

On conceivability and existence in linguistic interpretation¹

Salvatore Pistoia-Reda

Leibniz-Zentrum Allgemeine Sprachwissenschaft (ZAS), Berlin
pistoia.reda@zas.gwz-berlin.de

Abstract. This paper discusses the role of existence presuppositions and conceivability in linguistic interpretation. In particular, it is discussed evidence that the non-emptiness requirement on universally-quantified propositions might be satisfied through access to a background of knowledge concerning what might be the case in the actual world, as opposed to a background of knowledge concerning what is actually the case. The evidence discussed comes from empirical observations on the behavior of the scalar implicature mechanism. The crucial piece evidence amounts to the fact that the entailment pattern with existentially quantified propositions, which is crucial to generate the desired inference, is established when quantifiers range over non-existing but conceivable entities, but it cannot be established when quantifiers range over non-existing and inconceivable entities.

Keywords. Existence presupposition, entailment, implicatures, conceivability.

1. Introduction

In standard literature (see, e.g., [15] and reference cited therein), universally-quantified propositions, such as example (1) below, are taken to carry an existence presupposition, i.e. a presupposition to the effect that the quantifier's restrictor is not empty. In the example, the presupposed material attached to the proposition is that Greeks exist, i.e. that there are in fact individuals for the universal quantifier to range over. As

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follows from classic discussion in the philosophy of language, a similar existence presupposition is assumed to be carried by propositions containing definite descriptions, such as the example in (2). Also in this example, we seem to be invited to draw an inference to the existence of some individual, i.e. the individual who happens to be the author of the *Organon*.

(1) Every Greek is a philosopher.

(2) The author of the *Organon* lived in Athens.

In semantic analysis, presuppositions are treated as definedness conditions on the propositions containing the presuppositional items. Accordingly, presupposition failures, i.e. the cases in which the requirement fails to be satisfied, are analyzed in terms of undefinedness, that is truth-valuelessness. As a consequence, a universally-quantified proposition cannot receive a semantically proper evaluation unless the presupposition to the effect that the quantifier's restrictor is not empty can be satisfied. In the example (1) above, the universally-quantified proposition cannot be properly evaluated unless we can safely assume, against the background of information that we possess, that the set of Greek people is not empty. In a similar fashion, the example in (2) cannot receive a proper interpretation unless the existence presupposition can be satisfied.

A crucial consequence of this analysis in terms of undefinedness is that entailment patterns between the propositions containing the presuppositional items and other related propositions are suspended in case of a presupposition failure. Recall that, according to a generalized definition of entailment, two propositions φ and ψ of the same entailing type are taken to stand in an entailment relation if and only if for any world in which φ is assigned True as semantic value, ψ must receive the same assignment. Let us consider the entailment relation between universally-quantified propositions and existentially-quantified variants, such as in the example (3) below. Assuming that the universally-quantified propositions carry an existence presupposition, the entailment relation will be established whenever the presupposition can be satisfied. However, this entailment relation will not be established in case a presupposition failure occurs, since in this case the universally-quantified proposition cannot be assigned a proper semantic value. So, the entailment relation between propositions (1) and (3) will not be established, following such an analysis, whenever *it is known* that Greek people do not exist.

(3) Some Greeks are philosophers.

Let me now provide some specifications concerning the nature of the background of information that is standardly assumed to play a role in establishing whether presuppositions are satisfied. In standard analysis (see [17], [5], [18] and much subsequent

work), presuppositions are computed with respect to a so-called presuppositional *common ground*. This is a set of assumptions which are mutually believed by speakers while engaging in a conversation, i.e. a set of propositions that such conversationalists take for granted while exchanging information. The presuppositional common ground essentially relates to a set of uniquely determined circumstances - the *context set* - which is defined as the intersection of all propositions included in it.

