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Abstract

Geis and Zwicky's squib on "conditional perfection" (1971) released a hornet's nest of rebuttal and counter-rebuttal into the pragmatic atmosphere, with many scholars in the area playing alternately the roles of stinger and stingee. Geis and Zwicky's goal was to explain the notorious tendency among introductory logic students and ordinary speakers to 'perfect' an *if-then* conditional of the form of *If you mow the lawn, I'll give you five dollars* into the corresponding *iff* biconditional of the form *If and only if you mow the lawn, I'll give you five dollars*. In an overlapping pair of studies, van der Auwera (1997a,b) has recently contributed a comprehensive survey of the literature on conditional perfection before and since Geis and Zwicky as a microcosm of the development of post-Gricean pragmatic theory. While agreeing with van der Auwera on the centrality of the *if* → *iff* move for contemporary pragmatics, I will critique his treatment and offer my own perspective on the data and their ramifications, along with an expanded history that touches on the manifestations of conditional perfection and related inferential fallacies addressed in philosophical treatises, empirical psycholinguistic studies, and self-help primers. By extending the data base to include counterfactuals and other non-predictive conditionals, I will also present problems for Dancygier and Sweetser's (1997) alternative recent account of the CP phenomenon within the mental-spaces framework. The overall focus will be on the implications for the theory of conversational implicature, and in particular of R-based pragmatic strengthening, that can be drawn from the conditions on – and motivation for – conditional perfection. © 2000 Elsevier Science B.V. All rights reserved.

Keywords: Conditionals; Conditional perfection; Fallacy; Implicature; Invited inference; Pragmatic strengthening

[☆] Briefer (and hence less persuasive) versions of this paper were presented as the Second Annual Emeritus Lecture in honor of Michael Geis and Arnold Zwicky at the Ohio State University in May, 1997 and at Northwestern University in October, 1997. Thanks to those attending the earlier presentations for their helpful comments, to Johan van der Auwera, Scott Schwenter, Kai von Stechow, Kent Bach, Jacob Mey, and an anonymous JoP referee for some pertinent pointers, suggestions, and complaints, and to Dimitri Gutas, my informant for Ancient Greek.

1. Introduction

Michael Geis and Arnold Zwicky's (1971) seminal squib on the inference schema they dubbed *CONDITIONAL PERFECTION* (henceforth CP) recently celebrated its twenty-fifth birthday. The highlight of the silver anniversary ceremonies was the circulation and subsequent appearance of two overlapping papers by Johan van der Auwera (1997a,b). These twin treatises were designed not only to provide the correct treatment of the CP inference but also – as the title of van der Auwera (1997a) suggests – to characterize the history of scholarship on this question as a microcosm of the development of pragmatic theory and description over the last quarter century. Despite their usefulness and cogency, however, van der Auwera's are not the final words on conditional perfection either from a theoretical or historiographic perspective, as I shall attempt to demonstrate in the present study.

The aim of Geis and Zwicky (1971) was to baptize and illuminate the notorious tendency among introductory logic students and ordinary working speaker/hearers to 'perfect' an *if-then* conditional of the form of (1a) into the corresponding *if and only if* biconditional of (1c) through the mediation of the corresponding *only if* conditional of (1b).¹ CP, the tendency to move from (1a') to (1b'), was taken to be an instance of *INVITED INFERENCE*, a relation weaker than logical or semantic entailment.²

- (1) a. If John leans out of that window any farther, he'll fall.
 a'. $L \supset F$
 b. If John doesn't lean out of that window any farther, he won't fall.
 b'. $\sim L \supset \sim F$
 c. If and only if John leans out of that window any farther, he'll fall.
 c'. $L \leftrightarrow F$

In the same way, the utterance of (2a) was claimed to invite the inference of (2b) or equivalently (2b')/(2b''), thus yielding the conveyed meaning of (2c):³

¹ As van der Auwera stresses (and as we shall illustrate below), Geis and Zwicky (1971) were unwittingly echoing Ducrot (1969) in a number of respects. One such echo is in the consequences of this tendency or linguistic habit: "C'est sans doute cette habitude linguistique qui rend si difficile aux apprenants mathématiciens de distinguer les conditions nécessaires des conditions suffisantes" (Ducrot, 1969: 18).

² There is some indeterminacy in the literature about whether it is the 'invited inference' of (1b) itself that constitutes CP, or the biconditional (1c) conveyed by the union of this inference with the literal meaning of (1a). Since it is the status of the move from (1a) to (1b), or from (2a) to (2b–2b'') below, that is the critical step here, this indeterminacy should not trouble us.

³ As McCawley has observed (1981: 49–54; cf. also McCawley, 1974, 1993: 81–88; and, independently, Barker, 1993), *q* only if *p* is better paraphrased by 'If not-*p* then not-*q*' than by 'If *q* then *p*' (or by '*p* if *q*'), at least when *p* and *q* have different temporal and causal implications. Thus, as he points out, (i) is equivalent not to (ii) but rather to (iii):

- (i) You're in danger only if the police start tapping your phone.
 (ii) If you're in danger the police start tapping your phone.
 (iii) If the police don't start tapping your phone you're not in danger.

- (2) a. If you mow the lawn, I'll give you \$5.
 b. If you don't mow the lawn, I won't give you \$5.
 b'. Only if you mow the lawn will I give you \$5.
 b''. I will give you \$5 only if you mow the lawn.
 c. If and only if you mow the lawn, I'll give you \$5.

While invoking the (then largely unpublished) work on non-logical deduction by Paul Grice, Geis and Zwicky maintain that their invited inferences "are clearly distinct from the 'conversational implicatures' which are [Grice's] principal concern" (1971: 565). As we shall see, their resistance on this point has proved more of a speed-bump than a roadblock for others in search of the conditional-perfectionist grail. In any event, they proceed from CP to the parallel phenomenon of *INFERRED CAUSATION*, the fact that "sentences which express a temporal sequence of situations invite the inference that the first situation is a cause or reason for the second" (Geis and Zwicky, 1971: 564), as in (3a–b):

- (3) a. After a large meal, we slept soundly.
 [a'. As the result of a large meal, we slept soundly.]
 b. Having finished the manuscript, she fell into a swoon.
 [b'. Having finished the manuscript, she consequently fell into a swoon.]

In their discussion of inferred causation, Geis and Zwicky observe in passing (1971: 564) that "this principle of inference corresponds to the familiar fallacy *post hoc ergo propter hoc* (just as CP has its related fallacies)". It is with this correspondence between invited inferences and traditional fallacies that we will launch our study. The *post hoc ergo propter hoc* cases we shall return to in a bit, but we begin with an expansion of that Geis-Zwicky parenthetical.

2. CP and inferential fallacy

The 'related fallacies' to which Geis and Zwicky refer are those of *AFFIRMING* (or *ASSERTING*) *THE CONSEQUENT* and of *DENYING THE ANTECEDENT*. Each of these can be seen as a perversion of the corresponding valid laws of inference for conditional statements, *MODUS PONENS* and *MODUS TOLLENS* respectively, as schematized below (cf. Mackie, 1967):

- | | |
|---|--|
| <p>(4) <i>MODUS PONENS</i>
 [= <i>AFFIRMING THE ANTECEDENT</i>]
 If <i>p</i> then <i>q</i>.
 <u><i>p</i></u>
 Therefore, <i>q</i>.
 ↓</p> | <p><i>MODUS TOLLENS</i>
 [= <i>DENYING THE CONSEQUENT</i>]
 If <i>p</i> then <i>q</i>.
 <u>Not <i>q</i></u>
 Therefore, not <i>p</i>.
 ↓</p> |
| <p>(5) <i>AFFIRMING THE CONSEQUENT</i>
 If <i>p</i> then <i>q</i>.
 <u><i>q</i></u>
 Therefore, <i>p</i>.</p> | <p><i>DENYING THE ANTECEDENT</i>
 If <i>p</i> then <i>q</i>.
 <u>Not <i>p</i></u>
 Therefore, not <i>q</i>.</p> |

By the same token, the well-born inferential principle of contraposition (the inference of the negation of the antecedent from the negation of the consequent) illustrated in (6) gives birth to the two bastard children in (7), the latter corresponding to our invited inference in (1)–(2):

- (6) CONTRAPOSITION
If p then q.
Therefore, if not q then not p.
↓ ↓
- (7) a. CONVERTING A CONDITIONAL b. NEGATING ANTECEDENT AND CONSEQUENT
If p then q. If p then q.
Therefore, if q then p. Therefore, if not p then not q.

In place of Mackie's (1967: 170) unambiguous but rather cumbersome labels for (7a) and (7b), these inferences are sometimes distinguished as *CONVERSION* and *OBVERSION* respectively.

Two years after the appearance of Geis and Zwicky's squib, two of their then fellow Buckeyes (Boër and Lycan, 1973; cf. also Lilje, 1972) sought to recall the invitations, declaring the presence of a conditional neither necessary nor sufficient to generate the CP inference.⁴ It is not necessary because the 'invited inference' remains even if the conditional form is removed; thus the non-conditionals of (8) license the inference of (2b) just as strongly as the authorized licenser in (2a).

- (8) I'll pay you \$5 for mowing the lawn.
 Mow the lawn and I'll pay you \$5.
 Want to earn \$5? Mow the lawn.

The presence of a conditional is not sufficient either, since invited inferences disappear if the context is altered. Thus (8'a) may fail to trigger the inference of (8'b), however fervently John might wish it to do so.

- (8') a. If John quits, he will be replaced.
 b. If John doesn't quit, he won't be replaced.

For Boër and Lycan, the 'invited inferences', including those associated with inferred causation as well as CP, are attributable to the presence of what they call collateral information. When such information is present in the context, as in (3), the inferences are natural enough, but when the context renders such inferences implausible, as in (8''), no causative relation will be assumed to hold between the prior and subsequent events:

⁴ It may be significant that Boër and Lycan's broadside against Geis and Zwicky's 4.1-page squib ran to twenty-two pages. I calculate that any full rejoinder to their critique would at this rate now require a 241-page treatise, on the assumption that the progression has been arithmetic. The size of a monograph determined by a geometric progression will be left as an exercise for the reader.

- (8'') a. After a large meal, we went to a movie.
 b. Having finished the manuscript, she decided to publish it with Random House.

