AN INFERENTIAL MODEL OF COMMUNICATION, AS ENVISAGED IN RELEVANCE THEORY

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RESUMEN

La idea de P. Grice de que comunicarse consiste primordialmente en atribuir intenciones a un hablante es considerada por D. Sperber y D. Wilson como la base para explicar el modelo comunicativo *inferencial* que funciona independientemente del código lingüístico utilizado por los humanos en la comunicación. Así, la *teoría de la relevancia* desarrollada por dichos autores no sólo intenta dar cuenta de la comunicación verbal sino que trata de ser una teoría integradora, en el sentido de que pretende explicar el fenómeno de la comunicación en general, tanto verbal como no verbal.

ABSTRACT

Grice's contribution that communicating something by an utterance involves the attribution or recognition of the speaker's intentions is, according to D. Sperber and D. Wilson, the basic idea for explaining the *inferential* mode of communication which works independently and often combines with the linguistic code in human interaction. Thus, the *theory of relevance* developed by these authors does not only intend to account for human verbal communication but aims to be an integrating theory of communication, as it tries to explain not only utterance comprehension but also non-verbal (i.e. non-coded) communication.

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Natural languages have traditionally been looked at as functioning like *codes*. As we all know, a code is a system which pairs signals (i.e. symbols) with messages in a conventional arbitrary way. As a consequence of our considering languages to work like a code, it has also been taken for granted that human verbal communication is achieved just by a person encoding a message into a signal and by another person decoding this signal in order to get the message intended by the addresser[1].

This is how human communication has traditionally been accounted for. However, Sperber and Wilson (1995: 9) point out that this idea that languages are codes and that we communicate simply by encoding and decoding information offers just a very simplified scheme of what communication is. There is more to human communication than just a process of coding and decoding. The main argument that these authors give to back up their view is that one and the same sentence "can be used to convey an infinite number of different thoughts".

To illustrate, a sentence like 'I gave the money to him yesterday'[2], whose conventional meaning would be something like 'the speaker (1st person, singular, animate) offered a certain amount of money to someone (3rd person, singular, animate, male) the day before the utterance took place', can convey an infinite number of different thoughts depending on the elements making up the extralinguistic situation. In order to know what is the exact thought conveyed by a particular speaker of this sentence, we need to have access to contextual information, i.e. who is 'I', what exact amount of money the speaker is talking about, who the pronoun 'him' refers to, and when the sentence was uttered. Thus, on one occasion the thought conveyed by this sentence would be 'Mary gave 50 pounds to Mark on the 15th of June' and on another occasion the thought could be 'John gave 2.000 pounds to Peter on the 1st of May'. That is, there are different thoughts that could be communicated through the same linguistic expression or sentence.

The idea that a sentence can be used to communicate an infinite number of thoughts is also borne out by the fact that an utterance can carry different propositional attitudes or illocutionary forces. For instance, the sentence 'John is sleeping', when uttered, may be just an *assertion*

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describing an actual state of affairs; or it can be uttered with a rising intonation as a *request for confirmation*; or in another context it can be used to express *outrage* at the fact that John is still sleeping at lunchtime; or in other circumstances we can utter this sentence on seeing John sleeping *suggesting* that we could do the same; or it can have the force of an *order* for our addressee to wake John up. The speaker's intention in each of these examples, and therefore the thought communicated by each of them, is different; however, the linguistic expression used is the same in all cases. How we arrive at the speaker's intended meaning involves a process of inference through the use of extralinguistic information.

These examples lead also to another important idea highlighted by Sperber and Wilson: a linguistic expression is only an (interpretative) representation of a speaker's thought. This means that, in comparison with the linguistic expression used to convey it, a speaker's thought, first, has no reference indeterminacy; second, is semantically unambiguous; and third, is semantically more complete or richer.

Regarding the use of referring expressions, as we have seen, a speaker's thought has all the contextual referents assigned (as happened with 'Mary', 'Mark', etc. in the example above). As for semantic ambiguity, a speaker's thought is less ambiguous than the linguistic expression used to convey it, as we can see in the example 'I don't understand this stuff'. It is in the speaker's mind, and not in the linguistic expression itself, that the word 'stuff' is disambiguated. If it were uttered by you now, 'stuff' would probably refer to the things you are now reading. In relation to the idea of semantic completeness, a speaker's thought is semantically more complete or richer than the linguistic expression used, as is illustrated by the sentence 'Jennie is too short'. Too short for what? Too short for his boyfriend? Too short to work as a model? Too short to reach the shelf? This information is not present in the linguistic expression but is clear in the speaker's thought and it can also be clear to the addressee as long as they have access to sufficient extralinguistic information.

