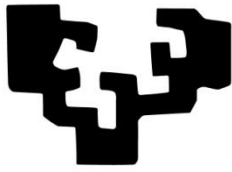


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**Scalar Implicatures:
A Gricean vs. a Relevance Theory Approach**

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Abstract

Griceans have always supported the idea that scalar implicatures are Quantity-based generalized conversational implicatures (GCI). With the purpose of explaining this phenomenon, they derived their own principles inspired in Grice's Quantity maxims and concluded that whenever a speaker uses a weak linguistic item of a given scale, no matter the context she is in, she will be implying (a) that she is not in a position to be more informative and that therefore (b) a stronger item of the scale will not hold. For instance, if there is a scale such as *<all, some>* and the speaker chooses the weaker element *some*, she will automatically be implying *not all*. However, Relevance theorists believe that scalar implicatures are context-based. Thus, they claim that these implicatures do not depend on any Quantity maxim to arise but on a notion of relevance that considers the context in which sentences are uttered. So although the speaker chooses the linguistic term *some* from the previously mentioned scale, the context should be taken into account to infer that she is implicating *not all*. The present paper aims to compare both pragmatic theories' approach to the scalar implicature case. Consequently, I will first explain the main features of each theory: how human verbal communication works, how implicatures are generated and how the information contained in such implicatures is recovered by hearers according to them. Then, I will introduce scalar implicatures and contrast the Gricean and Relevance Theory approaches (based on the previously explained features of each pragmatic tendency) to such phenomenon. To conclude, I will discuss what experimental pragmatics says about each proposal. The results from the application of each theory's approach to the case of scalar implicatures indicate that Relevance Theory predicts their generation more accurately. In the same way, experimental pragmatics denies that the Gricean system for generating scalar implicatures is the correct and most efficient one and verifies Relevance Theory's predictions about it as well as its analysis of scalar implicatures.

Keywords: scalar implicature, Gricean approach, Relevance Theory approach, experimental pragmatics

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1. Introduction

In pragmatics, there is a much discussed phenomenon called scalar implicature. Here are some examples, with the implicatures given in B:

- (1) A. Some of the singers are rich.
B. Not all of the singers are rich.
- (2) A. The glass is on the table or in the glass cabinet.
B. The glass is not both on the table and in the glass cabinet.
- (3) A. That couple has four children.
B. That couple does not have five children.

Pragmaticians like Laurence Horn (1972, 1984) and Stephen Levinson (1987, 1995) claim that these implicatures arise automatically from the use of certain linguistic elements that form a contrastive set $\langle S, W \rangle$ in which the stronger element (S) is the most informative one and entails a weaker (W) component, which is less informative. In this way, speakers that are not in a position to be fully informative make use of the weaker element, thus licensing the negation of the stronger item. In the case of (1) the contrastive set is $\langle \text{all}, \text{some} \rangle$, in the case of (2) $\langle \text{and}, \text{or} \rangle$ and in case (3) $\langle \dots 5, 4 \dots \rangle$. In all cases the stronger element (*all/and/five*) entails the weaker one (*some/or/four*); and the weaker element implicates the negation of the stronger one. These scalar implicatures are seen as generalized conversational implicatures and believed to be contrary to another type of generalized conversational implicatures, which tend to give rise to a more informative implicature instead of a negative one. Typical examples of this second type given by the pragmaticians mentioned above are the following:

- (4) A. The children and the parents went to the park.
B. The children and the parents went to the park together.
- (5) A. If you study, you will pass.
B. If and only if you study, you will pass.
- (6) A. She threw the glass and the glass broke.
B. The fact that the glass broke follows from the fact that she threw it.

By contrast, other pragmaticians (Sperber & Wilson, 1986/1995; Carston, 1995; 1998) state that for scalar implicatures to arise, the context needs to be considered.

Therefore, unless the context requires an inference to a more informative element, no implicature involving the negation of the stronger item will arise. Moreover, given this context-dependence, they believe that relevance needs to be considered when inferring implicatures, they reclassify scalar implicatures as particularized conversational implicatures and they negate the contrariness with the other type of implicatures, represented in (4) to (6) above.

The aim of this paper is to compare the Gricean and the Relevance Theory accounts for scalar implicatures. Hence I will first explain what implicatures are. Secondly, I will show how human verbal communication works and how non-explicit information is generated and recovered by hearers according to two different pragmatic approaches: Gricean Theory and Relevance Theory. Thirdly, I will introduce scalar implicatures and contrast how Griceans and Relevance theorists analyze such phenomena. Finally, I will look at what experimental pragmatics says about those analyses.

2. The notion of implicature

In verbal communication, what a speaker means usually goes beyond the meaning encoded in the particular sentence she uses. The American philosopher of language Paul Grice said that to get the total signification of an utterance or what is communicated, two levels need to be taken into account: what is said and what is implicated (Grice, 1975, 1989). What is said is the proposition expressed by the utterance; whereas what is implicated is the proposition obtained by inference partly on the basis of what the speaker has said. For example, if you are with a friend who is taking a bite of the sandwich she has just bought and you tell her “It smells delicious”, in the right situation your friend will probably respond by offering you a piece of sandwich (if she still has a piece of sandwich left, which is the most probable option given this context). Although the proposition expressed is “It smells delicious” (what is said), your friend has shown that she thinks you were implying you would like a bite and unless you deny it, the fact that you wanted a taste has been implied. Thus, what you have implicated (“I would like a bite of your sandwich”) goes further than what you said (“It smells delicious”).