Since this collateral information can be used to predict where the inferences are natural and where they are excluded, any additional notion of invited inference will be otiose:

"Most if not all of the G-Z phenomena can be explained in purely anthropological terms. That is, in each case we can completely account for the hearer's coming to have a certain belief or expectation just by pointing out beliefs and attitudes that he has simply as a result of his inductive observations of the way things typically work in his society or community, and irrespective of his linguistic competence of any linguistic facts that he has internalized. On this view, the G-Z phenomena have nothing to do with language at all." (Boër and Lycan, 1973: 497–498)

But while endorsing Boër and Lycan's observation that the presence of a conditional is neither a necessary nor sufficient condition for the generation of CP, I shall argue that their pessimistic conclusion is not warranted.

In fact, the inference-uninviters ultimately adopt a more non-committal stance, allowing for an alternate approach in which the phenomena in question – CP and inferred causation – do indeed constitute grist for the mills of linguistic pragmatics (Boër and Lycan, 1973: 498ff.). On this view, they maintain, the natural explanatory move is indeed (contra Geis and Zwicky) a turn toward Grice's Cooperative Principle and its attendant maxims of conversation. As van der Auwera (1997a,b) demonstrates, this is in fact the step taken by the preponderance of those toiling in the relevant vineyards, from Ducrot (1969) and Horn (1972) to van der Auwera himself (see Fig. 1 in van der Auwera 1997a: 268–269). Where the differences arise is in determining precisely which Gricean (sub)maxim applies and how it applies.

Whatever the ultimate explanatory mechanism, there can be no doubt that the tendency to draw Geis-and-Zwicky inferences is very real, assuming the context has been set up in the appropriate way. Nor does the polarity of the antecedent and consequent seem to affect this tendency. This is confirmed by the results of a study by Fillenbaum (1986), in which 80% to 90% of his subjects readily accepted the 'fallacious' inferences from the conditionals in (9a–b) to their primed counterparts.

- (9) a. If you fix the car I'll give you \$100.
 a'. → If you don't fix the car I won't give you \$100.
 b. If you don't shut up I'll scream.
 b'. → If you shut up I won't scream.

Now, to what can we attribute the invalid inference schemata noted by Geis and Zwicky and by innumerable hordes of fallacists before and since?⁵ One hypothesis, as unilluminating as it is uneconomical, is to posit lexical ambiguity:

⁵ Two unusually thorough historical treatments of fallacies are those of Hamblin (1970) and Ebbesen (1981).

"In common speech there is the ambiguity of 'if', which may mean simply 'if' or may mean 'if and only if'. Likewise, 'or' may mean 'either one or the other but not both', or it may mean 'possibly both, but certainly one or the other'." (Fearnside and Holther, 1959: 156)

"An expression that actually asserts only a proposition of the form 'If p then q ' may be wrongly taken as asserting ' q if and only if p '." (Mackie, 1967: 170)

Of course the 'unfortunate ambiguity' dodge is one not particularly congenial to linguists – or to philosophers weaned on the principle that Grice (1989 [1967]: 46) dubs Modified Occam's Razor: 'Do not multiply senses beyond necessity'. The literature on the so-called ambiguity of inclusive vs. exclusive *or* – and on the pragmatic recasting of that 'ambiguity' – is even more voluminous than that for conditional perfection; see Jennings (1994: ch. 3) for a compendium of illustrations from dozens of logic texts of the persistent myth – the term is from Barrett and Stenner (1971) – of a truth-functional exclusive disjunction in English and other languages.⁶

As to CP's cousins in (5a–b), sources (e.g. Hamblin, 1970: 36) generally award pride of place to John Neville Keynes, the nineteenth century logician I like to think of as the grandfather of modern liberal economics, for christening these fallacies:

"It is a fallacy if we regard the affirmation of the consequent as justifying the affirmation of the antecedent. For example, *If A is B, A is C; A is C; therefore, A is B*. It is a fallacy if we regard the denial of the antecedent as justifying the denial of the consequent. For example, *If A is B, A is C; A is not B; therefore, A is not C*." (Keynes, 1884: 232–233)

Not that Keynes actually discovered the fallacies: recognition of the invalidity of the inference schemata in (5a–b) can be traced back at least two millennia further to the Stoics, as later catalogued by Sextus Empiricus. Both affirmation of the consequent

"Such an argument as this is false:

If it is day, then it is light.

It is light.

Therefore, it is day.

⁶ An anonymous referee has called my attention to Wirth (1975), a paper which does in fact 'explain' CP by taking English sentences of the form *if p then q* to be semantically ambiguous between the propositional logic expressions $p \supset q$ and $p \equiv q$; the inferences at issue are thus not fallacious at all but valid deductions from a biconditional interpretation. Wirth claims (1975: 40) that the alternative pragmatic line "postulates a new type of inference in natural logic, whereas the logical ambiguity hypothesis does not involve any new type of phenomenon". But as noted, and as we shall see in more detail below, virtually every pragmatic analysis of CP involves some combination of standard multi-use tools from the pragmatic workshop. The same point applies to Wirth's related analysis of disjunction, which echoes the Fearnside and Holther line above: "It is well known that English *or* is ambiguous in that an English statement of the form *P or Q* may be true in the exclusive sense or in the inclusive sense" (Wirth, 1975: 41–42). As should have been clear from the literature when these words were written (cf. Barrett and Stenner, 1971; Horn, 1972, 1973) and is certainly clear by now (cf. Jennings, 1994, and references therein), this 'well known' ambiguity is more of a chimera. Not only does the burden of proof rest conceptually on anyone arguing for the semantic ambiguity of *if* and *or*, especially when an independent pragmatic account predicts the dual understandings of these operators, but the privative nature of the oppositions involved (the biconditional unilaterally entailing the conditional, and the exclusive disjunction the inclusive) guarantees that this burden will be hard to bear, for the reasons cited by Zwicky and Sadock (1975).

for it allows us to infer a false conclusion from true premises. (Sextus Empiricus, *Adv. Math.* VIII, 378, 17ff., in Mates, 1961: 107)

and denial of the antecedent

If it is day, then it is light.

It is not day.

Therefore, it is not light. (Sextus Empiricus, *Adv. Math.* VIII, in Mates, 1961: 83 and Egli, 1983: 86)

are on perspicuous display. But whence such faux pas in the inferential shuffle? Some detect nothing more interesting than stupid blunders in reasoning:

"To those who hopelessly confuse the order of horses and carts, affirming the consequent is a fallacy which comes naturally ... 'When cats are bitten by rabid hedgehogs they die. Here is a dead cat, so obviously there is a rabid hedgehog about' ... The arguer has mixed up the antecedents and consequents." (Pirie, 1985: 7–8)

But hopelessly confused and mixed-up arguer can subtly morph into crafty sophist:⁷

"This is an extremely good fallacy to use when you wish to impute base motives to someone. You can always gain a hearing for your suggestion of less-than-honourable motives, by use of a skilfully affirmed consequent: 'She's just a tramp. Girls like that always flaunt themselves before men, and she did appear at the office party wearing a dress that was practically transparent!'" (Pirie, 1985: 9)

When Pirie shifts to the corresponding fallacy of (5b), the diabolical forensic schemer is once again forgotten and we are back to the poor confused schnook:

"Like affirming the consequent, the fallacy of denying the antecedent is for those who do not really care if their brain is going forward or backwards." (Pirie, 1985: 50)

Pirie's fool-vs.-knave ambivalence on this point is amply replicated by other sources in the fallacist tradition, from Aristotle's rhetoric to today's pop-philosophical guidebooks festooned with cute cartoons, instances of fallacious reasoning from commercials to political sound bites (perhaps not that long a stretch) and titles like *The art of deception* or *Attacking faulty reasoning* and subtitles like *The counterfeit of argument*, *A practical guide to fallacy-free arguments*, *A training manual for intellectual subversives*, or *The use of reason in everyday life* (see references for full bibliographic information).

From Aristotle's treatment in the *Sophistical refutations* (*De sophisticis elenchis*) on, taxonomists have standardly reckoned affirmation of the consequent, denial of the antecedent, and false cause (*post hoc ergo propter hoc*) with the fallacies *extra dictionem*, those independent of language. In this respect, the latter differ palpably from those sophisms and fallacies in *dictione*, those dependent upon ambiguity, etymology or other aspects of linguistic form and development, as in the classic casu-

⁷ Perhaps unfortunately, the modern tradition has obscured the classical distinction between the inadvertent *fallacy* of the hopelessly confused naïf and the deliberate *sophism* of the self-conscious deceiver and rhetorical roué. Not for nothing is *sophist* the root of *sophisticated*.

istry of Ctesippus in Plato's *Euthydemus* (298): 'This dog is yours, this dog is a father, ergo this dog is your father' (Hamblin, 1970: 27, 55ff.).

But what motivates the classical and modern traditions to isolate and treat just certain syndromes within a indefinitely large set of paralogical pathologies?

"The modern books are, of course, quite consistent in treating it [the Fallacy of Affirming the Consequent] separately ... What is less clear is why it is singled out at all. Every invalid inference-schema of the propositional calculus – or, for that matter, of other logical systems – could, in theory, be dignified with a special name and treated similarly, yet we do not hear of any others. Why not the Fallacy of Inferring the Conjunction of Two Propositions from their Material Equivalence; or, say, the Fallacy of Distributing Quantifiers without regard to Negation Signs?" (Hamblin, 1970: 36–37)

That is, what makes the fallacious inference schema in (10) any less deserving of special status than those in (5a), (5b), or (3)?

- (10) $p \leftrightarrow q$
Therefore, p and q.

What bars Hamblin's 'Fallacy of Inferring the Conjunction of Two Propositions from their Material Equivalence' from the ranks of the fallacies *extra dictionem* is simply the unlikelihood that anyone would inadvertently commit (or insidiously apply) this particular paralogism, just as the traffic code is more likely to address the failure to stop on a red light than the failure to proceed on green.⁸

But there is no immunity against the drawing of unnamed fallacious conclusions, even for those who should know better. Here is Douglas Walton, professional Canadian fallacist and author or co-author of over two dozen important books and papers on the topic:

"For similar reasons [to those determining the invalidity of inferences involving affirmation of the consequent], denying the antecedent turns out to be invalid as a form of deductive argument. For example, the following argument is incorrect: 'If you're in Toronto then you're in Canada. You're not in Toronto. Therefore, you are in Canada'. This argument is invalid because the premisses could be true in the case where you're in Chicago. But it does not follow that you're in Canada ... Perhaps unfortunately, applying deductive logic is not so straightforward as one might think or like." (Walton, 1987: 74)

Indeed, not so straightforward at all, especially since Walton is not instantiating the conventional (5b) mode for the denial of the antecedent but is rather inventing the brand new fallacy in (5b'):

- | | |
|--|--|
| <p>(5b) DENYING THE ANTECEDENT:
TRADITIONAL MODE
If p then q.
Not p.
Therefore, not q.</p> | <p>(5b') DENYING THE ANTECEDENT:
WALTONIAN MODE
If p then q.
Not p.
Therefore, q (anyway!)</p> |
|--|--|

⁸ Or just as prescriptive grammarians keep reminding us that double negation 'really' affirms while letting us figure out for ourselves that a reinforced affirmation never amounts to a negation; as noted in Horn (1973: 213), "We are only warned against those sins we are considered susceptible of committing".

