

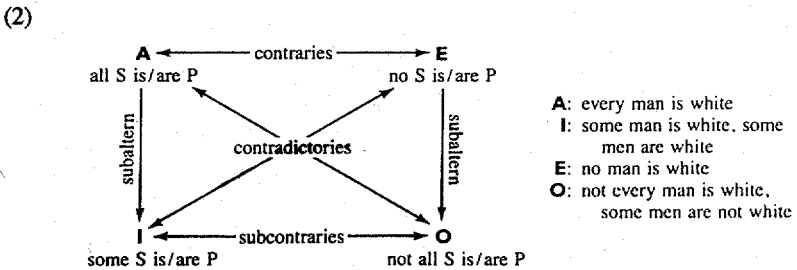
Hamburgers and Truth: Why Gricean explanation is Gricean¹

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Since Dick Grandy (this volume) offers a review of the last twenty years of Gricean cooperation, I shall concentrate on the first 2300 years and focus—in the spirit of McGarrigle (to appear) - on the influence of Grice on Aristotle. It is by now widely accepted that the Gricean mechanism for the generation of generalized conversational implicatures through the exploitation of the maxim of quantity (*Make your contribution as informative as required for the current purposes of the talk-exchange*) provides a natural account of weak scalar operators (*some, possible, permitted, or, warm*) as semantically one-sided, lower-bounded by their literal meaning (= *at least some, at least possible,...*) with the two-sided understanding (= *some but not all, possible but not necessary,...*) derived by an upper-bounding scalar implicature:

(1)		1-SIDED READING	->	2-SIDED READING
	Max has 3 children.	'...at least 3...'		'...exactly 3...'
	You ate SOME of the cookies.	'...some if not all...'		'...some but not all...'
	It's POSSIBLE she'll win.	'...at least \diamond ...'		'... \diamond but not certain...'
	John is patriotic OR quixotic.	'...and perhaps both'		'...but not both'
	It's WARM out.	'...at least warm...'		'...but not hot...'

This line provides a straightforward means for reconciling the apparent two-millennium-old conflict between the mutual implications intuitively relating the members of subcontrary pairs (*some/some not, possible/possible not,...*) and the desiderata of logical consistency and parsimony that remain unattainable when these implications are treated in semantic terms. But the quantity-driven pragmatic model of subcontrariety did not spring forth fully armed from the Gricean brow. I shall begin with a quick tour of some the highs and lows in the long history of subcontrariety, concentrating on those models that tend to prefigure the (neo-)Gricean approach to the Square of Opposition. The traditional assertoric square is laid out in (2) and the relevant terms of opposition identified in (3).



- (3)a. Corresponding A and E statements are CONTRARIES and cannot be simultaneously true (though they may be simultaneously false).
 b. Corresponding A and O (and I and E) statements are CONTRADICTIONARIES; members of each pair cannot be simultaneously true OR simultaneously false.
 c. An I statement is the SUBALTERN of its corresponding A statement (and O of E); a subaltern is unilaterally entailed by its corresponding superaltern.
 d. Corresponding I and O statements are SUBCONTRARIES and cannot be simultaneously false (though they may be simultaneously true).

The last of these oppositions has a rich and turbulent history, beginning with Aristotle's recognition that while contraries and contradictories cannot hold simultaneously, 'the contradictories of a pair of contraries can sometimes be true with reference to the same subject; for instance, "not every man is white" and "some men are white" are both true' (*De Interpretatione* 17b23). Indeed, this is an 'opposition' in name only:

Verbally four kinds of opposition are possible, viz. universal affirmative to universal negative [A/E], universal affirmative to particular negative [A/O], particular affirmative to universal negative [I/E], and particular affirmative to particular negative [I/O]: but really there are only three: for the particular affirmative is only verbally opposed to the particular negative.
(*Prior Analytics* 63b21, emphasis added)

It was five centuries later before the square of opposition came along, and with it the topographic term SUBCONTRARY for this relation: the subcontraries appear beneath the contraries.

Modal values can be superimposed onto the same square of opposition, with the A, I, E, and O vertices assigned respectively to the necessary, the possible, the impossible, and the not necessary (possibly not). But for Aristotle the modal subcontraries are not only mutually compatible, they are - on what he calls the 'two-sided' reading of possible - equivalent. But if whatever is necessary is possible and whatever is possible is possibly not (not necessary), then whatever is necessary is not necessary (*De Int.*, Chapter 13). While Aristotle could have restricted the subalternation to one-sided possibility and subcontrariety to the two-sided variety, retaining logical consistency if not parsimony, he did not adhere to this distinction within his modal syllogistic, of which McCall (1963: 1) notes that 'perhaps no other piece of philosophical writing has had such consistently bad reviews'.

On the standard logical account of the subcontraries, particularity and possibility are treated as parallel and unambiguous, but only at the cost of ignoring the intuition that led Aristotle to the formulation of complementary conversion between *possible* and *possible not*. Just as *Some S is P* has been regarded (since Aristotle) as true so long as AT LEAST one S is P, so too *S may be P* or *It is possible for S to be P* has been taken (since Aristotle's disciple Theophrastus²) to be true provided it is AT LEAST possible for S to be P; *some* is compatible with *all* and *possible* with *necessary*. The 'one-sided' versions of both operators have thus won the day, while their 'two-sided' competitors (*some but not all*, *possible but not necessary*) have been relegated to the role of secondary, composite operators, when they are mentioned at all.

