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Conditionals and Restrictives on Generics

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1. Introduction and background

For years linguists followed logicians in analyzing conditional sentences in terms of material implication. Despite apparent problems this approach gained support when, upon realizing the non-truth functional aspects of their meaning, it has been suggested (e.g. Grice 1967) that those interpretational properties are to be explained in terms of conversational implicatures. More recently, in view of the insurmountable problematicity of the material implication approach and following Lewis' (1975) theory of adverbs of quantification, it has been proposed that conditionals are to be analyzed as "devices for restricting the domains of various operators" (Kratzer 1986:8).ⁱ Within this approach it has been proposed that conditionals, dubbed restrictive *ifs*, are semantically and syntactically related to restrictive relative clauses on generic heads (Lewis 1975). Sentences such as the following were quoted as evidence:

- 1.a. *Wolves that have blue eyes are intelligent.*
- b. *Wolves are intelligent, if/when they have blue eyes.*
- 2.a. *People who have money can afford decent medical care.*
- b. *People can afford decent medical care if/when they have money.*ⁱⁱ

The syntactic suggestion was never considered seriously; there were too many ad-hoc requirements that it made on the theory. The semantic proposal, however, in one variety or another, is still an option that is sometimes entertained. The semantic accounts of the relation between the structures under investigation come in two varieties, with one position maintaining an identity (Carlson 1979) and the other a mere equivalence (Farkas 1981, Farkas and Sugioka 1983) between the structures. In this paper I will provide evidence for the semantic distinctions between conditionals (and so-called a-temporal *whens*) on the one hand and restrictive relative clauses modifying generic heads on the other. In this context I will show that extraposed relative clauses bear a stronger affinity to conditionals than their non-extraposed counterparts. A pragmatic treatment adopting some version of the Gricean maxims coupled with a consideration of the relevant informational structure will be proposed to account for the relatedness between the constructions under investigation.

2. Semantic identity - pros and cons

The semantic identity approach to the relatedness between conditionals and sentences with restrictive relative clauses modifying generic heads has been motivated by examples from anaphora. The apparent parallelism in the anaphoric options in the following (taken from Carlson 1979:71) seems to support this position:

- 3.a. *Dogs that have three legs are ill-formed. Such dogs (=dogs that have three legs) should be protected from cats.*
- b. *Dogs are ill-formed when/if they have three legs. Such dogs should be protected from marauding cats. (i.e. such dogs = dogs that have three legs)*

and also:

- 4.a. *Dogs that are of a rare breed are expensive. This is strange, because they (=dogs of a rare breed) are usually worse pets than other dogs.*
- b. *Dogs are expensive when/if they are of a rare breed. This is strange because they (=rare breed dogs) are usually worse pets than other dogs.*

However, Declerck (1988) shows that there are pragmatic reasons why the anaphoric expression in such cases takes the *if/when* clause into account. In examples such as the following (Declerck's 43a):

- 5.a. *Children are unmanageable when/if they are spoilt; that's why it is important not to spoil them.*

the anaphoric expression *them* excludes the material in the *if/when* clause, and refers to the antecedent *children* as an unmodified entity. In the case of restrictive relative clauses, the anaphoric expression would normally refer to the NP including the relative clause. However, Declerck maintains that there may be contextual instances where it would exclude the material in the relative clause, as in the following (Declerck's 44c):

- 5.b. *Dogs that are of a rare breed are expensive, otherwise, they are cheap. (they = dogs)*

So anaphora of this type cannot serve as reliable evidence for the semantic identity between the structures under investigation. It appears that pragmatics and contextual considerations ought to be resorted to in accounting for the similarity these constructions display in terms of reference and anaphora. It should, however, be pointed out that even under similar contextual considerations the anaphoric options available in the two constructions under investigation are distinct. This is evident in the following:

- 6.a. *Wolves are intelligent when/if they have blue eyes, and they are stupid when/if they have brown eyes.*
- b. **Wolves that have blue eyes are intelligent and they are*

stupid when/if their eyes are brown.

