

THE CONVERSATIONAL CONDITION ON
HORN SCALES

0. INTRODUCTION¹

Gazdar (1979), Horn (1972, 1989) and others have claimed that, given a pair of a semantically stronger expression (S) and a weaker expression (W), if a speaker chooses to make a weaker statement Q that contains W rather than a stronger statement P that contains S, the speaker implicates (as one possibility) that he or she believes or knows that P does not hold. For example, in uttering (1a) the speaker implicates (1b) on the basis of the pair *hot* and *warm*.

- (1)a. "It is warm in Northern California today."
 b. \vdash '(The speaker believes) it is not hot in Northern California today.'²

The implicature is defined as a part of the speaker's meaning that is conveyed by virtue of the assumption that the speaker and the hearer are obeying the Cooperative Principle of Conversation, and more specifically, various Conversational Maxims: Maxims of Quantity, Quality, Relation and Manner (Grice 1975). The type of implicature illustrated in (1) is called a Quantity implicature or more precisely a Quantity-1 implicature,

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² In this paper the following notational conventions are used.

"P"	the utterance P
'P'	the proposition P
$P \rightarrow Q$	P entails Q
$P \not\rightarrow Q$	P does not entail Q
$P \vdash Q$	the speaker conversationally implicates Q by P
$P \not\vdash Q$	the speaker does not conversationally implicate Q by P

since what is crucial in the production of this implicature is the first Gricean Maxim of Quantity – ‘make your contribution as informative as is required’. The pairs (or sets) of semantically stronger and weaker expressions that license or provide a basis for Quantity-1 implicatures are called Horn scales (Horn 1972, 1989; Levinson 1983). According to the convention introduced by Horn, such a scale is indicated in angular brackets, with the items in the scale ordered from strongest to weakest (from left to right), as in *<hot, warm>*.

The main question addressed in this paper is that of the constraints on Horn scales. Two kinds of constraints have been recognized in the literature. One of them is what I call the *informativeness requirement*: S must be more informative than W. A precise formulation of this requirement has been a much-discussed topic. Horn (1972) formulated it in terms of logical entailment: S must entail W. Hirschberg (1985) has observed that items related by non-entailment relationships such as rank orderings, spatial orderings, and process stages can also form Horn scales, and argues that any items constituting a partially ordered set in which it can be determined whether one item is higher or lower than another can function as a Horn scale. In addition to such an informativeness requirement, some researchers have proposed that S and W must satisfy certain additional conditions in order for S to function as a legitimate alternative to W so that it can be used in producing an implicature. For example, Gazdar (1977) has suggested that W and S must share selectional restrictions and item-induced presuppositions (cf. Gazdar 1979). Atlas & Levinson (1981) have claimed that S and W must belong to the same semantic field, have the same brevity, and be lexicalized to the same degree. Hirschberg (1985) has claimed that S and W must form a “salient” scale in a given discourse. Constraints of this latter sort exemplify what I shall call the *functional alternative requirement*.³

The primary concern of this paper is this functional alternative requirement. I will argue that various instances of functional alternative requirement can be reduced to one very general condition called the Conversational Condition, which is an outcome of the way Quantity-1 implicatures are worked out. I will show that this condition not only captures what previously proposed conditions have sought to capture, but also solves some controversial issues and explains previously undiscussed examples. I will also discuss possible alternative accounts based on Horn’s (1984, 1989) Q and R Principles and Sperber & Wilson’s (1981, 1986) Relevance

³ Questions concerning these two requirements are discussed as “the relative informativeness problem” and “the alternatives problem”, respectively, in Ginzburg (1989).

Theory. The consequences of this condition for the understanding of several important notions in the study of implicatures will also be discussed.

1. PROPOSAL

1.1. *Inference of Quantity-1 Implicatures*

Conditions on Horn scales are closely related to the process of deriving inferences which is involved in conversational implicature. Accordingly, we will examine this process first.

Quantity-1 implicatures in general are based on the interaction of the Quantity-1 Maxim and one of two Quality Maxims. In this paper I will use the following formulations of these Maxims.

- (2) Quantity-1: Make your contribution as informative (strong) as possible.⁴
- (3)a. Quality-1: Do not say what you believe is false.
- b. Quality-2: Do not say what you lack evidence for.

The existence of two distinct Quality Maxims allows the production of two different kinds of Quantity-1 implicatures identified by Gazdar (1979), Atlas & Levinson (1981), Leech (1983) and Horn (1989): in some cases a speaker who makes a weaker statement implicates that s/he does not know if a stronger statement holds of the situation being described; in other cases the speaker implicates that s/he believes (or knows) that a stronger statement does not hold of the situation. I will call the former type weak Quantity-1 implicature, and the latter, strong Quantity-1 implicature.

The two kinds of Quantity implicatures can be understood in terms of

⁴ This formulation is slightly different from Grice's original formulation 'make your contribution as informative as is required (for the current purposes of the exchange)'. Grice's formulation implies that one is supposed to make his contribution *only* as informative as is required. This upper bound of information is captured by the Quantity-2 Maxim, 'do not make your contribution more than is required in the context of the exchange'. In order to keep the two maxims apart, I will adopt the version of the Quantity-1 Maxim given in (2), which is in fact congruent with many reformulations of the Quantity-1 Maxim that have appeared in the literature. These include Harnish's (1976) Quantity-Quality Maxim: 'make the *strongest* relevant claim justifiable by your evidence [emphasis added]', which combines Grice's Quantity-1, Relation, and Quality-1 Maxims; and Horn's (1984) Q Principle: 'make your contribution sufficient; say *as much as you can* [emphasis added]'. The phrase "for the current purposes of the exchange" found in Grice's formulation is relevant only to the Quantity-2 Maxim, which constrains the amount of information to be conveyed.

a clash between the Quantity-1 Maxim and one of the Quality Maxims (Grice 1975, Harnish 1976). Weak implicature is produced when the Quality-2 Maxim is involved (Harnish 1976: 344). Consider (4), which is one of Grice's original examples.

- (4)a. (A is planning with B an itinerary for a holiday in France. Both know that B wants to visit his friend C.)
 A: "Where does C live?"
 B: "Somewhere in the south of France."
 b. |→ 'B does not know which town C lives in.'

The choice of the expression *somewhere in the south of France* in preference to the actual name of a town infringes Quantity-1. To use a town name, however, the speaker (B) must have evidence for it; otherwise s/he would violate Quality-2. Quality-2 cannot be infringed to fulfill Quantity-1. (The Quality Maxims are the most basic of the conversational maxims (Grice 1975, Horn 1984); they cannot be violated to conform to any of the other maxims (Harnish 1976).) B's use of *somewhere in the south of France* over a town name can thus be explained if B does not have evidence for the use of a town name and is opting to fulfill Quality-2 over Quantity-1. There is no other explanation. B knows, or at least assumes, that A can work this out. Therefore, B has implicated that s/he does not know which town C lives in.

Strong implicature involves Quality-1. Consider (1). The process of deriving inferences involved in the implicature of (1b) is as follows. The use of *warm* over *hot* infringes Quantity-1 (since the use of the latter would make (1a) stronger). To use the term *hot*, however, the speaker must believe that the term actually holds of the situation being described; otherwise s/he would infringe Quality-1. Quality-1 cannot be infringed to satisfy Quantity-1. The speaker's use of *warm* over *hot* can thus be explained if s/he does not believe that *hot* holds of the situation and is opting to fulfill Quality-1 over Quantity-1. There is no other explanation. The speaker knows, or at least assumes, that the hearer can work this out. Therefore, the speaker has implicated that s/he believes (or knows) that it is not hot in Northern California.

As Horn (1989) and Leech (1983) have argued, the weaker implicature is produced when the speaker's knowledge with respect to the choice of S vs. W is assumed to be incomplete, and the stronger implicature, when it is not. This difference reflects the two kinds of occasions where these two Quality Maxims are relevant. Quality-1 is relevant when the speaker's

knowledge regarding the subject matter of the utterance is assumed to be complete, while Quality-2 is relevant when it is not.⁵

1.2. *The Conversational Condition on Horn Scales*

Given the above inference process, a scale does not license a Quantity-1 implicature if the following condition is violated.

- (5) Conversational Condition: The choice of W instead of S must not be attributed to the observance of any information-selecting Maxim of Conversation other than the Quality Maxims and the Quantity-1 Maxim (i.e., the Maxims of Quantity-2, Relation, and Obscurity Avoidance, etc.).

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 is to be attributed to the observance of one of the Quality Maxims, and not to some other factor. The speaker cannot assume that the hearer makes this inference if there is a possibility that some other reason exists for the speaker not to be using S. Such a reason might be that S represents information that is not required in context; or that S represents information not relevant to a current discourse; or that S is an obscure expression; etc. That is, 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. If the non-use of S can be attributed to the observance of these maxims, Quantity-1 implicatures cannot be produced.⁶

The Conversational Condition is a natural consequence of the inference process involved in the working out of Quantity-1 implicatures, and in

⁵ Gazdar (1979) claims that weak implicature is produced on the basis of a scale that involves a clause, such as *<know S, believe S>* or *<S₁ since S₂, S₁ if S₂>*, whereas strong implicature is produced on the basis of a non-clausal scale, such as *<all, some>*. However, weak implicature can be produced on the basis of scales that do not involve a clause, as long as the speaker's knowledge with respect to the choice of S and W is regarded as incomplete (cf. *<spaniel, dog>* in footnote 7 or *<otooto 'younger brother', kyoodai 'brother'>* in (11)); and strong implicature can be produced on the basis of a scale that does involve a clause, as long as the speaker's knowledge with respect to the choice between S and W is regarded as complete (cf. (22a) below).