This approach has proved to be especially popular for the general assertoric statements, where a millenium of logicians have followed Avicenna's lead:

If you say "some men are so-and-so", it is not necessary that some others are not so-and-so. If the proposition is about all, it is also about some.
(Avicenna (ibn-Sina)/Zabeh 1971: 24)

Nevertheless, there is an equally longstanding, if less hallowed, tradition of taking *some* to be two-sided and thus incompatible with *all*. Some have read it into Aristotle -

On the Aristotelian theory...wherever the affirmative "some are" applies, the negative proposition "some are not" holds also. (Dewey 1938: 182)

Aristotle seems to think that the main function of a particular statement is to describe a situation where the corresponding universal statement is false. His reasoning seems to be: If the universal is true, why assert the particular?
(Rose 1968: 41)

But this reading appears dubious for Aristotle's assertorics, given his endorsement of the one-way subaltern entailment from A to I and from E to O:

For having shown that it belongs to all, we will have shown also that it belongs to some; similarly, if we should show that it belongs to none, we will have shown also that it does not belong to all. (*Topics* 109a3)

Priority evidently belongs instead to the 5th-6th century Buddhist logician Dīnāga and his colleagues who, in their *hetu-cakra* or Wheel of Reasons,

do not admit four kinds of proposition like Aristotle and the Scholastics, but only three, since they interpret 'Some S is P' not as 'at least some' but as 'at least some and not all'...This would give a logical triangle in place of the western logical square. (Bochenski 1961: §53.14; cf. Tucci 1928)

This triangle of oppositions did not surface in the West until the mid-nineteenth century, when Sir William Hamilton of Edinburgh inaugurated a debate over the proper treatment of the subcontraries. Distinguishing two senses of *some*, the INDEFINITE (*at least some*) and the SEMI-DEFINITE (*some but not all*), Hamilton (1860: 254) regarded the latter as basic: 'Some, if not otherwise qualified, means some only - this by presumption.' On this reading of the particular, the two statements *Some men are learned* and *Some men are not learned* are not only (as for Aristotle) compatible, given that their conjunction is consistent, but logically indistinct. The purported opposition between the two subcontraries, charged Hamilton (1860: 261), was 'only laid down from a love of symmetry, in order to make out the opposition of all the corners in the square of opposition...In reality and in thought, every quantity is necessarily either all, or none, or some. Of these the third...is formally exclusive of the other two.'

But even Hamilton tended to restore the indefinite *some* to its traditional place in his version of the syllogistic, although his practice was inconsistent enough to result in total incoherence, as his arch-rival Augustus De Morgan was quick to point out. While acknowledging the existence (at least in 'common language') of Hamilton's 'presumption' whereby *some* conveys *not all* (*some not*), De Morgan defends the standard practice of relegating this inference to an extra-logical domain. De Morgan's subtle views are sampled below:

IN COMMON CONVERSATION the affirmation of a part is meant to imply the denial of the remainder. Thus, by 'some of the apples are ripe', it is always [sic] intended to signify that some are not ripe.

(De Morgan 1847: 4)

Some, in logic, means *one or more, it may be all*. He who says that *some are*, is not to be held to mean *the rest are not*. 'Some men breathe'...would be held false in COMMON LANGUAGE [which] usually adopts the complex particular proposition and implies that some are not in saying that some are.

(De Morgan 1847: 56)

COMMON LANGUAGE makes a certain conventional approach to definiteness, which has been thrown away in works of logic. 'Some' usually means a rather small fraction of the whole; a larger fraction would be expressed by 'a good many'; and somewhat more than half by 'most', while a still larger proportion would be 'a great majority' or 'nearly all'.
(De Morgan 1847: 58)

With logicians the word *some* has in all time been no more than a synonym of *not-none*: it has stood for *one or more, possibly all*. WITH THE WORLD AT LARGE it is sometimes *possibly all*, sometimes *certainly not all*, ACCORDING TO THE MATTER SPOKEN OF. But with the logician "some are" is merely and no more than the contradictory of "none are". Of these two one is true and the other false, and *some* equally contains some-certainly-not-all and some-possibly-all.

(De Morgan 1861: 51)

There are three ways in which one extent may be related to another...: complete inclusion, partial inclusion with partial exclusion, and complete exclusion. This trichotomy would have ruled the forms of logic, IF HUMAN KNOWLEDGE HAD BEEN MORE DEFINITE...As it is, we know well the grounds on which predication is not a trichotomy, but two separate dichotomies.
(De Morgan 1858: 121)

De Morgan's views are reflected in John Stuart Mill's even more directly proto-Gricean account of the subcontraries. In spurning Hamilton's innovations, Mill objects that

No shadow of justification is shown...for adopting into logic A MERE SOUS-ENTENDU OF COMMON CONVERSATION in its most unprecise form. If I say to any one, "I saw some of your children today", he might be justified in inferring that I did not see them all, NOT BECAUSE THE WORDS MEAN IT, but because, if I had seen them all, it is most likely that I should have said so: EVEN THOUGH THIS CANNOT BE PRESUMED UNLESS IT IS PRESUPPOSED THAT I MUST HAVE KNOWN WHETHER THE CHILDREN I SAW WERE ALL OR NOT.
(Mill 1867: 501)

Emphasis in the De Morgan and Mill citations is added to reflect Grice's influence here. Notice especially the epistemic rider on quantity-based inferences: the use of a weaker predicate suggests (implicates) that FOR ALL THE SPEAKER KNOWS the stronger predicate on the same scale could not have been substituted *salva veritate*.