The inability of the conditional in the first conjunct in (6a) to restrict the reference of the genus described by the head noun *wolves* in a manner similar to the one displayed by the restrictive relative clause in the first conjunct in (6b), results in the admissibility of (6a) and the inadmissibility of (6b). Following are additional instances which challenge the semantic identity account of the affinity between the structures under investigation and which appear to advocate an alternative approach.

3. Distinctions between the structures

3.1. Lack of counterparts

3.1.1. Existential contexts

There are several instances where there is no possible counterpart to one of these constructions in terms of the structural option provided by the other. This is evident in existential contexts like the following:

- 7.a. *People who weigh over 1500 pounds do not exist/ were never born.*
- b. *#If/when people weigh over 1500 pounds, then they do not exist/ were never born.*

The ill-formedness of (7b) indicates that there is no available *if* counterpart specifying the type of people who are non-existent. The well-formedness of (7a), by comparison, suggests that there are no such restrictions on the type of predication on any properly restricted sub-type of entities. One can specify that a particular group of entities does not exist. It is instructive, in this context, to note that there is a logical equivalence between the sentences in (7a) and (7b). Both in fact amount to the claim that if entities possess the property of weighing that much then these entities are not people. There is a logical expression of this equivalence in the following formula:

$$\sim \exists x (Px \wedge W1500 x) = \forall x (W1500 x \supset \sim Px)$$

However, this is not a linguistic fact; it is a logical fact, and as such, it need not, in fact, should not, be expressed via any grammatical means. Hence the logical equivalence between the propositions expressible by (7a) and (7b) does not necessarily reflect a parallel linguistic affinity.

3.1.2. Counterfactuals

Counterfactual conditionals provide yet another example of a context where the two constructions under investigation do not

display parallelism. Consider:

- 8.a. *If elephants had been smaller, they would have been taken as pets.*
b. *#Elephants that had been smaller, would have been taken as pets.*

(8b) cannot express the hypothetical state-of-affairs. If it is interpretable despite its ill-formedness, it can only be understood to express reference to a subtype of elephants, those that had been smaller at some earlier point in time, and the circumstances under which the hypothetical state-of-affairs would obtain are left unspecified.ⁱⁱⁱ

Another example would make the difference even more explicit (Ziv 1976:69):

- 9.a. *If people could run 100 miles an hour, they would not have worked so hard developing fast means of transportation.*
9.b. *People who could run 100 miles an hour, would not have worked so hard developing fast means of transportation.*

Indeed, both (9a) and (9b) could be uttered felicitously in some conference on transportation where the speaker wished to attribute the immense technological progress in the field to the basic physical limitations of mankind. However, they are distinct in that (9a) depicts a counterfactual state-of affairs, stating what could or could not have happened, if a different set of circumstances were to prevail here; whereas, (9b) depicts a different world, one where another kind of human creature (with different physical capabilities) would not have done as much. It is as if the other kind of civilization is compared to ours with respect to its work incentives. It is thus evident that the tense-time distinctions between the two constructions amount to a lack of counterpart in the case of counterfactuals.

3.2. *The restrictive function*

In addition to the lack of parallelism between the sentences under investigation in the existential and the counterfactual contexts, these sentences also differ in the nature of the restrictive function that they involve. The material that is included in the relative clause helps restrict the *kind*, that is to say, the head noun and the relative clause jointly form a unit designating a restricted genus; the material in the relative clause provides information by means of which the (restricted) kind is identified.^{iv} The *if/when* clause, on the other hand, specifies the conditions under which the state-of-affairs will hold true of the genus (designated by the NP) as a whole.^v In the following (from Ziv 1976:19):

- 10.a. *Students who do not attend classes regularly cannot graduate with honors.*

10.b. *Students cannot graduate with honors if/when they do not attend classes regularly.*

it is clear that (10a) makes a statement about "students who do not attend classes regularly", whereas (10b) makes a statement about "students" and specifies that the generalization holds only when they do not attend classes regularly. This difference accounts for the distinction in the appropriate explicatory question. Thus, schematically:

11.a. What kind of NP ?

or specifically:

11.a' What kind of students can graduate with honors ?

would be appropriate for (10a). But:

11.b. Under what circumstances/ conditions ?
b'. When?

b". When/ Under what circumstances can't students graduate with honors ?

would be appropriate for (10b).