⁶ A less elaborated version of the Conversational Condition appears in O'Hair (1969: 52): "[A] person A making a statement S implies with respect to a hearer H that he cannot make a stronger statement S', provided that it is reasonable for A to take it that H would be interested in the extra information conveyed by S', unless H is overtly aware that A has a reason for not making S' which for A outweighs H's interest".

this sense there is nothing surprising about it. What is noteworthy about making this claim is all the instances of the functional alternative requirement can be reduced to the Conversational Condition; previously proposed formulations of the functional alternative requirement are either subsumed under this condition or can be shown to be invalid as conditions on Horn scales, as I will show in the course of this paper.

One crucial notion in the Conversational Condition is that of an information-selecting maxim. By information-selecting maxims I mean those maxims that govern the choice between expressions that differ in meaning (i.e., those maxims that influence the choice between S and W). This means that maxims that govern the choice of forms but not their semantic contents, such as Maxim of Brevity, do not participate in the Conversational Condition as maxims the observance of which constrains the production of an implicature (constraining maxims). I will discuss this point in 3.1. Also, the Quantity-1 Maxim is excluded from the Conversational Condition as a constraining maxim, even though it is an information-selecting maxim. The reason for this is obvious. The motivation for choosing a weaker expression cannot be that the speaker is trying to maximize the information conveyed.

One might also note that the Conversational Condition (5) above assumes the Gricean Maxims of Quality, Quantity, Relation and Manner (though some of them are slightly reformulated). There have been some proposals about collapsing these maxims (e.g., Horn 1984, Wilson & Sperber 1981). The distinction between the Maxim of Quantity-2 and the Maxim of Relation has been regarded as especially problematic (Grice 1975, Horn 1984, Levinson 1987a, Wilson & Sperber 1981). In this paper, I will keep these two maxims apart (and touch upon the difference between the two in Section 2.2). However, since both of these maxims participate in the Conversational Condition as constraining maxims (i.e., they are both information-selecting maxims), collapsing them would in fact be compatible with the central claim of this paper. There have also been proposals in which additional conversational maxims are recognized, especially in the area of politeness (e.g., Leech 1983). The Conversational Condition above predicts that Quantity implicatures cannot be produced if the choice of W instead of S can be attributed to the observance of such additional maxims if they are information-selecting maxims.

In the following sections, I will first examine three subinstances of this Conversational Condition: the Quantity-2 Condition, the Relevance Condition, and the Non-Obscurity Condition. I will also examine the case where a Quantity-1 implicature is not produced because of a possible observance of Leech's (1983) Maxims of Politeness.

2. INSTANCES OF THE CONVERSATIONAL CONDITION

2.1. *The Quantity-2 Condition*

First, let us examine one subinstance of the Conversational Condition: the choice of W instead of S must not be attributed to the speaker's observance of the Quantity-2 Maxim, which states 'Do not make your contribution more informative than is required in the context of the exchange'. This instance of the Conversational Condition can be rephrased as (6), which I will call the Quantity-2 Condition.

- (6) The Quantity-2 Condition: S must not convey more information than is required in the particular context of utterance in which W is used.

In relation to the Quantity-2 Condition, it is important to recognize two kinds of quantity of information, which may be characterized as quantity on the horizontal axis and quantity on the vertical axis. Quantity on the horizontal axis is the amount (strength) of information on physically or socially defined scales such as quantity, temperature, age, height, military rank, etc. For example, the terms *hot* and *warm* represent different values on the horizontal axis of quantity: the term *hot* is used to refer to a range of temperature relatively higher than that of *warm*. Quantity on the vertical axis, on the other hand, refers to the degree of the detailedness or specificity of information, with which a referent or a state is described. For example, the terms *spaniel*, *dog* and *animal*, the terms *100°F* and *hot* (as representing outdoor air temperature), or the terms *the United States*, *California*, and *Los Angeles* differ in detailedness of description. The amount of information measured on the vertical axis can be rephrased as the level of specificity.

These two kinds of quantity of information differ crucially in that items differing along the horizontal axis of information represent different situations, while those differing along the vertical axis involve different description of the same situation. For example, the choice of *warm* vs. *hot* depends on the degree of temperature that the speaker describes with these terms. The choice of *dog* and its subordinate terms such as *spaniel* and *shepherd*, on the other hand, depends on how much the speaker wishes to convey in describing a referent or a state. Differences in information on the horizontal axis are thus ascribed to the different values that a situation has on a physically or socially defined scale; differences in information on the vertical axis are ascribed to the linguistic forms that the speaker uses to refer to a referent or state.

Most examples in which the Quantity-2 Condition is relevant involve

quantity on the vertical axis. We will now discuss several different cases of this.

2.1.1. *Lexical Specificity in Taxonomy (Set-Subset Relation)*

The first point to be considered is the degree of the lexical specificity in a set of lexical items forming a taxonomy. The taxonomy of biological terms, for example, usually involves at most five levels (e.g., Berlin, Breedlove & Raven 1973). The taxonomy of animal terms has the “unique beginner” term, such as *animal*, “life form” terms such as *bird*, *fish*, and *mammal*, “generic” terms such as *dog*, *cat*, and *sheep*, “specific taxa” terms such as *spaniel* and *Siamese*, and “variety taxa” terms that are even more specific (Berlin, Breedlove & Raven 1973). Among these different levels of specificity in a taxonomy, one is regarded as the “basic level”, which is psychologically and functionally special (e.g., Rosch *et al.* 1976). Terms at this level represent the unmarked choice in contexts where no further specification of category is needed to achieve adequate reference (Brown 1958, Cruse 1977, Rosch *et al.* 1976). The basic level in animal taxonomy is usually the generic level (Cruse 1977, Rosch *et al.* 1975, Wierzbicka 1985). A similar hierarchy can be found in other biological taxonomies (e.g., fruit names) and in non-biological taxonomies (e.g., clothes) (see Rhodes (1985) for discussion).

Since items on different levels of a taxonomy differ in terms of specificity of information (i.e., information on the vertical axis), they are expected to form a Horn scale, such as $\langle \textit{spaniel}, \textit{dog}, \textit{animal} \rangle$ and $\langle \textit{golden delicious}, \textit{apple}, \textit{fruit} \rangle$. In fact, since an affirmative statement with a hyponym (subordinate term) and an affirmative statement with a hypernym (superordinate term) are in an entailment relationship (Lyons 1977), such a pair of hyponym and hypernym satisfies the entailment criterion for Horn scales proposed by Horn (1972).

Terms in a taxonomy present an interesting phenomenon with respect to implicature (Hirschberg 1985, Reiter 1990). As Hirschberg has pointed out, these terms sometimes support implicature, but very often they do not. Consider B’s utterance in (7a). In spite of the scale $\langle \textit{spaniel}, \textit{dog} \rangle$, this utterance cannot be used to implicate (7b).

- (7)a. (A and B are talking about their neighbor Jane. Both knows that she has only one dog and that it is a spaniel.)
 A: “What is Jane doing there?”
 B: “She is walking her dog.”
- b. \nrightarrow ‘(B believes) Jane is not walking her spaniel.’

Hirschberg (1985: 160) explains this phenomenon by noting that, unless certain conditions obtain, “salient” scales of specificity in taxonomy (which function as Horn scales in context) are upper-bounded by the basic level term, with more specific terms excluded from a salient scale. In the present account, this failure to produce implicatures can be attributed to the violation of the Quantity-2 Condition. In the kind of context for B’s utterance in (7a) described above, the use of *dog* is natural because of its basic level status, and is informative enough to achieve intended reference; information about a specific breed of dog is not a required piece of information in this context. Therefore the Quantity-2 Condition is violated and so the scale ⟨*spaniel*, *dog*⟩ does not license an implicature in such a context.

It should be noted that the failure to produce an implicature on the basis of (7a) cannot be attributed to the *inappropriateness* of the subordinate (specific taxa) term in the context in which a basic level term is used. The use of a term like *spaniel* instead of *dog* in (7a) is by no means inappropriate; a description of a referent can be as detailed as the speaker desires (Cruse 1986). The point of the above explanation is that S conveys more than is *required*, although a speaker can choose to use S in describing the referent.

Hirschberg (1985) claims that scales like ⟨*Siamese*, *cat*⟩ support implicature only when a term belonging to a level subordinate to the basic level has been mentioned in the previous discourse and thereby evoked for inclusion in the salient scale, as in (8).

- (8) A: “Do you have a Siamese?”
B: “I have a cat.”

The present account, in contrast, predicts that an implicature should be produced whenever *dog* is used in a context in which the mention of the breed of a dog is normally required, and that such cases are not confined to sequences like (8) above. That this is indeed so can be seen in the following example, where (9a) can be used to implicate (9b).

- (9)a. Notice: “LOST: Brown and white dog with a long tail. Has white patch on forehead and left front paw. Answers to ‘Rex’. Lost on March 10 in this park.”
b. ‘The speaker believes that the dog described in (9a) is not a spaniel (or any other breed that is commonly known); it is perhaps a mongrel.’

In a notice for a lost dog such as (9a), the speaker is normally expected to give a maximally detailed description of the dog in order to establish

adequate reference, and the mention of a specific breed name is therefore expected. The Quantity-2 Condition is thus satisfied in such a context, and an implicature is produced.⁷ A reference to a particular dog in a dog show can create the same effect (cf. Cruse 1977: 156).