– not a mode of inference likely to tempt too many down the paralogical primrose path.

For an equally implausible mode of fallacious (or sophistical) reasoning that is less likely than Walton's to have arisen from the failure to proofread one's copy, we have this curious non sequitur from the Stoics' compendium:

"Incoherent arguments are arguments which are invalid because there is no logical connection of the premises with one another or with the conclusion.

If it is day, then it is light.

But in fact wheat is being sold in the market.

Therefore, Dion is walking." (Sextus Empiricus, *Adv. Math.* VIII, *Pyrrh.* 2, 146, in Mates, 1961: 82 and Ebbesen, 1981: 27)

Or, more generally,

- (11) If p then q.

r.
Therefore, s.

Even the Socrates of the Platonic dialogues never tried a ploy quite that blatant.

Returning to the question of how we are to motivate CP or the corresponding fallacies, the natural starting point is as usual Aristotle. In the most influential treatise on fallacies ever written, he attributes the tendency to affirm the consequent as in (5a) to an inappropriate conversion. In traditional logic, conversion applies validly to particular affirmatives (if some Fs are Gs, some Gs are Fs) and universal negatives (if no Fs are Gs, no Gs are Fs), but not to universal affirmatives (all Fs can be Gs without all Gs being Fs) or conditional (hypothetical) statements. Whence the trap for the unwitting victims of carelessness or sophistry:

"The refutation which depends upon the consequent arises because people suppose that the relation of consequence is convertible. For whenever, suppose A is, B necessarily is, they then suppose also that if B is, A necessarily is ... Since the ground is wet after it rains, we suppose that if the ground is wet, it has been raining, whereas that does not necessarily follow." (Aristotle, *Sophistical refutations*, 167b1ff.)

For Aristotle, then, the defining characteristic of the fallacy of consequence is the translation of a one-way implicational relation into a two-way equivalence, "based on a false assumption of unbreakable unity between elements which are, in fact, capable of being separated" (Ebbesen 1981: 8); instead of merely predicating B of (all) A, B is equated to A.

In the passage above, Aristotle introduces what will prove to be an important tool for the analysis of error (or deceit) within hypothetical reasoning:

"The mistake seems to consist of treating the conditionals as expressing, not only sufficient, but also necessary conditions. Suppose I can affirm that if and only if it rains, the streets are wet. I can now affirm, when it has not been raining, that the streets will not be wet. Or in the case when the streets are wet, I can affirm that it has been raining. But the conditional in the if-and-only-if interpretation is false: as a general principle, rain is not a necessary condition for the wetting of streets – the water-wagon may have washed them down ... Rain is a sufficient condition for wet streets, but not a necessary condition.

This being the case, nothing follows from ‘denying the antecedent’ or ‘affirming the consequent.’” (Fearnside and Holther, 1959: 155; see also Damer, 1995: 128–129)

One plausible motivation for this conversion is the fact that even when the P of the *if P then Q* connection is not a logical necessity for the truth of Q, it may accompany *most* instances of Q in the actual world. Wet streets may not *always* result from rain, but they *usually* do. P may thus serve as a ‘sign’ of Q:⁹

“In rhetorical arguments, proofs based on signs also depend on consequences, as for those who seek to show that a man is an adulterer because he wears fancy clothes and cruises at night, since that is the way such people act. There are, however, many who behave in this way of whom the charge in question [of adultery] does not hold.” (Aristotle, *Sophistical refutations* 167b10–13; *Rhetoric* 1401b23–24)

Note, though, that what is a deductive invalidity may well count as a rational step in a practical induction, or in Aristotle’s terms a proof based on signs. If you’re looking for a nice, safe married man (not to be confused with looking for a husband), checking out the bars for a spiffy looking fellow with a roving eye might not be a bad place to start, although, as Aristotle would no doubt caution, your pick-up may be a single guy with a dime-store ring – or a sociologist trolling for data.

It will be noticed that Aristotle’s presentation of the fallacy of consequence as an error in conversion renders this fallacy in a form quite closely akin to CP. The only difference between the Aristotelian and the Geis-and-Zwicky modes (i.e. 7a–b, repeated here) pertains to whether the logically innocuous move of contraposition has also applied.

- | | |
|---|---|
| (7) a. CONVERTING A CONDITIONAL
[= Aristotle’s conversion]
<u>If p then q.</u>
Therefore, if q then p. | b. NEGATING ANTECEDENT AND
CONSEQUENT [= CP]
<u>If p then q.</u>
Therefore, if not p then not q. |
|---|---|

Aristotle’s next example, courtesy of Melissos (5th century B.C.) and his proof of the eternal nature of the universe, suggests an awareness that these two inferences are indeed alternate versions of the fallacy of consequence:

“Melissos’s argument that the universe is eternal assumes that the universe has not come to be (for from what is not nothing could come to be) and that what has come to be has done so from a first beginning. If, therefore, the universe has not come to be, it has no first beginning, and is therefore eternal. But this does not follow: for even if what has come to be always has a first beginning, it does not also follow that what has a first beginning has come to be, any more than it follows that if someone who has a fever is hot, someone who is hot must have a fever.” (Aristotle, *Sophistical refutations*, 167b13–20)

⁹ For reasons best left to the psychobiographers, Aristotle was so fond of the case of the unjustly accused adulterer he used it twice, in the *Rhetoric* as well as the *Sophistical refutations*. The translation is mine, based on the texts and consultation with informants; I follow George Kennedy’s (1991) Oxford *Rhetoric* in using ‘cruises’ as the gloss for the Greek *πλανῶμαι* here since it’s appropriately neutral as to sex of cruisee.

Aristotle here portrays Melissos as deriving two interchangeable invalid conclusions from one (hypothetically) valid premise:

- (12) If x has come to be, x has a first beginning.
If x has not come to be, x has no first beginning. (cf. 7b)
If x has a first beginning, x has come to be. (cf. 7a)

While (7b) may not appear as a straightforward syllogism in the classical fallacist literature, at least one prominent scholastic does explicitly treat (7a–b) as free variants of the same fallacy. For the thirteenth century logician Peter of Spain (a.k.a. Pope John XXI), the inferences in (13) – the first and third obviously adapted from the master – all illustrate *falsa consequentia*.¹⁰

- (13) a. If he is an adulterer, he is sleekly dressed.
If he is sleekly dressed, he is an adulterer. (cf. 7a)
b. If he has stolen something, he has neither earned nor borrowed it.
If he has neither earned nor borrowed it, he has stolen it. (cf. 7a)
c. If it is made, it has a source.
If it is not made, it has no source. (cf. 7b)
d. If it is a man, it is an animal.
If it is not a man, it is not an animal. (cf. 7b) (Peter of Spain, *Tractatus VII*: 158–59 (1972: 171–172; 1990: 151–152))

After exposing the fallacy of consequence in the *Rhetoric* with an assist from the man taken in alleged adultery, Aristotle moves swiftly to the fallacy of non-cause as cause, and more specifically the *post hoc ergo propter hoc*, henceforth PHEPH:

“Another [fallacy] is taking a noncause as a cause, for example when something has taken place at the same time or after [something else]; for people take what happens later as though it happened because of what preceded, and especially people involved in politics, for example Demades [regarded] the policy of Demosthenes as the cause of all evils, for the war took place after it.” (Aristotle, *Rhetoric*, 1401b30ff.)

The modern reader may discern a contemporary Demades in Bob Dole, with his dark asides during the 1988 campaign about all those ‘Democrat wars’ – the two World Wars and the Korean and Vietnamese wars, all begun with a Democrat in the White House.

The inductive, and lexical, import of the treatment of sufficient conditions as necessary ones is nicely brought out in a passage from De Morgan (1847) addressing PHEPH:

¹⁰ The original of Peter’s assimilation of ‘destruction of the antecedent’, as in (13d), to the fallacy of consequence runs as follows (*Tract. VII*, 159, lines 18–22):

“Hic est consequens:
‘si est homo, est animal;
ergo si non est homo, non est animal’
a destructione antecedentis.”

"The *non causa pro causa*. This is the mistake of imagining necessary connexion when there is none ... The idioms of language abound in it, that is, make their mere expressions of phenomena attribute them to apparent causes, without intent to assert real connexion. Thus we say that a tree *throws* a shadow, to describe that it hinders the light. When the level of a billiard table is not good, the favoured pocket is said to *draw* the balls. A particular case of this fallacy, which is often illustrated by the words *post hoc, ergo propter hoc*, is the conclusion that what follows in time follows as a consequence. When things are seen together, there is frequently an assumption of necessary connection. There is, of course, a presumption of connexion: if A and B have never been seen apart, there is a probability (the amount of which depends upon the number of instances observed) that the removal of one would be the removal of the other. It is when there is only one instance to proceed upon that the assumption falls under this fallacy; were there but two, inductive probability might be said to begin." (De Morgan, 1847: 268–269)

De Morgan's case can be supported by adducing even clearer linguistic correlates of PHEPH from the province of diachrony. English contributes the shifts illustrated in (14):

- (14) if P then Q
 Q, since P (cf. Geis and Zwicky, 1971: 565–566)
 Q follows from P
 Q is a consequence of P
 even if P, still Q

Similarly, the Latin connective *cum* acquired the logical relations of 'since', 'although', or 'because' as well along with the purely temporal 'when', 'while', or 'after'.