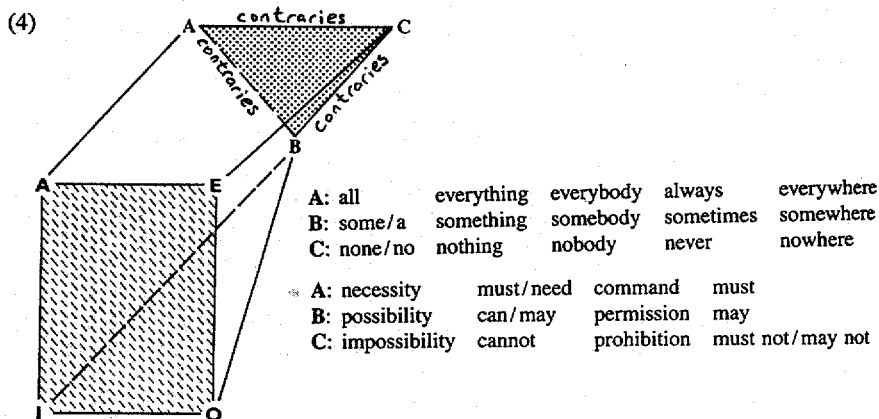
Mill's allusion to a tacit principle that requires the speaker to use the stronger *all* in place of the weaker *some* when possible, and to draw the corresponding inference when the stronger term is not used, is echoed even by one of Hamilton's would-be supporters:

Whenever we think of the class as a whole, we should employ the term All; and therefore when we employ the term Some, it is implied that we are not thinking of the whole, but of a part as distinguished from the whole—that is, of a part only.
(Monck 1881: 156)

John Neville Keynes, the grandfather of modern economics, similarly noted in his 1906 *Logic* (202-3) that a speaker whose knowledge is incomplete cannot use *some S's are P* with the meaning 'some only'.

The idea that *some* should be assigned the two-sided rather than, or along with, the one-sided meaning did not die with Hamilton. Ginzberg (1913, 1914) carried the quarrel across the Channel, jettisoning the square of opposition for a triangle of contraries with vertices representing *all*, *none*, and *exactly some*—'quelques et rien que quelques'. But Couturat (1913, 1914), only too happy to play De Morgan to Ginzberg's Hamilton, attempts to dissuade his countryman from following 'le plus mauvais des logiciens' in collapsing the two distinct subcontraries into one basic proposition which is in fact a logical conjunction; he argues that the classical system cannot be perfected by adopting 'précisions' that are foreign to its very spirit.

The same logical triangle, still undrawn, makes an implicit reappearance in Jespersen's tripartition of logical operators (1917: Chapter 8). The category labels and instantiations here are Jespersen's, the geometry mine.



But while Jespersen's B category, the nadir of this Triangle of Opposition, corresponds SEMANTICALLY to the conjunction or neutralization of the I and O vertices of the traditional Square, it has the lexical membership of the I vertex (*some*, *possible*). On logical, epistemic, and discourse grounds the identification of I and O is untenable, precisely for the traditional reason that the former is the contradictory of E, the latter of A.

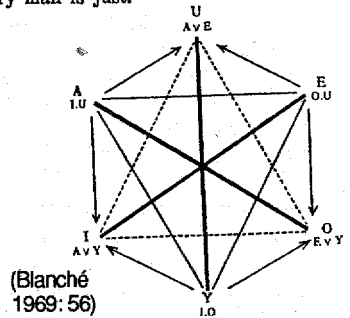
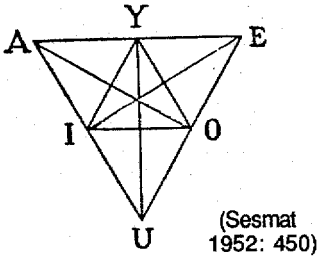
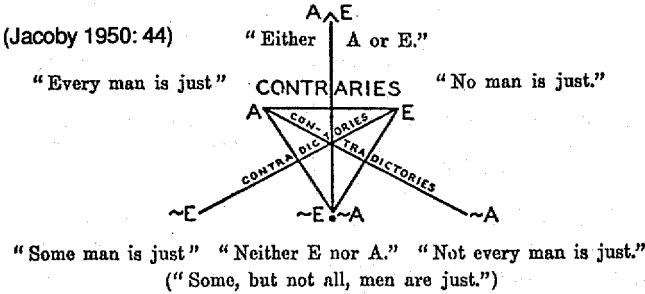
In fact, what we need here is not so much a triangle as a defective three-cornered square, given that in a wide variety of languages those values mapping onto the southeast corner of the square are systematically restricted in their potential for lexicalization. Thus alongside the quantificational determiners *all*, *some*, *no*, we never find an O determiner **nal*; corresponding to the quantificational adverbs *always*, *sometimes*, *never*, we have no **nalways* (= 'not always', 'sometimes not'). We may have equivalents for *both* (of them), *one* (of them), *neither* (of them), but never for **noth* (of them) (= 'not both', 'at least one...not'); we find connectives corresponding to *and*, *or*, and sometimes *nor* (= 'and not'), but never to **nand* (= 'or not', 'not...and')—at least not outside the lexicon of electronic circuitry. The missing O phenomenon, extending to the modals and deontics, is reinforced by a general tendency of O-->E drift, wherein lexical items or collocations associated by their compositional form or etymology with the O corner of the square move inevitably northward toward E. As I have argued more fully elsewhere (Horn 1972; Horn 1989: §4.5), the pragmatic inferential relation between the positive and negative subcontraries results in the superfluity of one of these subcontraries for lexical realization, while the functional markedness of negation assures that the superfluous, unlexicalized subcontrary will always be O.³

