would, besides its ad-hocness, not be able to account for the "invited inference" (Geis and Zwicky (1971)) or implicature nature (Grice (1975)) of causality in these cases. There would not be any distinction between the cases involving implied causality and those containing explicit linguistic expressions of causality.

Thus, the difference in cancellability of causality between the following sentences would be unaccounted for. Compare:

(13) A: What happened ?

B: John insulted Mary and she cried for half an hour.

But she did not cry because he insulted her, she cried because John was going away and she was going to miss him.

(14) Mary was crying because John insulted her.

# But she wasn't crying because he insulted her. She cried because John was going away and she was going to miss him.

Thus, the causal implicature in (13) where no explicit linguistic marker of causality is evident is cancellable (as conversational implicatures are) but the causal meaning of (14) is not, hence the contradiction in (14). Attributing causality to linguistic entities in the instances where there is no evident linguistic candidate thus amounts to a misrepresentation of their semantics. In line with the distinction between the semantics of the sentences under consideration and their extra conveyed senses, we would be able to account for the causal interpretations in the relevant cases via calculable conversational implicatures, following from Grice's relevance maxim. Relevance is instantiated in these cases by causality, due to knowledge of the world. It is therefore not the linguistic representation of causality that is crucial in the interpretation of such sentences, rather the conceptual availability of this basic notion is responsible for the interpretation at hand. The state-of-affairs portrayed here can be construed as an argument for the conceptual independence of causality as a basic reasoning principle in human cognition and perception in general. Its linguistic realization may be a reflection and a by-product of this salience rather than its source.<sup>11</sup>

The view I am advocating in the present context would not regard it as an accident that conditionals, temporals, coordinators and subordinators of an open-ended nature and various instances of parataxis across languages could be interpreted as involving causal relations. Rather, any instance in language where a co occurrence of propositions occurs which is not specified for a given semantic relation, is likely, given the proper contextual considerations, to be interpreted as an instance of causality. In determining the relevance of the propositions in question and their discourse coherence we apparently search for the most appropriate context (cf. Sperber and Wilson (1986)) and this one is likely to involve causality (cf. Ziv (1988)). Regarding causality as a major instantiation of relevance and coherence against which given propositions and textual sequences are checked makes the correct predictions with respect to the range of instances involving implicit causal relations in discourse in general and in specific sentences in particular. This view seems to be substantiated by the salience of causality in human reasoning in general and further empirical support for it is definitely called for.<sup>12</sup>

#### 4. Contextual dependence and causal interpretation

Having established the conceptual independence of causality from its linguistic realizations,

I will now examine its contextual dependence. I will advance the claim that the concept is context free, that is, we understand it in the abstract, but that its particular instantiations in specific instances are largely context dependent. Thus, whether two events are related causally or not may be a matter of knowledge of the world, belief, and the like. So a child may relate things causally which we as adults would not, and likewise scientific investigation would proceed by establishing causal relations which may (and often do) prove erroneous upon more advanced research. This does not invalidate the concept of causality, but it makes particular instantiations of it crucially context, knowledge and belief dependent.

To take a couple of specific examples consider the following:

(15) Mom is asleep because it is two o'clock.

The child relates the circumstances causally to his mother's state.<sup>13</sup>

Yet another example requiring knowledge about the state-of- affairs in the world is the following:

(16) The old king has died of a heart attack and a republic was declared.

(17) A republic was declared and the old king has died of a heart attack.