The restrictive function of the relative clause is evident when the relative clause occurs in the same *information unit* (to use Declerck's (1988:142) concept in this context) as its head noun, namely, when it is unextraposed.^{vi} When the relative clause is extraposed from its head noun, however, it no longer functions in restricting the head, rather, much like *if/when* clauses, it specifies the circumstances under which the situation portrayed in the main clause holds of the genus presented in the head noun. Witness the extraposed counterpart of (10a) in:

10.c. *Students cannot graduate with honors who do not attend classes regularly.*

and the appropriateness of the explicatory question in (11b") rather than in (11a') with respect to it. The same state-of-affairs holds of the conditional counterpart of (10a) in (10b).

In what follows I will argue that extraposition of relative clauses results in a distinct segmentation of the informational units of the sentences in question and consequently sentences with extraposed relative clauses are more likely to have informational *if/when* counterparts than their non-extraposed alternants.

4. Extraposed relative clauses

4.1. *General characteristics*

In the unmarked case a restrictive relative clause in English constitutes part of a larger syntactic entity the head element of

which is a noun. Restrictive relative clauses are conceived of as providing information which is intended to help "identify the referent of the expression within which they are embedded" (Lyons 1977:761). In cases where the reference is generic, the descriptive material included in the restrictive relative clause helps restrict the genus. Hence, in (10a) the genus designated by the NP in subject position "students who do not attend classes regularly" is a proper subset of the genus designated in the relevant NP in (10b) "students". When extraposed, the restrictive relative clause ceases to constitute part of the NP within which it was originally embedded^{vii} and likewise, predictably, ceases to function in restricting the reference of the head noun (from which it has been extraposed). Syntactically, extraposed restrictive relative clauses are adjoined to the end of the clause from which they have been extracted,^{viii} and functionally, they come to constitute part of a distinct information unit and, consequently, fulfil a different discourse function. In their extraposed position, the restrictive relatives specify the conditions under which the generalization expressed in the main clause would hold true of the genus as a whole.^{ix} Interestingly, in this function they seem to have close conditional or a-temporal *when* counterparts. In what follows I will investigate the particular constraints that seem to hold of extraposed restrictive relative clauses and show that they are consistent with their status as "functional alternatives" to conditionals.

4.2. Constraints on appropriateness

Restrictive relative clauses extraposed out of non-existential sentences (cf. footnote 9) appear to be constrained such that their informational content has to display a systematic dependence on the set of circumstances portrayed by the proposition in the main clause. This dependence, which I have elsewhere (Ziv 1976:17) referred to as "a systematic logical relation", is exemplified by such "logical relations" as causality, deduction, and conditionality. In what follows I will illustrate this property and offer a comparison between extraposed and non-extraposed restrictive relative clauses. Consider:

- 12.a. *People who do not eat properly can get very sick.*
- 12.b. *People can get very sick who do not eat properly.*
- 13.a. *In this country a person who does not cheat on his income tax is considered exceptionally honest.*
- 13.b. *In this country a person is considered exceptionally honest who does not cheat on his income tax.*

The sentences in (12) and (13) display a systematic dependence of the causal nature between the propositions in the restrictive relative clause and the one in the main clause.

