Iuxta propria principia

Contextual Blindness in Implicature Computation

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Abstract In this paper I submit evidence for a grammatical vision of Scalar Implicature. I start by examining one of the most powerful arguments in favor of the grammatical vision. The argument is based on a Contextual Blindness principle according to which the Scalar Implicature mechanism assumes a notion of logical entailment, rather than entailment given common knowledge. I present the argument, and then discuss one crucial difficulty related to quantifiers. I propose to adopt a presuppositional analysis of the universal quantifier to ensure that the relevant entailment relation between a universal alternative sentence and a base existential sentence is obtained. Some researchers have recently argued that a Scalar Implicature can only arise if the existence presupposition carried by the universal quantifier is satisfied contextually. However, I submit evidence for the *automatic* satisfaction of such presupposition, much in the spirit of recent hypotheses concerning the nature of the different presuppositions attached to the universal quantifier.

Keywords Scalar Implicature · Contextual Knowledge · Presupposition · Universal Quantifier

1 An argument for blindness

Under grammatical approaches, a Scalar Implicature (henceforth: SI) is assumed to be generated not as a consequence of a conversational effort made by the speaker in the attempt to provide a maximally informative and salient contribution to the discourse (cf. [5], [4]); but as the result of a natural tendency to maximize the semantic strength of scalar sentence meaning, possibly related to the "spontaneous logicality"

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of natural languages (see [1]). On such a vision, thus, the domain of relevant information assumed by the mechanism is only populated by information concerning the logical and formal properties of the structures used. Consequently, one of the main arguments in favor of a grammatical vision is based on a Contextual Blindness assumption, according to which the SI mechanism operates "blindly" with respect to the set of shared contextual information (see [11]). Let me introduce the argument in some more details.

The negation of the entailing alternative of a base existential sentence is shown to be generated despite the fact that it results in a contextual contradiction, namely a contradiction given common knowledge. As argued by Magri, the oddness of a sentence like (1) below is due to a clash produced by the SI that *not every Italian comes from a warm country* with the piece of common knowledge according to which Italians come from the same country (as is customary, here and throughout the paper I use the symbol "#" as a diacritic for oddness).

(1) # Some Italians come from a warm country

As is obvious, if at least some Italians come from a warm country (the literal, standard meaning of the base sentence), then it cannot be the case that some of them do not come from a warm country (the strengthened meaning obtained via SI). The oddness of a sentence whose standard meaning is enriched with a blind contextually contradictory SI is predicted on account of the Mismatch Hypothesis, that could possibly be extended to other cases of pragmatic conflicts, like contextual tautologies.

The foregoing account of oddness based on Contextual Blindness is presented by Magri himself as a "modern version" (that is, a formalization) of a proposal originally due to Hawkins (see [6]). In his theory, Hawkins suggested that the oddness of a sentence like (2) below is to be explained on account of the mismatching SI that the speaker is not in a position to utter the entailing alternative sentence in which the singular indefinite is replaced by the definite article: the two elements are assumed to be part of a lexical scale, the same as positive quantifiers. In this case, the relevant piece of contextual information is the fact that in our societies people generally have a unique father.

(2) # A father of the victim arrived late

Magri's argument is incompatible with any pragmatic account of SI, the same as Hawkins' proposal. The detailed motivation for this conclusion is the following. In a Gricean framework, a SI is generated because of the violation of a conversational maxim, namely Quantity, according to which speakers should provide a maximally informative contribution to the ongoing discourse.[1] As originally noted by Heim (see [7]), Quantity compares the base sentence with its alternatives based on the amount of information provided to the conversation. But, because of contextual knowledge, (1) and its alternative *Every Italian comes from a warm country* convey exactly the same amount of information, namely the information that Italy is a warm country. Thus,

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[1] Note that, while Quantity plays a predominant role in a Gricean account of SI, other maxims, like Quality and possibly Manner, are as well included in the explanation; see [15] for an overview of the account.

no violation of the maxim can possibly arise by uttering (1) instead of the alternative, and therefore no mismatching SI can be predicted on such account.

In Magri's argument, the SI mechanism is assumed to take the universal alternative as *asymmetrically* entailing the base existential sentence, despite the fact that contextually the two sentences are equivalent, namely the entailment relation holds symmetrically. Asymmetrically entailing alternatives are negated obligatorily (cf. [13]), provided that they are suitably assigned relevance as the result of a relevance assignment procedure. Being linguistically triggered, such procedure is assumed as satisfying certain grammatical axioms, according to which an uttered sentence is always relevant, and contextually equivalent sentences of the uttered sentence are always relevant, i.e. relevance is closed with respect to contextual equivalence. This ensures that the universal alternative will be negated in the relevant case.