This information that goes beyond what was strictly speaking said was first introduced under the notion of implicature by Grice (1975). Grice divided implicatures into two categories: conventional and non-conventional. Conventional implicatures are decoded from the meaning of a specific word that is used in the utterance; so they are part of the conventional force of the utterance¹ (Grice, 1989). Non-conventional implicatures, on the other hand, may be conversationally² implicated and will therefore be inferred in context on the basis of what the speaker has said and of the assumption that the speaker is being cooperative. In the same way that implicatures are split into conventional and non-conventional, non-conventional implicatures of the conversational type are subdivided into, on the one hand, particularized conversational implicatures (PCI) and on the other, generalized conversational implicatures³ (GCI). The difference between them is that while PCIs do not depend on a specific linguistic item and need a particular context to arise, GCIs do depend on a certain linguistic item to arise and are, consequently, normally present; they do not need a particular context to arise (Grice, 1975). An example by Levinson may help to see this contrast between PCIs and GCIs:

(7) a. Context 1:

A: "Do you know what time it is?"

B: "Some of the guests are already leaving."

PCI: "It must be late."

GCI: "Not all of the guests are already leaving."

b. Context 2:

A: "Where's John?"

B: "Some of the guests are already leaving."

PCI: "Perhaps John is already leaving."

GCI: "Not all of the guests are already leaving."

(Levinson, 1995: 92)

¹ But they do not belong at the level of what is said because they do not affect the truth of the utterance. An example would be *John is a Republican but he is honest*, which according to Grice would give rise to the conventional implicature that there is a contrast between being a Republican and being honest, or between John being a Republican and John being honest (Grice, 1975).

² Conversational implicatures own certain features: (i) defeasibility/cancelability, (ii) calculability, (iii) nondetachability, (iv) reinforceability and (v) indeterminacy (see Grice, 1975, 1989).

³ Grice noticed the difficulty to differentiate generalized conversational implicatures from conventional ones, because they both depend on a particular linguistic item to arise (Grice, 1975).

As we can see, the PCI will vary from context to context but the GCI will remain unchanged because it does not depend on the particular context to arise, but instead on a certain linguistic item, which in this case is an NP of the kind “Some of the X”.

We have seen so far what an implicature is and its subtypes. In the next section, I will explain how they arise.

3. The cooperative principle and the maxims

According to Grice (1975), talking is a cooperative activity governed by rationality: speakers obey a principle that Grice calls the “cooperative principle” (CP henceforth) and hearers assume that they do:

- (8) “Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged” (Grice, 1975: 45)

Grice also developed some rules that gave meaning to this CP, namely conversational maxims⁴:

QUANTITY

1. Make your contribution as informative as required (for the current purposes of the exchange)
2. Do not make your contribution more informative than is required

QUALITY – Try to make your contribution one that is true (supermaxim)

1. Do not say what you believe to be false
2. Do not say that for which you lack adequate evidence

RELATION

1. Be relevant

MANNER – Be perspicuous (supermaxim)

⁴ Grice mentions the existence of other maxims that he does not deal with (“aesthetic, social, or moral in character”) (Grice, 1975).

1. Avoid obscurity of expression
2. Avoid ambiguity
3. Be brief (avoid unnecessary prolixity)
4. Be orderly

(Adapted version from Grice, 1975: 45-46)

Grice's basic idea is that in interpreting an utterance, hearers assume the CP and the maxims (or at least the CP) have been observed, and look for an interpretation that accords with this assumption.

3.1. The generation of implicatures in the Gricean system

Let's look at an example of how a conversational implicature is generated and how the information it conveys is recovered in the Gricean system. The following example is one that Grice proposed in his *Logic and Conversation* paper⁵:

(9) A: Where does C live?

(10) B: Somewhere in the South of France.

(11) Implicature: B does not know where in the South of France C lives.

(Grice, 1975: 51)

As we can see, what is said by B's utterance in (10) is less informative than required to answer A's question in (9). According to Grice, this example involves a clash between the first Quantity maxim ("Make your contribution as informative as is required for the current purposes of the exchange") and the second Quality maxim ("Do not say that for which you lack adequate evidence"). The non-fulfillment of the first maxim of Quantity is seen as an indication that B is observing the second maxim of Quality instead and that he knows that if he was to make a more informative statement, he would be infringing it⁶. As a consequence, B is unable to be more specific (11) (Grice, 1975).

⁵ I have selected this example because it introduces the generation of implicatures from the failure to fulfill the first Quantity maxim, precisely the one that according to Griceans gives rise to scalar implicatures, the focus of this paper.

⁶ Grice asserted that the most important maxim was the one of Quality; only when the Quality maxim is satisfied, the others can come into operation (Grice, 1975).

Nevertheless, this strategy as well as Grice's communication system has been highly criticized. Although Grice and his followers support the idea that successful communication is achieved via the assumption of the CP and its maxims, pragmatics working within the framework of Relevance Theory (Sperber & Wilson, 1986/1995; Richardson & Richardson, 1990; Carston, 1995, 1998; Wilson 2016) position themselves in favor of a more cognitive principle. Sperber and Wilson were the first to argue that the key to inferential communication is not placed in any social principle of cooperation or maxims that participants must take into account but rather in a basic assumption about human cognition. This assumption is that human cognition is relevance-oriented (Sperber & Wilson, 1986/1995). Therefore, despite taking as a starting point some of Grice's assumptions about verbal communication (namely, that an utterance conveys a speaker's meaning that has to be recognized and that this meaning must be inferred from her behavior together with the context the utterance has taken place in), they say that to infer a speaker's meaning hearers are guided by a presumption of optimal relevance, not by a cooperative principle and conversational maxims (Wilson, 2016).

In order to understand this idea better, I will outline the main points of Sperber and Wilson's Relevance Theory (1986/1995).

4. Relevance Theory

Relevance Theory is based on a definition of relevance and two principles: the Cognitive Principle of Relevance and the Communicative Principle of Relevance (Sperber & Wilson, 1986/1995; Wilson, 2016).

4.1. The concept of relevance

Sperber and Wilson assumed that "people have intuitions of relevance; that they can consistently distinguish relevant from irrelevant information, or in some cases, more relevant from less relevant information" (Sperber & Wilson, 1986/1995: 119). We must notice that information can be relevant in one context and not in another, so the basic notion we want to define is that of relevance in a context. Sperber and Wilson proposed the following definition of relevance:

- (12) Relevance: "An assumption is relevant in a context if and only if it has some contextual effect in that context."