Both types of examples ('I gave the money to him yesterday' and 'John is sleeping') show that when we use a linguistic expression in verbal

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communication, very often there is not a correspondence between the semantic representation (or conventional meaning) of that linguistic expression and the thought that is communicated. Or, in the words of Sperber and Wilson, although it is true that a language is a code that pairs phonetic representations of sentences (i.e. acoustic signals) with the semantic representations of these sentences (i.e. the abstract, conventional or literal meaning), there is often a *gap* between the semantic representations of sentences and the thoughts actually communicated by utterances. How we bridge this gap is what Sperber and Wilson try to explain through their relevance theory. Suffice it to say now that this bridging from *what is said* to *what is* actually *meant* involves a process of inference by means of the use of contextual information.

Sperber and Wilson's theory of relevance is grounded in cognitive psychology and findings in this scientific field have proved the fact that the recognition of intentions is a normal feature of human cognition (1995:32). Thus, Grice's idea of communication as the recognition of the communicator's intentions (1957) (although with some modifications[3]) is seen by Sperber and Wilson as crucial in understanding how human interaction takes place as it provides the basis for the development of an *inferential mode* of communication.

Before Sperber and Wilson, other authors such as Searle (1969) or Gazdar (1979) tried to incorporate Grice's ideas into their pragmatic theories but, instead of developing an inferential model of communication, they elaborated on the idea that interlocutors share knowledge of conventional rules, thus ending up making amendments to the code model.

On the contrary, Sperber and Wilson distinguish two independent (yet usually combined) modes of communication: a conventional and non-inferential one, known as the *code model,* and a non-conventional and inferential model, which these authors call the *ostensive model.* Communication between humans is then considered possible without the existence of a code (namely, a linguistic code), i.e. without a set of conventions.

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TWO MODELS OF COMMUNICATION: *CODE* AND *OSTENSION*

Just as the *code* model consists of two processes, *coding* and *decoding*, the *ostensive* model involves two steps: *ostension* and *inference*. Therefore, we can say that *coding* is for the *code model* what *ostension* is for the *ostensive model*, and *decoding* is for the *code model* what *inference* is for the *ostensive model*. In other words, *ostension* is a productive process and it is thus carried out by the addresser, whereas *inference* is an interpretative process performed by the addressee.

In *ostensive-inferential communication:* The communicator produces a stimulus[4] in order to fulfil two intentions (Sperber and Wilson 1995: 163):

1. *the informative intention*: to make mutually manifest[5] to communicator and audience a set of assumptions[6] or, in other words, to make the audience believe something.

2. *the communicative intention*: to make his informative intention mutually manifest. That is, the intention to make the audience recognise that he has an informative intention, i.e. that he wants to communicate something.

One of the essential characteristics of *ostensive-inferential communication* is that the communicator's communicative intention has to be fulfilled, i.e. that it should be known (or rather *manifest*, in Sperber and Wilson's terms) both to addresser and addressee that the former wants to make manifest a set of assumptions. When the communicator's communicative function is not fulfilled, i.e. when either the addressee does not recognise that the communicator has an informative intention, or when she recognises that the addresser intends to communicate something but the fact that she has recognised this is not mutually known by both addresser and addressee, communication may fail.

For example, imagine the situation in which I go to my parents' and hand out my hair-drier to my father (a bald man!), who is very good

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at mending things and is used to my asking him to fix things for me. This ostensive stimulus of handing out my hair-drier is used to make manifest the assumptions 'that there's something wrong with my hair-drier and that I want my father (i.e. the addressee) to mend it'.

Here, my *informative intention* is the assumption that I want to make manifest, i.e. that I want my father to entertain in his mind: 'There's something wrong with my hair-drier and I want you to mend it'. My *communicative intention* is the intention that my father recognises the fact that I have an informative intention, i.e. that he realises that I want to communicate something to him (that I want to make something manifest to him). The communicative intention has to be fulfilled for communication both to be considered ostensive and to take place successfully.