Presuppositions are described as entailments from the presuppositional common ground, i.e. as propositions that must follow from the set of shared assumptions or, equivalently, as propositions that must be true in every circumstance included in the context set, if the proposition carrying the presupposition has to be properly evaluated. To consider a classic example, a proposition like (4) below carries a presupposition to the effect that there was a time in the past in which Socrates used to drink wine during symposia. However, if it is contextually known that Socrates never indulged in drinking alcohol while engaging in philosophical disquisitions, the proposition will suffer from a presupposition failure and will consequently be unevaluable. Back to our examples with quantified propositions, the universally-quantified proposition will not be defined if conversationalists share the information that Greeks do not exist. So, a consequence of this assumption is that the entailment relation between quantified propositions will not be established in case contextual knowledge implies that the restrictor of the universal quantifier is empty.

(4) Socrates has stopped drinking wine during symposia.

In this work, I will follow standard treatment in analyzing the existence presupposition of universally-quantified propositions as a definedness condition on such propositions. In particular, I will follow standard analysis in assuming that the entailment pattern between quantified propositions cannot be established unless the existence presupposition of universally-quantified propositions is satisfied. However, in my discussion I will show that such an entailment pattern does seem to be established even in cases in which the existence presupposition cannot be satisfied with respect to the presuppositional common ground. In such cases, the presuppositional common ground will actually entail the presupposed proposition to be false. This, I take it, is proof that in these cases the background of information with respect to which the existence presupposition is checked is different from the presuppositional common ground. In the end, I will propose that the entailment relation, while not being sensitive to what is actually the case in the real world, is sensitive to what might be the case in the real world.

2. Implicatures and entailment

In order to make the empirical point that the entailment pattern between quantified propositions obtains without reference to the common ground I have to introduce the phenomenon of scalar implicatures. In Gricean accounts (see, among others, [7], [6], [4]), a scalar implicature is obtained as a result of a meaning strengthening procedure activated by the observation that the speaker has made a weaker statement than she could have made in principle. Under the assumption that the speaker is cooperative and rational (this conjunction is held to be redundant in some versions of the theory), the hearer is thus entitled to draw the conclusion that the speaker does not believe an alternative stronger proposition to be the case. Under the further assumption that the speaker is opinionated as to the truth-value of propositions, the hearer can conclude that the speaker believes the alternative stronger proposition to be false and subject to negation. Such a procedure is mainly based on the exploitation of the first conversational maxim of quantity, according to which alternative statements are ordered based on their informativeness, operationally treated in terms of contextual entailment, i.e. entailment given common knowledge. Classic examples of scalar implicatures involves the meaning strengthening of a disjunctive propositions like (5a), obtained by negating the alternative stronger conjunctive proposition (5b), and of an existentially-quantified proposition like (6a) derived via negation of the universally-quantified proposition (6b).

- (5) a. Socrates was denounced by Anytus or Meletus.
b. Socrates was denounced by Anytus and Meletus.
- (6) a. Some philosophers read the Organon.
b. Every philosopher reads the Organon.

In grammatical approaches (see, e.g., [2]; [1], [3]), however, it is assumed that the meaning strengthening procedure is part of a computationally-oriented mechanism and obtains on account of the pure logical properties of the propositions involved. In particular, in such accounts propositions are taken to be compared based on pure logical, rather than contextual, entailment. Evidence in favor of this analysis seems to come from the following reasoning. Consider the existentially-quantified proposition (7a) below. Now, common knowledge entails that all Greeks come from the same country. Based on this piece of information, the base proposition and its universally-quantified alternative (7b) provide the exact same amount of information, which can be rendered as the information that Greece is a warm country. In other words, assuming contextual information, the two propositions stand in a relation of contextual equivalence rather than contextual entailment. However, if this is the case, we

shouldn't expect a scalar implicature to arise, if we assume that the mechanism can access contextual information. [10] argued that the oddness effect produced by the base proposition in this case is proof that a scalar implicature has been generated (see also [11] and [12] for discussion). Indeed, if generated, the scalar implicature is predicted to generate a contextual contradiction, since assuming what we know it cannot be the case that some Greeks come from a country which is warm and some other Greeks come from a country which is not warm. And contextual contradictions notoriously give rise to infelicity effects. Magri proposes that this oddness is thus proof that the scalar implicature mechanism is based on a computational principle of contextual blindness.