(Sperber & Wilson, 1986/1995: 122)

The relevance of an input is a matter of degree. The greater the number of cognitive effects and the smaller the processing (mental) effort to get them, the more relevant the input will be (Sperber & Wilson, 1986/1995).

4.2. The two principles of relevance

Relevance Theory makes two claims: one about cognition and another about communication.

As regards cognition, Relevance Theory states that of all the inputs available at any given moment, our cognitive system tends automatically to process those with the greatest expected relevance and to build a context that will enable our inference system to maximize the relevance of the input. This idea is collected in the First Principle of Relevance or Cognitive Principle of Relevance:

- (13) Cognitive Principle of Relevance: “Human cognition tends to be geared to the maximization of relevance.”

(Sperber & Wilson, 1986/1995: 260)

Regarding the communication claim, Relevance Theory proposes a rather different theory from Grice’s. Instead of seeing communication between humans as cooperative exchanges of information, they suggest that to communicate with someone is to attract the addressee’s attention and to offer her (relevant) information (Sperber & Wilson, 1986/1995). As mentioned above, the human cognitive system tends to select what is most relevant from the context (Cognitive Principle of Relevance); hence, in order for the hearer to choose the speaker’s utterance as the most relevant input to attend to, the speaker must ensure that her utterance “achieves the required level of relevance”. This claim is what Sperber and Wilson called the (Second) Principle of Relevance or Communicative Principle of Relevance:

- (14) Communicative Principle of Relevance: “Every act of ostensive communication communicates a presumption of its own optimal relevance.”

(Sperber & Wilson, 1986/1995: 260)

Besides, Sperber and Wilson said that an utterance is optimally relevant under two conditions:

(15) Presumption of optimal relevance:

(a) The ostensive stimulus is relevant enough for it to be worth the addressee's effort to process it.

(b) The ostensive stimulus is the most relevant one compatible with the communicator's abilities and preferences.

(Sperber & Wilson, 1986/1995: 270)

Clause (a) says that the addressee can take for granted that the utterance will give rise to enough cognitive effects for the effort it will take to process it and clause (b) says that the utterance is the one that conveys those effects most economically in terms of processing (Sperber & Wilson, 1986/1995; Wilson, 2016).

4.3. Revising the generation of implicatures in the Gricean system

Relevance Theory does not rely on any cooperative principle or maxims for the generation of implicatures but on a presumption of optimal relevance. Therefore, Relevance theorists suggest a rather different approach from the Gricean one to explain the formation of implicatures.

(9) A: Where does C live?

(10) B: Somewhere in the South of France.

(11) Implicature: B does not know where in the South of France C lives.

(16) Implicature: B is not willing to say where in the South France C lives.

As we saw above (section 3.1.) the Gricean system would only account for the generated implicature in (11). Indeed, (16) seems to be problematic for a Gricean communicative approach, since the maxims cannot deal with the type of case in which the speaker does not want to provide information (Sperber & Wilson, 1986/1995).

By contrast, the presumption of optimal relevance can account for both implicature (11) and implicature (16). If the hearer takes (10) as evidence that speaker B would like to be more specific, following clause (b) of the presumption of optimal relevance (“The ostensive stimulus is the most relevant one compatible with the communicator's abilities and preferences”) (11) is implied: that she is unable to do so. (16), on the other hand, follows from the assumption that in (10) B is able to be more specific and clause (b) of the revised presumption of optimal relevance (again) suggesting that B prefers not to be that specific (Sperber & Wilson, 1986/1995; Carston, 1998).

Hitherto we have had a look at how communication is achieved according to Grice and Relevance Theory, what implicatures are and how their generation is explained by the Gricean system and by Relevance Theory. Hereafter, the paper will address a much discussed type of implicatures traditionally derived from Grice's Quantity maxims: scalar implicatures.

5. Generalized Quantity implicatures

When introducing the distinction between PCIs and GCIs, Grice gave the following example to explain the latter (adapted version from Grice, 1975):

(17) X is meeting a woman this evening.

(18) GCI: The woman that X is meeting is not X's wife, mother, sister, or perhaps even close platonic friend.

(19) I broke a finger yesterday.

(20) GCI: The finger was my own.

Both (18) and (20) are a generalized conversational implicature because in order to arise they depend on (a) the CP and its maxims, specifically on the maxims of Quantity and (b) a certain linguistic item (in this case the expression “an X”) and they differ from entailments and conventional implicatures in that they both are defeasible; that is, the opposite of the implicature can be added to the utterance without contradiction (“X is meeting a woman this evening; in fact X is meeting his/her daughter” and “I broke a finger yesterday and it was not my own”).

(18) arises because at the level of what is said “the speaker has failed to be specific in a way in which he might have been expected to be” (Grice, 1975: 57). In this case, the speaker was probably expected to say who that woman is but has failed to be specific by using a more informative expression like my wife/mother/sister etc. so here the Quantity 1 expression “a woman” implicates that the “woman” is not related to the speaker (Grice, 1975). Consequently, (18) is claimed to be derived from the non-fulfillment of the first Quantity maxim (“Make your contribution as informative as is required for the current purposes of the exchange”). (20) instead, is derived from the second Quantity maxim (“Do not make your contribution more informative than is required”) because in this case the expression “a finger” implicates that the finger is closely related (that it belongs) to the speaker (Grice, 1975). Here, the expectation seems to be that people tend not to break other people’s fingers and so the speaker does not need to give the information whose finger she broke.

Followers of Grice (henceforth “Griceans” or “Neo-Griceans”) such as Laurence Horn and Stephen Levinson have drawn the conclusion that these Gricean Quantity maxims seem to pull in opposite directions (Horn, 1972, 1984; Levinson, 1987, 1995, 2000). They state that while the first maxim of Quantity gives rise to implicatures that communicate a proposition more definite than what is said by implicating the negation of a semantically stronger proposition (a woman +> not my mother etc.); the second maxim of Quantity causes inferences more precise than what is said because what is implicated is stronger than what is said (a finger +> my finger).