Imagine now that I know my father is coming over to my house, so I leave the broken hair-drier on the kitchen table hoping that he will see it when he arrives. My father and I have a coffee at the kitchen table (so he, consequently, sees the hair-drier) but he doesn't realise that I have an informative intention, i.e. he doesn't realise that I want to make manifest to him the assumptions that my hair-drier is broken and that I want him to mend it. In other words, my communicative intention is not fulfilled. It is because the communicative intention is not fulfilled that my father may make the wrong assumptions, e.g.: 'that I forgot the hair-drier in the kitchen because I keep on being so untidy and disorganised'. On other occasions, the addressee may recognise that the communicator has an informative intention but because the stimulus used (e.g.: leaving the hair-drier on the table) is not overt[7], (i.e. because it is not mutually manifest by communicator and audience that the former wants to communicate something), the audience may ignore the fact that the addressee intends to inform her of something. In this last case and going back to the example, my father, even though realising that I *intend* to inform him of something in relation to my hair-drier, acts as if he has failed to recognise my intention to communicate (since I haven't conveyed this in an overt way). This way, I may think that my father is just absent-minded, but not that he has refused to mend the hair-drier.

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Only the first stimulus, when I hand out the hair-drier to my father, is considered to be *ostensive* and only then can we speak of *ostensive-inferential communication.* In the second case, when I leave the hair-drier on the table, the stimulus is not considered ostensive and so we cannot speak of *ostensive communication.*

In these examples a non-coded stimulus has been used. We must bear in mind that there is no conventional association between the gesture of handing out a hair-drier to someone and the message that 'the hair-drier is broken, and I want you to mend it'. On another occasion the same stimulus could make manifest a different set of assumptions: 'You can have my hair-drier, I've bought a new one'. It is the contextual factors that will enable the addressee to infer the intended (i.e. *relevant*) message.

On other occasions the ostensive stimulus may be a coded, verbal one. Instead of handing out the hair-drier to my father, I could have said to him (while pointing to my soaked hair): *Everything seems to break down, when you most need it.* This utterance acts as an ostensive stimulus to make manifest to my father that my hair-drier is broken and that I want him to mend it. However, a mere process of decoding using knowledge of the linguistic code will not lead the addressee to the intended message: there is no conventional association between the sign 'Everything seems to break down, when you most need it' and the message that my hair-drier is broken and I want you to mend it. In order for my father to arrive at the intended message he has to go through a process of inference by using both contextual information derived from the immediately observable environment (me pointing to my wet hair), and extralinguistic information retrieved from his long-term memory, i.e. the assumption that whenever something breaks down I take it to him to mend it.

What conclusion can we draw from this example? Very often linguistic expressions function as ostensive stimuli or, in the words of Sperber and Wilson (1995:27), "the output of decoding is correctly treated by the audience as a piece of *evidence* about the communicator's intentions" (the emphasis is mine). The same idea is expressed by Blakemore (1991:44) when she says that an utterance is just a "linguistic clue" to what the speak-

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er really means, but this clue has to be interpreted together with contextual information. What these authors mean is that besides decodifying the literal meaning conveyed by a particular utterance, the addressee has to perform some inferential tasks using contextual information in order to get to the message intended by the addresser.

The main idea to be highlighted is that, according to Sperber and Wilson, it is possible for human communication to take place without a code model, but the ostensive model is always necessary. (We must acknowledge that having a code model facilitates things but a linguistic code is not indispensable). For example, I can communicate that I'm hot and want someone to open a window, without saying anything, just by fanning myself ostensively so that the addressee can infer what I mean using the context. However, I cannot communicate that I'm hot just by saying *I'm boiling*, without there being any process of inference that will allow the addressee to infer: first, who 'I' refers to; and second, that what the speaker means is not the literal meaning given by the linguistic code (that he is being cooked in water at 100ºC) but that he is hot and wants someone to open a window. This idea is expressed clearly by V. Escandell (1996: 129) in the following quotation: "(...) entre lengua y comunicación no hay una relación de correspondencia biunívoca. (...) el lenguaje *puede* ser *un* instrumento de comunicación, pero no es *el* instrumento –es decir, no es el único medio- necesario e imprescindible de que se sirve la comunicación humana".