The thin line between deductive fallacy and inductive proof surveyed by Aristotle and De Morgan – and celebrated in largely reliable but logically invalid rules of thumb of the 'Where there's smoke, there's fire' family – is also surveyed by Hamblin (1970):

"Logicians are in the habit of presenting induction as an argument from particular to general in such a way as to guarantee that it commits the Fallacy of the Consequent. In one chapter of a textbook we are shown schemata such as

Crow No. 1 is black
 Crow No. 2 is black
 ...
 Crow No. *n* is black

Therefore, all crows are black

as examples of conditionally valid inductions and in another we are given comparable arguments as unconditionally fallacious. [Whence] ... the tendency to give as examples of the Fallacy of the Consequent instances of what might be construed as valid, or at least incipient, inductions." (Hamblin, 1970: 47)

We have only to shift avian species to reinforce Hamblin's point. Some American readers of a certain age may recall from the Red Scare era the old trade union adage on how to spot a communist, a principle Walter Reuther was fond of invoking in the late 1940's:

- (15) If it walks like a duck and quacks like a duck, it must be a duck.

Even if we assume that a particular manner of walking and talking is common to all ducks (a questionable assumption, perhaps – but then are *all* adulterers sleekly dressed?), these can only be plausible, not telltale, inductive signs of duckery; there may well be fellow-travelling geese, swans, or ballplayers¹¹ who acquired the relevant habits by osmosis or genetic predisposition. The conversion of 'Every duck Qs' to 'Every Qer is a duck' is as logically unsound as it is empirically natural.

It may have been noticed that we have shifted here from the illicit conversion of conditionals of (15) to the illicit conversion of universals. But this is not too surprising, especially in light of the move apparently first suggested by John Wallis (1687: ii, 10) on which 'if' is assimilated to 'every case in which'.¹² Even for those unwilling to follow Wallis along this reductionist road, the two propositional forms are obviously semantically close, down to the inapplicability of simple conversion to each. Indeed, for Mill (1843) the illegitimate conversion responsible for the fallacy of consequence (and, by extension, for CP) is naturally viewed as one arising in the mental processing of universals:

"The simple conversion of an universal affirmative proposition, All A are B, therefore all B are A, I take to be a very common form of error ... And so with another form of fallacy, not substantially different from the preceding: the erroneous conversion of an hypothetical proposition. The proper converse of an hypothetical proposition is this: If the consequent be false, the antecedent is false; but this, If the consequent be true, the antecedent is true, by no means holds good, but is an error corresponding to the simple conversion of an [sic] universal affirmative. Yet hardly anything is more common than for people, in their private thoughts, to draw this inference. As when the conclusion is accepted, which it so often is, for proof of the premises ..." (Mill, 1843: 803–804)

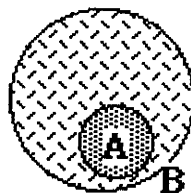
As with CP itself, this is an inductively natural, if deductively invalid, step, as recognized by psychologists investigating the circumstances in which *All As are Bs* is taken to license the inference of its converse, *All Bs are As*: "Such interpretations, although logically invalid, often correspond to our experience of reality, and being guided by experience are usually regarded as justifiable procedures" (Chapman and Chapman, 1959: 224). Empirical studies indicate that this justification for such procedures – along with that for denying the antecedent or affirming the consequent – varies with the degree of abstraction of the data (*All As are Bs* vs. *All collies are dogs*), with the binarity of the situation (whether the antecedent represents one of only two possible states of affairs), with the emotive involvement of those performing the computation (affective or 'socially controversial' material producing more instances of fallacious reasoning), and with the cognitive load of the problem; see Wilkins (1928), Lefford (1946), Wason (1964), and Wason and Johnson-Laird (1972).

¹¹ The reference is to Joe 'Ducky' Medwick, Hall of Fame outfielder for the St. Louis Cardinals et al. from 1932 to 1948, who "walked with a waddle and swung with a vengeance" (*Newsweek* obituary, 31 March 1975, 53). My sources do not record any remarkable aspects of Mr. Medwick's elocution or politics.

¹² Wallis's equation of *si* to *omnis casus quo* has more recently been exploited in one form or another by Kratzer (1978), Sommers (1982), and von Fintel (1997); see also Horn (1989: 473ff.). I am indebted to Kai von Fintel and Victor Sánchez Valencia for discussion of this point.

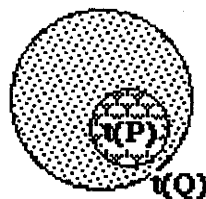
The parallel Mill draws between the universal and hypothetical ‘form[s] of error’ can be schematized as in Fig. 1.

(16)



- a. Every A is a B.
- b. Every B is an A.
- c. $A = B$

(16')



- a. If P then Q.
- b. If Q then P.
- c. $P \leftrightarrow Q$

Fig. 1. The universal and hypothetical forms of error.

The non-B A, or B–A, space in (16) is virtually reduced until the B set is functionally coextensive with A, or – to paraphrase Grice’s memorable remark – until Bness is neither narrower nor wider than Aness.¹³ In the same way, if P then Q (i.e., in the Wallis translation, every case in which P is true is a case in which Q is true) is ‘perfected’ to the point at which Qness is neither smaller nor larger than Pness.

When you begin working on these patterns in which sufficiency is not enough, you begin to see them under every bush, reflecting Böer and Lycan’s (1973) observation that nothing crucial about CP (or the related fallacies) hinges on the form of conditionals, not to mention the tradition (dating back, as we have seen, to the *Sophistical refutations*) of classifying the fallacies in question as *extra dictionem* or language-independent. Thus the symptoms of CP or illicit conversion may lurk within a conditional (or, as Mill would have it, ‘an hypothetical’) proposition, within the corresponding universal statement, or when no overt logical connective is present at all. Thus consider the following sign posted outside the drive-through window at my branch of the Bank of Boston:

We wish to serve all of our customers promptly. Please have identification ready. Rolled coins & large cash transactions are welcome inside the bank lobby.

Fig. 2

¹³ Delivered at the ‘Performadillo’ Conference on Performatives, Presuppositions, and Implicatures, University of Texas, Austin, March 1973.

Inside must be understood here as ‘inside and only inside’, allowing us to convert the bank’s regulation to what we shall refer to as CP-normal form:

- (17) a. If x is in the bank lobby, x is welcome to make a \$1,000,000 deposit.
- b. Iff x is in the bank lobby, x is welcome to make a \$1,000,000 deposit.

Fortunately, my cash transaction was small enough to be administered externally.

On a related note, Neal Whitman has reminded me of the country music hit ‘If the good die young’ by Tracy Lawrence (on *Alibis*, Atlantic #82483, 1993), with the first line:

- (18) I’m gonna live forever if the good die young.

The implicit argumentation here is somewhat more sophisticated. Beginning with the assumption presented in the postposed protasis of (18), we have the conversion of (18’a) into (18’b), resulting as usual in the equivalence in (18’c) – but this time with a scalar twist, as approximated in (18’d):

- (18’) a. If x is good, x dies young.
- b. If x dies young, x is (must have been) good.
- c. Iff x is good, x dies young.
- d. The better (worse) x is, the younger (older) x dies.

I suspect (18) remains technically unsound as a conclusion even on a generous reading of this schema, but I will eschew the formal proof here.

For one more venue in which sufficient conditions are strengthened to necessary-and-sufficient ones we turn to a family of conceptual tasks empirically investigated by Wason (1960) and his followers and critics. In the original task, subjects were presented with the triple 2-4-6 and told that this sequence exemplified a rule or pattern that they were to determine. The subjects were told that they could propose as many triples as they liked in search of the correct rule, and that the experimenter would let them know if the proposed triple did or did not conform to the rule. Subjects were to identify the rule only when they were sure they knew it. As it happens, the target rule was ‘numbers in ascending sequence’; a majority of the subjects advanced incorrect rules representing specific subcases of the correct one, typically assuming (in the absence of negative feedback) that the integers must all be even, must differ from each other by two, must form an arithmetic progression, and so on. The subjects in question essentially arrived at true conditionals of the types displayed in (19), which they then incorrectly promoted to biconditionals.¹⁴

¹⁴ Wason later reflects (1968: 173–174) that his study demonstrates “how dogmatic thinking and the refusal to entertain the possibility of alternatives can easily result in error”, or even in the “fixated, obsessional behaviour” characteristic of closed, unfalsifiable systems such as “existentialism and the majority of religions”.

- (19) a. If $[C > B > A]$ and A, B, C are even, $A-B-C$ is accepted.
 b. If $[B = A + 2]$ and $C = B + 2]$, $A-B-C$ is accepted.
 c. If $[C > B > A]$ and $C - B = B - A]$ (i.e. if $A-B-C$ form an arithmetic progression), $A-B-C$ is accepted.
 d. If $[C > B > A]$ and B is the mean of A and $C]$, $A-B-C$ is accepted.

* In this condensed retelling of the family saga of interrelated non-language-dependent fallacies, we have surveyed the explanations proffered for the tendency to convert or perfect conditional statements and their functional kin. Since Aristotle, this tendency has often been ascribed to the fact that the deductive invalidity of arguments resulting from this tendency is offset by their inductive naturalness, given the difficulty of establishing causal correlations. While the general practice of strengthening a sufficient condition into a necessary one – implying or inferring that a formal implication is to function as an informal equivalence – is reflected in realms from rhetoric to empirical psychology to lexical diachrony and exploited by sophists, song-writers, and bankers alike, its application is subject to the vagaries of context and in particular to the beliefs and goals of speaker and hearer. In this respect, the analysis of CP and its family of fallacies is a natural target for pragmaticists, whose job description includes the explanation and delimitation of defeasible inference. But which items are to be pulled from the pragmatic toolkit and how they are to be deployed?

3. Conditionals ‘R’ us: CP and pragmatic strengthening

“It is undoubtedly true that Geis and Zwicky are responsible for quickening linguistic interest in conditional perfection. But they were not the first to introduce the problem into modern linguistics ... This merit goes to the French linguist Ducrot (1969). He moreover does not merely envisage a Gricean analysis but surpasses Geis and Zwicky in actually proposing one, which though incorrect is definitely on the right track ... Using modern terminology, one would now say that Ducrot derives [2b] or [2c] as a scalar conversational implicature.” (van der Auwera, 1997b: 170)

For van der Auwera (1997b: 173–174, 1997a: 262–263), the ‘correct’ scalar analysis derives from a suggestion presented informally in Horn (1972: 107–108) and semi-formally in Cornulier (1983: 247–248):

“We can suppose, very roughly, that in [*One is allowed to sit in this seat if one is disabled or if one is older than 70*] the word *if* keeps its merely sufficient condition meaning, and that the utterance situation suggests that if other sufficient conditions (allowing to sit there) did exist, they would have been mentioned, so that the only mentioned property (to be disabled or older than 70) is the only property which gives the right to sit there (presumption of exhaustivity).” (Cornulier, 1983: 247)

Van der Auwera reconstructs this analysis by way of the now standard conversational-implicature-inducing quantitative scales (Horn, 1972; Fauconnier, 1975; Gazdar, 1979; Hirschberg, 1985):

- (20) if p, q and if r, q and if s, q
 if p, q and if r, q
 ↑if p, q

In this ordered structure, a proposition on a given line unilaterally entails any proposition on a lower line (entailment proceeds downward from S(tronger) to W(eaker) schemata), while the assertion of a lower or weaker proposition implicates that the speaker was not in a position to have substituted a higher or stronger proposition *salva veritate* (implicature proceeds upward from W to the negation of S).