- (7) a. Some Greeks come from a warm country.
 b. Every Greek comes from a warm country.

3. Entailment with empty sets

Despite Magri is quite explicit in this respect (see, e.g., [10, p. 258]), evidently the entailment pattern between quantified propositions cannot be established on account of the purely logical properties of quantifiers. The point here is that there are circumstances in which universally-quantified propositions are true while, at the same time, existentially-quantified propositions are false. Such circumstances typically obtain when the universal quantifier's restrictor is empty. Given the definition in (8a), whenever the restrictor is empty the whole universally-quantified proposition will have to be assigned True as semantic value, since a false antecedent cannot but produce a true proposition in an implication. However, in this case the existentially-quantified variant has to be assigned False as a semantic value given the definition in (8b), since there cannot be a nonempty intersection of two sets one of which is the empty set. To be sure, there are of course alternative possibilities to establish the entailment pattern between universally quantified and existentially-quantified propositions *logically*, i.e. assuming that the entailment pattern follows on account of the pure meaning of quantifiers. To make an example, connexive logics (see, e.g., [13]) submit a different of existentially-quantified proposition, along the lines of (9). As it is clear, if we assume this modified definition, we aren't forced to derive an inference to the existence of P-individuals. But I will not pursue this direction here.

- (8) a. $\forall x (Px \rightarrow Gx)$
 b. $\exists x (Px \wedge Gx)$
- (9) $\exists x (\neg (Px \rightarrow \neg Gx))$

As suggested in [16], a possible response for grammatical accounts building on the principle of contextual blindness would involve imposing that universally-quantified propositions carry an existence presupposition, as discussed at the outset. However, there are reasons to suspect that the satisfaction of the existence presupposition is at the origin of the entailment pattern in this case, at least assuming standard presuppositional analysis discussed above. Consider for instance the existentially-quantified base proposition in (10a) below. Now, our common knowledge entails that Greece is currently a republic, which amounts to the assumption that Greek kings do not exist, once we have also made clear that we are not referring to past sovereigns of Greece. If we assume the presuppositional analysis of universally-quantified proposition, the universally-quantified alternative proposition in (10b) should be taken to be undefined, since the non-emptiness requirement on the restrictor of the universal quantifier cannot be satisfied with respect to the presuppositional common ground. In other words, the presuppositional common ground entails the presupposed proposition, i.e. the proposition that Greek kings exist, to be false. But, as we know, undefinedness of a universally-quantified proposition implies that the entailment pattern with existentially-quantified variants cannot be established. Now, a crucial consequence of the latter fact, i.e. of the fact that no entailment pattern can be established in this case, is that no scalar implicature should be attached to the existentially-quantified base proposition under analysis. However, as suggested in [14], this base proposition also produces an infelicity effect, and this new case of oddness could be explained by assuming a natural modification of the reasoning that we have discussed above in order to account for the infelicity of (7a). To be more precise, common knowledge entails that all Greeks come from the same country, *irrespective of their occupation or social status*. The crucial modification is italicized here. Consequently, negating that every Greeks come from a country which is warm (as it would be obtained by generating the scalar implicature), while asserting that some Greeks come from a country which is warm (which amounts to the so-called existential base meaning of the proposition), would contradict the above-mentioned piece of contextual information, and is then expected to generate a clear infelicity effect.

- (10) a. Some Greek kings come from a warm country.
 b. Every Greek king comes from a warm country.

But the generation of a contradictory scalar implicature is not the only possible explanation of the oddness effect produced in the case of existentially-quantified propositions such as (10a). One alternative explanation would capitalize on the fact that the existentially-quantified proposition is construed with a reference failure noun phrase. As a consequence, this reference failure might be the source of the oddness effect in this case. However, there are at least two reasons to reject this alternative explanation.