THE SCOPE OF WHAT IS COMMUNICATED

Before explaining what the role of inference is in relevance theory, it is vital to address the question of *what is communicated*, that is, what the object of study of relevance theory is. The main idea that is put forward by Sperber and Wilson is the belief that what is communicated in human interaction ranges from very specific propositions, to rather vague meanings or impressions.

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It has already been suggested that very often in verbal communication the speaker communicates more than he says literally by means of words or sentences. In other words, there is a distinction between *sentence meaning* and *speaker meaning* (also referred to as *the speaker's intention* or *implicated meaning*). Thus, in example (1), taken from Sperber and Wilson (1995:56), Mary would normally be taken to mean that she does not want any coffee (in other contexts, those in which she does want to keep awake, that she wants coffee):

(1) Peter: *Do you want some coffee?*
Mary: *Coffee would keep me awake.*

Therefore, in many cases (probably most cases) of linguistic communication the speaker is said to communicate: 1.a proposition that is expressed explicitly by means of the words uttered (the proposition that 'coffee would keep Mary awake') and 2. a proposition that is conveyed indirectly and derived through inference (the proposition that 'Mary does not want any coffee'). Pragmatics is said to be concerned with the meaning conveyed indirectly whereas semantics deals with the conventional meaning[8].

In the above example both the literal meaning and the implicated meaning are very precise, i.e. both can be expressed through an explicit linguistic paraphrase: 1. coffee would keep Mary awake; and 2. Mary does not want any coffee. However, in normal conversation, the speaker's intentions are often very vague and difficult to spell out. For instance, example (2), taken from Blakemore (1992:10), is not so straightforward as example (1) in the sense that it is not so easy to paraphrase by means of a proposition what the speaker implicates, i.e. the speaker's meaning.

(2) Peter: *What shall we do this evening?*
Mary: *I'm really tired.*

Here, the literal meaning of the utterance *I'm really tired* is again very precise (the proposition that 'Mary is really tired'). However, the implicated meaning or speaker meaning is not so easy to pin down. What does Mary really mean? That she doesn't want to do anything at all? That she doesn't want to do anything exhausting? That she wants to sleep? That

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she wants to stay in and read a novel? As we can see, in everyday interaction it is usual to communicate our intentions very vaguely.

This phenomenon of vagueness and indeterminacy of the speaker's intentions is very frequent in literature. For instance, what exactly does Shakespeare mean when, in his sonnet 60, he says:

> Like as the waves make towards the pibbled shore,
> So do our minutes hasten to their end;
> Each changing place with that which goes before,
> In sequent toil all forwards do contend.

We could paraphrase what Shakespeare means through the proposition: 'Life goes by quickly just as waves move quickly'. However, this proposition fails to convey many of the *effects* or *impressions* that Shakespeare's sonnet transmits.

As has been seen so far, we not only communicate precise meanings or propositions (as with the literal meaning of sentences, or the implicated meaning of example (1)), but also more vague meanings such as with example (2), and even a whole range of impressions or thoughts, such as with Shakespeare's sonnet. Therefore, in communication we can speak of a continuum going from very precise to very vague meanings. Pragmatic models before relevance theory had only taken care of those cases of implicated meanings that were precise as in example (1) and ignored cases in which the speaker's intentions were vague. In contrast, Sperber and Wilson's theory of relevance can account for all types of communicated meanings, whether precise or vague. What is more important, literary utterances are not seen as different from those occurring in everyday conversation but all cases of communication are accounted for by means of just one principle, the *Principle of Relevance.*

The examples above only make reference to verbal communication, i.e. this in which the ostensive stimulus used is an utterance, but vagueness of meaning also applies to non-verbal communication. Imagine you open the balcony of a hotel room which overlooks the sea, and as you do it you sniff ostensively. What do you intend to communicate exactly? That you feel relaxed by the breeze coming in? That the smell of the sea is invigorat-

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ing? That you are delighted to be there? That you missed the smell of the sea?[9] A whole range of impressions and thoughts could be communicated by this ostensive stimulus.

THE ROLE OF *INFERENCE* IN THE THEORY OF RELEVANCE

In order to understand what the process of inference is, it is vital that we know where in our brain such a mechanism takes place. Humans have in their brain two types of systems which process data, namely *input systems* and *central systems*.