Causality (in the opposite direction) is also evident in:

- 14.a. *People who can read Chaucer with no difficulty must be quite intelligent.*

- 14.b. *People must be quite intelligent who can read Chaucer with no difficulty.*
- 15.a. *Athletes who can lift such heavy weights must be quite strong.*
- 15.b. *Athletes must be quite strong who can lift such heavy weights.*

In these sentences a deduction is made by the speaker on the basis of a causal relationship obtaining between the information contained in the main clause and that which is contained in the restrictive relative clause. Yet another instance of a systematic dependence between the propositions in the main clause and the restrictive relative clause is evident in cases involving "conditionality" as in:

- 16.a. *Politicians who want to be elected to office in this state should propose the legalization of abortion.*
- 16.b. *Politicians should propose the legalization of abortion who want to be elected to office in this state.*

Concessiveness (as in the following example adapted from Quirk, Greenbaum, Leech and Svartvik 1972:740) provides another instance of such a dependence:

- 17.a. *Tourists who dislike the idea of visiting ancient monuments (still) think this castle is worth a visit.*
- 17.b. *Tourists think this castle is worth a visit who dislike the idea of visiting ancient monuments.^x*

and even definitions as in:

- 18.a. *People who are against war or violence are pacifists.*
- 18.b. *People are pacifists who are against war or violence.*

constitute a case where a dependence is manifested between the set of circumstances depicted by one clause and the set portrayed in the other.

In the sentences above the relevant logical dependence is expressed in both the extraposed and non-extraposed versions. In what follows I will show that the sentences with the extraposed relative clauses are more constrained than their non-extraposed counterparts, such that the extraposed version must display the relevant logical dependence between the propositions expressed by its constituent clauses; no such restriction holds of non-extraposed restrictive relatives.

The difference between the following extraposed and non-extraposed sentences is indicative:

- 19.a. *Girls who can play soccer usually major in English.*
- 19.b. *?Girls usually major in English who can play soccer.*
- 20.a. *People who live in glass houses like ice cream.*
- 20.b. *?People like ice cream who live in glass houses.*

In the non-extrapolated version the characterization of the set of people possessing a given property may be arbitrary, no necessary generalization is required. As the speaker you could have observed that the states-of-affairs portrayed in (19a) and (20a) are true, without there being any necessity involved. The sentences in (19b) and (20b), however, imply that there is some systematic dependence involved between the set of properties depicted in the sentences. The lack of such a rationale, under normal assumptions about the world, results in lack of acceptability as in (19b) and (20b).^{xi}

The following sentences may serve as evidence for the fact that the extrapolated clauses are associated with causality (the relevant "logical dependence") more closely than their non-extrapolated counterparts. I will utilize judgments of redundancy in pointing out the potential existence of the causal relationship in question. The addition of an explicit causal clause to a sentence with an extrapolated relative clause where there is a causal dependency between the propositions in the main clause and in the relative clause would result in a redundant statement of causality; however, the addition of a similar causal clause to the non-extrapolated counterpart of the sentence would not result in the same judgment of redundancy.^{xii} This is substantiated by speakers' evaluations of the following:

21.a. *In this country, people who do not cheat on their income tax are considered honest, because they do not cheat on their income tax.*

21.b. *In this country people are considered extremely honest who do not cheat on their income tax, because they do not cheat on their income tax.*

Indeed, speakers reported that (21b) includes a redundant statement of causality, whereas (21a) does not.^{xiii} It is significant to note in this context that it is not the mere repetition of the material twice in a sequence that is to be held responsible for the judgment of redundancy in (21b), as is evident from the lack of such redundancy in the following sentences where the clauses in question occur in a sequence:

22. *Babies may cry after you have washed them, because you have washed them.*

23. *In those days, students got embarrassed when you met them in the library before an exam, because you met them in the library before an exam.*