In an attempt to see more closely how these maxims work, they developed principles inspired in Grice’s conversational maxims.

5.1. Horn’s principles

Horn (1972, 1984, 1989) reduced the Gricean maxims to two principles:

(21) (i) The Q Principle (Hearer-based)

Make your contribution sufficient (Quantity 1)

Say as much as you can (given R)

(ii) The R Principle (Speaker-based)

Make your contribution necessary (Relation, Quantity 2, Manner)

Say no more than you must (given Q)

(Adapted version from Horn, 1984: 13)

According to Horn, the Q Principle corresponds to Grice's first maxim of Quantity and also collects the first two manner maxims ("Avoid obscurity of expression" and "Avoid ambiguity"). In the same way, Q-based implicatures are generalized because they arise in the absence of special circumstances, though they may be cancelled. Moreover, following the Q-principle, a speaker, in saying *p*, implicates *at most p* or *not more than P* (Horn, 1984).

The primary examples arising from the Q principle are the scalar predications (known as Horn scales). Horn (1972, 1984, 1989) defined them in terms of entailment; the stronger element (which appears to the left) on a given scale entails the weaker one (which appears to the right). These are some examples of Horn scales:

(22) Horn scales

<all, most, many, some>

<and, or>

<adore, love, like>

<excellent, good, OK>

<always, usually, often, sometimes>

<. . . , 6 , 5 , 4 , 3 , 2 , 1>

<obligatory, permitted>

(Horn, 1989: 231-232)

(23) Q-based inferences based on some of the scales above

a. <all, some>

Some of my friends are coming to my house tonight

+> Not all of them are coming

b. <. . . , 6 , 5 , 4 , 3 , 2 , 1>

I made four cakes for her birthday

+> I didn't make five

The R-principle, instead, takes in Grice's second Quantity maxim, the maxim of Relation and the other two manner maxims ("Be brief" and "Be orderly"). In contrast

with Q-based implicatures, the R Principle licenses a speaker who says *p* to implicate *more than p* (Horn, 1984).

(24) R-based inferences

p and *q* → *p* preceded *q* (*p* caused *q*)

a and *b* VP'd → *a* and *b* VP'd together

a ate the cake → *a* ate the whole cake

I don't think that *p* → (I think that) not-*p*

I have a new car and the windows don't close → ... the windows of my new car ... (Bridging)

(Horn, 1984: 18)

(25) Exemplification of some of the R-based inferences

a. *p* and *q* → *p* preceded *q* (*p* caused *q*)

It rained and I got wet → The rain caused me to get wet

b. *a* and *b* VP'd → *a* and *b* VP'd together

My sister and my friend went to the gym → My sister and my friend went to the gym together

Just as Grice's two Quantity maxims are in conflict, the Q-and R-principles just summarized often clash. The first principle (Q) seems to give rise to the negation of a stronger proposition than the one at the level of what is said, whereas the second principle (R) seems to generate stronger propositions than the ones at the level of what is said (Horn, 1984).

5.2. *Levinson's principles and heuristics*

In the same way that Horn developed his schema for Grice's maxims, Levinson (1987, 1995) also established his own principles⁷:

(26) (i) Q-principle:

1. Speaker's maxim: "Make your contribution as informative as is required for the current purposes of the exchange" Specifically: don't provide a statement that is

⁷ Levinson (1987, 1995) developed three principles (Q, I, M) but for the purpose of this paper I will leave the M principle aside.

informationally weaker than your knowledge of the world allows, unless providing a stronger statement would contravene the I-principle.

2. Recipient's corollary: Take it that the speaker made the strongest statement consistent with that he knows.

(ii) I-principle:

1. Speaker's maxim: The Maxim of Minimization
"Say as little as necessary" i.e. produce minimal linguistic clues sufficient to achieve your communicational ends, bearing Q in mind.
2. Recipient's corollary: Enrichment Rule
"Amplify the informational content of the speaker's utterance, by finding a more specific interpretation, up to what you judge to be the speaker's m-intended point".

(Adapted version from Levinson, 1987: 67-68)

These principles were later referred to as heuristics (Levinson 1995; 2000):

(27) (i) Q1: "What is not said is not the case".

(ii) Q2⁸: "What is simply described is stereotypically and specifically exemplified".

- (a) Unmarked expressions warrant rich interpretations to the stereotype.
- (b) Minimal forms warrant maximal interpretations.

(Adapted version from Levinson, 1995: 97)

According to Levinson these are default heuristics because they are automatic: "they are applied unless there are explicit indications (in the nature of the context or the content of the message) that they should not be" (Levinson, 1995: 96). Just as in Grice's idea of communication participants are supposed to follow the CP and its maxims, here the idea is that participants know that they are all making use of these heuristics. Besides, they are allusions to the corresponding Gricean maxims: Q1 for the first maxim of Quantity, and Q2 for the second maxim of Quantity.

⁸ Q2 heuristic was later referred to as I-heuristic (Levinson, 2000).

Now let's have a look at the different inferences these heuristics by Levinson give rise to.

5.2.1. QI- and I-default inferences

Just as Horn's Q-principle based inferences, Levinson's Q1 inferences also rely on a contrastive set of linguistic items. Though there are different typologies, the most widely known are the scalar ones, in which given an ordered pair of expressions <S,W> where S is the "strong" member, and W the "weak" member, the production of an utterance with the weaker item will carry the GCI that the stronger element does not hold whenever it is used.