The *input systems* (also referred to as peripheral or perceptual systems) are very 'specialised mechanisms' because they are sensitive only to a particular kind of sensory stimulus. For instance, the acoustic system is an input process which is only sensitive to acoustic information, and the visual system is an input process only sensitive to visual information. The aim of the input systems is to transform 'lower-level' sensory representations (whether they are visual, acoustic, olfactory, etc) into higher-level *conceptual representations* (i.e. into *assumptions*), which are all in the same format regardless of the input system they come from. Such conceptual representations (or assumptions) have a logical form, which means that they can undergo deductive rules and enter into relations of implication and contradiction with other conceptual representations. The *linguistic system* is also an input system, because it is sensitive only to a particular sensory stimulus, i.e. acoustic signals or utterances (in the case of spoken language), or visual signals or inscriptions (in the case of written language). Thus, for instance, in spoken communication the linguistic input system of an addressee decodes the acoustic signals produced by the speaker and transforms them into a *conceptual representation* (i.e. into an assumption).

The *central systems*, by contrast, are 'unspecialised inferential mechanisms' as they operate over *conceptual representations*. As has just been said, these 'higher-level' representations are modality-neutral, i.e. they are all in the same format no matter which input system they come from. It is

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because of this that the central systems can perform inferential tasks by integrating information derived both from the different input systems and from other conceptual representations already existing in the individual's encyclopaedic memory. The type of *inferential comprehension* that takes place in utterance interpretation, as well as in cases of non-verbal communication, is a *central thought process.*

For example, when a certain addresser, Tom, makes the utterance *I'm boilin*g to mean that he is hot and wants his addressee to open a window as she is sitting next to it, automatically the addressee's linguistic input system will transform the sounds produced by Tom's utterance of the sentence 'I'm boiling' into a higher level conceptual representation, i.e. into the assumption that 'the speaker is boiling'. This conceptual representation will then be processed in the central thought processes by integrating conceptual information derived from other input systems (e.g.: the visual mechanism) and from the addressee's encyclopaedic memory. First, from the visual input system the addressee will infer two assumptions that 'I' (i.e. the speaker) refers to Tom, and also that she herself is sitting next to the door. From the encyclopaedic memory, the addressee would derive the stereotypical assumption[10] that usually when a person says they are boiling, they mean they are very hot. These assumptions together with the assumption derived from the linguistic input system, i.e. that the speaker is boiling, will enable the addressee to infer that Tom is hot and must be requesting her to open the door.

This distinction between *input systems* and *central systems* can help to shed a light on the fuzzy distinction between *semantics* and *pragmatics.* Semantics would be concerned with the action of decodifying linguistic expressions, carried out by the linguistic input system (just as the sounds obtained from the utterance *I'm boiling* are decodified into the semantic representation 'the speaker is boiling'). Conversely, pragmatics is concerned with the interpretation of utterances in the central thought processes by going through a spontaneous process of inference which makes use of information derived not only from the linguistic input system but from other input systems (e.g.: visual, olfactory, auditory), and from memory, i.e. the individual's overall representation of the world.

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DEMONSTRATIVE AND NON-DEMONSTRATIVE INFERENCE

The type of inference which takes place in utterance comprehension is a *non-demonstrative inference*, rather than a *demonstrative inference* of the type:

All men are mortal (premise)
Socrates is a man (premise)

Socrates is mortal (conclusion)

The main difference between demonstrative and non-demonstrative inference lies in the fact that the former is valid in all contexts whereas the latter cannot be said to be valid in all contexts, but is considered only 'likely to be right'. In fact, demonstrative inferences like the one in the example above are context-free because they involve a fixed set of premises and, therefore, can be valid in all contexts. However, the premises involved in inferential comprehension vary according to the information that has been processed by the addressee's input systems as well as according to the assumptions which make up her encyclopaedic memory, or that she can derive by means of her inferential abilities.