Thus Jespersen's tripartition gets the lexical facts right, but for the wrong reason. With characteristic insight, Sapir opts for a solution midway between the classical Square and the Jespersenian Triangle. His particular subcontraries are neither semantically bilateral nor strictly unilateral:

'Not everybody came' does not mean 'some came', which is implied, but 'some did not come'. Logically, the negated totalizer [not every] should include the totalized negative, i.e. opposite or contrary [none], as a possibility, but ordinarily this interpretation is excluded. (Sapir 1930: 21)

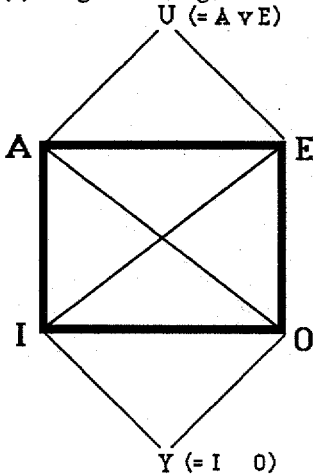
Note especially Sapir's use of *is implied* (vs. *means*) and his qualifier *ordinarily*, emphasizing the essential role of the context in licensing the implication in question.

One final triangulist salvo was launched in the early 1950's, appropriately enough by three philosophers working independently but exploiting essentially the same geometry. For Jacoby (1950), Sesmat (1951-2), and Blanché (1952, 1953, 1969), the square and triangle of (4) can be combined to form a logical hexagon on which the diametrically opposed terms are contradictories:

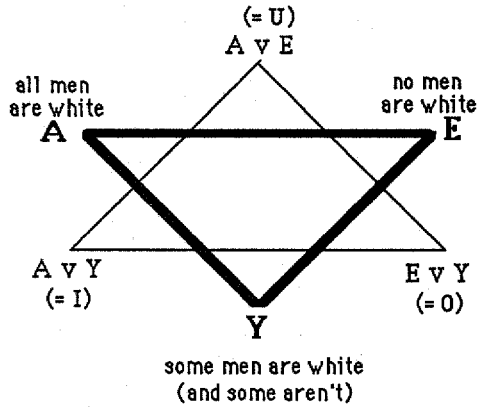


More accurately, a major triangle of mutual contraries A E Y, representing De Morgan's trichotomy of definite human knowledge, is superimposed upon a minor triangle of subcontraries whose vertices - designated appropriately enough as I O U⁴—are disjunctively defined. Curiously, Doyle, Sesmat, and Blanché fail to note that what we want here is not so much the Logical Hexagon of (5) as the Logical Magen David of (6):

(5) Logical hexagon



(6) Logical Magen David



These efforts to redesign the square have met with general nonacclaim⁵ or, in the case of Jacoby's (1950: 43-44) 'double triangle', with a prescient response by an unfortunately obscure proto-Grice in an equally obscure Jesuit journal:

What can be understood without being said is usually, in the interest of economy, not said...A person making a statement in the form, "Some S is P", generally wishes to suggest that some S also is not P. For, in the majority of cases, if he knew that all S is P, he would say so...If a person says, "Some grocers are honest", or "Some books are interesting", meaning to suggest that some grocers are not honest or that some textbooks are not interesting, he is really giving voice to a conjunctive proposition in an elliptical way.

Though this is the usual manner of speech, there are circumstances, nevertheless, in which the particular proposition should be understood to mean just what it says and not something else over and above what it says. One such circumstance is that in which the speaker does not know whether the subcontrary proposition is also true; another is that in which the truth of the subcontrary is not of any moment.

(Doyle 1951: 382)

Thus, a host who has received a couple of acceptances and no declinations from his invitees could felicitously claim that some of those invited will come without licensing an inference from I to O and hence to Y. In more current terminology, Doyle depicts Quantity as potentially overridden by either Quality or Relation (cf. Horn 1984 and below). But like De Morgan, Mill, and Monck before him, Doyle must tacitly appeal to a crucial principle yet to be explicitly codified.

An early formulation of this principle is offered by Strawson (1952: 178-9), who however credits his 'general rule of linguistic conduct' to 'Mr. H. P. Grice':

One should not make the (logically) lesser, when one could truthfully (and with greater or equal clarity) make the greater claim.

Grice's own 'first shot' at the relevant principle (1961: 132)—

One should not make a weaker statement rather than a stronger one unless there is a good reason for so doing.

—later evolves into his [FIRST] MAXIM OF QUANTITY (Grice 1967/1975: 45):

Make your contribution as informative as is required (for the current purposes of the talk-exchange).

Fogelin arrives independently at the same principle in the form of his RULE OF STRENGTH (1967: 20-22):

Make the strongest possible claim that you can legitimately defend!