(28) Examples of Q Contrast Sets

Scalar: <*all, some*>, "some" +> 'not all'

Negative scales: <*none, not all*>, "not all" +> 'not none, i.e., some'

Clausal: <*since-p-q, if-p-q*>, "if p then q" +> 'p is uncertain'

Nonentailment scales: <*succeed, try*> "try" +> 'not succeed'

Nonentailment sets: {*yellow, red, blue, . . .*} "yellow" +> 'not red, etc.'

(Levinson, 2000: 36)

The inferences produced by the I-heuristic are quite varied but they all seem to be inferences to more specific interpretations; so that what is implicated generally is a stereotype, a subcase of what is said (Levinson, 1995). Contrary to Q1 inferences, which are negative inferences (the negation of the stronger element of the scale), I inferences are positive.

(29) Examples of I-based inferences

a. "John's book is good"

+> the one he read, wrote, borrowed, as appropriate.

b. "John turned the switch and the motor started."

+> p and then q, p caused q, John intended p to cause q, etc.

c. "John and Jenny bought a piano"

+> together

d. "The picnic was awful. The beer was warm."

Bridging: +> 'the beer is part of the picnic.'

(Levinson, 2000: 37-39)

As Levinson noted “in certain ways these three principles [heuristics]⁹ are quite clearly antagonistic: they encourage inferences in opposite directions” (Levinson, 1995: 105). In fact, they work in the same manner as Horn’s ones: Q1-based inferences tend to negate a stronger proposition than the one at the level of what is said, whereas I-based inferences tend to be stronger than the proposition at the level of what is said (Levinson, 1995, 2000).

5.3. Summary

In section 5 we have seen that among Grice’s conversational implicatures, one of the most representative ones are those involving the maxims of Quantity. As a consequence, many Griceans have developed their own principles and heuristics to see how they work, reaching the conclusion that while implicatures inferred from the first Quantity maxim are the negation of a stronger proposition than the one uttered, implicatures derived from the second Quantity maxim are stronger propositions than the one expressed.

Among the implicatures derived from the first Quantity maxim and its corresponding principle and heuristic, the best known ones are scalar implicatures. According to Neo-Griceans these implicatures are generalized because they emerge from a certain linguistic item that belongs to a given scale which contains a contrastive set of elements <S,W> in which S is the strongest element and W a weaker one. Hence, a speaker using the weaker element (W) will be implicating that the stronger one (S) does not hold (Horn, 1972; Levinson, 1987; Matsumoto, 1995).

Regarding the implicatures derived from the second Quantity maxim as well as from its parallel principle and heuristic, though quite heterogeneous, they show a certain degree of commonality: the implicated content is more specific than the uttered one (Levinson, 1987).

6. Scalar implicatures: A Quantity vs. a Relevance approach

Scalar implicatures have been a much discussed issue among both Neo- and Post-Griceans. As we have seen, the formers claim that they are GCIs because they

⁹ As I pointed out above, the third or M-heuristic is not relevant to this paper so it has been left out.

depend on Grice's first Quantity maxim and a linguistic item to arise. Moreover, they argue that such inferences are in contrast with implicatures derived from Grice's second Quantity maxim. The latter, however, state that scalar implicatures do not depend on any maxim to arise but on Relevance Theory's principles. Consequently, they believe that Relevance Theory would be more accurate than a Quantity maxim, principle or heuristic to explain the scalar implicature phenomena. The reasons seem quite clear: to begin with, Relevance Theory denies the contrariness between Q-based and I-based implicatures (section 6.1.). Secondly, the principle of relevance restricts all previously seen Gricean theories (section 6.2.). Finally, while Gricean accounts only give an explanation of when these implicatures arise, Relevance Theory can explain when these implicatures arise and when they do not (section 6.4.).

6.1. There is no clash

As previously seen Neo-Griceans such as Horn (1972, 1984, 1989) and Levinson (1987, 1995, 2000) claim that the two Gricean Quantity maxims as well as their own principles and heuristics make opposite predictions. While Grice's first Quantity maxim, Horn's Q principle and Levinson's Q heuristic give rise to implicatures that negate a stronger proposition than the one uttered ((18) below), the application of the second Quantity maxim of Grice, Horn's R principle and Levinson's I-heuristic imply a stronger proposition than the one uttered ((20) below). Let's have a look at Grice's (1975) previous example:

(17) X is meeting a woman this evening.

(18) GCI: The woman that X is meeting is not X's wife, mother, sister, or perhaps even close platonic friend.

(19) I broke a finger yesterday.

(20) GCI: The finger was my own.

By contrast, Relevance theorists state that such maxims, principles and heuristics are not really in "fundamental conflict" (Richardson & Richardson, 1990; Carston, 1995, 1998).

The Relevance theorist Robyn Carston (1995) claims that the two maxims, principles and heuristics work in the same way. She argues that in both cases "what is communicated" entails "what is said" and "what is implicated" does not entail "what is

said” because it is a stronger or weaker proposition than the one given at such level (Carston, 1995). Besides, she goes further and affirms that both can share the same explanation for the implicatures they generate, meaning that they do not give rise to opposite predictions (Carston, 1998). I recall her example here:

(30) John was reading a book.

(31) Implicates: John was reading a non-dictionary.

(32) Some people like eating raw liver.

(33) Implicates: Not everyone likes eating raw liver.

(Carston, 1998: 194)

According to Neo-Griceans, implicature (31) would be the result of the R-principle (“Make your contribution necessary; Say no more than you must”)/I-heuristic (“What isn’t said is the obvious”). Implicature (33), instead, would result from the application of the Q-principle (“Make your contribution sufficient; Say as much as you can”)/heuristic (“What isn’t said, isn’t the case). Nevertheless, Carston demonstrates that both implicatures (31) and (33) could arise from either of the two principles/heuristics just mentioned. She argues that implicature (31) could be derived from a Horn scale <dictionary, book> in which the choice of the weaker element causes the negation of the stronger one and that (33) could be seen as a derivation through the use of stereotypical knowledge in the sense of Levinson’s I-heuristic because “raw liver is generally assumed to be unappetizing” (Carston, 1998: 194).