To take an example[11]:
John: *Are you going to the conference?*
Karen: *It's on pragmatics.*

The interpretation of the utterance *It's on pragmatics* depends on the assumptions which form part of John's overall representation of the world. Thus, if John's encyclopaedic memory contains the assumption that Karen is very interested in pragmatics, he will interpret the utterance *It's on pragmatics* as affirmative. Thus, the non-demonstrative inference will be as follows:

The conference is on pragmatics (premise)
If someone is very interested in pragmatics, they will go to a conference on pragmatics (premise)
Karen is very interested in pragmatics (premise)

Karen will go to the conference (conclusion)

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However, imagine that John does not know whether Karen likes pragmatics or not, but he notices how she winces when she utters the sentence *It's on pragmatics.* This visual information together with stereotypical encyclopaedic information that when someone winces it is because they don't like something, will enable John to infer the assumption that Karen is not going to the conference.

This idea of context-dependency is also highlighted by Levinson (1983:114) when he speaks of the *defeasibility* of pragmatic inferences. As he puts it, "an inference is defeasible if it is possible to cancel it by adding some additional premises to the original ones". In fact, the demonstrative inference about Socrates above remains valid whatever new premise you add to the original premises. By contrast, the non-demonstrative inference about Karen can be cancelled if she tells us later that she is going away the week the conference takes place.

As we have seen, non-demonstrative inferences are context-dependent and this is the reason why one and the same utterance *It's on pragmatics* may receive different interpretations: I'll go to the conference / I won't go to the conference. This explains why misunderstandings may occur when the contextual premises[12] used by the hearer in the inferential process are not the same as those envisaged by the speaker. As Blakemore (1992:14) points out "hearers' choice of contextual premises does not always match the ones envisaged the speaker". Imagine, for instance, that Karen had expected John to know that she hates pragmatics so that he can infer from her utterance that she is not going to the conference. However, John wrongly assumes that Karen likes pragmatics and uses this assumption as a premise in the process of inference, which leads him to the wrong conclusion, i.e. that Karen will go to the conference.

THE *DEDUCTIVE RULES* OF THE INFERENTIAL PROCESS

It is assumed by both cognitive psychology and pragmatic theory that humans use *deductive rules* in the inferential process carried out by the

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central thought processes. Such *deductive rules*[13] (unlike other logical operations like those used in conscious, non-spontaneous, reasoning tasks to prove that an argument is valid[14]) are the only logical processes which take place in spontaneous, inferential comprehension. This empirical assumption is justified mainly by means of the following argument:

First, for any organism which represents the world in conceptual terms, that is, in terms of a set of assumptions, a deductive system would effect an important economy of storage. Given a set of deductive rules, the logical implications of any set of assumptions would be recoverable from it by means of the deductive rules, and would not need to be separately stored (Sperber and Wilson 1995:85).

Therefore, it is assumed that we employ *deductive rules* as part of our mental equipment, but which rules we use exactly is still a matter of empirical investigation. All the same, the *deductive rules* which form part of humans' deductive system can be characterised attending to their formal and semantic properties.

As regards its formal properties, a deductive rule is a *logical implication*, i.e. it is a logical computation like any other existing in any deductive system. Such a logical implication holds only in virtue of the formal properties of assumptions and takes no account of their semantic properties. For instance, in most standard logics and also in humans' deductive system, there is a deductive rule called *and-elimination rule* (e.g.: $P \& Q$ logically implicates P).

With relation to its semantic properties, what distinguishes a *logical implication* (or *deductive rule*) from other computations is that the concluding assumption stands in a semantic entailment relation to the premise (or premises). That is, whenever the premises are true, the conclusion is also true. For instance, Sperber and Wilson (1995:84) provide the following example, which involves an *and-elimination rule*:

Input: Apples grow in orchads and grapes grow in vineyards
Output: Apples grown in orchads

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All *logical implications* (i.e. all *deductive rules*) are *entailments*, because they guarantee that, if the premises are true, the conclusion must also be true[15]. The reverse does not always hold.

There exist two types of *logical implications*, namely *analytic* and *synthetic rules*. Analytic rules are characterised because they involve only 'one' assumption as input, i.e. only one premise. This type of logical implication is necessary and sufficient for understanding the semantic content of an assumption, as the conclusions of analytic implications are 'intrinsic' to the meaning of the premise. An example of an analytic rule is the *and-elimination rule* explained above.