The sentences with the extrapolated restrictive relative clauses, which exemplify the constraint on the occurrence of systematic dependence between the states-of-affairs depicted in the main clause and in the subordinate clause, appear to bear a closer affinity to conditionals and a-temporal *whens* than their non-extrapolated counterparts. Thus, the systematic dependence between the two states-of-affairs is a built-in requirement in conditionals and a-temporal *whens*. Conditionals and a-temporal *when* sentences explicitly specify such a dependence, be it of a causal variety or some other such dependence. Subjecting the

relevant conditionals and a-temporal *whens* to the appropriate redundancy judgment test, as in the case of the sentences with restrictive relative clauses, would result in similar redundancy judgments. Hence (21c) (following) would display the same redundancy pattern as the one witnessed in the case of the extraposed restrictive relative clause in (21b):

21.c. *In this country, if/when people do not cheat on their income tax, they are considered honest, because they do not cheat on their income tax.*

This finding substantiates the claim that when extraposed, restrictive relative clauses modifying generics function like the *if/when* clauses in specifying the conditions under which the proposition in the main clause will hold true. Non-extraposed restrictive relatives, by comparison, were shown to function in restricting the referent of the head noun.

5. The nature of the relation

The original attempts to relate *if* clauses to (non-extraposed) restrictive relative clauses modifying generic heads have been shown to encounter major difficulties and to miss significant generalizations concerning their distinct distributional and semantic properties. However, in view of the observed differences between extraposed and non-extraposed restrictive relatives on generics, it appears that the affinity worth pointing out is the one between conditionals and extraposed restrictive relatives on generics. Recall that the initial suggestion regarding the relationship between conditionals and restrictive relatives concerned the apparent "restrictive function" of the *if* construction. However, it has been pointed out above that the conditionals do not fulfil the presumed restrictive function,^{xiv} rather, much like the extraposed restrictive relatives, they specify the conditions under which the state-of-affairs depicted in the main clause would hold true. The similarities between the latter two constructions seem to originate from the fact that they show the same segmentation of the relevant information units. Thus, in both the conditionals and the extraposed restrictive relatives the clause in question belongs to a distinct information unit from the relevant generic noun phrase.^{xv} It has, likewise, been shown that in both constructions there is a systematic dependence between the propositions expressed by the two clauses.

An account of the paraphrase relationship between the constructions under investigation may be derivable from Gricean implicatures, specifically relevance-driven implicatures (of whatever variety).^{xvi} This pragmatic account will, in addition to capturing the relevant affinities between the structures under investigation, also be in line with the semantic distinctions evident between them.

i.. In line with this analysis, whenever there is no explicit operator in the sentence under investigation, an abstract one is to be posited (cf. Kratzer 1986).
ii.. Note that a-temporal *when* was conceived of as fully synonymous with and exemplifying exactly the same properties as restrictive *if*. However, cf. the discussion in 3.1.2. and footnote 3 for problems with these assumptions.
iii.. Note, in this context, that the presumed identity of the *if* /*when* clauses breaks down in such cases. Compare the well-formedness of (8a) in the text with the marginal nature of (i):

(i) ? *When elephants had been smaller they would have been taken as pets.*

and the potentially worse

(ii)* *Elephants would have been taken as pets, when they had been smaller.*

iv.. Cf. Carlson (1978) for an interesting study of reference to kinds in English.
v.. Declerck (1988:163) dubs this function "indirect restriction", since, as he puts it, they "do not restrict the reference of an NP directly. Rather their function is to restrict cases."

vi.. Declerck (1988:142) characterizes *information unit* in terms of intonation and information-structure. A similar view, whereby information structure is systematically correlated with intonation units is advocated by Halliday (1967:202-203) and Quirk, Greenbaum, Leech and Svartvik (1985:1356) explicitly state that "a tone unit is coextensive with an information unit". In the absence of independent criteria determining information structure at this stage, I will adopt a similar view of information units. Note that no assumption is made here about the specific syntactic structure realizing the intonational /informational units. (Cf. Ziv (1994a) for a discussion of the relevance of informational and intonational considerations in determining the structural status of a particular utterance type.)