To begin with, experimental analysis on speakers' judgments showed that existentially-quantified propositions with reference failure noun phrases, such as (10a), statistically correlate with existentially-quantified propositions construed without reference failure noun phrases, such as (7a), in case both would produce a contextual contradiction when enriched with the scalar implicature, i.e. in case both are construed by combining the reference failure with a verb phrase yielding a contextual contradiction. This would seem to demonstrate that the basis of this correlation is the contextual contradiction generated by the scalar implicatures attached to the two propositions. In addition, existentially-quantified propositions like (10a) have been demonstrated to elicit inappropriateness judgments. However, this observation contradicts the standard empirical pattern observed in, e.g., [9], according to which existentially-quantified propositions construed with reference failure noun phrases, such as (11) below, can be used naturally (as opposed to reference failures obtained with propositions containing strong quantifiers). In conclusion, assuming that a contradictory scalar implicature has been generated in the case of (10a) would seem to provide the best explanatory account of the observed oddness.

(11) Some Greek kings enjoy hunting.

But if a scalar implicature has been generated in this case, an immediate conclusion would be that the entailment pattern between the two quantified propositions has been established even if this pattern was not established logically and the definedness of the universally-quantified proposition does not follow from the presuppositional common ground.

4. Entailment with inconceivable entities

A possible solution to account for the observed behavior would be imposing that the scalar implicature mechanism be sensitive to the notion of Strawson-entailment, as proposed and defended by [20] (see also [21] and [19] for earlier discussion). According to the definition, two propositions φ and ψ of the same entailing type stand in a Strawson entailment relation if and only if they stand in a classic, generalized entailment pattern in the intersection of worlds in which presuppositions are satisfied. From a theoretical point of view, it is crucial to realize that Strawson-entailment is part of an *algorithmic* machinery, in that it simply depends on adding an additional, tacit premise to the argumentative scheme connecting the two propositions, i.e. the premise that presuppositions are satisfied. Once such an additional premise is put in place, and justified as part of our explanation, the argumentative scheme connecting universally-quantified and existentially-quantified propositions will be realized by simply assuming knowledge of the meaning of quantifiers. In other words, the definition does not require the existence presupposition attached to universally-quantified propositions to

be satisfied in the actual world. This is the reason why this solution based on Strawson-entailment is generally held to be compatible with grammatically-oriented accounts building on notions such as blindness in the case of scalar implicatures. But, in addition, and crucially from our point of view, this solution does not require the existence presupposition to be satisfied *in any world*, as the entailment pattern is supposed to be established on account of purely logical relations between quantifiers, plus the enriching tacit premise to the effect that presuppositions are satisfied.

According to this solution based on Strawson-entailment, then, the scalar implicature mechanism does not assume (actual or constitutive) knowledge when establishing the entailment pattern between quantified propositions. As we have seen in the case of existentially-quantified propositions such as (10a) above, this solution generates a desired prediction. In such cases, the entailment pattern is shown to be obtained even if actual knowledge cannot play a role in establishing it, i.e. even if the presupposed presupposition does not follow from the presuppositional common ground. However, this solution would also wrongly predict an entailment pattern between existentially quantified and universally-quantified propositions such as (12a) and (12b) below, featuring not merely non-existing but inconceivable entities, i.e. entities such that our constitutive knowledge of things entails that cannot exist in the actual world or in any conceivable world. Under the crucial assumption that alternative propositions which are part of a relevant entailing pair are obligatorily subject to negation, a consequence of this prediction would be the generation of a scalar implicature attached to the base proposition. It is immediate to realize that the scalar implicature possibly attached to this base proposition would generate a contradiction when conjoined with the piece of knowledge that the property of being equal to rectangles must hold for any instance of a given geometrical entity, including round squares. In other words, it cannot be the case that some round squares are equal to rectangles while some other round squares are distinct from rectangles. The proposition is thus expected to produce an infelicity effect; and it is not difficult to realize that the proposition does, in facts, generate a clear oddness effect. This would seem to demonstrate that a scalar implicature has been generated in this case, by virtue of a Strawson-entailment relation.