The basic level terms in a semantic domain may differ from language to language. That is, conventions about what count as the expected quantity of information in describing a particular object are to some extent language-specific. One such example concerns reference to siblings. In English, when a speaker introduces a brother or sister of a certain person (reference person), the relative seniority of the brother or sister vis-a-vis the reference person is not required information. Therefore, (10b) cannot be implicated on the basis of (10a).

- (10)a. "This is Andrew's brother Peter."
 b. \nrightarrow 'The speaker does not know whether Peter is Andrew's older brother or younger brother.'

In contrast, Japanese has as basic level sibling terms four words that semantically incorporate both relative seniority and sex (i.e., *ani* 'older brother', *otooto* 'younger brother', *ane* 'older sister', and *imooto* 'younger sister'). It also has terms that convey sex information only (e.g., *kyoodai* 'brother'), but, like English *sibling* or *parent*, they are not basic level terms. The information about relative seniority as well as sex is therefore necessary in referring to a brother or a sister in Japanese. For this reason, (11a), which is comparable to English (10a), is an unlikely utterance and if uttered conveys the implicature of (11b).⁸

- (11)a. "Kochira wa Takashi-kun no kyoodai no
this TOP Takashi-Mr. GEN brother GEN

⁷ The production of this implicature illustrates the mechanism that determines whether strong or weak Quantity implicature is produced. In (9a), the speaker's knowledge about the breed of a dog is expected to be complete, since the speaker is presumably the owner of the dog. Therefore strong implicature is produced (i.e., 'the speaker knows that it is not a spaniel, spitz, poodle, boxer, etc.'). If (9a) is a notice for a found dog, as in (i) below, a different implicature is produced.

- (i) Notice: "FOUND: Brown and white dog with a long tail. Has white patch on forehead and left front paw. Found on March 10 in this park".

In this case the speaker's knowledge about the breed of the dog is not expected to be complete. Therefore, what results is weak implicature: the speaker does not know what breed the dog is.

⁸ Another possible interpretation of (11a) is that the speaker for some reason does not want to say whether Michio is older or younger than Takashi. (11b) is implicated when this interpretation is not likely.

Michio-kun desu.”

Michio-Mr. COP

- b. |→ ‘The speaker does not know whether Michio is Takashi’s older brother or younger brother.’

The following Korean example is perhaps even more striking. In this language the basic level term to describe a younger sibling is *tongsayng*, which is used either to refer to a younger brother or to a younger sister, although the basic level terms for older siblings are restricted to a particular sex. For this reason, (12a) cannot be used to implicate (12b).

- (12)a. “Youngme-hanthey-nun oppa hana, unni hana,
Youngme-DAT-TOP older-brother one, older-sister one,
 kuliko tongsayng-i hana iss-ta.”
and younger-sibling-NOM one be-indicative
 ‘Youngmee has one older brother, one older sister, and one younger sibling.’

- b. |↯ ‘The speaker does not know whether the younger sibling is male or female.’

In Japanese, in contrast, failure to convey information about the sex of a younger sibling does license an implicature, because of the basic level status (unlike Korean) of *imooto* ‘younger sister’ and *otooto* ‘younger brother’. Thus, (13a), which is comparable to Korean (12a), can be used to implicate (13b):

- (13)a. “Taroo ni wa ani ga hitori, ane ga
Taro LOC TOP older-brother NOM one older sister NOM
 hitori, soshite shita ni moo hitori i-masu.”
one and under LOC more one be-POLITE
 ‘Taro has one older brother, one older sister, and another one under his age.’

- b. |→ ‘The speaker does not know if the younger sibling is male or female.’

2.1.2. Information in Partonomy (Part-Whole Relation)

The Quantity-2 Condition is also relevant to implicatures supported by items on different levels of a part-whole hierarchy, often called “partonomy” or “meronymy” (Cruse 1986). One example of partonomy is a set

of place names such as *the United States*, *California*, and *Los Angeles*. The same place can be referred to by different expressions forming such a hierarchy. When a person mentions his/her birthplace, say Los Angeles, s/he can use any of the three place names mentioned just above. The level of such a hierarchy can be regarded as the level of specificity.

Quantity implicatures can be produced on the basis of such scales (Hirschberg 1985), as in the “south of France” example above, but this is not always the case. For example, consider (14).

- (14)a. A: “Bill seems to be visiting many countries these days. Where is he now?”
 B: “He is in Japan”.
 b. ↯ ‘(B believes) Bill is not in Tokyo.’

B cannot implicate (14b) by making the utterance in (14a). This is predicted by the Quantity-2 Condition. The expected amount of information in referring to a location is dependent on several factors (cf. Schegloff 1971). One of them is the speaker’s assumption about the level of specificity that the hearer expects. In this context, the level of specificity for the description of a location that is expected is the level of a country. In such a context, information about the city name can be regarded as more informative than is required, and therefore the Quantity-2 Condition is not satisfied.

Compare this example with the “south of France” example above, in which the interlocutors are discussing a travel itinerary. In such a context mention of a town name would be expected. The use of indefinite *somewhere* reinforces the implicature produced.

2.1.3. *Choosing the Level of Elaboration*

Another set of examples in which the Quantity-2 Condition is relevant involves the degree of elaboration of a scale. Some scales, such as the evaluation scale, can have different degrees of elaboration. For example, the positive evaluation scale in its least elaborated form might be ⟨*very good*, *good*⟩. In some contexts, a more elaborated scale such as ⟨*excellent*, *very good*, *good*⟩ is employed; and additional terms like *exceptional* and *superb* can also be added.

The production of implicature is dependent on how elaborated a scale is assumed in the particular context. The level of elaboration can be regarded as the level of specificity which is required in the context. Consider the statement (15a).

- (15)a. “Peter has very good analytical ability.”
 b. ‘The speaker believes that Peter does not have excellent analytical ability.’

In certain discourse contexts, such as a detailed letter of recommendation, the speaker is indeed likely to be implicating (15b). This would be especially clear if stronger expressions like *excellent* and *superb* were actually used frequently in other parts of the same discourse. In such a case it is clear that the speaker is assuming a scale of high specificity (elaboration) that includes terms like *excellent* and *superb*, and therefore an implicature is produced. In contrast, in a context in which such expectation for an elaborated scale is absent, the expression *very good* cannot be used to implicate ‘not excellent’. This would be most clear if the speaker had been explicitly told to evaluate in terms of the choices *very bad*, *bad*, *good*, and *very good*. In such a context, use of the term *excellent* would constitute an unnecessarily detailed description, and therefore an implicature is not produced.

A similar argument applies to temperature terms. Among the terms *warm*, *hot*, and *boiling*, the first two are included in the least elaborated version of the positive temperature scale, while *boiling* is included only in more elaborated versions.⁹ Whether the expression *hot* is used to implicate ‘not boiling’ thus depends on the degree of elaboration (specificity) of the scale used.

2.1.4. On ⟨Regret, Know⟩ and ⟨Know, Believe⟩

2.1.4.1. A Problem

The Quantity-2 Condition can also be used to explain a tricky problem involving scales consisting of items differing in their “lexical presuppositions” (i.e., presuppositions triggered by lexical items). One scale that has been discussed in this regard is ⟨*regret*, *know*⟩. Statements containing these two verbs are related by entailment; (16b), for example, entails the truth of (16a). Therefore, *regret* and *know* satisfy the entailment criterion for Horn scales (Horn 1972).

- (16)a. “They know that there was an accident.”
 b. “They regret that there was an accident.”

⁹ In this sense the scale ⟨*boiling*, *hot*, *warm*⟩ involves both vertical and horizontal axes of information. The term *boiling* is regarded as stronger than *hot* not only in terms of the degree of temperature, but also in terms of the degree of lexical specificity or detailedness, since *boiling* can be regarded as a specific case of *hot*.

However, this pair (very often) does not license an implicature. For example, (17b) cannot be implicated on the basis of B's second utterance in (17a).

- (17)a. A: "Shall I call and tell them about the accident?"
 B: "You don't have to. They already know that there was an accident."
 b. \nrightarrow '(The speaker believes) they do not regret that there was an accident.'

One possible factor that precludes the production of a Quantity-1 implicature based on *regret* and *know* is the difference in the lexical presuppositions of these two verbs. The verb *know* triggers the presupposition of the truth of the proposition expressed in its complement clause (Kiparsky & Kiparsky 1970). Thus, (16a) presupposes the truth of (18a). Emotive factive verbs like *regret*, on the other hand, trigger two presuppositions (Kiparsky & Kiparsky 1970). (16b), for example, presupposes the truth of (18b) as well as (18a).

- (18)a. 'There was an accident.'
 b. 'They know that there was an accident.'

Thus the non-production of an implicature from B's utterance in (17a) might be attributed to the violation of a condition like (19), proposed in Gazdar (1977).

- (19) Presuppositional Condition on Horn scales: The presuppositions triggered by S must be the same as those triggered by W.

In fact, however, Gazdar himself (1979) has since argued that this Presuppositional Condition is not empirically true. He observes that this condition does not hold for the pair \langle *know*, *believe* \rangle . The verb *know* triggers the presupposition of the truth of the proposition expressed in the complement clause, while *believe* does not (i.e., it is neutral to the truth of its complement proposition). In spite of this presuppositional difference, this pair does license an implicature (as I will show below). Therefore, Gazdar claims, \langle *know*, *believe* \rangle forms a Horn scale, and so he rejects the Presuppositional Condition above. However, he has no alternative explanation for the non-production of implicature based on \langle *regret*, *know* \rangle , and must content himself with the position that "scales are, in some sense, 'given to us'" (p. 58).

The issue of the implicatures based on *know* and *believe* is a bit complicated, and deserves close examination. There are two kinds of differences between *know* and *believe*, and either can provide the basis for a

Quantity-1 implicature. The first is the presuppositional difference that I have just noted. This difference can be the basis for implicature in an exchange like the following.