Invoking a Gricelike 'distinction between what a statement implies (or entails) and what the use of a statement indicates', Fogelin emphasizes the connection between the rule-governed nature of language and the license to draw inferences obtained through the assumption that rules are being obeyed:

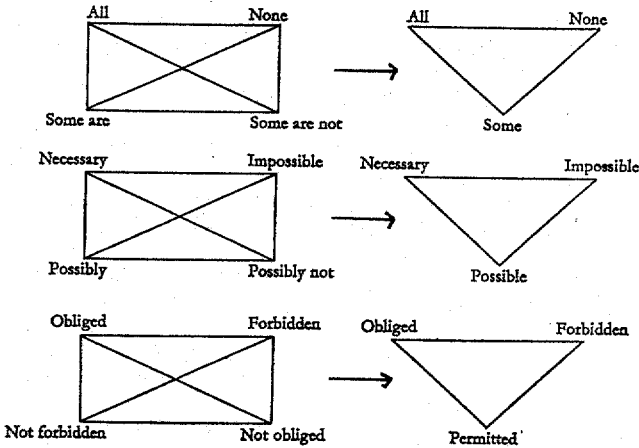
The use of language is under the governance of rules and thus when someone employs a given expression we are entitled to assume that the appropriate rules are being followed. When we can draw inference from the use of a statement that we cannot draw from the statement itself, this usually indicates that our inference is grounded on the assumption that some linguistic rule is in force.

In the case of the Rule of Strength, we have these corollaries:

- Do not employ an I or an O proposition in a context where you can legitimately employ an A or an E proposition...The use of one subcontrary typically suggests the appropriateness of using the other.
- Do not affirm one subcontrary if you are willing to deny the other.
- Subcontraries tend to collapse together.

Thus accoutered, Fogelin (1967: 22) tries his own hand at beating squares into triangles:

(7)



As our earlier avatars from De Morgan to Doyle recognized, the arrows are activated only when the context allows. Thus Fogelin's triangles - as distinct from those of the Jacoby-Sesmat-Blanché triumvirate - are pragmatically derived and not semantically driven.

Finally, we come to Harnish's MAXIM OF QUANTITY-QUALITY (1976: 362), Make the strongest relevant claim justifiable by your evidence, which decomposes into three subrules at potential loggerheads: Be as informative as necessary, Be relevant, Have evidence for what you say. Harnish cites Grice and Fogelin, as well as O'Hair (1969:45):

Unless there are outweighing good reasons to the contrary, one should not make a weaker statement rather than a stronger one if the audience is interested in the extra information that would be conveyed by the latter.

O'Hair in turn takes Grice 1961 as a starting point, while Fogelin, who takes no cognizance of Grice, leans on Nowell-Smith, who seems to have been equally unaware of the existence of his erstwhile fellow Oxonian Paul Grice, and vice versa.⁶ Nowell-Smith's definition and rules of contextual implication (1954: 80-82) are given as follows:

A statement *p* contextually implies a statement *q* if anyone who knew the normal conventions of the language would be entitled to infer *q* from *p* in the context in which they occur.

Rule 1: When a speaker uses a sentence to make a statement, it is contextually implied that he believes it to be true. [cf. Grice's Quality1]

Rule 2: A speaker contextually implies that he has what he himself believes to be good reasons for his statement. [cf. Grice's Quality2]

Rule 3: What a speaker says may be assumed to be relevant to the interests of his audience. [cf. Grice's Relation]

Clearly an idea whose time had come. We have in embryo here all of Grice's content maxims EXCEPT Quantity or Strength; by putting Nowell-Smith together with Fogelin we arrive in the neighborhood of Grice (1967/1975: 45-6) and William James:

QUALITY: Try to make your contribution one that is true.

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

QUANTITY:

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

RELATION: Be relevant.

MANNER: Be perspicuous.

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

But while Nowell-Smith discusses irony, lying, and play-acting as 'secondary uses of language', he offers no general account of speaker meaning, cooperation, or exploitation to explain how conveyed meaning arises, just as Mill, Doyle, and Fogelin, despite their recognition of a quantity or strength rule exploitable to generate the pragmatic upper-bounding of the subcontraries, lack a coherent set of rules or maxims whose interaction yields the rich array of nonlogical inferences in context described in the post-Gricean literature. More specifically, the forerunners never explicitly anticipate Grice's Cooperative Principle—Make your conversational contribution such as is required, at the state at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged—of which (as Georgia Green points out in her contribution to this volume) the maxims must be seen merely as special instances. It was Paul Grice who put it all together.

The invocation of the maxims may not be universally regarded as a breakthrough, especially given their self-evident or trivial appearance. The skeptic may recall Lord Macaulay's general maxim that nothing is so useless as a general maxim, and it might be further wondered whether Grice's neo-Kantian gang of four (or nine, counting submaxims) represents a significant advance over the rather bulkier set assumed by an earlier colonist also commemorated this BLS weekend (Washington [1746]1988). My proposed mapping relations between Grice's conversational maxims and George Washington's 'rules of civility and decent behavior in company and conversation' would not necessarily be endorsed by the General, wary as he notoriously was of foreign entanglements.

- (8) 79th: Be not apt to relate news if you know not the truth thereof. [cf. Quality]
 35th: Let your discourse with men of business be short and comprehensive. [cf. Quantity]
 90th: Being set at meat, scratch not; neither spit, cough, or blow your nose, except if there is a necessity for it. [cf. Relation]
 73th: Think before you speak; pronounce not imperfectly nor bring out your words too hastily, but orderly & distinctly. [cf. Manner]
 80th: Be not tedious in discourse or in reading unless you find the company pleased therewith. [cf. Manner]

The appeal to informativeness or strength in the various castings and recastings of the principle invoked implicitly by Mill, Monck, and Doyle, and explicitly since Grice, assumes that such a notion can be defined and quantified. An obvious starting point here is the relation of unilateral entailment or proper inclusion of classes, as recognized by Fogelin: 'A proposition "a" is stronger than a proposition "b" if "a" implies "b" but "b" does not imply "a" —for some appropriately defined sense of 'implies' stronger than