Van der Auwera regards the pattern evinced in (20) as parallel to the classic instances of Gricean scalar implicature (a.k.a. quantity- or Q-based implicature as in Horn, 1984) determined by the scales in (21) and (21’), as when an assertion about some Fs being Gs is taken to implicate that (for all the speaker knows) not all of them are.

- (21) All of them left
 ↑Some of them left
- (21’) None of them left
 ↑Not all of them left

The motivating principle at work here is most familiar in the form of Grice’s first maxim of quantity (1989 [1967]: 26–27): “Make your contribution as informative as is required (for the current purposes of the exchange)”. While this principle is not novel with Grice (see Horn, 1990 for discussion and references), one particularly significant precursor of his maxim is due to a fellow Oxonian who (with acknowledgments to his colleague ‘Mr. H.P. Grice’) attributes the inferences in question to “... a ‘pragmatic’ consideration, a general rule of linguistic conduct ... that one does not make the (logically) lesser, when one could truthfully (*and with equal or greater linguistic economy*) make the greater, claim” (Strawson, 1952: 179, emphasis added). As we shall see, Strawson’s parenthetical rider will play a crucial role in our retelling of the CP story.

It will be noticed that the scale invoked by van der Auwera in (20) explicitly refers to propositional variables for hypothetical states of affairs to be excluded – Cornulier’s ‘other sufficient conditions’ – although these conditions never seem to figure directly in the reasoning that takes us from *if p then q* to *if not-p then not-q*. For that matter, one might ask, why assume the scale in (20) rather than the more straightforward one in (22)?

- (22) if and only if p, q (iff p, q)
 ↑if p, q

To be sure, the biconditional in the upper line does unilaterally entail the one-way conditional in the lower line. But this seems to yield just the opposite prediction from the one we want. If ... S ... unilaterally entails ... W ..., how is it that ... W ... (*if p then q*) here communicates not the negation of ‘... S ...’ as in (21) and (21’) but rather ‘... S ...’ itself (*iff p then q*)?

As van der Auwera (1997b: 175) notes, the key step is that of showing “how one can stop *if* from Q-implicating the negation of *if and only if*”, or more generally how the assertion of α ... can be blocked from implicating $\sim(\alpha$ and only α ...). The response offered by Levinson (1987: 69–71) and others (e.g. Atlas and Levinson, 1981; Horn, 1984) is dismissed by van der Auwera as unconvincing, but this reac-

tion is based on a misconception of the substance of that response. Van der Auwera takes Levinson and the other authors to claim “that the relevant linguistic items must be lexicalized to the same degree” (1997b: 175). Thus *if* ... will (correctly) be barred from implicating that the stronger expression, *if and only if* ..., fails to hold (for all the speaker knows), since – despite the existence of the strength or informativeness scale in (22) – *iff* is not as lexicalized as *if*.¹⁵ Now, van der Auwera rejects this argument on the grounds that other instances of successful Q-implicatures do clearly differ in degree of lexicalization (see also Matsumoto, 1995: 42ff.).

But in fact the *correct* generalization is not the justly maligned (23a–b):

- (23) a. To constitute a genuine scale for the production of scalar implicatures, each item must be *lexicalized to the same degree*. (Atlas and Levinson, 1981: 44, emphasis added)
 b. Genuine Q(uality)-implicatures [involve] tight Horn scales and similar contrast sets of *equally brief*, *equally lexicalized* linguistic expressions ‘about’ the same semantic relations. (Levinson, 1987: 71, emphasis added)

but something more in the nature of (24):

- (24) The utterance of ... *W* ... (containing an unembedded occurrence of a weak scalar value) will Q(uality)-implicate that the speaker was not in a position to affirm ... *S* ... (where ... *S* ... is informationally stronger than, i.e. unilaterally entails, ... *W* ...) only if *S* is *at least as lexicalized* as *W* within the relevant domain.

This is shown by both reflection and a consultation of other pragmatic work in this spirit: see e.g. Horn (1984, 1989, 1990, 1993), *inter alia*, as well as Levinson’s actual argumentation for a ‘Brevity Condition’ to ensure that the speaker didn’t choose *W* over *S* “simply in order to be brief, i.e. to conform to the Maxim of Manner” (Levinson, 1983: 135).¹⁶ The conditions under which Q-based implicature is constrained are those in which *S* is *less* lexicalized, longer, or – more generally – more marked as a contribution than *W*, not those in which it is *more* lexicalized or briefer.

¹⁵ *Iff* is obviously a self-conscious innovation within the vocabulary of mathematicians, logicians and linguists. The first citation in the OED is from a 1955 topology text by J.L. Kelley in which *iff* appears, as it does in most early instances, in the definition of technical terms. The fuller *if and only if*, while also largely technical, has a wider distribution than the abbreviation but is also clearly less lexicalized than *if*. Nor is it, as often assumed, necessarily idiomatic: see the McCawley and Barker references in fn. 3 and Horn (1996) for arguments that *if and only if* is a semantically compositional coordination of *if* and *only if*.

¹⁶ As Matsumoto (1995: 44–45) observes, there is a significant overlap between the considerations of brevity and lexicalization invoked by Levinson. Matsumoto shows (see also Horn, 1989, 1993) that the factors determining when a potential Q-based scalar implicature will be overridden can be quite difficult to pin down, but the generalization in (24), though not entirely successful, will serve the current purposes.

Thus it is true, but irrelevant, that “the requirement of an equal lexicalization seems unduly severe” (van der Auwera, 1997b: 176) and that it is rejected in practice by Levinson himself, as in the invocation for a Q-implicature from *not all* to the negation of ‘none’ in (21’) above (24 in van der Auwera, 1997b). Significantly, the fact that *not all* is less lexicalized than *none* strengthens the tendency to draw the upper-bounding (*not all* +> *none* (= some)) scalar implicature here compared to its positive (*some* +> *all*) counterpart where the items that differ in strength are equivalent in degree of lexicalization (see Horn, 1989: 497ff., for a detailed discussion of the effect of this asymmetry in lexicalization on quantifier scope facts).

When degree of lexicalization is not a factor, scalar implicature goes through. Thus, each of the ordered n-tuples of items in (25)

- (25) <*always, usually, often, sometimes*>, <*and, or*>, <*certain, likely, possible*>, <*hot, warm*>, <*cold, cool*>, <*thumb, finger*>, <*excellent, good, OK*>

constitutes a Q-relevant scale such that the affirmation of any weak or intermediate value will implicate (*ceteris paribus*) that – for all the speaker knows – the value(s) on its left could not have been substituted *salva veritate*.

But when *S* is less economical than *W* in the appropriate sense, no Q-implicature is triggered even when unilateral entailment provides the necessary strength differential. In the extended standard square of opposition for the binary connectives in Fig. 3, entailment proceeds downward along the usual gravitational lines.

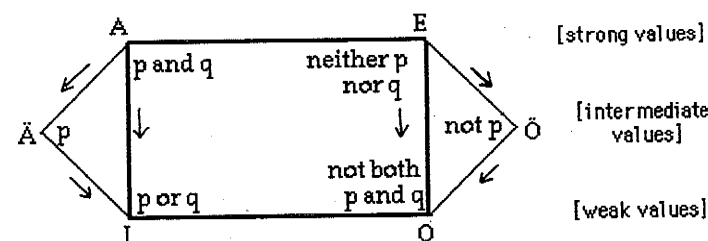


Fig. 3. The extended standard square of opposition (Horn, 1990: 464, after Czezowski, 1955 and Fogelin, 1967)

The A-form conjunction unilaterally entails its (unlabeled) simplex counterpart, and each of the two unilaterally entails the I-form disjunction. But while the assertion of a disjunction does implicate that (for all the speaker knows) the singular expression and conjunction fail to hold (from my assertion that *The Democrats are corrupt* or *the Republicans are corrupt*, you will tend to infer that I didn’t know for a fact that the Democrats are corrupt, much less that both parties are), a singular statement (*Bill is corrupt*) does not implicate anything about the character of, say, Newt. My affirmation of *Ä* fails to implicate that (for all I know) not-*A*.

relevant to the speaker's contribution. And what could make such a condition more relevant than its necessity? On this view, Quantity and Relation/Manner conspire to establish the tendency to perfect conditionals.²¹

Nor would this be unprecedented: it is argued in Horn (1989: §3.3) that the presuppositionality of negative statements results from the mutual reinforcement of Q and R. In particular, the marked status of negation is derived from the the Q-based requirement that speakers be as informative as possible – where positive statements are characteristically more informative than negative ones – together with the R-based principle responsible for the speaker's eliminating from her message whatever would increase processing effort without increasing relevant content (Horn, 1989: 201). As with negatives, so with conditionals.

This line of argument is prefigured by Oswald Ducrot:²²

(30) a. Si Pierre vient, Jacques partira.

b. Si Pierre ne vient pas, Jacques ne partira pas.

"Dans la plupart des contextes imaginables, la personne qui entend [30a] conclut non seulement que la venue de Pierre entraîne le départ de Jacques, qu'elle en est la condition suffisante, mais aussi qu'elle en est la condition nécessaire, que le départ de Jacques est subordonné à la venue de Pierre. Il serait considéré en effet comme assez anormal, ou comme mensonger, d'énoncer [30a] si l'on ne pense pas [30b]." (Ducrot, 1969: 17)

tion of the Gricean schema. The Q Principle is a lower-bounding hearer-based guarantee of the sufficiency of informative content ('Say as much as you can, modulo Quality and R'); it collects the first Quantity maxim and the first two submaxims of Manner, and is systematically exploited (as in scalar cases) to generate upper-bounding implicata. The R Principle is an upper-bounding correlate of the Law of Least Effort dictating minimization of form ('Say no more than you must, modulo Q'); it collects the Relation maxim, the second Quantity maxim, and the last two submaxims of Manner (in particular, the submaxim of Brevity), and is exploited to induce strengthening or lower-bounding implicata. Q-based implicature is typically negative in that its calculation refers crucially to what could have been said but wasn't: H infers from S's failure to use a more informative and/or briefer form that S was not in a position to do so. R-based implicature (or the I-implicature of Atlas and Levinson, 1981; Levinson, 1987) typically involves social rather than purely linguistic motivation and is exemplified by indirect speech acts (in particular, euphemism) and negative strengthening. The functional tension between these two antinomic forces motivates and governs not just implicature but a wide range of linguistic phenomena from politeness strategies to the interpretation of pronouns and gaps, from lexical and semantic change to the analysis of conversational interaction.