It should be noted that, building on work by Fox (see [3]), Magri actually argues that asymmetric entailment is replaced by non-contradictoriness as the appropriate relation for alternatives generation. Let me elaborate a bit on this point. It is a general tenet of the theories of SI that alternatives are derived based on a two-steps process. First, it is widely maintained that a set of so-called scalar alternatives is obtained by substituting the lexical items belonging to the same lexical scale, e.g. the scale of positive quantifiers (see [8]). Second, the set of scalar alternatives is suitably restricted. According to classical work (see [9]), the set of scalar alternatives is restricted by selecting the alternatives that are semantically stronger than the base sentence, i.e. alternatives that asymmetrically entail the base sentence. But in Fox's and in Magri's approach the set of scalar alternatives is restricted by selecting the alternatives whose negation is consistent with the base sentence, and that can therefore be excluded "innocently". As is clear, the two resulting sets, namely the set of innocently excludable alternatives and the set of semantically stronger alternatives, are not extensionally equivalent, for the former also contains the non-weaker alternatives of the base sentence: these are alternatives that neither entail the base sentence, nor are entailed by it. In this paper, I would like to stick to the traditional view, mostly for an independent, conceptual motivation: I do not see strengthening as a side effect of a SI generation, thus I do not see stronger alternatives as a noncore species of alternatives. Most importantly, I maintain that the discussion offered below does not depend on how we stand on this specific matter. As Magri notes, in fact, non-contradictoriness needs to be defined in terms of entailment. So, whichever of the two alternative approaches we adopt, what interest us more at this point is the following consequence of Magri's argument for blindness: the notion of entailment that is assumed by the mechanism must be that of "logical" entailment, rather that entailment given contextual knowledge.

2 A difficulty

There is an important piece missing from Magri's picture. Under common treatments in classical logic, sentences containing an existential quantifier do not, strictly speaking, follow *logically* from the sentence obtained by replacing the existential quantifier with the universal quantifier. Under specific circumstances, universal sentences can

be true while at the same time existential sentences are false. Given the conditional definition of the universal quantifier, it is easy to realize that such specific circumstances obtain when the restrictor of the quantifier is empty, i.e. when there are no individuals that the quantifier is ranging over. Thus, for the universal alternative *Every Italian comes from a warm country* to entail the base existential sentence (1), we need to assume further that the set of Italians is not empty.

A standard response to this difficulty involves assuming that the universal quantifier carries an existence presupposition to the effect that the quantifier's restrictor is not empty. Importantly, this response is compatible with an approach building on Contextual Blindness: under a standard analysis of entailment à la von Fintel, the relevant relation is assumed to hold if and only if the quantifier's restrictor is not empty. Briefly and informally put, the reasoning goes as follows. Suppose that we have two sentences, at least one of which contains presuppositional items. Suppose further that we can derive the set of worlds in which the presuppositions of the first and possibly of the second sentence are satisfied. On this analysis, the entailment relation between the two sentences is defined in the intersection of the worlds in which the presuppositions of the sentences are satisfied. As is clear, the possible circumstance that a presupposition is not satisfied in the actual world is completely irrelevant for the entailment relation to hold. In sum, the entailment relation between the base and the alternative sentence may not be that of logical entailment; but contextual enrichment of the relation is unnecessary to obtain the desired pattern. Being linguistic phenomena, SI and other analogous interpretive mechanisms are expected to operate *iuxta propria principia*, namely on the basis of inner principles of linguistic computation.

There has been discussion in the literature concerning the interaction between presuppositions and SI. For one, Schlenker has criticized the traditional assumption that universal quantifiers carry an existence presupposition (see [16]). He maintains that the information to the effect that the universal quantifier is not ranging over an empty set of individuals is absent in certain occasions. In other occasions, such information projects strangely, assuming standard patterns of presupposition projections predicted when presuppositional items are embedded under other operators. These facts, he observes, are not problematic for a pragmatic approach to SI, for we simply need to posit that contextual knowledge is accessed during the computation to ensure that the relevant entailment pattern is obtained. More recently, a trivalent vision[2] has emerged in the debate that takes the SI mechanism as generating the unspecific inference to the effect that none of the alternative sentences are true (as opposed to the strict inference that alternatives are false). When alternatives contain presuppositional items, the mechanism can give rise to one of the two following results: if the presuppositions are satisfied, the alternatives are straightforwardly negated; if the presuppositions are not satisfied, the alternatives yield presupposition failure. Thus, these two accounts have in common the following prediction: a SI can be generated if and only if the non-emptiness requirement attached to the universal quantifier is contextually satisfied. We now turn to the discussion of this prediction.

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[2] To date, there are no published studies explicitly adopting such an approach. However, a detailed overview and partial defense of it is contained in [17].

3 A new evidence for blindness

3.1 An unexplained oddness asymmetry

I would like to submit that the oddness asymmetry displayed by (3) and (4) provides evidence *contra* Schlenker and the trivalent vision.