These analyses show that scalar implicatures which according to Horn and Levinson can possibly be derived from one of the two different principles/heuristics can also be derived from the other principle.

6.2. Relevance over Quantity

In her 1998 paper Carston affirms that:

“Even those pragmatists most committed to the principle concerning quantity of information have no choice but to advert considerations of relevance, even when they are explained the paradigm case of quantity-based implicatures, namely scalar implicatures. They all rely on an intuitive notion of relevance, none

having attempted any precise characterization of the notion or the factors that go into making an utterance more or less relevant”.

(Carston, 1998: 190)

Those considerations of relevance are present in the Gricean maxims and Neo-Gricean principles explained in this paper (Horn’s and Levinson’s ones in this case). I shall begin by analyzing the Gricean Quantity maxims in more depth.

Grice’s first Quantity maxim “Make your conversational contribution as informative as is required” is completed by some information in brackets, namely, “for the current purposes of the exchange”. According to Welker (1994) it is clear from the information in the brackets that “Quantity-1 is “bounded” by Relevance so that “the maxim of Relevance may be more important than Quantity-1” (as cited in Carston 1998: 189).

In the same way, Grice’s second Quantity maxim “Do not make your contribution more informative than is required” seems to be constrained by Relevance again. Indeed, Grice himself noted down that this maxim was quite controversial and that “its effect will be secured by a later maxim, which concerns relevance” (Grice, 1975: 46).

Just as Grice acknowledged that the maxim of relation governs one of his Quantity maxims (Grice, 1975), Matsumoto (1995) considers that in order to obtain a scalar implicature from the first Gricean maxim of Quantity, Sperber & Wilson’s notion of relevance must be taken into account:

“What is crucial in the working-out of a Quantity-1 implicature is that the speaker assumes that the hearer infers that the non-use of S (...) may be due to the speaker's observance of the Maxims of Quantity-2 ('Do not make your contribution more than is required in the context of the exchange'), Relation ('Be relevant'), and Obscurity Avoidance ('Avoid obscure expressions'), etc.”

(Matsumoto, 1995: 25)

He says that when the speaker is not being as informative as she is required, that is, when she is not using the stronger element of the scale, it is for some reason: maybe the stronger element conveys information that it is not required in the context; or maybe

it is irrelevant in the context, or maybe it is an unclear expression (Matsumoto, 1995). He also claims that Relevance Theory can account for those three reasons, so he suggests gathering them together under the following condition for scalar implicatures:

“The use of W instead of S must not be attributed to S being less relevant in Sperber & Wilson's sense (i.e., carrying fewer contextual effects and/or requiring more processing effort).”

(Matsumoto, 1995: 53)

Relevance Theory explains the first reason (non-requirement of more information) by means of effort-effect (the smaller the processing effort and the greater the cognitive effect, the more relevant the input); the second (irrelevancy) by means of the notion of relevance, which comprises context; and, finally, the third (unclear expression) by clause (b) in the presumption of optimal relevance (“The ostensive stimulus is the most relevant one compatible with the communicator’s abilities and preferences”).

Another consideration of relevance by Neo-Griceans is that of Levinson (1987) in his I-Principle and I-Heuristic. As regards his I-Principle “Amplify the informational content of the speaker’s utterance, by finding a more specific interpretation up to what you judge to be the speaker’s m-intended point” (Levinson, 1987: 68). Carston says that to know what the speaker’s m-intended point is the concept of relevance is needed (Carston 1998: 186). Neo-Griceans have no way of explaining such “intended point” via maxims or principles and heuristics; therefore Carston believes that a well-defined notion of relevance may help because to discover the speaker’s “m-intended point” the context needs to be taken into consideration. Concerning his I-heuristic ““What is simply described is stereotypically and specifically exemplified” (Levinson, 1995: 97), Carston objects that the notion of relevance rather than stereotypicality would be more precise (Carston, 1995). In fact, there is no reason to suppose that one interpretation is more obvious (more stereotypical) than another one unless the context in which it is uttered is taken into account (here is when relevance comes into play). Let’s recall one of Levinson’s I-based inference examples in (29): *John’s book is good*. According to Levinson, this utterance implicates conversationally that the book is “the one he read, wrote, borrowed, *as appropriate* [my italics]” (Levinson, 2000: 37), being each interpretation a default inference and choosing “the appropriate” one in terms of

obviousness or stereotypicality. Nevertheless, Carston denies that any of the listed interpretations is a default inference (Carston, 1995): “The book that John read” is not a more obvious or stereotypical interpretation than “The book that John wrote” without considering the context.

All in all, it seems that relevance is over Quantity. Consequently, implicatures derived from the Quantity maxims are constrained by relevance and this leads us to two conclusions that I will discuss in the next subsections. First, that these implicatures may be not GCIs but PCIs; and second, that the Relevance approach would probably predict scalar implicatures better because it would explain both their occurrence and non-occurrence.

6.3. Scalar implicatures as PCIs

One of the consequences of affirming that the notion of relevance needs to be considered in Quantity-based inferences, in this case in scalar implicatures, is that the resulting implicatures become context-dependent. In fact, as explained before, the notion of relevance is context-based. Thus, given that context-dependency, scalar implicatures should be viewed as PCIs rather than GCIs (Carston, 1995).

The other consequence of affirming that the observance of the notion of relevance is essential when inferring information involving Quantity is, as I will demonstrate in the next section, that Relevance Theory seems more accurate in the prediction of scalar implicatures than any Quantity-based inference system.

6.4. A Quantity vs. a Relevance approach to scalar implicatures

Neo-Griceans (Horn, 1972; Levinson, 1987; Matsumoto, 1995) explain that scalar implicatures arise from Grice’s first Quantity maxim or from an application of some principles or heuristics based on Grice’s maxims and especially on the first Quantity maxim and the availability of an ordered set of linguistic items. However, they do not explain the cases where they do not arise. In contrast, Relevance theorists can account for the non-emergence of scalar implicatures (Sperber & Wilson, 1986/1995; Carston, 1998).