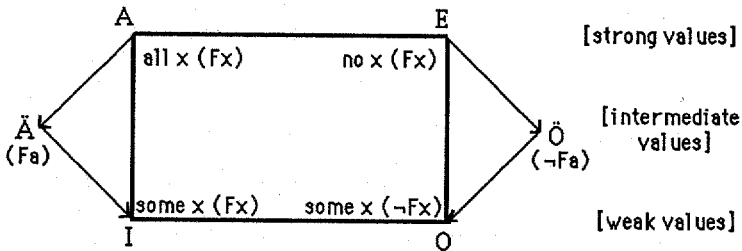
material implication (Fogelin 1967: 20). A similar conception of informativeness can be discerned in Aristotle:

If one is to say of the primary substance what it is, it will be more informative and apt to give the species than the genus. For example, it would be more informative to say of the individual man that he is a man than that he is an animal (since the one is more distinctive of the individual man while the other is more general); and more informative to say of the individual tree that it is a tree than that it is a plant.

(Categories 2b10ff.)

Of course, as recognized by Fogelin, and no doubt by Aristotle and Grice, to provide a real (and not just working) definition of informational strength is no simple matter. Some of the difficulties involved are addressed in Thomason 1987 and Ginzburg 1989.

But strength is not enough. In (5) above we extended the Square of Opposition vertically to produce a tall hexagon by including a southerly **Y** vertex corresponding to the conjunction of the subcontraries and a northerly **U** vertex corresponding to the disjunction of the contraries. But we can also follow the (mutually independent) suggestions of Czezowski (1955) and Fogelin (1967: 17) and extend the Square OUTWARD to form a FAT hexagon. This move is motivated by the need to represent singular propositions with respect to their universal and particular counterparts, unmodalized propositions with respect to the necessary and the possible, and so on. Adopting \bar{A} for the intermediate positive (westerly) value between **A** and **I**, and \bar{O} for its contradictory, the negative (easterly) intermediate value between **E** and **O**, we get the figure below:



The unlabeled values are intermediaries of subalternation in that each unilaterally entails the weak value below it and is unilaterally entailed by the strong value above it. Thus *Everybody won* unilaterally entails *Kim won*, which in turn unilaterally entails *Somebody won*; if nobody came then Lee didn't, and if Lee didn't then someone didn't. Similarly, if Kim won AND Chris won (**A**) then Kim won (\bar{A}), and if Kim won then Kim won OR Chris won (**I**); necessarily *p* (**A**) unilaterally entails *p* (\bar{A}) which entails possibly *p* (**I**), and so on for all sets of values mapping onto the positive and negative sides of the fat hexagon.

But the symmetry of the fat hexagon belies an asymmetry in implicature. If I tell you that my wife is either in the kitchen or the bedroom, you will infer that I don't know that she's in the kitchen (Grice 1961: 130). But I can inform you that the kitchen is a mess without implicating that the bedroom isn't. If you tell me something is POSSIBLY true, I will assume you don't know it's true, but if you tell me that something is true (e.g. that all bachelors are unmarried), I will not assume you don't know it's NECESSARILY true. That is, the use of the weak **I** or **O** form proposition licenses the inference that the speaker was not in a position to use the corresponding intermediate (or strong) proposition, but the use of an intermediate \bar{A} or \bar{O} form does NOT quantify-implicate the negation of its strong

counterpart, A or E respectively. Since there is no quantity- or information-based distinction between these (sub)subalternations, we must seek the source of the asymmetry elsewhere. As O'Hair (1969: 45-48) observes for the disjunctive cases, the crucial distinction here relates not to the content (what is said) but to the form (HOW what is said is said): it is because the intermediate values are not only more informative but BRIEFER than their more southerly counterparts that the use of the latter will strongly implicate against the former. But the strong values, while more informative than their unlabeled mates, are more prolix, so Quantity here is offset by Manner and potentially by Relation. The richness of Grice's framework makes it possible to begin to develop a theory of not just what CAN be implicated but what WILL be implicated in a given context.

I have argued (Horn 1984, 1989) that if we assume (with Grice 1975: 46-7 and contra Sperber & Wilson 1986) that Quality is primary and essentially unreducible, we can attempt to boil the remaining maxims and submaxims down to two fundamental countervailing principles. Within the dualistic functional model I propose, the R Principle—MAKE YOUR CONTRIBUTION NECESSARY—is an upper-bounding speaker-oriented correlate of the Law of Least Effort dictating minimization of form: SAY NO MORE THAN YOU MUST (GIVEN Q). The Q Principle—MAKE YOUR CONTRIBUTION SUFFICIENT—is a lower-bounding hearer-based guarantee of the sufficiency of informative content: Say as much as you can (given R and the Maxim of Quality; cf. Doyle 1951: 382, cited above). R collects Gricean Relation, the second submaxim of Quantity⁷, and the last two submaxims of Manner, while Q responds to the first submaxim of Quantity and the first two Manner submaxims. The functional tension between these two antinomic principles governs not just the determination of implicatures but a wide range of linguistic phenomena, from lexical change to politeness strategies, from periphrastic causatives to logical double negation, from euphemism to the interpretation of pronouns and gaps; cf. Horn 1984, 1989 for details and Sperber & Wilson 1986 and Levinson 1987 for other attempts to reduce or reconstruct the maxims and to predict the resolution of maxim clashes.