(Adapted from  
Cohen 1971)

Interpreting these sentences as involving causally related statements requires understanding of basic issues concerning political affairs, such as questions of the nature of monarchy vis a` vis a republic. Knowledge of the world or facts about the world with particular reference to these issues renders the causal interpretation accessible. No such option is available otherwise. The instances of deduction discussed above (2.4) as well as the modifications of speech acts (2.3) both clearly involve knowledge of the world in the process of the interpretation of causality. Thus, understanding the relevant direction of causality in the case of deductions, for instance, as in the case of (11) (slightly revised here to avoid the modality problem)

(11') Jim is very rich, if he spends so much on women.

would presuppose knowledge that people do not become rich as a result of spending money. Rather, the knowledge that mostly rich people can spend money lavishly dictates the direction of causal interpretation; namely, because he spends so much, we may conclude that Jim is very rich. Likewise, the cases where explicit lexical causality indicators modify speech acts, as in (10),(repeated here):

(10) She is not here, because I don't see her car.

are understood non-literally, solely on the basis of our knowledge of the world. Thus, the non-sensical nature of the literal interpretation of the causal clause as providing the reason for the state-of-affairs depicted in the main clause is the determining factor in rejecting this reading and favoring the speech act modification interpretation in its stead. Clearly, what is involved in all these interpretations is a particular instantiation of causality, not the concept as a whole. The dependence

of the notion of causality on context, knowledge and beliefs about the world is thus evident.

In this paper we have been able to establish the conceptual independence of causality from linguistic realizations, but to point out its contextual dependence in particular instantiations. One question to be asked in the present context is the extent to which this state-of-affairs is typical of other concepts (e.g. temporality). Several other problems were raised in the course of the paper pertaining to the nature of relevance, coherence, linguistic under specification and a variety of co occurrences, inter alia; all await further research.

#### Notes

1. In this context cf. von Wright (1963), Stalnaker (1968) and Lewis (1973a) and (1973b), inter alia.
2. Cf. Hume (1888, 1938) and Mackie's(1974) survey of a variety of philosophical accounts of Causation.
3. Cf. Piaget's (1930) extensive discussion of the development of causality in the child.
4. In fact it would be surprising to discover a language where there is no overt realization of causality. The items in question, however, need not necessarily be exclusively associated with causality, nor should causality have identical extensions across languages. Thus, certain American-Indian languages seem to recognize a restricted type of Causality, the physical manifestation kind only. (I am indebted to D. Tuggy for this datum.)
5. Cf. Ziv (1993) for a pragmatic account of causality in instances involving conjunction.
6. Such studies flourished in the days of generative semanticists (cf. McCawley (1971),(1973), Fodor (1970), Shibatani (1972) and (1976) inter alia) but they are very much alive in various current theories of grammar in one guise or another as well, despite obvious difficulties. The problems pertain to the analysis of verbal entities in terms of causality where there is no overt morphological evidence. Thus, if kill is analyzed as 'cause to die', shouldn't give be the causative counterpart of have and teach of learn ? (cf. Miller and Johnson - Laird (1976) for a discussion of causality in perception, conception and language.)
7. Cf. Cole (1976) for an interesting study of the productivity of causative constructions in Colloquial Hebrew.
8. Levi (1974) and ( 1976 ) studies such combinations in both English and Hebrew and utilizes atomic semantic predicates as **Cause** in their analysis.
9. An additional example of implicit causality is provided by the peculiar use of future tense will in conditionals as proposed by Comrie (1985). The difference in grammaticality between:
  - (i) If you'll do the shopping for me, I'll give you some money.
 where the payment precedes the shopping, and:
  - (ii)\* If it'll rain, you should take an umbrella.
 with the same precedence relation between the states of affairs depicted in the main and in the subordinate

clause, is, accordingly, due to the fact that there is a causal relation between the clauses in (i) but not between those in (ii). In accounting for such uses of the future tense will we have to resort to implicit causality. (I am indebted to R. Landau for drawing my attention to this reflection of causality in language.)

10. For a discussion of the division of labor between semantics and pragmatics and the possibility to predict various senses in the case of the coordinating conjunction and see Ziv (1993) and references therein.

11. In this context the question of the prototypicality of causality is raised, naturally. Is there any other salient concept that displays similar properties in terms of linguistic vs. conceptual realizations? As intimated above, temporality seems like a suspect.

12. Cf. Ziv (to appear) for arguments that being a primary concept causality functions as a basic organizing principle in narrative and non-narrative texts as well.

13. This is a true instance of "constant conjunction" in line with Hume's conception of causality in general.

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