As an illustration, I will examine the scalar cases involving taxonomies¹⁰ and the construction “some of the X”.

¹⁰ Taxonomy is the naming of groups that share a set-subset relation. Since the items in each group are ordered in levels of specification, they can be considered one type of Horn scale (Matsumoto, 1995).

6.4.1. *Scalar implicatures involving taxonomies*

Examples taken from Carston (1998):

(34) A: What did you buy for your mother?

(35) B: I bought her flowers.

(36) Predicted scalar implicature: I didn't buy her roses.

(37) A: Billy got a dog for Christmas.

(38) Predicted scalar implicature: Billy didn't get a spaniel.

Following Neo-Gricean principles, the predicted scalar implicatures in (36) and (38) would arise as a consequence of the speaker having chosen the weaker element of a Horn scale involving a taxonomy, namely <rose, flower> and <spaniel, dog> and failing, therefore, to be more specific. However, Relevance theorists claim that in these contexts no scalar implicature would arise because the answer that B is giving in (35) and the sentence B utters in (37) make the utterance optimally relevant (Sperber & Wilson, 1986/1995).

Hirschberg (1985) also contributed to the explanation of scalar implicatures involving taxonomies. She argues that this type of scales only give rise to implicatures when “a term belonging to a level subordinate to the basic level has been mentioned in the previous discourse” (as cited in Matsumoto, 1995:29). That is, scalar implicatures involving taxonomies only arise when they are relevant in the context they are produced. For instance, in the previous example, the scalar implicature (36) “I didn't buy her roses” would only arise from B's answer (35) “I bought her flowers” if A's question had mentioned a term belonging to a subordinate level (in this case, roses) to the basic level (flowers): “Did you buy roses for your mother?” As this is not the case, (35) is relevant enough in the context above and the taxonomy <rose, flower> does not license a scalar implicature. As regards example (37), in this context it is not necessary to mention the breed of the dog. So A's utterance in (37) is again relevant enough and no scalar implicature to “not a spaniel” arises.

Hence, once again, relevance seems to give a better explanation for the scalar implicature phenomenon.

6.4.2. *Scalar implicatures involving the construction “some of the x”*

When talking about scalar implicatures, Griceans (Horn, 1972; Levinson, 1984; Matsumoto, 1995) mention the Horn scale <all, some> and argue that whenever the speaker chooses the weaker element of such scale (some) she is automatically implicating the negation of the stronger element (not all). Nevertheless, there seem to be many examples in which no scalar implicature to “not all” arises from the use of “some”:

(39) Some birds flew past the window.

(40) I’d like some apples.

(41) It took me some time to get here.

(42) The park is some distance from my house.

(Carston, 1995: 235)

As we can see, no implicature to “not all” arises in any of the above cases. Instead, the interpretation of each sentence seems to be “some and probably all”. Analyzing this phenomenon, Carston (1995) noticed that the most used examples to account for scalar implicatures involve the construction “some of the X” and not the word “some” alone.

In the same way, Carston (1995) observed that it can also be the case that we find the structure “some of the X”, but again, no implicature to “not all” arises; pointing out that the emergence of a scalar type implicature by the use of such a construction is attached to a context in which the contrast between “some” and “not all” is relevant. Let’s see all of this exemplified:

(43) A: If you or some of your neighbors have pets, you shouldn’t use this pesticide in your garden.

(44) B: Thanks. We don’t have pets, but some of our neighbors certainly do.

(45) A: Do all, or at least some, of your neighbors have pets?

(46) B: Some of them do.

(Sperber & Wilson, 1986/1995: 277)

According to Neo-Griceans, the inference from “some” to “not all” is a GCI. Thus, they would claim that utterances in (44) and (46) give rise to the following implicature:

(47) “Not all of our neighbors have pets.”

By contrast, Relevance theorists claim that implicature (47) only arises from B’s utterance in (46). In fact, the present examples fulfill the features that Carston noticed and the ones I have mentioned above: on the one hand, that both examples involve the construction “some of the X” and on the other, that the derivation of the scalar implicature depends on the context. Therefore, while (44) does not give rise to an implicature, (46) does (Carston, 1998).

Sperber and Wilson’s (1986/1995) contribution to the explanation of the emergence of scalar implicatures also takes into account the context in which a construction like “some of the X” is used. That is why in the case of (44) they say that no implicature arises. For them, B’s utterance is relevant enough for the context in which it is produced, so there is no need to suppose that she wanted to communicate that “not all of their neighbors have pets” (A only asks whether some of the neighbors have pets and he does not ask if all of them do).

Regarding (46) Sperber & Wilson (1986/1995) point out that B’s utterance could give rise to two implicatures, given clause (b) of the presumption of optimal relevance: on the one hand, that B is unable to say whether all of her neighbors have pets (speaker’s ability); on the other, that B is unwilling to say whether all of her neighbors have pets (speaker’s preference). Moreover, although the proposition that B expresses is relevant (it fulfills the notion of relevance defined in (12)), they argue that the speaker could have been more informative in the context provided (in fact, A asks whether all of the neighbors or at least some of them have pets).

In sum, it seems that whereas the presumption of optimal relevance can explain both the emergence and the non-emergence of scalar implicatures, Neo-Gricean theories cannot.

7. Experimental pragmatics on scalar implicatures

Scalar implicatures have also been a much discussed phenomenon in experimental pragmatics (Noveck, 2001; Papafragou, 2003; Bott & Noveck, 2004; Guasti et. al., 2005; Noveck & Sperber, 2007). Such experimental approaches have provided evidence when deciding which of the two pragmatic tendencies presented in this paper (the Neo-Gricean and the Relevance Theory) predicts the so-called scalar implicature cases more accurately.