Synthetic rules involve two separate assumptions or premises as input. Unlike analytic rules, synthetic implications are not concerned with 'understanding' assumptions (i.e. are not concerned with the semantic content of assumptions) but with exploiting the initial premises to the full by working out the 'logical consequences' that can be derived from these assumptions. As Sperber and Wilson explain (1995:107):

> (...) We assume, as do most current models of memory, that information is broken down as far as possible into smaller units before being stored in memory (...). Any organism interested in improving its overall representation of the world must therefore be interested in recovering as many synthetic implications as possible from any set of assumptions it is currently processing, before the set is dismantled for separate storage. Analytic implications, by contrast, are only worth recovered as a means to an end, the end being the recovery of further synthetic implications.

An example of a synthetic implication is the rule of *modus ponendo ponens* and of *conjunctive modus ponens*, which are illustrated below:

E.g.: (1) a. If there's a bus coming and there's no traffic, we'll get to work on time (premise)
b. There's a bus coming (premise)
c. If there's no traffic, we'll get to work on time [from (a) and (b) by conjunctive moduns ponens]
d. There's no traffic (premise)

We'll get to work on time [from (c) and (d) by moduns ponens].

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The logical implications in (1) are synthetic implications (conjunctive modus ponens and modun ponens). However, before working out the synthetic implications in (1), the analytic implications of 'there's a bus coming and there's no traffic' are worked out to check that the semantic content of such a conjoined assumption has been understood so as to be able to derive the synthetic implications above.

NOTES

1 Throughout this article, the terms *communicator*, and *addresser* are used as synonyms of *speaker*, and the pronoun 'he' is employed to make reference to this entity. Likewise, the terms *audience* and *addressee* as well as the pronoun 'she' are often used instead of *hearer*.

2 Single inverted commas are used with sentences, propositions and assumptions, whereas utterances will be written in italics in this paper.

3 Strawson (1964, 1971) reformulates Grice's definition of what it is to mean something by an utterance . Such a new version consists of three sub-intentions:

To mean something by *x*, S [speaker] must intend:

S's utterance of *x* to produce a certain response *r* in a certain audience *A*;

A to recognise S's intention (a);

A's recognition of S's intention (a) to function as at least part of *A*'s reason for *A*'s response *r*.

Sperber and Wilson (1995) in turn speak of two intentions of the communicator of a message, namely the *informative intention* (i.e. to make manifest or more manifest to the audience a set of assumptions, or in other words, to make the audience believe something), which would be the same as intention (a) above, and the *communicative intention*, (the hearer's recognition that the speaker has an informative intention, i.e. that the speaker wants to communicate something) which would be equivalent to condition (b) above.

For Sperber and Wilson only intention (b) is essential in communication, whereas (a) may not always be fulfilled, nor may intention (c), which is a consequence of intention (a). In the words of Sperber and Wilson, the *communicative intention* is always fulfilled in human communication, even if the *informative intention* is not. For instance (example adapted from Sperber and Wilson 1995: 22), a communicator of the utterance *I had a hoarse voice last week* may succeed in making the addressee recognise that he wants to communicate something (*communicative intention*) but may fail in making the hearer believe the assumption that he had a hoarse voice the previous week, i.e. the communicator's *informative intention* fails to be carried out.

4 A stimulus is a modification of the physical environment which is designed to be perceived (Sperber and Wilson 1995 :29). When the addresser *overtly* conveys to the addressee that he is using a stimulus to communicate something, this stimulus is considered to be *ostensive*. For instance, if someone points to their watch to indicate to a peer that it is late, this action of pointing to the watch is an ostensive stimulus because it is known to both addresser and addressee (or in Sperber and Wilson's words *it is mutually manifest*) that the communicator

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wants to communicate something (in this case he wants to communicate the assumption that it is late, and possibly also other assumptions such as that they should leave). However, if a man puts on some after-shave to make his partner feel aroused by his manly smell, he will probably do it sparingly so that his intention won't be manifest to his partner. In this case the smell of after-shave is a stimulus but it is not an ostensive stimulus (Sperber and Wilson 1995: 153).