- (12) a. Some round squares are rectangles.
b. Every round square is a rectangle.

There are reasons to doubt, however, that the source of the infelicity produced in the case of (12a) is the scalar implicature attached to the proposition. The main evidence against this explanation is the fact that the very same oddness effect seems to be replicated in the case of (13), where the reference failure noun phrase with inconceivable entities is combined with a verb phrase not yielding a contradiction. However, the proposition does not seem to correlate with the existentially-quantified proposition in (14), where the noun phrase, construed without reference failures of

any kind, is combined with a verb phrase this time yielding a contextual contradiction. Experimental analysis is needed in this case to clarify what the judgments really are with respect to the different oddness effects generated in the distinct cases; but, if this intuition is correct, then the source of the oddness of propositions such as (12a) does not seem to be a contradictory scalar implicature.

(13) Some round squares are green.

(14) Some squares are rectangles.

Let us suppose, then, that a scalar implicature cannot be generated in the case of existentially-quantified propositions such as (12a) (and 13). This fact can be understood as a consequence of the impossibility of establishing a proper entailment pattern between the existentially-quantified proposition in (12a) and its universally-quantified alternative in (12b). And this has to be understood as a consequence of the undefinedness of the universally-quantified proposition. In other words, the reasoning to account for all of the data that we have considered up to this point, provided that our judgments are confirmed by experimental analysis, would be the following: Definedness of universally quantified propositions through satisfaction of the existence presupposition is a necessary and sufficient condition for the entailment pattern with existentially-quantified propositions to be established. So, whenever the universally-quantified proposition is not satisfied, we can safely assume that the said entailment pattern is not established. And whenever the entailment pattern can be observed, we can safely assume the definedness of the universally-quantified proposition. Similarly, we assume that whenever the entailment pattern cannot be observed, we can conclude that the universally-quantified proposition is not defined. We observed the entailment pattern in cases such as (10a), where the existentially-quantified proposition is construed with a reference failure noun phrase. Since the definedness of the universally-quantified proposition is to be assumed in this case, this means that the existence presupposition has been satisfied but not through access to the presuppositional common ground. However, we do not observe the entailment pattern between quantified propositions in the case of (12a), where the existentially-quantified proposition is construed with non-existing and inconceivable entities. This means that the universally-quantified proposition is not defined. In other words, the existence presupposition has not been satisfied. So, satisfaction of the existence presupposition must depend on access to a background of knowledge which contains non-existing entities but excludes entities that we cannot possibly conceive of. This is why the tentative conclusion we can draw from this discussion is that the satisfaction of the existence presupposition, and thus the entailment pattern between quantified proposition, clearly does not depend on what is the case in the actual world; however, our discussion shows that existence presupposition and entailment pattern depend on what might actually be the case. That is

to say, the existence presupposition is enriched with a modal flavor in this case, à la [8].

5. Conclusion

In this paper I have discussed the role of existence presuppositions in the interpretation of universally-quantified propositions. Satisfaction of the existence presupposition carried by such propositions is intended as a definedness condition. Definedness of universally-quantified propositions through satisfaction of the existence presupposition is interpreted as a necessary and sufficient condition for the entailment patterns with existentially-quantified propositions to be established. I have submitted evidence that the entailment pattern is established when universally-quantified propositions would not be satisfied with respect to the presuppositional common ground of conversationalists. Since the satisfaction of the existence is necessary for establishing the entailment pattern, this means that the existence presupposition has been satisfied through access to a background of knowledge which does not necessarily include existing entities, i.e. entities that we mutually believe to exist in the actual world. I have also discussed evidence that the entailment pattern cannot be observed in cases where universally-quantified propositions would not be satisfied if the relevant background contained inconceivable entities. The conclusion that we can tentatively draw from this discussion is that the existence presupposition must be understood as having a modal flavor in such cases, that is to say it is satisfied through access to a background of knowledge which does not depend on what is the case in the actual world but on what might actually be the case.

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