- (20) A: "Is John really ill?"
 B: "He believes that he is ill."

B's utterance can be uttered to produce either a strong or a weak Quantity-1 implicature on the basis of this presuppositional difference concerning the truth of the complement clause, depending on whether the speaker's knowledge in this regard is assumed to be complete or not. If speaker B cannot be assumed to know whether John is ill or not, then B's utterance in (20) can be used to produce the weak implicature of (21a). If the speaker B can be assumed to know whether John is ill or not (e.g., if B is a doctor), then it can be used to produce the strong implicature of (21b).¹⁰

- (21)a. 'The speaker does not know if John is ill (i.e., the speaker does not know if the presupposition of *know* holds).'
- b. '(The speaker believes) John is not ill (i.e., the speaker does not believe that the presupposition of *know* holds).'

The strong implicature reading (22b) is the only possibility in utterance (22a) under normal circumstances. In this example, the complement clause represents a statement about the speaker, the truth (or falsity) of which the speaker normally can be expected to know.

- (22)a. "John believes that I am a student."
 b. '(The speaker believes) the speaker is not a student.'

The other difference between the two verbs is the degree of confidence expressed: *know* entails that the referent of its subject NP is fully confident of the truth of the proposition expressed in its complement, while *believe* involves a lesser degree of confidence. This point can be illustrated by the contrast between the following sentences.

- (23)a. John believes that Mary is ill, but he is not really sure.

¹⁰ When *believe* is used in the sense of 'accept the claim (that...)' it might not seem to license a similar implicature. However, an implicature is produced when *believe* is stressed. The following is one example.

- (i)a. "Many persons today BELIEVE that the earth is round."
 b. |→ '(The speaker believes) it is not the case that many persons today "know" that the earth is round (i.e. The speaker believes that the earth is not really round).'

- b. #John knows that Mary is ill, but he is not really sure.

The relationship between *believe* and *know* in this regard is like the relationship between *some* and *all* or *be likely* and *be certain*, as has been suggested by Horn (1978b, 1989).

One example in which this difference is the basis for an implicature is (24), in which *believe* is used to implicate a lack of full confidence on the part of the referent of *she*.

- (24) “Does she believe so or know so?”

An adequate account of Quantity implicature must explain the production of implicatures based on $\langle know, believe \rangle$ in examples like (20), (22), and (24), as well as the non-production of implicatures based on $\langle regret, know \rangle$ in examples like (17).¹¹

2.1.4.2. *The Quantity-2 Account of $\langle Know, Believe \rangle$ and $\langle Regret, Know \rangle$*

The difference between $\langle know, believe \rangle$ and $\langle regret, know \rangle$ stems from their differences with respect to the Quantity-2 Condition. Consider the choice between *know* and *regret*. These verbs differ not only in terms of their lexical presuppositions, but also in terms of the absence/presence of an assertion about the emotional state of the subject: *regret* is used to assert that the referent of the subject NP thinks it unfortunate that the proposition expressed in the complement clause is true, while *know* makes

¹¹ Gazdar's example of an implicature produced on the basis of the scale $\langle know, believe \rangle$ is given in (i). He claims that the speaker of (ia) implicates (ib) because s/he could have said (ic).

- (i)a. “I believe that he's ill.”
 b. \rightarrow ‘I don't know that he's ill.’
 c. ‘I know that he's ill.’

The verb *know* in (ib) is special in that it differs from *believe* only in terms of the degree of confidence expressed; no presuppositional difference is involved.

Gazdar (1979: 142) claims that this *know* is not different from the factive *know* in meaning, and that a possible presupposition is canceled because of its contradiction with asserted information. (The verb *know* triggers the presupposition that the speaker believes that the complement clause represents something true, while the negated sentence as a whole denies it.) This process is explained in terms of his rules of the projection of presuppositions. If Gazdar is right, the same phenomenon should be observed in equivalent sentences in all languages. However, the following Japanese sentence does not have the non-factivity found in (ib).

- (ii) #“Boku wa Taro ga soko ni itta koto o shir-anai”.
ITOP Taro NOM there GOAL went COMP ACC know-NEG
 I don't know that Taro went there. (intended reading; non-factive, uncertain)

no assertion regarding emotion. Because of this difference, the two verbs are used to answer two totally different questions: 1) whether someone believes in a true proposition with confidence (for *know*) and 2) what sort of emotional attitude one has toward a proposition (for *regret*). Therefore, it is easy to identify contexts in which the speaker is expected to say whether a certain person knows something or not, but is not expected to say whether that person regrets it or not. This is clearly true in (17) above. The use of *regret* in place of *know* in B's utterance in (17a) would convey more information than is required in this context, so the Quantity-2 Condition is not satisfied and an implicature is not produced.

On the other hand, *know* and *believe* do not differ regarding the absence/presence of any additional assertion. Rather, the difference between them lies in the absence/presence of a presupposition and in the degree of some scalar notion (i.e., confidence) that is asserted. These differences in the information conveyed by *know* but not by *believe* cannot be dismissed as more than is necessary in exchanges in which implicature is produced. First, the presuppositional difference between the two verbs is crucial information in an exchange in which this difference is the basis for an implicature. In (20) above, for example, the factuality of John being ill is the focus of the exchange. The same can be said of (22). The difference in degree of confidence is also a crucial part of the information to be conveyed in examples in which this difference serves as the basis for implicature. This is clearly true in (24) above, in which *know* and *believe* are contrasted in terms of the degree of confidence being expressed. Thus, the additional strength of the statement with *know* (rather than *believe*) cannot be dismissed as more than is required in these contexts. Therefore the Quantity-2 Condition is satisfied, and an implicature is produced.

2.2. *The Relevance Condition*

A second subinstance of the Conversational Condition on Horn scales is that the choice of W instead of S must not be attributed to the speaker's observance of the Maxim of Relation, which states "Be relevant". This subinstance of the Conversational Condition can be rephrased as in (25).

- (25) The Relevance Condition: the information that S conveys must be relevant to the discourse in which W is used.

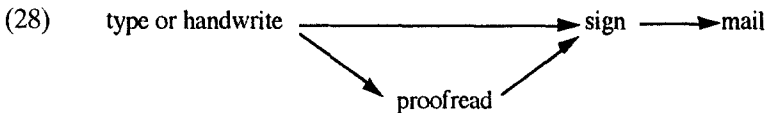
A similar statement is made in Levinson (1983: 135), who says that, in order for S and W to count as a Horn scale, S 'might be desirable as a contribution to the current purposes of the exchange (*and here there is*

perhaps an implicit reference to the maxim of Relevance) [emphasis added]. This condition is also built in in Harnish's (1976) Quantity-Quality Maxim: 'make the strongest *relevant* claim justifiable by your evidence [emphasis added]'.

Consider now the difference between (26) and (27).

- (26)a. A: "What have you done with that mail?"
 B: "I've typed it."
 b. \mapsto 'B has not mailed it yet.' (=Hirschberg's (1985) 163)
- (27)a. A: "Did you handwrite that letter?"
 B: "No. I typed it."
 b. $\not\mapsto$ 'B did not mail it.'

This difference in the production of implicatures is just what the Relevance Condition predicts. The implicature in (26) is based on the scale (28), which is defined in terms of process stages (Hirschberg 1985).



In (26) the point of the utterance is how far a given process has progressed in terms of the scale given in (28). The information carried by the term *mail* is therefore relevant to the current discourse in (26), and so the Relevance Condition is satisfied, allowing an implicature to be produced. In (27), on the other hand, the event of typing is considered as an isolated event, not as one stage in the larger process of writing a letter. Therefore, the information carried by *mail* is not relevant; hence the Relevance Condition is not satisfied, and so no implicature is produced.

Note that the statement 'I mailed it' in the context of (27) does not convey any information required in this exchange. Therefore this statement cannot be said to convey *more* information than is required. In this sense this example differs from those discussed in relation to the Quantity-2 Condition, and cannot be attributed to the Quantity-2 Condition.

Consider also (29) and (30).

- (29)a. A: "What did your grandpa do?"
 B: "He was a politician. He was governor of California."
 b. \mapsto '(B believes) he was not president of the United States.'

- (30)a. A: "What state was he governor of?"
 B: "He was governor of California."
 b. \nrightarrow '(B believes) he was not president of the United States.'

The implicature in (29) is based on a scale consisting of rank terms: (*president of the United States, governor of California*). The difference between (29) and (30) shows that this scale licenses an implicature only when the point of the utterance is to inform the hearer of the most significant (e.g., highest) office the person in question held. This is what the Relevance Condition predicts: in (29a), the information carried by *president of the United States* is relevant to the current discourse, while in (30a) it is not. Thus the Relevance Condition is satisfied in (29a), but not in (30a).

The Relevance Condition makes it unnecessary to posit the condition proposed by Atlas & Levinson (1981): the pair of expressions licensing a Quantity-1 implicature should belong to the same semantic field. What this condition seeks to capture is a special case of the Relevance Condition. Items in the same semantic field are intrinsically related to each other in meaning, and therefore each member of a given semantic field is highly likely to be relevant to the discourse in which another one is used. However, Atlas & Levinson's formulation is too strong, or at least too inflexible. An implicature can in fact be licensed by lexical items that are not usually regarded as being in the same semantic field. Example (26a) above is such a case. It is not clear whether a set of words like *type*, *sign*, and *mail* can be regarded as forming a semantic field; and even if they are regarded as being in the same field, a condition based on the notion of semantic field alone can say nothing about the difference between (26a) and (27a).