vii.. Cf. Ziv (1976) for a discussion of the syntactic properties which differentiate extraposed relative clauses from their non-extraposed counterparts. In this context, it is instructive to specify that the relevant extraposed structures are instances of movement and not just cases where the relative clause occurs in a position where it is "detached" from its head, e.g. by the interruption of some parenthetical material as in:

i. *That French klutz, if you will excuse the expression, who produced the dirtiest movie this year, was awarded first prize in the last film festival.* (Ziv 1976:2)

Likewise, afterthoughts, which display distinct structural and functional properties (cf. Ziv 1976:9-11, Ziv 1985 and Ziv 1994b), are excluded from the current study.

viii.. Cf. Ross' (1967) *upward boundedness* (alternatively dubbed "the right roof constraint"), whereby syntactic operations moving material to the right display this structural constraint.

ix.. An interesting exception is evident in the case of relative clauses co-occurring with existential main clauses. In the case of existentials, the restrictive relative may be extraposed preserving its restrictive function, as is evident in:

i. *People do not exist who can run a hundred miles an hour.*

Note that whether the relative clause is extraposed as in (i) above or whether it is non-extraposed as in the following:

ii. *People who can run a hundred miles an hour do not exist.*

it serves the same restrictive function. In this context it is worth recalling the lack of a proper *if/when* counterpart in such cases, as is evident in the sentences of (7) in the text. At this stage I can only point out the obvious relation between the lack of an *if/when* counterpart and the existence of the restrictive option in instances involving extraposition with existentials, but Declerck (1988) proposes an explanation for this phenomenon.

x.. The concessive reading is available in (17b) with a special contrastive intonation pattern where *dislike* is highlighted. This stress pattern seems to bring out the "concessive" sense in place of the expected positive dependency evident otherwise.

xi.. Recall in this context the difference between universally quantified NPs as in (ia):

i.a. *All the people who eat too much can get sick.*

and generic NPs as in:

i.b. *People who eat too much can get sick.*

In the statement in (ib) the characterization of the kind (*people who eat too much*) is essential to the properties attributed to this genus, namely, potentially getting sick. It can hardly be the case that the characterization of this genus would be accidental. However, in the case of the universally quantified NP in (ia), the characterization of the individuals making up the set may be arbitrary; no genus is referred to and the members of the relevant set may happen to possess a property which need not be an essential property characterizing its members.

xii.. It would have been logical to expect parallel results to obtain in cases of contradiction, such that the negation of an explicit causal statement in the case of a sentence with an extraposed relative would result in a contradiction and lack thereof in the case of its non-extraposed counterpart. However, there seem to be distinct discourse considerations affecting judgments of contradiction and judgments of redundancy (cf. Ziv 1976:35-38).

xiii.. I will not address here the question whether the causal dependence is part of the semantic content of the extraposed version, or whether it is just more strongly implicated in this context than in its non-extraposed counterpart. Note that the latter option offers a gradient conception of implicature, or else an instance of grammaticalization.

xiv.. Accordingly, there is a uniform treatment of conditionals, such that no distinction is hypothesized between so-called restrictive *ifs* and regular conditionals and likewise no distinction is drawn between sub-types of *when* clauses. This is in line with the approach advocated in Declerck (1988).

xv.. The distinct segmentations into information units between extraposed and non-extraposed restrictive relatives seem to account for the difference between these two as well as between nonextraposed restrictives and conditionals. In this context it is worth mentioning an interesting example of the distinction between conditionals and non-extraposed restrictives which seems to be explicable on the basis of the different

segmentations of information units. The example is taken from Declerck (1988:141):

i. *Orphans are children whose parents are not alive.*

ii.# *Orphans are children if their parents are not alive.*

xvi..It is irrelevant for our present purposes whether the framework adopted for the various implicatures is Grice's original one (1967, 1975), some relevance theoretic alternative, as in Sperber and Wilson (1986) or a rationality based version, as in Kasher (1976 and 1982), but cf. Ziv (1988) for some relevant considerations in this connection.