²¹ The characterization of CP in Horn (1973) appears within a discussion of various fallacies representing what are clearly non-Q-based inferences in ordinary reasoning, including the PHEPH-style inferences responsible for the logical sense of originally temporal expressions like English *since* and *still* (see (14)) or the interpretation of *The flag is red* as 'The flag is all red' (Horn, 1973: 212–213). This last move, the predication of the part taken as predication of the whole, corresponds to the Fallacy of Composition. The lexical strengthening of expressions like *since* has been cited elsewhere (Atlas and Levinson, 1981; Horn, 1984; König and Traugott, 1988) as instances of conventionalized and 'on-line' I(nformativeness)- or R-based implicature. Thus the analysis of CP in Horn (1973) foreshadows the I- and R-based accounts of the following decade, calling into question van der Auwera's implication that I was later seduced away from my earlier Q-based insight by the wiles of (Atlas and) Levinson.

²² Scott Schwenter (p.c.) has alerted me to the fact that in more recent work, Ducrot (1990: 133) has rejected his earlier implicature-based approach to CP in favor of one based on argumentative topoi. I have not had the opportunity to consult this work.

Anticipating Geis and Zwicky's discussion, Ducrot sees the inference from (30a) to (30b) as an instance of the pragmatic relation of *sous-entendu*. For one thing, he observes, the tendency is attenuated or suppressed when the conditional appears within the scope of another illocutionary operator, as in (30'), which does not occur with semantic inferences.

(30') Est-ce que, si Pierre vient, Jacques partira?

The kinship between Ducrot's *sous-entendu* and Grice's implicature is evident, although the descriptions were arrived at independently. In other work from the same period (the years when Grice's William James lectures were circulating in manuscript form in Britain and the U.S. but had not yet appeared in print), Ducrot elaborates a *loi d'exhaustivité* that corresponds to a quantity maxim in its formulation and its exploitation as a source of upper-bounding *sous-entendus*, e.g. the inference that a speaker affirming that a predicate holds for *certain*s ... was not in a position to have affirmed that it holds for *tous* ...:

"[La 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 susceptibles 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)

Ducrot's *sous-entendu* has a considerably richer lineage within the taxonomy of non-logical inference than does its Anglophone rival – even in the Anglophone literature itself. Here is John Stuart Mill writing in opposition to Sir William Hamilton of Edinburgh's definition of *some* as 'some only, some but not all':

"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 added)

Note the opposition of sentence meaning and speaker meaning, the inference computed from what *wasn't* said as well as what was, and the role of epistemic uncertainty in determining the force of the inference – all traits stressed a century later by both Ducrot and Grice.

The conditional *sous-entendu*, however, involves not the upper-bounding inference from *W* to 'not *S*' (as in that from *some* to 'not all') but the strengthening inference from *W* to '*S*'. In particular, Ducrot recognizes that the relation in (30) is analogous to that involving litotes or understatement,²³ as exemplified by the tendency to

²³ See Horn (1989: ch. 5) for an R-based account of such pragmatic strengthening processes, especially those occurring in negative contexts.

interpret the negative assessment in (31a) as an expression of the stronger negative judgment in (31b).

- (31) a. Jacques ne déteste pas le vin.
b. Jacques aime beaucoup le vin.

“L’auditeur ne cherche une litote que lorsque l’utilisation d’un énoncé plus fort aurait quelque chose de déplacé, d’inconvenant, de répréhensible. Si X et X’ sont deux énoncés situés sur une même échelle de signification, et si le second ne diffère du premier que parce qu’il occupe un degré supérieur de cette échelle, si, d’autre part, une règle de convenance s’oppose, ou peut sembler s’opposer à l’emploi d’X, l’auditeur qui entend X a tendance à l’interpréter comme X’.” (Ducrot, 1969: 22)

In both (30) and (31), then, there is the ‘W’ +> S move, but in (30) there is in addition the role played by Manner, the fact that the speaker seems to have gone out of her way to provide additional material which, given the operation of linguistic economy (our R Principle), must be assumed to be relevant. Thus, to posit any restriction will tend to suggest that the general predication holds not just when, but *only* when, this restriction is satisfied:

“Le locuteur observe, dans le choix de son énoncé, une espèce de loi d’économie. Si on dit d’une personne qu’elle aime les romans policiers, l’auditeur est tenté de conclure, pour s’expliquer la précision apportée par le mot ‘policiers’, qu’elle aime peu, ou moins, les autres romans. Car, si elle aimait tous les romans, à quoi bon ajouter cette détermination ...” (Ducrot, 1969: 22)

Whence, as we have seen, the CP effect:

“Lorsque l’on utilise [30a], on ne pose le départ de Jacques qu’après avoir demandé à l’interlocuteur de faire l’hypothèse préalable de la venue de Pierre. Mais, si Jacques devait partir de toute façon, ou simplement s’il devait partir même au cas où Pierre ne viendrait pas, à quoi bon subordonner l’annonce de son départ à l’évocation de l’arrivée de Pierre? ... Si mon interlocuteur a tenu à subordonner l’énonciation du départ à l’énonciation de la venue, et si, d’autre part, il est censé ne pas parler en vain, je peux conclure avec une certaine vraisemblance que, pour lui, le fait du départ est subordonné au fait de la venue.” (Ducrot, 1969: 22–23)

As we have also seen, the strengthening of sufficient to necessary conditions applies in a wide range of cases that carry conditional force but often lack conditional form. Unsurprisingly, Ducrot’s fan of detective novels can be adjusted to fit our Procrustean bed:

- (32) a. ($\forall x, x \in \text{novels}$) (If x is a detective novel, Agatha likes x)
b. ($\forall x, x \in \text{novels}$) (If Agatha likes x, x is a detective novel)
c. ($\forall x, x \in \text{novels}$) (Iff x is a detective novel, Agatha likes x)

A particularly rich vein of strengthened sufficiency is provided by the lexical process of R-based narrowing (Horn, 1984; König and Traugott, 1988), in which an expression gradually comes to refer to a salient subset or member of the set of entities to which it previously referred. As with the related phenomena of CP and PHEPH, the prescriptivist tends to find such shifts illogical, but this verdict does not stand in their way:

“Restriction of meaning has at all times been a cause of astonishment to etymologists. We know the observations of Quintilian on the subject of *homo*: ‘Are we to believe that *homo* comes from *humus*, because man is born of the earth, as if all animals had not the same origin?’ Yet it is most certain that *homines* did signify ‘the inhabitants of the earth’. It was a way of opposing them to the inhabitants of the sky, *Dii* or *Superi*.” (Bréal, 1897: 114)

Putting Bréal’s derivation into CP-normal form yields (33), where $A \leftarrow B$ signals that a term once denoting ‘B’ has been extended to refer to ‘A’ (either instead of or in addition to ‘B’):

- (33) a. If x is a person, x is from the earth.
b. If x is from the earth, x is a person.
c. Iff x is a person, x is from the earth [*humus*].
[*homo*] \leftarrow

Nor should this development seem terribly exotic to English speakers, since *earthling* instantiates precisely the same R-based narrowing effect.

The process illustrated in (33) represents one of two distinct sources of narrowing within diachronic lexicography. In Q-based, linguistically motivated narrowing, the target is the complement of a previously named subset: the existence of a specific hyponym H of a general term licenses the use of the general term for the complement of the extension of H. Examples include the development of specific uses or senses of *dog* (excluding bitches), *cow* (excluding bulls), *rectangle* (excluding squares), *finger* (excluding thumbs), and *animal* (excluding humans, birds, and/or fish). Our interest, however, is in the pattern of R-based, positive narrowing to a salient or stereotypical exemplar. Illustrations include the *par exemplar* narrowing of Lat. *fenum* ‘produce’ \rightarrow ‘hay’ and Greek *álogo(n)* [lit., ‘speechless one’] \rightarrow ‘horse’, the originally argot-based restriction of *deer* (cf. Ger. *Tier*) and *hound* (cf. Ger. *Hund*) to animals constituting a hunter’s salient goal and assistant, and the loaded senses acquired by *poison* (cf. *potion*) and *liquor* (cf. *liquid*). Recalling Ducrot’s observation (1969: 22) cited above that speaker’s understatement – or hearer’s strengthening – is most likely when “l’utilisation d’un énoncé plus fort aurait quelque chose de déplacé, d’inconvenant, de répréhensible”, it is not surprising that the night-soil of euphemism should prove especially fertile for the development of R-narrowed meanings: cf. *inter alia* *disease*, *accident*, *undertaker*, *pass away*, *special education*, and *toilet*.

In both euphemistic and general domains, the R-based narrowing may result in development of AUTOHYPONYMS, in which the general sense survives in privative opposition with a specific and stronger sense or use. Thus we have *color* (for ‘hue’, excluding black, whites, and grays), *temperature* (for ‘fever’), *number* (for ‘integer’), *man/homme* (for ‘male adult human’), *Frau/femme/mujer* (‘wife’ < ‘woman’).²⁴ Among the euphemisms, we have *drink* (for ‘imbibe alcohol’), intransi-

²⁴ Notice that in several of these cases there is a specialized term already in existence, so a Q-based narrowing of e.g. *temperature* or *number* would have yielded such complementary restricted senses as ‘a

tive *smell* (for ‘stink’), and *friend*, which may either Q-implicate ‘no more than friend, i.e. not lover, spouse, etc.’ or alternatively – with the appropriate pause and/or circumflex eyebrows – R-implicate ‘more than friend.’

Consider the evolution of *go to the bathroom*, whose conventional meaning has undergone a final shift, as Morgan (1978: 263) points out, as soon as one can speak of a dog going to the bathroom on the kitchen floor. Historically, we have the development illustrated in (34) in which the execution of the relevant function moves, as it were, from a sufficient to a necessary condition for bathroom visits, resulting (as with the *homines* of 33c) in the identification of the two activities:

- (34) a. If (and when) *x* excretes, *x* goes to the bathroom.
 b. If (and when) *x* goes to the bathroom, *x* excretes.
 c. Iff (and when) *x* excretes, *x* goes to the bathroom.