2.3. On the Manner Conditions

So far I have discussed two subinstances of the Conversational Condition based on the Maxims of Quantity-2 and Relation. Does the Conversational Condition have subinstances based on the Maxims of Manner? Here I will discuss two of Grice's Maxims of Manner: the Maxim of Obscurity Avoidance ('Avoid obscure expressions') and the Maxim of Brevity ('Be brief'). The other Maxims of Manner (e.g., 'Be orderly' and 'Avoid Ambiguity') will not be discussed because it is not clear how they relate to the choice of S vs. W.

2.3.1. *The Non-Obscurity Condition*

Quantity-1 implicature cannot be produced if the choice of W instead of S can be attributed to the observance of the Maxim of Obscurity Avoidance. That is, the Conversational Condition has (31) as a subinstance.

- (31) The Non-Obscurity Condition: S must not be obscure (to the hearer).

An example of the choice of expressions governed by the Maxim of Obscurity Avoidance comes from the choice of place terms discussed earlier. Schegloff (1971) has pointed out that one factor governing the description of location is the speaker's assumption about the hearer's familiarity with relevant place names. Speakers do not usually use a proper name (without an explanation or qualification of some sort) if they think that the name is unfamiliar to the hearer. For example, a person from a small town not far from Tokyo can choose to introduce himself/herself as having been born "near Tokyo" or "in the Tokyo area", if s/he thinks that the name of the town might be unfamiliar to the hearer, even when s/he is encouraged to give a specific place name.¹² This phenomenon can be regarded as a special case of the Maxim of Obscurity Avoidance. As can be seen from this example, in which a more informative expression (a place name) is avoided, this maxim can influence the choice between a weaker expression and a stronger expression, and it is therefore an information-selecting maxim.

The production of a Quantity-1 implicature is not produced when a more informative place name is unfamiliar (obscure) to the hearer. Consider (32).

- (32)a. A: "What town is Bill living in?"
 B: "He is living in some small town not far from Tokyo."
 b. 'B does not know which of the small towns not far from Tokyo Bill is living in.'

In (32a) B is expected to name the town where Bill is living. However, B gives a less informative answer. The production of the possible implicature (32b) is dependent on the speaker's (B's) assumption regarding the hearer's (A's) knowledge of the towns in the Tokyo area. If B thinks that A is knowledgeable about this particular part of Japan (e.g., A is from the Tokyo area), then (32b) is implicated. If B thinks that A is not familiar

¹² A speaker can of course choose to mention an unfamiliar proper name. In that case the name is usually put in a special frame like "a (some) X called Y", as in "a town called Urawa".

with the neighborhood of Tokyo, on the other hand, the implicature is not produced.

This difference is exactly what the Non-Obscurity Condition predicts. If the hearer is assumed to be unfamiliar with the neighborhood of Tokyo, the town name must be unfamiliar (obscure) to the hearer; hence the Non-Obscurity Condition is violated and no implicature is produced. If the hearer is assumed to be familiar with the neighborhood, on the other hand, the town name must be familiar to the hearer; hence no violation occurs and an implicature is produced.

Another phenomenon which may perhaps be explainable in terms of the Non-Obscurity Condition is Horn's (1984) observation concerning pairs of lexical and periphrastic causatives, such as *kill* and *cause . . . to die* (see Shibatani 1976, McCawley 1978, Kageyama 1980, Atlas & Levinson 1981, Horn 1978a, 1984). The lexical causative is semantically restricted to stereotypical causation (e.g., direct, unmediated causation through physical action), while the periphrastic causative is usually semantically neutral with respect to the stereotypicality of causation. Lexical causatives do not exist for all causative meanings, but when there is a lexical causative that semantically overlaps with a periphrastic causative, the lexical causative, being more specific and therefore more informative, is pragmatically given priority over the periphrastic causative, the result being the non-use of the periphrastic causative for stereotypical causation in such cases (Shibatani 1976, McCawley 1978; see also Kageyama 1980, Atlas & Levinson 1981, Horn 1978a). Thus, the speaker of (33a) implicates (33b).¹³

- (33)a. "John caused Mary to die."
 b. \mapsto '(The speaker believes) John didn't kill Mary (directly or in a stereotypical way).'

However, Horn (1984) has observed a certain exception to this general rule. The restriction of the use of a periphrastic causative expression to

¹³ This account differs from that of Kageyama (1980) and of Atlas & Levinson (1981), who seem to believe that the meanings of these two kinds of causatives are the same at the semantic level (in accordance with the position of Generative Semantics) and that the difference arises due to some sort of conversational principle: speakers use less effort in expressing typical situations, and more effort in expressing atypical situations. (Horn (1984) also appeals to a similar principle to explain the restriction of the meaning of lexical expressions to typical situations, though he also uses the Maxim of Quantity-1 to explain the restriction of the meaning of periphrastic expressions.) While this tendency might be at work in the process of semantic change, I believe that these two sorts of expressions are in fact different at the semantic level in a synchronic description. One reason to believe this is that different periphrastic causative constructions (e.g., *cause NP to VP*, *make NP VP*, *get NP to VP*) have different semantic interpretations (see Goldsmith 1984, for example), and this cannot be predicted simply by possible implicatures.

non-stereotypical causation is not observed when the periphrastic expression in question is unnatural, far-fetched, or rarely used. Consider the meanings of (34a), (35a), and (36a) in this regard.

- (34)a. "That sort of behavior really makes (gets) me angry."
- b. "That sort of behavior really angers me."
- (35)a. "The director made the actress afraid."
- b. "The director frightened the actress."
- (36)a. "The witch made the glass {clean/dry}."
- b. "The witch {cleaned/dried} the glass."

Though meanings of the periphrastic expressions in (35a) and (36a) are restricted by their (b) counterparts, this is not true of (34a). The difference is that the lexical expressions in (35) and (36) are fully natural and frequently used, but the lexical expression in (34) is much less so. In the present account, the reason that no implicature is produced on the basis of $\langle \textit{anger, make} \dots \textit{angry} \rangle$ is precisely this violation of the Non-Obscurity Condition.

Incidentally, example (33) above involves a morphologically unrelated pair *kill* and *cause to die*; as such it shows the inadequacy of Horn's (1978a, 1984) view that only a morphologically related pair of lexical and periphrastic expressions can constitute a Horn scale.¹⁴

2.3.2. *The Non-Existence of the Brevity Condition*

Another Maxim of Manner that Grice has proposed is the Maxim of Brevity: 'Be brief'. This maxim states that when there are two roughly synonymous expressions one of which is apparently more prolix than the other, the speaker who uses the prolix expression implicates that the

¹⁴ Horn's evidence for this claim involves the pair $\langle \textit{drop, make} \dots \textit{fall} \rangle$. He claims that unlike many pairs of morphologically related lexical and periphrastic causatives that license implicatures (e.g., $\langle \textit{move, make} \dots \textit{move} \rangle$), the meaning of *make* . . . *fall* is not restricted by the presence of *drop*. In examining *make* . . . *fall* and *drop*, Horn seems to be assuming that the only semantic difference between lexical and periphrastic causatives involves the stereotypicality of the causation situation. The meaning of *drop*, however, is in fact further restricted: it is typically used for an unintentional, unexpected, or sudden process. The periphrastic expression *make* . . . *fall* cannot be used to refer to such a process; we thus have the contrast between (i) and (ii).

- (i) John dropped his wallet without realizing it.
- (ii) #John made his wallet fall without realizing it.

Therefore, the pair $\langle \textit{drop, make} \dots \textit{fall} \rangle$ does not constitute a convincing evidence for the relevance of morphological relatedness in licensing implicatures.

intended meaning is distinct from that conveyed by the briefer expression.¹⁵ Are Quantity-1 implicatures blocked if the choice of W instead of S can be attributed to the observance of this maxim? Such a proposal has in fact been made by Levinson (Atlas & Levinson 1981, Levinson 1983):

- (37) Brevity Condition: The stronger item must be of equal brevity to the weaker item.

Levinson further notes that this condition ensures that the speaker “did not use [the weaker expression] rather than [the stronger one] simply in order to be brief (i.e., to conform to the Maxim of Manner)” (Levinson 1983: 135). The formulation of this condition is similar to that of the Conversational Condition: the possibility of the non-use of S being attributed to a certain Maxim functions as a constraint on Quantity-1 implicature. However, the Brevity Condition above is not a real condition on Horn scales, as will now be demonstrated.

One example of the possible implicatures that this condition might rule out is example (38), which is based on Suppes (1972).

- (38)a. “Watch out for that spider.”
 b. \nrightarrow ‘The speaker does not know the color, size, or exact position of the spider he warns about.’
 c. “Watch out for the black, half-inch long spider that has a green dot in its center and is about six inches from your left shoulder at a vertical angle of about sixty degrees.”

In uttering (38a), (38b) is not implicated, even though the speaker could, for example, have uttered (38c), which is far more informative. One might argue that this non-production of implicature is attributed to the violation of the Brevity Condition posited above.

However, this non-production of implicature can also be explained by the Quantity-2 Condition. What precludes the production of implicature may not be the stronger expression’s length per se, but the superfluous information about details of the spider conveyed by that expression. If, as is typically the case, a description like *that spider* and possibly non-linguistic cues such as pointing that might accompany the utterance are

¹⁵ This is the least studied of Grice’s maxims, and it is not entirely clear precisely how it should work. Some have pointed out, for example, that there are many near-synonymous pairs of briefer and longer expressions that do not seem to license an implicature (Wilson & Sperber 1981, Poser 1992).

enough to achieve the intended reference, further details about the spider (e.g., its color, size, position) can be regarded as unnecessary information.