(3) # Some Swedish matadors come from a cold country
(4) Some Swedish matadors know latin

Below I present a possible account of the asymmetry which is crucially based on the presence of a mismatching SI. For the time being, it is important to underline that the oddness of an existential sentence with a reference failure NP (there are no bullfighters coming from Sweden) should be surprising under the common pattern of empirical observations. According Lappin and Reinhart (see [10]), for instance, the great majority of informants judges such sentences as felicitous and truth-evaluable; only in a small number of cases, and with a significantly lower incidence than in other comparable cases, they reject the sentences as infelicitous. Incidentally, note that such kind of observations have been taken by some researchers as evidence in favor of a non-presuppositional analysis of indefinites (see [12]); while other researchers have criticized the assumption that a presuppositional analysis of indefinites is forced to predict truth-value gap judgments in case of reference failure NPs (see [2]). In any case, the empirical facts observed in connection with (3) and (4) do not conform to the basic pattern found by Lappin and Reinhart, and generally assumed in the literature. Specifically, they do not conform with respect to (3), which has been rejected by most informants tested in an informal setting as irretrievably bad. Sentence (4), on the other hand, has been accepted by the same informants that rejected (3), and assigned a classical truth-value. As things stand, the oddness asymmetry is left unexplained under common treatments.

3.2 An account of the asymmetry based on a mismatching SI

I take it that the source of (3)'s oddness is the SI that *not every Swedish matador comes from a cold country*. Similar to Magri's original example, the strengthened meaning of the base sentence is in contradiction with the piece of contextual information that Swedes come from the same country, irrespective of their occupation. Based on the Mismatch Hypothesis, the sentence is thus expected to produce an infelicity effect. Information of two kinds are being ignored by the SI mechanism in this case. First, the base sentence and its universal alternative are contextually equivalent. The mechanism is thus blind to the fact that the relation of asymmetric entailment is replaced by symmetric entailment, that is equivalence, in context. Second, and most importantly for our current purposes, the SI mechanism is blind to the fact that the restrictor of the universal quantifier contained in the alternative sentence is contextually known to be empty. Given that universal sentences are uninterpretable whenever the restrictor of the quantifier is empty, and that the asymmetric pattern of entailment is non derivable in such cases, a plausible explanation of the observed

facts is that the existence of Swedish matadors has been assumed by the SI mechanism *automatically*, that is prior than any kind of contextual access was allowed. The proposed explanation has a theoretically relevant ramification. In assuming that the existence presupposition has been satisfied prior than access to the context was allowed, thus alluding to the presence of internal principles that imposed the satisfaction, the proposed explanation provides a significant corroboration of the natural asymmetry between the three presuppositions carried by universal quantifiers. As noted by Sauerland, the existence presupposition is the only *lexical* presupposition attached to the quantifier, i.e. the only presupposition encoded in the semantic import of the relevant item; the anti-duality and the anti-uniqueness presupposition are just implicated presuppositions (see [14]).[3]

It is fundamental for the consistency of our explanation to account for the felicity of (4). This sentence is superficially similar to (3), and analogously characterized by the presence of a reference failure NP. As specified above, under linguistic treatments asymmetrically entailing alternatives are negated only under the assumption that they are assigned relevance by the relevance assignment procedure. In the case of (3), the universal alternative is necessarily negated. Since an uttered sentence always counts as relevant, and relevance is assumed to be closed under contextual equivalence, the alternative cannot but count as relevant. But in the case of (4) the universal alternative is not contextually equivalent to the base sentence, i.e. they provide a different amount of information.[4] As a consequence, the alternative is not necessarily negated. Suppose however that previous conversation has made such an alternative relevant. In this case, a SI is attached to the base sentence. Since there is nothing contradictory, nor for that matter tautological, in assuming that some Swedish matadors know latin while other Swedish matadors do not, the detection of the SI via oddness is impossible.

3.3 Asserted universal sentences

There is a remaining point to be discussed. The pattern found by Lappin and Reinhart is completed with the observation that universal sentences with reference failure NPs are judged as odd by almost the totality of informants. The oddness is generally said to be the consequence of a presupposition failure. I intend to adhere to the traditional view in this respect. Thus, I argue that the existence presupposition is satisfied automatically when the universal sentence is implicitly computed and considered as alternative: in such a case, the universal sentence is not taken as an attempted contribution to the conversation; but it is converted into a definiteness condition checked against contextual information and subject to common felicity conditions when the sentence is interpreted as assertion. The consequent prediction thus emerges that the universal alternative sentences of (3) and (4) give rise to similar effects when taken as explicit assertions. The existence presuppositions carried by the two occurrences of

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[3] The asymmetry is also confirmed by evidence from acquisition: see [18].

[4] This statement could be controversial, for the two sentences could be taken as being contextually equivalent on account of the emptiness of the relevant domains. Be that as it may, as explained below in the text the proposed explanation is effective even if the universal alternative is assigned relevance and thus negated.

the universal quantifier are not satisfied contextually. And I take it that this prediction is correct.

(5) # Every Swedish matador comes from a cold country
(6) # Every Swedish matador knows latin

4 Conclusion

According to standard treatments in classical logic, universal sentences do not entail existential sentences *logically*, but only under the assumption that the restrictor of the universal quantifier is not empty. This straight observation seems to be problematic for grammatical approaches to SI building on Contextual Blindness. In this paper I proposed a solution to overcome this difficulty, based on a presuppositional analysis of the relevant quantifier; and provided evidence that the existence presupposition carried by the quantifier is assumed to be satisfied *automatically*, when the universal sentence is considered as alternative. I concluded by discussing a possible way to make the proposed solution compatible with the classic pattern of empirical observations.

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