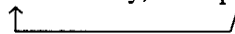


Elsewhere in the land of unmentionabilia, we have the narrowing that results when what is “*déplacé*, *inconvenant*, *répréhensible*” involves sex and reproduction. Folk-rocker Ian Robertson plays off both literal and euphemistically standard senses of one particular autohyponym in this verse:

- (35) I never slept with you,
 Though we must have made love a thousand times.
 For we were just young,
 Didn’t have no place to go.
 (Incredible String Band, ‘First girl I loved’, from *Layers of the onion*, Hannibal #4438, 1967)

More prosaically, we have the following pattern, building from the generalization (occasionally honored in the breach, as in 35) that when two people are sexually engaged, they typically end up sleeping together (‘condorming’) too – ideally afterward rather than during.

- (35') a. If *x* makes love with *y*, *x* [*literally*] sleeps with [= *alongside*] *y*.
 b. If *x* sleeps with *y* [*ceteris paribus*], *x* makes love with *y*.
 c. Iff *x* makes love with *y*, *x* sleeps with *y*.



In euphemism, a speaker achieves protective coloration by virtually referring to a taboo object without technically referring to it. An analogous source of R-based restriction that shares the social or cultural motivation of euphemism is the attenuation of negative force. Once again, we avoid invoking the loaded meaning in a

temperature *other than* that in the fever range’ and ‘a *non-integer*’ respectively, just as a straightforward Q-based strengthening of *if p then q* would have resulted in the reverse CP effect noted earlier, i.e. in the negation of *iff p, q*.

straightforward and unambiguous way by packaging contrary negatives in contradictory clothing.²⁵ This yields another of the Millian fallacies:

“The very frequent error ... of mistaking reverse of wrong for right, is the practical form of a logical error with respect to the Opposition of Propositions. It is committed for want of the habit of distinguishing the *contrary* of a proposition from the *contradictory* of it, and of attending to the logical canon, that contrary propositions, though they cannot both be true, may both be false.” (Mill, 1843: 804)

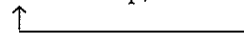
Once again, this ‘very frequent error’ is amply reflected in ordinary usage – “[t]he essence of formal negation is to invest the contrary with the character of the contradictory” (Bosanquet, 1888: 281) – and there are specific contexts in which this tactic is especially likely to surface. One is the tendency for negatively-prefixed adjectives (*unhappy*, *unfriendly*, *un-American*, *immoral*) or verbs (*dislike*, *disbelieve*) to acquire strengthened contrary readings. Two other contexts are cited by Bosanquet as illustrations of his investment principle:

“From ‘he is not good’ we may be able to infer something more than that ‘it is not true that he is good’.” (Bosanquet, 1888: 293)

“[Consider] the habitual use of phrases such as *I do not believe it*, which refer grammatically to a fact of my intellectual state but actually serve as negations of something ascribed to reality ... Compare our common phrase ‘I don’t think that’ – which is really equivalent to “I think that ___ not”.” (Bosanquet, 1888: 319)

Thus we have the R-based strengthening of a general, formally contradictory negation to a specific, contrary interpretation in the case of litotes, especially with positive predicates, whose antonyms are most likely to trigger avoidance mechanisms. I say I don’t like a paper or that I’m not especially thrilled with it precisely to avoid saying that I dislike it; at the same time, I count on your willingness to fill in the intended R-strengthened (contrary) interpretation rather than simply taking me at my (contradictory) word. In an embedding environment, this same practice is responsible for the ‘neg-raising’ understanding, the tendency to interpret a higher-clause negation over certain predicates of opinion, desire, or likelihood, as if it had lower-clause scope. Converting again to CP-normal form:

- (36) a. If *x* disbelieves that *p* [= believes that not-*p*], *x* does not believe that *p*.
 b. If *x* does not believe that *p*, *x* disbelieves that *p* [= believes that not-*p*].
 c. Iff *x* disbelieves that *p*, *x* does not believe that *p*.



In each case, the contrary meaning is sufficient but not logically necessary to establish the truth of the contradictory, yet it is treated as if it were necessary – not surprisingly, since it represents the inductively salient case that makes the contradictory true and since there may be social constraints against direct expression of the stronger contrary.

²⁵ See Horn (1989: ch. 5) for elaboration.

Like the derivation of *homo* from *humus*, the ‘neg-raised’ understanding of *I don’t believe that p* as conveying ‘I believe that not-*p*’ tends to arouse the ire of the philosopher and grammarian.²⁶ This should strike a familiar chord, since the denial of the antecedent (or affirmation of the consequent) arouses the ire of fallacists in precisely the same way and, we have argued, for precisely the same reason. Each represents essentially the same phenomenon: R-based strengthening of a sufficient to a necessary and sufficient condition.

Our move to assimilate conditional fallacies and negative strengthening has an ancient lineage. The fourteenth century logician Robert Bacon begins by distinguishing among three varieties of interaction between negation and its focus: the ordinary negative name (*nomen negatum*) ‘isn’t just’ (*non est iustus*), the infinite name (*nomen infinitum*) ‘is not-just’ (*est non iustus*), and the privative name with incorporated negation (*nomen privatum*) ‘is unjust’ (*est iniustus*), as schematized in Fig. 4.

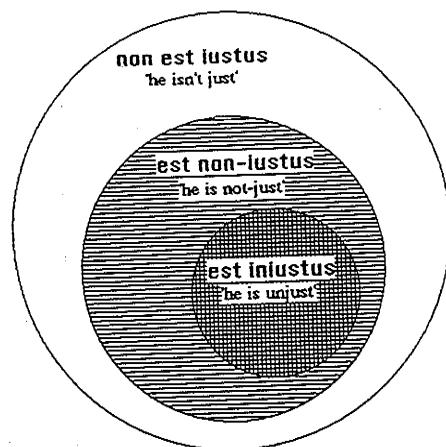


Fig. 4. Three varieties of interaction between negation and its focus.

Technically, he notes, the third unilaterally entails the second and the second the first (see Figure 4), but ordinary usage is not always consistent with this:

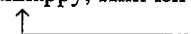
“Ex hiis patet quod bene sequitur argumentum a privato ad infinitum, ut: ‘est iniustus; ergo est non iustus.’ Similiter: ab infinito ad negatum, ut: ‘est non iustus; ergo non est iustus.’ E converso autem non tenet, sed est *paralogismus consequentis*.” (Bacon, *Syncategoremata*: Braakhuis, 1979, vol. I, 144–145; Spruyt, 1989: 252, emphasis added)

²⁶ The first systematic treatment of the neg-raising phenomenon, that of Tobler (1882), refers to the logically unwarranted placement (*logisch ungerechtfertigte Stellung*) of negation, while contemporary logicians from Quine to Hintikka typically bemoan the ‘quirk of English’, ‘peculiarity’, or ‘unfortunate ambiguity’ responsible for the offending readings; see Horn (1989: §5.2) for references and discussion.

“From these it is apparent that the argument follows validly from the privative to the infinite, thus ‘s/he is unjust, therefore s/he is not-just’. Similarly, from the infinite to the negative, thus ‘s/he is not-just, therefore s/he isn’t just’. However, the converse does not hold, but is the fallacy of consequence.”

Thus the move from the contradictory *Kim isn’t happy* to the contrary *Kim is unhappy* is an instance of the fallacy of consequence, and hence of CP, the deductively invalid but inductively plausible strengthening of a sufficient condition to a necessary-and-sufficient condition:

- (37) a. If Kim is unhappy, Kim isn’t happy.
b. If Kim isn’t happy, Kim is unhappy.
c. Iff Kim is unhappy, Kim isn’t happy.



4. Unperfectable conditionals (and others)

As we have seen in some detail, not *only* conditionals license CP effects. We have also noted (following Lilje, 1972; Boër and Lycan, 1973; and Zuber, 1974) that not *all* conditionals license them. Some conditionals are immune by their very semantic-pragmatic nature from the fallacy of perfection. One case in point is the non-causal or ‘Austinian’ conditional whose locus classicus has become (38a).²⁷

- (38) a. If you’re thirsty, there’s some beer in the fridge.
b. There’s some beer in the fridge (whether you’re thirsty or not).
c. ?If there’s no beer in the fridge, you’re not thirsty.

As Austin (1956: 210) notes (cf. also Zuber, 1974; Zaefferer, 1991), these (un)conditionals entail their consequents, so that if (38a) is true, (38b) will be true as well. Nor do they allow ordinary contraposition, as we see in (38c). The formal antecedent in an Austinian *if p then q* conditional offers grounds for the relevance of the statement that *q*; since *p* does *not* offer a sufficient condition for the truth of *q* here (being entirely irrelevant to the truth conditions of *q*), there can be no CP effects, which require a sufficient condition to promote to necessity. A response to (38a) of the form ‘So if I’m not thirsty, there’s no beer?’ is a typical comeback, but not a sincere one.²⁸ In fact the jocular effect of such a response to non-causal conditionals

²⁷ Austin’s actual example was *There are biscuits on the sideboard if you want some*, but the beer/fridge case has tended to supplant it (even in French, as in Zuber, 1974: 105), perhaps because so many neo-Austinians are epistemically insecure with respect to British biscuits and, *a fortiori*, sideboards.

²⁸ Compare this putatively humorous anecdote from the New York Times ‘Metropolitan Diary’ (13 July 1998):

Rebecca Mai and Tiffany Otto were in a SoHo boutique when they were approached by an eager salesman.

‘Ladies’, he said. ‘If there’s anything you need, I’m Nick’.

‘And if we don’t need anything, who are you then?’ one of the ‘ladies’ asked.

reinforces the psychological plausibility, if not logical validity, of CP within causal conditionals and other affirmations of sufficient condition.

By the same token, *even if* conditionals, whether subjunctive or indicative, fail to trigger CP effects (see e.g. König, 1986: 236). This is hardly surprising, since it has been frequently noted (cf. inter alia Pollock, 1976; Bennett, 1982; McLaughlin, 1990; Lycan, 1991; Barker, 1991, 1993, 1994) that an assertion of *even if p, q* does not establish *p* as a sufficient condition for the truth of *q*; indeed, the point of a conditional like (39a) (from Stalnaker, 1968) is to stipulate that (39c) would be true regardless of whether (39b) is true.