In the above example, S is both unnecessarily informative and more lengthy than W, and therefore it is not clear which of the two is the crucial factor. Nevertheless, there is some evidence in favor of an explanation based on the quantity of information. First, in cases where S is not unnecessarily informative, W can be used to produce an implicature even when S is more lengthy than W. Consider the following scale: *(a little more than warm, warm)*. An implicature is produced on the basis of this scale when *a little more than warm* is a part of the scale used in the discourse. (39) is an example.

- (39)a. “It was warm yesterday, and it is a little bit more than warm today.”
 b. |→ ‘The speaker believes that it was not “a little bit more than warm” yesterday.’

This example shows that the relative prolixity of S cannot by itself constrain the production of Quantity-1 implicature. If a stronger item is regarded as carrying necessary information, that expression is expected to be used even if it is prolix. That is, one cannot reduce lengthiness at the cost of necessary information.

This observation is in fact consistent with the nature of the Maxim of Brevity. The Maxim of Brevity states that the speaker chooses a briefer expression over a more prolix one *if they are roughly synonymous*. That is, the Maxim of Brevity governs only the formal complexity of the expression used, not the amount of information conveyed; as Grice states, “[w]hile the maxim of quantity concerns how much you say, brevity concerns how much you take to say it” (quoted as personal communication from Grice in de Beaugrande & Dressler 1981: 121). This means that the Maxim of Brevity is not an information-selecting Maxim at all. In consequence, it is not really relevant to the Conversational Condition.

2.3.3. *On If and Only If and If*

2.3.3.1. *The Degree of Lexicalization*

An issue related to the Brevity Condition is one of lexicalization. Levinson (Atlas & Levinson 1981, Levinson 1987a, b) has proposed (40) as a condition on Horn scales.

- (40) The Lexicalization Condition: S and W must be lexicalized to the same degree.

Levinson does not explain the difference between this condition and the Brevity Condition, although this condition apparently covers many cases where the Brevity Condition would also be relevant.

Levinson invokes the Lexicalization Condition to explain the non-production of an implicature on the basis of *<if and only if, if>*, exemplified in (41).

- (41)a. "I will give you five dollars if you mow the lawn."
 b. \nrightarrow '(The speaker believes) it is not the case that the speaker will give the hearer five dollars if and only if the hearer mows the lawn.'
 c. \rightarrow '(The speaker believes) the speaker will give the hearer five dollars if and only if the hearer mows the lawn.'
 d. "I will give you five dollars if and only if you mow the lawn."

(41a) is a weaker statement than (41d) since (41d) entails (41a). However, (41b), which is the negative counterpart of (41d), cannot be implicated on the basis of (41a). On the contrary, (41a) "invites" the inference of (41c), which is the proposition that the utterance (41d) expresses (Geis & Zwicky's (1971) "invited inference"). Levinson says that non-production of the implicature of (41b) on the basis of *<if and only if, if>* is due to the different degree of lexicalization between *if and only if* and *if*. However, the Lexicalization Condition, like the Brevity Condition, cannot be a condition on Horn scales, for it would rule out Horn scales such as *<a little more than warm, warm>*, *<kill, cause to die>*, and *<pink, pale red>* (see McCawley 1978).

In fact, the phenomenon of *if and only if* and *if* can be explained in totally different terms. First, it should be noted that the case of *<if and only if, if>* is not an isolated one. Consider (42) and (43).

- (42)a. "Three men came."
 b. \nrightarrow '(The speaker believes) it is not the case that exactly three men came.'
 c. \rightarrow '(The speaker believes) exactly three men came.'
 d. "Exactly three men came."
 (43)a. "Bill met John on the way home."
 (where the speaker knows that meeting Mary is of concern to the hearer¹⁶)
 b. \nrightarrow '(The speaker believes) it is not the case that Bill met John but not Mary on the way home.'

¹⁶ Cf. the Relevance Condition above.

- c. \vdash '(The speaker believes) Bill met only John on the way home.'
- d. "Bill met John but not Mary (or any other person) on the way home."

(42d) and (43d) entail (42a) and (43a), respectively, and therefore (42a) and (43a) are weaker statements than their (d) counterparts. However, (42a) and (43a) do not allow the expected implicature of (42b) and (43b).¹⁷ On the contrary, the implicatures (42c) and (43c) can be produced (when the Conversational Condition is satisfied).

What (41), (42), and (43) have in common is that the stronger statements are stronger than the weaker ones due to the addition of a negative proposition: 'the speaker will not give the hearer five dollars if the hearer does not mow the lawn' in (41d); 'not more than three men came' in (42d); 'Bill did not meet Mary on the way home' in (43d). I will call such stronger statements *negatively restricted stronger statements*.

This characteristic of negatively restricted stronger statements can be reduced to the non-scalar nature of expressions like *exactly three*. Horn (1989) discusses the problem of the scalarity of expressions that form a Horn scale. What he says boils down to condition (44):

- (44) **Scalarity Condition:** Expressions that form a Horn scale must be either 1) all positively scalar (e.g., *<all, some>*) or 2) all negatively scalar (e.g., *<no, few>*).

The negatively restricted expressions discussed above are non-scalar (i.e., neither positively nor negatively scalar), and therefore may not participate in a Horn scale. This point will become clearer by the following test. Horn points out the parallelism between his notion of scalarity and Barwise & Cooper's (1981) notion of monotone properties of quantifiers and determiners. (In Barwise & Cooper's theory, "quantifier" refers to an NP (e.g., *some men*), and "determiner" refers to a term like *some* in *some men*.) The monotone property of a quantifier NP is defined by

¹⁷ One reviewer for *Linguistics and Philosophy* has suggested that *<exactly three, three>* can license an implicature in an exchange like the following.

- (i) A: So, are there exactly three people in that list?
B: Well, there are three people in this list.

B's utterance may imply 'not exactly three', but this is not a case of implicature. In this exchange B is metalinguistically commenting on A's inappropriate use of the expression *exactly three* (cf. Horn 1985). B's utterance in (ii) below plays the same function.

- (ii) A: Have you met Bernst[iʰ]n?
B: I have met Bernst[ay]n.

whether the predicate can be strengthened or weakened *salva veritate* (i.e., without changing the truth value of the sentence) when the NP appears in the subject position. Monotone increasing quantifiers allow the predicate to be weakened *salva veritate*, while monotone decreasing quantifiers allow the predicate to be strengthened *salva veritate*. Those quantifiers that do not allow the predicate to be weakened or strengthened *salva veritate* are non-monotone. Consider (45), (46), and (47).

- (45)a. Some men entered the race early.
 b. \nrightarrow Some men entered the race.
- (46)a. No men entered the race early.
 b. \nleftarrow No men entered the race.
- (47)a. Exactly three men entered the race early.
 b. \nleftrightarrow Exactly three men entered the race.

In (45) the subject NP *some men* allows its predicate to be weakened but not strengthened *salva veritate*, and therefore it is monotone increasing. In (46) the subject NP *no men* allows its predicate to be strengthened but not weakened *salva veritate*, and therefore it is monotone decreasing. Finally, in (47) the NP *exactly three men* does not allow its predicate to be either strengthened or weakened *salva veritate*, and therefore it is non-monotone. Determiners that induce these properties of NPs are correspondingly classified into the same three categories: *some* is monotone increasing; *no* is monotone decreasing; *exactly three* is non-monotone.

Horn notes that monotone increasing expressions are positively scalar, monotone decreasing expressions are negatively scalar, and non-monotone expressions are not scalar. The “negatively restricted” expressions in (41) through (43) can be characterized as non-monotone by this criterion, and therefore they are non-scalar. I have already shown that the expression *exactly three* is non-monotone. (48) shows that *John but not Mary* is also non-monotone, and therefore non-scalar.

- (48)a. John but not Mary went home.
 b. \nleftrightarrow John but not Mary went home early.

Because of this non-monotone (or non-scalar) property of these negatively restricted NPs, they cannot participate in Horn scales.

A similar statement can be made about *if* clauses and *if and only if* clauses. *If and only if* clauses display a phenomenon parallel to non-monotone NPs: this clause does not allow its consequent clause to be strengthened or weakened *salva veritate*, as shown in (49).

- (49)a. I will give you five dollars if and only if you mow the lawn.
 b. \leftrightarrow I will give you five dollars by noon if and only if you mow the lawn.

This contrasts with *if* clauses, which exhibit a phenomenon parallel to monotone increasing NPs such as *three men*. An *if* clause allows its consequent to be weakened but not strengthened *salva veritate*, as shown in (50).

- (50)a. I will give you five dollars if you mow the lawn.
 b. \leftarrow I will give you five dollars by noon if you mow the lawn.

These tests show that *if and only if* clauses are not scalar in nature, while *if* clauses are scalar (on a positive scale). Therefore these two clauses do not form a Horn scale.

Thus, the non-production of implicature on the basis of the weaker and stronger statements in (41) through (43) is to be attributed to the general condition on the scalarity of items in a Horn scale. This condition is a part of the informativeness requirement on Horn scales. (For an extended commentary on the role of implicature in *only if* and *if and only if* conditionals, see van der Auwera (to appear) and references therein.)

2.3.3.2. *Invited Inference as Quantity-1 Implicature*

This analysis of *if and only if* provides support for the Quantity-1 implicature account of Geis & Zwicky's "invited inference" of conditional sentences (Horn 1972: 107, Boër & Lycan 1973, de Cornulier 1983), which is argued against by Atlas & Levinson (1981). As indicated above, sentences like (41a), repeated here as (51a), "invite" inferences such as (51b), which states that the antecedent given in (51c) represents the only case in which the consequent of the conditional is true.