Grice's model of conversational interaction and nonlogical inference is most dramatically distinguished from competing accounts by his emphasis on how the exploitation of shared tacit principles allows an interlocutor to map what was SAID into what was MEANT based on what was NOT said. This feature is also present in the independently arrived-at pragmatic theory of Oswald Ducrot, which is equipped with its own version of the quantity or strength rule and its own definition of exploitation:

[The *Loi d'exhaustivité*] exige que le locuteur donne, sur le thème dont il parle, les renseignements les plus forts qu'il possède, et qui sont susceptible d'intéresser le destinataire...Le destinataire, supposant que le locuteur a respecté cette règle, aura tendance, si la réserve du locuteur ne peut pas être attribuée à une absence d'information, à interpréter toute affirmation restreinte comme l'affirmation d'une restriction (s'il ne dit que cela, alors qu'il sait ce qui s'est passé, c'est qu'il n'y a que cela).

(Ducrot 1972: 134)

But Grice's notion of exploitation, unlike Ducrot's, plugs into a comprehensive system of maxims and extends from conversational to conventional inferences in ways Grice himself may not fully recognize. In his recent defense of semantic presupposition, Noel Burton-Roberts points out that a pragmatic theory of presupposition framed 'in terms of assumption-sharing between speaker and hearer' is 'quite simply wrong':

If I were to say to you, 'My sister is coming to lunch tomorrow', I do presuppose that I have a sister but in presupposing it I do not necessarily assume that you have a prior assumption or belief that I have a sister.

(Burton-Roberts 1989: 26)

From this observation, Burton-Roberts correctly concludes that presupposition cannot be defined directly in terms of mutual knowledge. But then nobody ever said it could. For Stalnaker 1974, pragmatic presuppositions are 'propositions whose truth [the speaker] takes for granted, or seems to take for granted, in making his statement' (1974: 198); presupposed material can be communicated as new information by a speaker who 'tells his auditor something...by pretending that his auditor already knows it' (Stalnaker 1974: 202). The linking of presuppositions to what is potentially non-controversial, rather than to what is mutually known, was motivated by an observation of Jerry Sadock:

I am asked by someone who I have just met, "Are you going to lunch?" I reply, "No, I've got to pick up my sister." Here I seem to presuppose that I have a sister even though I do not assume that the speaker knows this.

(Stalnaker 1974: 202, citing Sadock (p.c.))

The idea that a speaker can ACT AS IF a proposition is part of the common ground when it isn't, and thereby force the hearer to adjust her map of the common ground to encompass that presupposed proposition, was later codified in Lewis's RULE OF ACCOMMODATION for presupposition:

If at time t something is said that requires presupposition P to be acceptable, and if P is not presupposed just before t , then—*ceteris paribus* and within certain limits—presupposition P comes into existence at t .

(Lewis 1979: 340)

But this notion of accommodation, which Lewis generalizes to permission statements, descriptions, vagueness, relative modalities, performatives, and planning, and which Sperber & Wilson (1986) put to their own uses in Relevance Theory, is itself—as Stalnaker recognized—just a special case of Gricean exploitation. So we should not be surprised to find Grice himself (1981: 190) forging the same connection:

It is quite natural to say to somebody...*My aunt's cousin went to that concert*, when one knows perfectly well that the person one is talking to is very likely not even to know that one had an aunt, let alone know that one's aunt had a cousin. So the supposition must be not that it is common knowledge but rather that it is noncontroversial, in the sense that it is something that you would expect the hearer to take from you (if he does not already know).

Grice, working in isolation from the Stalnaker-Lewis tradition—indeed, this 1981 publication recapitulates a 1970 talk in Urbana which precedes the development of that tradition—thus provides the foundation for a tenable construct of pragmatic presupposition. But unintentionally so: faithful to his Oxford roots, Grice himself always saw presupposition as a semantic notion. Of course, he didn't really NEED pragmatic presuppositions since his conventional implicatures (Grice 1975) fit the same job description, as Karttunen & Peters (1979) have shown. But even the Oxonian in charge of the presupposition detail was no stranger to accommodation, although it is not clear how any notion of presupposition so qualified can remain semantic. Here is Strawson (1950: 344) polishing off his shot across the Russellian bow:

A literal-minded and childless man asked whether all his children are asleep will certainly not answer "Yes" on the ground that he has none; but nor will he answer "No" on this ground. Since he has no children, the question does not arise. To say this is not to say that I may not use the sentence, "All my children are asleep" with the intention of letting some one know that I have children, or of deceiving him into thinking that I have. Nor is it any weakening of my thesis to concede that singular phrases of the form "the so-and-so" may sometimes be used with a similar purpose. Neither Aristotelian nor Russellian rules give the exact logic of any expressions of ordinary language; for ordinary language has no exact logic.

The collapsing of Strawson's sleeping children into the sister of Stalnaker and Sadock, who herself metamorphoses into Grice's aunt's concert-going cousin, who in turn mutates into the lunch-going sister of Burton-Roberts, should remind us that in the evolution of pragmatic theory, all progress is relative.

In the valuable Retrospective Epilogue to his collected works, Grice relates the genesis of the William James lectures. Having developed (though not yet named) the doctrines of exploitation and conversational implicature in response to Wittgensteinian objections to the causal theory of perception, he recalls (1989: 374-75),

It then occurred to me that apparatus which had rendered good service in one area might be equally successful when transferred to another; and so I canvassed the idea that the alleged divergences between Modernists' Logic and vulgar logical connectives might be represented as being a matter not of logical but of pragmatic import.