According to the Gricean assumption that this type of GCI is a default inference, that is, that it can be inferred automatically from a linguistic item (unless there is some specific indication in the context blocking it), Neo-Griceans believe that such implicature is inferred regardless the context and that its inference, being instantaneous, speeds up communication (Levinson, 1995, 2000). For instance, the use of the scalar term *some* will automatically imply *not all* unless it is cancelled (*Some and in fact all*). By contrast, Relevance theorists are opposed to those beliefs and claim that the appearance of this kind of implicature is context-dependent and that consequently, the processing effort to infer it is different than if we treated it as a default inference (Sperber & Wilson, 1986/1995; Carston, 1998). In this case, the use of *some* will be literally interpreted as *possibly all*, unless the context indicates that the scalar interpretation *not all* is more relevant. Experimental pragmatics on scalar implicatures supports Relevance Theory's hypotheses.

When discussing the effort that hearers are required to make when interpreting scalar implicatures, Noveck and Sperber (2007: 14) drew the following table:

	GCI theory	relevance theory
literal	default enrichment + context-sensitive cancellation, <i>hence slower</i>	no enrichment, <i>hence faster</i>
enriched	default enrichment, <i>hence faster</i>	context-sensitive enrichment, <i>hence slower</i>

Table 1. *Contrasting predictions of GCI theory (Gricean) and Relevance Theory regarding the speed of interpretation of scalar terms.*

They argue that default inferences as well as their cancellation require a processing effort. Therefore, if default inferences had to be frequently cancelled, the processing effort invested to infer the literal (semantic) implicature would contradict the nature of the default interpretation itself because the inference would not be automatic. Hence, its cancellation would imply a great processing effort as first the implicature would be derived by default and then cancelled. (Noveck & Sperber, 2007). They compare this with the effort of inferring the implicature in the way that Relevance theorists suggest: by taking the context into account and deriving it only when it is relevant. Thus, the pragmatic (scalar) interpretation would be more costly to derive but the literal (semantic) one would not require any effort at all. All in all, Noveck and Sperber doubt both the idea of treating the pragmatic meaning of the scalar terms as a default inference and the claim that as they are default implicatures, they do not require a big effort to be derived make sense.

As an example, Noveck and Sperber (2007) use the scalar terms *<and, or>*. Although they do not have statistical data to present, they question the Gricean idea to treat the utterances of the form “P or Q” as implicating “not (P and Q)” by default together with the belief that such an inferential process warrants faster communication. After demonstrating that some uses of utterances like “P or Q” are exclusive (they imply “not P and Q”) and other inclusive (they imply “P or Q or both P and Q”), they recommend that rather than assuming the scalar (pragmatic) implicature to be the default one and as a result, assert that it speeds up communication, such assertions should first be investigated.

Bott and Noveck (2004) proved wrong Neo-Griceans’ claim that when using scalar terms, the pragmatic interpretation is automatically derived. Moreover, they demonstrated that the pragmatic interpretation takes longer to be inferred than the literal one. They created four experiments. In the first one, 22 participants were given a task that involved the use of the scalar terms *some* and *all* (like *Some* elephants are mammals and *All* elephants are mammals) and they were asked to identify them as true or false. In the first round they were ordered to treat *some* literally (*some and possibly all*) and in the second to treat *some* pragmatically (*some but not all*). The rest of experiments (Experiments 2, 3 and 4) used the same task as in Experiment 1 but involved little

changes. In Experiment 2 the exemplar was modified to verify the results obtained from Experiment 1 avoiding possible criticism pointing that the experiment could be biased in favor of the literal interpretation because (a) it was identified as “true” and (b) there is a supposition that people take longer to deny a sentence rather than to confirm it. In Experiment 3 participants were not told how to interpret *some*. Lastly, in Experiment 4, participants had a fixed amount of time (in one case long time and in the other short) to respond. The four experiments indicated that the first treatment that people do of *some* is the literal one (*some and possibly all*) contradicting the predictions of the Gricean default inferential system. Furthermore, Experiments 3 and 4 gave evidence that the pragmatic interpretation requires more processing effort than the literal one.

Noveck (2001) designed three experiments whose results also refuted Neo-Griceans’ assertion that the pragmatic interpretation in scalar implicatures requires a low processing effort because it is inferred by default. The first experiment tested participants to interpret the modal *might* in a context in which both the literal interpretation (*might* compatible with *must*) and the pragmatic one (implicating *must not*) are inferable. The second experiment used the same task as Experiment 1, but participants were trained to infer the literal interpretation. Lastly, the third experiment asked participants to mark as true or false sentences with the linguistic elements *some* and *all* in order to analyze which interpretation of the weak scalar expression *some* was more likely to be made. Participants were from 5-year-olds to adults, except in the third experiment, where the youngest were 7 years old. Results from the three experiments showed that adults are more likely than children to infer the pragmatic interpretation in each of the cases, providing evidence that the pragmatic interpretation results from a greater processing effort than the literal one (at least in children’s case).

Musolino and Papafragou (2003) and Guasti et al. (2005) also supported the idea that children tend to use the literal (semantic) meaning of a weak scalar term as the default interpretation. Nevertheless, they report that such tendency is reduced when they are instructed (Musolino and Papafragou, 2003; Guasti et al., 2005) or when the context in which the utterances containing a weak scalar term makes highly relevant the pragmatic interpretation (Guasti et al., 2005).

8. Conclusion

This paper has shown two major analyses for scalar implicatures. I have presented both the Gricean and the Relevance Theory account from a theoretical and experimental perspective, concluding that the most accurate theory to predict the scalar implicature phenomenon is Relevance Theory. Moreover, I have also tried to demonstrate that the Gricean account for verbal communication is less adequate as well as its explanation of how implicatures are generated or how the information conveyed by them is recovered. Many claims of their theory have been criticized and denied by means of relevance: (i) the contrariness between Q-based and I-based inferences, (ii) the attempt to explain the generation of implicatures without considering the context in which they arise and (iii) their Quantity-based account of the generation of scalar implicatures.

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