- (51)a. "I will give you five dollars if you mow the lawn."
 b. \mapsto '(The speaker believes) the speaker will give the hearer five dollars if and only if the hearer mows the lawn.'
 c. "I will give you five dollars if and only if you mow the lawn."
 d. "I will give you five dollars if you mow the lawn, or if you clean all of those rooms (i.e., if you do something else)."

Utterances like (51a) have corresponding stronger statements of two sorts: negatively restricted stronger statements like (51c) and positively enhanced stronger statements like (51d), both of which entail (51a). Atlas & Levinson (1981) claim that the inference of (51b) from (51a) is different

from Quantity-1 implicature, since the Quantity-1 implicature from the utterance of (51a) should be that the speaker does not believe the truth of (51c), which is in fact the opposite of the actual inference derived from (51a), namely, (51b). Further, this observation leads them to claim that the inference of (51b) is based on a new principle of conversation: the Principle of Informativeness ('Read as much into an utterance as an inference to the best interpretation'). However, as I have argued, there is a principled reason for the non-production of implicatures based on negatively restricted stronger statements like (51c). Since (51c) cannot be the kind of stronger statement that licenses an implicature, the only possible stronger statement for the production of an implicature is of the type (51d). Therefore, a speaker who utters (51a) implicates that s/he does not believe the truth of (51d) (or any other such positively enhanced stronger statement to the effect that the hearer can also be given five dollars if s/he does something other than mowing the lawn). Namely, the failure to mention more than one case in which the consequent of the conditional is true is interpreted as suggesting that the speaker believes that it is the only case in which the consequent is true. This is exactly what the "invited inference" of (51a) is (i.e., (51b)). Thus, the invited inference of a conditional sentence is a case of Quantity-1 implicature.

This Quantity implicature account of "invited inference" makes it possible to explain why the meaning of *if and only if* is not lexicalized. Horn (1972) points out that a quantifier meaning is not lexically expressed when there exists an expression which can be used to implicate that meaning. The meaning of *not all* ($\sim\forall$), for example, is not lexicalized because of the existence of *some*, which can be used to implicate 'not all'. This can be extended to the case of *if* and *if and only if*; the meaning of *if and only if* is not lexicalized because of the existence of *if*, which can be used to implicate 'if and only if'.

The production of "invited inference" is also constrained by the Conversational Condition proposed in this paper, especially by the Relevance Condition and the Quantity-2 Condition. As Lilje (1972) and Boër & Lycan (1973) have pointed out, not all conditional sentences support Geis & Zwicky's invited inference. In the present account, an implicature (i.e., an invited inference) is not produced when the failure to mention more cases in which the consequent of the conditional is true can be the result of observing the Maxim of Relevance or the Maxim of Quantity-2. This is borne out in examples (52) and (53). (53) is taken from Lilje (1972).

- (52)a. A: "How old is Chuck?"
 B: "He's fifteen."
 A: "Oh, if he is fifteen, he is qualified for the work."
 b. \nrightarrow '(A believes) Chuck is qualified for the work, if and only if he is fifteen.'
- (53)a. "If this cactus grows native to Idaho, then it's not an *Astrophytum*."
 b. \nrightarrow '(The speaker believes) if and only if this cactus grows native to Idaho, it is not an *Astrophytum*.'

Speaker A in (52a) is not implicating (52b) by his or her second utterance. The explanation goes like this. In making this utterance, A is not expected to mention the entire age range that makes an applicant qualified for the work. Rather, A is expected to comment specifically about Chuck; and whether Chuck would also be qualified if he were fourteen or sixteen, for example, is irrelevant. Therefore, possible stronger statements do not satisfy the Relevance Condition and an implicature cannot be produced. In (53a) the point of the utterance is to provide one piece of evidence that the cactus in question is not an *Astrophytum*. Mentioning other pieces of evidence that lead to the same conclusion would be regarded as conveying unnecessary information, and the Quantity-2 Condition would be violated. Therefore an implicature is not produced.

Particularly interesting in this regard are indicative counterfactual conditional sentences. As Boër & Lycan (1973) and Akatsuka (1986) observe, sentences like the one B uses in (54a) do not allow an invited inference such as (54b).

- (54)a. A: "I am the Pope."
 B: "If you are the Pope, I am the Empress of China."
 b. \nrightarrow '(The speaker believes) if and only if the hearer is the Pope, the speaker is the Empress of China.'
 c. "If you are the Pope or if you are the Prince of Wales (or whoever else A cannot be), I am the Empress of China."

This can be attributed to the context-bound nature of those sentences (Akatsuka 1986) and to the Relevance Condition above. Akatsuka (1986) notes that indicative counterfactual sentences always require a previous context, since they are used to point out the absurdity of some specific assertion made by another person (e.g., a hearer), as in (54a). Stronger statements such as (54c) would thus be irrelevant in the context in which B's utterance in (54a) is used, as they would not be responding to A's specific statement. Therefore, the implicature of (54b) is not produced.

Thus, the present account reduces Geis & Zwicky's invited inference to a case of Quantity-1 implicature, and its production is constrained by the Conversational Condition proposed herein.

2.4. *Politeness Conditions*

Grice's conversational principles do not constitute an exhaustive list of principles governing conversation. Leech (1983), for example, has proposed other sorts of conversational principles that he calls Politeness Principles. The production of a Quantity-1 implicature can also be blocked if the choice of W instead of S can be attributed to the speaker's observance of these principles. Let us take Leech's Approbation Maxim: 'Avoid saying unpleasant things about others, and more particularly, about the hearer' (Leech 1983: 135). In Brown & Levinson's (1987) terms, this is a case of redressing a threat to the hearer's 'positive face'. Consider (55) in this regard.

- (55)a. "I'm a bit unhappy about your suggestion".
 b. \nrightarrow '(The speaker believes) the speaker is not very unhappy about the hearer's suggestion'.

In spite of the scale (*very unhappy, a bit unhappy*), (55a) can *not* be used to implicate (55b) in a context in which being polite is a necessary part of the exchange. In such a context the non-choice of *very unhappy* can be attributed to the observance of the Approbation Maxim, and therefore an implicature is not produced. (See also Horn 1989: Chapter 5 for discussion on politeness and constraints on implicature.)

In Japanese, an important principle of pragmatics is the Modesty Maxim: 'Minimize praise of self; maximize dispraise of self' (Leech 1983: 136). Quantity-1 implicatures are not produced when the choice of W instead of S can be attributed to the observance of this maxim. In the following exchange, for example, which is set in a context where this maxim is important, B's utterance cannot be interpreted as his implicating (56b).

- (56)a. (An interviewer is talking with the winner of a sumo match)
 A (an interviewer): "Tsuppari ga subarashikatta desu ne."
pushing NOM splendid-PAST COP SFP
 'Your push was splendid, wasn't it.'

B (the winner of a sumo match): “Maa maa desu.”

so-so *COP*

‘It was so-so’.

- b. \nrightarrow ‘(B believes) his push was not splendid’.

2.5. *Summary of Section 2*

The discussion in this section has demonstrated that the Conversational Condition proposed above can give a unified account of quite a wide range of examples involving the production and non-production of Quantity-1 implicatures. It not only captures what previously proposed conditions have tried to capture, but also resolves controversial issues (e.g., the problem with respect to *regret*, *know*, and *believe*), and explains previously undiscussed examples (e.g., those involving politeness).¹⁸

3. SOME ALTERNATIVE CONCEPTIONS OF MAXIMS AND CONDITIONS ON QUANTITY IMPLICATURES

In this section, I will consider the Relevance Theory of Sperber & Wilson (Sperber & Wilson 1981, 1986; Wilson & Sperber 1981; Wilson in press; etc.) and Horn’s (1984, 1989) Q and R Principles in terms of the claims made above.

3.1. *Sperber & Wilson’s Relevance Theory*

Sperber & Wilson (1981, 1986) have proposed the Principle of Relevance as a general principle governing “ostensive” or overt communication. This principle, they claim, subsumes all of Grice’s maxims (Wilson & Sperber 1981). The Principle of Relevance states that every act of ostensive communication creates an expectation of maximal relevance. Because of this principle, the hearer interprets the speaker’s utterance in a way that best satisfies this expectation of relevance. The notion of relevance here is a comparative one, and is defined in terms of the amount of contextual effects (i.e., non-trivial logical implications derivable only from the *combination* of context and the content of what is said) balanced by processing effort. That is, the more contextual effects an utterance has in a given

¹⁸ See Matsumoto (1993) for further examples of how the production of implicatures on the basis of Japanese numeral classifiers can be blocked due to the observance of some maxims of conversation.

context and the less processing effort it requires, the more relevant the utterance is in the context.

This notion of relevance can be illustrated by the following examples.

- (57)a. Bill, who has thalassemia, is getting married to Susan.
- b. Bill, who has thalassemia, is getting married to Susan, and 1967 was a great year for French wines.

Sperber & Wilson (1986: 127) claim that these two utterances have the same contextual effects in a context consisting of the following assumptions: two people both of whom have thalassemia should be warned against having children; and Susan has thalassemia. However, these two utterances differ in their degree of relevance, since, they claim, (57b) requires more processing effort than (57a). As can be seen from this case, Relevance Theory explains the avoidance of excessive (irrelevant) information in terms of the additional effort required for processing.

This notion of relevance suggests the possibility of unifying my Quantity-2 Condition, Relevance Condition, and Non-Obscurity Condition into the following condition.

- (58) 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).