5 An assumption is manifest to an individual if either he is capable of *perceiving* it through their cognitive perceptual abilities, like for instance the visual or auditory abilities or if he is capable of *inferring* it through their cognitive conceptual abilities, like for example the ability to make inferences or the ability to retrieve things from memory (e.g.: from the encyclopaedic memory). In Sperber and Wilson's words, an assumption is manifest to an individual when he is capable of "representing it mentally and accepting its representation as true or probably true" (1995: 39). An important observation related to the idea of perceiving or inferring information is that human cognitive abilities, both perceptual and conceptual, vary from individual to individual. As a result, even though two individuals may share the same physical environment, there may be facts that are manifest to only one of them and not to the other, just because their cognitive abilities can differ.

6 An *assumption* is a description about the world, i.e. it is a conceptual representation about the world or belief that an individual entertains in their mind as being true or probably true. An individual's overall mental representation of the world (also called encyclopaedic knowledge) is made up of all the assumptions that they entertain in their mind. According to Blakemore (1992: 18), such assumptions "include memories of particular occasions and about particular individuals, general cultural assumptions, religious beliefs, knowledge of scientific laws, assumptions about the speaker's emotional state and assumptions about other speakers' perception of your emotional state" .

7 Only overt communication is considered by Sperber and Wilson to be genuine communication, and this is distinguished from covert communication, i.e. when the communicative intention is not mutually manifest to addresser and addressee.

8 However, one should not forget the fact that the process of going from the conventional meaning of the word 'me', i.e. 'first person, singular, animate, human,' to the contextual meaning 'Mary' is a matter of pragmatics, and not of semantics (at least, not of *sentence* semantics).

9 Example taken from Sperber and Wilson (1995).

10 According to Sperber and Wilson (1995: 88), an individual's encyclopaedic memory is made up of *factual assumptions* and *assumption schemas* (other names for this notion are *frame*, *prototype*, or *script*). Among assumption schemas, one can distinguish stereotypical assumptions and expectations about frequently encountered objects and events. For instance, people often have a stereotypical idea of a pet as being an animal like a dog or a cat, and not like an elephant or a spider. Thus, when we hear that someone has bought a pet, we automatically assume that they have bought a dog or a cat, unless we are given specific evidence to the contrary.

11 Example adapted from Blakemore (1992:13).

12 It must be borne in mind that in relevance theory the notion of context is different from the idea of context of previous pragmatic theories. Broadly speaking, the context in which an ostensive stimulus (e.g.: an utterance) is interpreted consists of only a subset of the assumptions about the world that an individual entertains in their mind. Thus, the context is defined in "psychological" terms and it is an "internal" notion of context since it is not restricted to the immediate physical environment (traditionally referred to as the *context of situation*) or to the immediately preceding discourse (also called *co-text*). Other assumptions can form part of the context in which newly

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presented information is processed, such as assumptions retrieved or derived through inference from the addressee's encyclopaedic memory. Another important idea to be highlighted is that the context in relevance theory is not given in advance of the comprehension process (as in former pragmatic theories) but is *constructed* in the process of interpretation. This idea of context can be linked to Jenny Thomas's idea that "meaning is constructed by the hearer" (Thomas, Jenny, *Meaning in interaction: An introduction to pragmatics*, Longman, London, 1995, p.203). The construction of context or, in other words, the selection of the right contextual premises in which the new information is processed is geared by what Sperber and Wilson call the *Principle of Relevance*, which basically involves the idea of achieving the greatest informative effects (or in the words of Sperber and Wilson, *contextual effects*,) with the minimum processing cost.

13 The *deductive rules* used in spontaneous, inferential processes trigger what are called *non-trivial logical implications*. To take an example, *elimination-rules*, like *and-elimination rule* below, are believed to form part of the deductive system of spontaneous inferencing.

E.g.:(Sperber and Wilson 1995: 86).

Input: $P \& Q$

Output: P

14 Such logical processes give rise to what are known as *trivial logical implications*. An example of this type of logical implication are *introduction-rules*, like for instance *and-introduction rule*.

E.g.: (Sperber and Wilson 1995: 96).

Input: (i) P

(ii) Q

Output: $P \& Q$

15 It is important to bear in mind that assumptions are entertained in the mind with different degrees of strength. That is, they are not always either true or false, but can be assigned gross confirmation values, like *certain*, *very strong*, *strong*, *weak*, and *very weak*. The degree of confirmation of an assumption depends on its *accessibility* and on *how the assumption has been acquired*. (For more information of the confirmation value of assumptions, see Sperber and Wilson 1995: 75-83).

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