For philosophers, the most significant of these divergences is that between the material conditional and the if-then of ordinary language. But Grice's Modified Occam's Razor ('senses are not to be multiplied beyond necessity'), honed with his personal philosopher's stone (the cooperative principle and its component maxims), cuts a wide swath through the ancient thickets of meaning and ambiguity—i.e. GRICE SAVES.

Grice observes in the same retrospection (1989: 375) that 'when a sentence which used in isolation standardly carries a certain implicature is embedded in a certain linguistic context, for example appears within the scope of a negation-sign', that negative operator may 'be interpreted as governing not the conventional import but the nonconventional implicature of the embedded sentence'. I have argued (Horn 1985) that both Grice's case in point, the denial of a conditional, and that of 'paradoxical negation' in scalar contexts (*You didn't eat v SOME of the cookies, you ate ALL of them*) can be subsumed within a generalized neo-Ducrotian theory of metalinguistic negation.

But where, you may ask, do the hamburgers come in? Grice departs crucially from his predecessors and from such coevals as Fogelin and Ducrot in regarding linguistic cooperation in the conversational enterprise as a subcase of a general theory of rationality (see again Georgia Green's paper in this volume). Thus, he reminds us,

It is irrational to bite off more than you can chew whether the object of your pursuit is hamburgers or the Truth. (Grice 1989: 369)

Ever true to the spirit of Quantity and to Washington's 97th Maxim,

Put not another bit into your mouth till the former be swallowed. Let not your morsels be too big.
(Washington 1988: 27)

Grice was always rational enough to bite off neither more nor less than his appetite allowed. But no man lives by meat alone, much less a philosopher of language large enough to bestride the warring camps of Russell's Modernists and Strawson's Neo-Traditionalists (Grice 1989: 372). And anyway hamburgers need rolls. So it is meet that such a healthy portion of the Gricean legacy on pragmatic inference consists not of solutions but of problems and questions, of roadmaps and menus. For, as Grice reminds us elsewhere in offering a defense of absolute value admittedly 'bristling with unsolved or incompletely solved problems',

If philosophy generated no new problems it would be dead... Those who still look to philosophy for their bread-and-butter should pray that the supply of new problems never dries up.
(Grice 1986: 106)

Fortunate indeed are we linguistic philosophers and philosophical linguists, nourished with the ground meat of conversational logic and the fresh bread of Gricean analysis. We know that we shall never starve, for we have been served the biggest Mac of all.

Footnotes

¹I would like to acknowledge the help of Jay Atlas, Bob Fogelin, Dick Grandy, Georgia Green, Jerry Sadock, Bob Stalnaker, and Jean Thomson in lighting my way along some of the longer and windier byways of scholarship.

²As Aristotle's pupil and successor as head of the Peripatetic school, as well as his nephew, the executor of his will, and the lover of his son (Suidas/Bekker 1854: 498), Theophrastus presumably knew whereof he spoke.

³That the O vertex, unlike its three square companions, enjoys no simple representation was recognized by St. Thomas, who observed that whereas in the case of the universal negative (A) 'the word "no" [*nullus*] has been devised [sic!] to signify that the predicate is removed from the universal subject according to the whole of what is contained under it', when it comes to the PARTICULAR negative (O), we find that

there is no designated word, but 'not all' [*non omnis*] can be used. Just as 'no' removes universally, for it signifies the same thing as if we were to say 'not any' [i.e. 'not some'], so also 'not all' removes particularly inasmuch as it excludes universal affirmation.

(Aquinas, in *Arist. de Int.*, Lesson X, Oesterle 1962: 82-3)

⁴It will be noticed that Sesmat's hexagon has the Y above and the U below, as does the somewhat sketchier model of Hegenberg 1957. I opt here for Blanché's vowel system for its mnemonic value. Von Wright (1951) proposes in effect a logical pentagon, with a nadir (= our Y) for the conjunction of I and O but no apex (= U) for its contradictory.

⁵In fact, the triangulist perspective—minus the geometry—has its adherents still. Thus Kuroda (1977: 97-8) posits an 'every-day reading' of *Some animals are white*, which is 'assumed to entail' *Some animals are not white*, so that the two come out 'logically equivalent'. Kuroda is not dissuaded from this 'logical equivalence' by his recognition that

on its 'every-day reading', *Some animals are white* cannot serve as the contradictory of *No animals are white* since both propositions will be false if ALL animals are white. A semantic account of assertoric and modal subcontrariety is also endorsed by Morpurgo-Tagliabue (1981: 502):

The $\exists x$, the 'possible', may, to some extent, come nearer and nearer to the 'all (x)', the 'necessary', without ever reaching it, like Achilles and the tortoise...It is excluded that while saying 'not-all' (O) one could mean 'nobody' and saying 'not-nobody' (I) one could mean 'all'...If I say "not all people are clever" (O), this means that there are some who are stupid.

⁶While something was clearly in the air in the Oxford of the early 1950's, the Oxonian atmosphere was decidedly diffuse. His exclusion from what Grice (1986: 49) fondly recalls as the ordinary language philosophers' 'Play Group' that met every Saturday until the death of their primus inter pares J. L. Austin may have placed Nowell-Smith out of the loop as far as the development of the theory of contextual implication was concerned.

⁷Note the connection between Relation and the second Quantity submaxim: what could make a speaker's contribution more informative than is required except the inclusion of material irrelevant for the current purposes of the exchange?

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