Since a stronger statement should produce at least the same set of contextual effects as corresponding weaker statements, what really counts in (58) is the amount of processing effort.

At first sight, this condition appears to work well with the examples examined earlier. Some examples discussed in relation to the Quantity-2 Condition, the Relevance Condition, and the Non-Obscurity Condition might indeed be explained by this alternative condition. (38) is one good example: here the stronger expression is undoubtedly much harder to process. The non-production of an implicature on the basis of terms in taxonomy, such as *spaniel*, *dog* in (7a) above, might also be explained by the greater effort required to process subordinate terms, which are less frequent in occurrence than basic-level terms and therefore harder to process (cf. Wilson, in press). The examples considered in relation to my Non-Obscurity Condition might also be explained in this way, given that obscure expressions are by their very nature hard to process.

However, condition (58) does not appear to explain the entire range of examples considered in this paper. First, it is not clear how this condition can explain politeness-based examples such as (55) and (56) above. In (55), for example, the stronger statement "I'm very unhappy about your

proposal” cannot be regarded as less relevant in Sperber & Wilson’s sense than the weaker statement (55a) actually uttered.

The second problem, which is more interesting in view of the general nature of Relevance Theory, concerns examples in which a stronger statement requires less processing effort. Consider (59).

- (59)a. “It was a little bit more than warm yesterday, and it is just plain hot today.”
 b. |→ ‘(The speaker believes) it was not hot yesterday.’

The stronger expression (*just plain*) *hot* presumably requires less processing effort than the weaker expression *a little bit more than warm*, in that it is both briefer and more frequent. Contrary to condition (58) above, however, an implicature can be produced on the basis of *(hot, a little more than warm)*.

What this example shows is the inadequacy of Relevance Theory in its association of amount of information with processing difficulty. As I pointed out in relation to (57), Relevance Theory treats examples involving excessive information as requiring more processing effort. In fact, however, the strength of statements and processing effort are independent notions.

3.2. Horn’s *Q* and *R* Principles

Another important reformulation of Gricean maxims is that of Horn’s *Q* *R* principles (Horn 1984, 1989). According to the most recent version of this typology of maxims of conversation (Horn 1989), Grice’s Maxim of Quantity-1, Obscurity Avoidance and Ambiguity Avoidance are grouped together as the *Q* principle, while the Maxims of Relation, Quantity-2, Brevity, and Orderliness are subsumed within the *R* principle. The *Q* Principle states ‘Make your contribution sufficient; say as much as you can (given *R*)’. The *R* Principle, on the other hand, states ‘Make your contribution necessary; say no more than you must (given *Q*)’. These two principles are in conflict, and one restricts the other in a way that Horn (1984) characterizes as a “division of labor”.

On the basis of this distinction, one might restate the Conversational Condition as (60).

- (60) The use of *W* instead of *S* must not be attributed to the observance of the *R* Principle.

This condition faces problems similar to those just discussed in relation to the Relevance Principle above. First, politeness-based examples cannot

be explained in this way. Second, condition (60) makes a different prediction about the role of the Maxim of Brevity than does the Conversational Condition. (60) would allow the possibility of a Quantity-1 implicature being not produced if the choice of W instead of S can be attributed to the observance of the Maxim of Brevity, since this maxim is included in the R principle. To the contrary, I have argued above that the Maxim of Brevity is not an information-selecting maxim and therefore it does not participate in the Conversational Condition. This suggests that the Maxim of Brevity should not be collapsed with the Maxims of Quantity-2 and Relation (cf. Levinson 1987a). Again, maxims governing the amount of information must be separated from maxims governing the choice of forms. Condition (60) also makes an incorrect prediction about the role of the Maxim of Obscurity Avoidance.

4. FURTHER IMPLICATIONS

One important consequence of the Conversational Condition is that the production of all Quantity-1 implicature is context-dependent; the context of utterance determines whether the use of S would satisfy the Conversational Condition or not. This view has further implications for three issues in the study of conversational implicature. They are 1) the distinction between generalized and particularized Quantity-1 implicatures, 2) the notion of Horn scale itself, and 3) entailment as a condition on Horn scales.

First, consider the distinction between generalized Quantity-1 implicatures (implicatures produced without any particular context or special scenario) and particularized Quantity-1 implicatures (implicatures requiring a specific context in order to be produced) (Grice 1975). This distinction is controversial. Hirschberg (1985: 43), for example, points out that what have been treated as generalized implicatures in the literature are in fact context-dependent. She claims that the distinction between the two kinds of implicature is a false one, and so-called generalized implicatures are only relatively context-independent.

The present study supports her view. As I have argued, satisfaction of the Conversational Condition (the functional alternative requirement) is context-dependent. Some of the examples of the context-dependency of implicature discussed in this paper involve scales that have been treated elsewhere as ones licensing generalized Quantity-1 implicatures. Such cases include the scales *<superb, excellent, very good, good>* and *<boiling, hot, warm>* discussed in 2.1.3. In the present account, the difference between generalized and particularized implicatures is reduced to the

question of whether or not the intrinsic semantic relationship between S and W is such that S usually satisfies the Conversational Condition when W is uttered.

Another concept that the present discussion forces us to reconsider is the notion of Horn scale itself. Horn scales have usually been defined as scales that license generalized Quantity-1 implicatures, which are supposed to be context-independent. However, the present discussion has shown that the scales that actually license implicatures can be identified only in context.

In the view proposed in this paper, the notion of Horn scale can be reconceptualized in two different ways. First, it might be preserved as a context-independent notion: it might refer to the set of all scales that can license a Quantity-1 implicature at least in some context. Horn scales in this sense might be termed *possible Horn scales*. Possible Horn scales are those scales that satisfy the informativeness requirement. Alternatively, the notion of Horn scale can be defined on a context-by-context basis: Horn scales in the context C might refer to those scales that actually license an implicature in C. Horn scales in this sense might be termed *functional Horn scales*. The functional Horn scales in the context C are those scales that satisfy both the informativeness requirement and the functional alternative requirement in C.¹⁹

The present discussion also has interesting implications for the informativeness requirement on Horn scales. One problem relevant here is the status of logical entailment as a constraint on Horn scales (Burton-Roberts 1984; Gazdar 1979; Hirschberg 1985; Horn 1972, 1985, 1989). This is in fact the major constraint on Horn scales proposed by Horn (1972) himself. However, some have claimed that certain pairs holding a logical entailment relationship do not license an implicature. The pair *<regret, know>* is an illustration, and indeed this pair has been adduced as a counterexample to the view that the entailment relation is a sufficient condition on Horn scales (e.g., Burton-Roberts 1984). In addition, as I have shown above, two words that are in a relation of hyponymy (and therefore of entailment) often fail to license implicatures (e.g., *dog* and *spaniel*).

In this paper, however, I have argued that the non-production of an implicature in these cases is due to the violation of the functional alternative requirement. That is, these pairs are possible (though not always

¹⁹ Such implicatures can of course be canceled when they conflict with entailment or the speaker's world knowledge, as has been discussed in relation to the projection problem of implicatures (e.g., Gazdar 1979). In this sense, functional Horn scales should be defined as those that license Gazdar's (1979) "actual" as well as "potential" implicatures in a particular context.

functional) Horn scales. There is therefore no real counterexample to the view that logical entailment is a sufficient informativeness condition on possible Horn scales (as long as the scalarity condition introduced in 2.3.3.1 is satisfied).

This does not mean, however, that logical entailment is a necessary informativeness condition on Horn scales. There are numerous examples in the literature to show that this is not true (Hirschberg 1985, Horn 1989; cf. Fauconnier 1975, Fillmore, Kay & O'Connor 1988, Kay 1990), including those based on rank terms and on process stage terms that I have used above. As Hirschberg (1985) observes, all sorts of expressions that constitute an ordered set in which it is possible to determine whether one item is higher or lower than another appear to be able to function as Horn scales (possible Horn scales). The informativeness requirement is, then, simply that S and W are ordered and that S is stronger than W (aside from the problem of scalarity).²⁰

5. SUMMARY

In this paper, I have proposed the Conversational Condition as the functional alternative requirement on Horn scales. This condition is an outcome of the way Quantity-1 implicatures are worked out, and states that the choice of W instead of S must not be attributed to the observance of any information-selecting maxims of conversation other than the Maxims of Quality and Quantity-1. I have examined many cases of the production and non-production of an implicature in terms of this Conversational Condition, and have shown that it can give a unified account of quite a wide range of examples. Various specific conditions that have been proposed are not needed; all instances of functional alternative requirement can be reduced to this general condition, and therefore they are simply a consequence of the way Quantity-1 implicatures are worked out. I have also shown that alternative formulations based on Sperber & Wilson's

²⁰ Hirschberg (1985) claims that implicature can be licensed by any partially ordered set or POSET, which she defines as a set of items in which it is possible to determine, for any two items ordered in that relation, whether one item is higher or lower than another, *or whether the two are alternates with respect to some common higher or lower value*. It is not clear to me why the statement about alternates is included here. She appears to believe that (ia) can be used to implicate (ib) on the basis of alternates: *type* and *handwrite*. It is not clear that this should count as a case of Quantity implicature. I would say, rather, that it involves an inference based on world knowledge: one does not usually type and *handwrite* one and the same letter.

- (i)a. "I've typed it."
- b. 'The speaker believes that he has not handwritten it'.

Principle of Relevance and Horn's Q and R Principles cannot account for the full range of data. Finally, the proposed account also suggests that 1) the distinction between generalized and particularized implicature is not clear; 2) two notions of Horn scales should be recognized; and 3) logical entailment can be a sufficient (but not necessary) condition of the informativeness requirement.

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