- (39) a. (Even) if the U.S. halts the bombing, North Vietnam will (still) not agree to negotiate.
 b. The U.S. will halt the bombing.
 c. North Vietnam will not agree to negotiate.

Note that this holds whether or not the *even* explicitly occurs in the antecedent or a *still* in the consequent. While there has been some dispute about whether *even if* conditional in fact entails its consequent (see above references for discussion), it is undeniable that (as in the case of the Austinian conditionals just mentioned) neither contraposition nor modus tollens holds. That is, as McLaughlin (1990: 33–34) observes, neither (40a) nor (40b) follows from an assertion of (39a) understood as an *even if* conditional.

- (40) a. If North Vietnam agrees to negotiate, the U.S. {will not halt/will not have halted} the bombing.
 b. If the U.S. halts the bombing, North Vietnam will not agree to negotiate.
North Vietnam will agree to negotiate.
 ∴ The U.S. will not halt (will not have halted) the bombing.

Halting of the American bombing campaign is not advanced in (39a) as sufficient grounds for North Vietnamese intransigence; rather, it is seen as insufficient grounds for the attenuation of an already established intransigence. The (*even*) *if* conditional in (41a) is not converted to (41b) or ‘perfected’ to the *iff* biconditional in (41c) because it is only sufficient conditions that implicate necessary-and-sufficient ones.

- (41) a. If you gave me \$1000, I (still) wouldn’t mow the lawn.
 b. Only if you gave me \$1000 would I not mow the lawn.
 c. If and only if you gave me \$1000, I (still) wouldn’t mow the lawn.

Antecedents presupposed by their consequents, as in (42), and antecedents entailing their consequents, as in (43), are also incompatible with CP.

- (42) a. If there’s a King of France, he’s bald.
 b. If Jack has a wife, she’s miserable.

- (43) a. If that’s a cat, it’s a mammal.
 b. If she’s a phonologist, she’s a linguist.

Rather than listing those varieties of conditional statements that exclude CP effects, why not simply list those that allow them? As Mike Geis (p.c.) remarks, the promotion of sufficient conditions to necessary ones often seems causally dependent on the goals of speaker and hearer in the discourse context of the conditional; in particular, the promise, threat, and warning character of conditionals like those addressed to the window-leaner of (1) or the prospective lawn-mower of (2) are especially suggestive. Comrie (1986), for one, maintains that CP is most natural with prohibitives. Ever since Aristotle pinpointed the temptation to infer *If the streets are wet, it has rained* and *If he’s hot, he has a fever*, however, it has also been clear that the conversion or perfection of conditionals cannot be restricted to warnings, threats, or promises.

A stronger claim has recently been advanced by Dancygier and Sweetser (1997). Their approach to conditionals, while often subtle and insightful, entails that perfectibility is built into the conventional meaning of (certain) conditionals, a step that would make it impossible to generalize the pattern to those CP-inducing sufficient conditions that don’t involve conditional form. In addition, Dancygier and Sweetser explicitly argue that all cases of *if* → *iff* strengthening involve predictive conditionals. But this cannot be the case; beginning with the Aristotelian rain and fever cases, non-predictive instances of CP are legion. Counterexamples to the conventionalization and/or prediction theses range from the injunctions of (44), respectively attributable to Jesus, Sir John Harrington, Harry Truman, and your parents,

- (44) If thy right eye offend thee, pluck it out.
 If it prosper, none dare call it treason.
 If you can’t stand the heat, get out of the kitchen.
 If you know what’s good for you, you’ll stop that.

to the contexts of cops and robbers in (45), quid pro quo in (46), and lex talionis in (47),

- (45) One false move and I’ll shoot.
 Don’t do the crime if you can’t do the time.
 (46) You help me, I help you.
 You scratch my back, I scratch yours.
 (47) An eye for an eye, a tooth for a tooth.
 Garbage in, garbage out.

and from the conditionalized directives of (48)

- (48) Break glass in case of emergency.
 Feeling sleepy? Pull off the road and take a nap.
 Stop here on red.

to the launderer's enthymemes of (49).²⁹

- (49) No tickee, no washee.
 No pain, no gain.
 • No shirt, no shoes – no service.
 Nothing ventured, nothing gained.

In each case, the sufficient condition identified in the virtual protasis is regularly promoted to a necessary and sufficient one, yet it is not obvious how to extend either Comrie's notion of prohibition or Dancygier and Sweetser's schema of prediction + conventionalization to the full range of the examples of (44)–(49) in any non-circular way. Since paratactic protases are widely attested in the conditionals of the world's languages (cf. Haiman, 1986), it would be interesting to determine the generality of the cross-linguistic prevalence of CP in such environments, but this question will have to be left to future research.

Finally, we turn briefly to one class of conditionals generally figured among the non-CP-inducers. CP has standardly been seen as applying to indicative conditionals only, not to subjunctives or counterfactuals. Granted, there is an apparent asymmetry between indicative and subjunctive conditionals with respect to CP:

- (2) a. If you mow the lawn, I'll give you \$5.
 b. If you don't mow the lawn, I won't give you \$5.
 (50) a. If you had mowed the lawn, I'd have given you \$5.
 b. If you hadn't mowed the lawn, I wouldn't have given you \$5.

Given that (50a) is generally felicitous only against the background of the presupposition that you did not in fact mow the lawn, it will not straightforwardly invite the inference of (50b), which induces the opposite presupposition.³⁰ But if we focus on the actual connections between protasis and apodosis in the two cases, there is a parallel: in both cases, the sufficient condition (51a) is strengthened pragmatically to the necessary-and-sufficient condition (51b).

²⁹ Of course, if the 'understood' *if* is an *even if* – 'No credit, no problem' – the conditional will be unperfectable, for the reasons we have noted. No sufficiency, no CP!

³⁰ Notice that this 'presupposition', however it is to be analyzed, cannot be part of the semantics of the subjunctive per se. Among the examples that have cited to prove that subjunctive conditionals are not necessarily counterfactuals are those in (i)–(iii):

- (i) If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show. (Anderson, 1951: 37)
 (ii) If Mary were allergic to penicillin, she would have exactly the symptoms she is showing. (Karttunen and Peters, 1979: 6)
 (iii) If the butler had done it, we would have found just the clues that we did in fact find. (Comrie, 1986: 90)

See Comrie (1986) and von Stechow (1998) for more on the semantics of subjunctive vs. indicative conditionals.

- (51) a. [you mow the lawn] \rightarrow [I give you \$5]
 ('is-a-sufficient-condition-for')
 \Downarrow
 b. [you mow the lawn] \leftrightarrow [I give you \$5]
 ('is-a-necessary-and-sufficient-condition-for')

Where (2) and (50) differ is in whether the set of worlds against which we evaluate these connections includes the actual world or not; in (50a) what I *say* is that in the closest world to the actual one in which you mowed the lawn, I gave you \$5; what I *implicate* is that in that world I gave you the money (not just *if* but also) *only if* you mowed the lawn.

By the same token, in uttering (52a),

- (52) a. If I had watered that plant, it would have survived.
 b. If Leonardo diCaprio had watered that plant, it would have survived.

I acknowledge that in the nearest world (the one as much like the actual one but) in which I remembered to water the plant, it survived. I thereby implicate, in the usual CP manner, the converse: in the nearest world in which the plant survived, (it's because) I watered it. Thus my watering the plant is not just a sufficient but also a necessary condition for the plant's survival, unfortunately (given the usual presuppositions) a condition not met. What separates the peculiar (52b) from the reasonable (52a) is that even though it's just as true – an adventitious visit by the teen idol, sprayer in hand, would have rescued my coleus as surely as my watering it would have done – it's a sufficient condition that cannot naturally be understood as a necessary one: in the nearest world in which the plant survived, young Leo wasn't the one who watered it, I was. Only those counterfactuals that are convertible in this manner are contextually plausible as well as true.

5. Last words?

The problem raised by CP is one we encounter whenever we cruise the transitional neighborhood of the semantics/pragmatic border: how do we draw the line between what is said and what is implicated? As stressed by Ducrot, as argued for by Gricean theory, and indeed as assumed by the fallacists as well, the tendency to read sufficient conditions (e.g. the protasis of *if p then q*) as necessary-and-sufficient conditions (*iff p, q*) involves not the semantics of what conditionals *say* but the pragmatics of what speakers can be rationally assumed to *implicate* (or to *sous-entendre*). In this respect, the R-based strengthening that motivates CP, PHEPH, litotes, and other instances of on-line inferencing – as well as the related phenomena of euphemism and neg-raising – is complementary to the Q-based upper-bounding of scalar predication. In each case, establishing an independent pragmatic motivation for the tendency in question allows a simpler and more general account of the construction's conventional meaning.

In tracing the fallacist tradition back to Aristotle's *Sophistical refutations*, we have seen that it's never quite clear whether the advice so generously offered is intended more as a shield against sophistry or as an instruction manual for would-be sophists. In this respect, professional fallacists from yesterday's rhetoricians to today's pop philosophers are the moral equivalent of the purveyors of electronic detection equipment. But more to the point, is there any money to be made in perpetrating CP, PHEPH, and analogous fallacies? As it happens, this question has been addressed:

"Now for some people there is more profit in seeming to be wise, than in being wise without seeming to be (for the art of the sophist is the semblance of wisdom without the reality, and the sophist is one who makes money from an apparent but unreal wisdom)." (Aristotle, *Sophistical refutations* 165a20–24)

To this end, the recipe of success for the sophist in an academic debate includes an elaborate and diverse list of forensic ingredients (*Soph. Ref.* 165b12ff., 174a17ff.; cf. also Hamblin, 1970: 50ff.). Among these are length ('for it is difficult to keep several things in view at once'), speed ('for when people are left behind, they look ahead less'), contentiousness ('for when agitated everybody is less able to take care of himself'), and the reduction of one's adversary to ungrammaticality or babbling. But as a fellow poker-player, I am especially taken with Aristotle's tactic of the well-timed bluff:³¹

"What often produces the strongest impression of refuting one's adversary is the most highly sophistical insinuation of all: having proved nothing, one does not put the final proposition in the form of a question, but rather affirms it as a demonstrated conclusion: 'So-and-so is not true' ... Conclusions should not be put in a form in which one's respondent can deny them, but rather must be taken and used as granted." (Aristotle, *Sophistical refutations*, 174b8–12, 39–40)

While it is more of a challenge to utilize these useful suggestions in written argument, I have done my best to go on for far longer than I should have and to throw my points together in such a way as to make it as difficult as possible for anyone to follow them, but I cannot be certain that I have managed to reduce my readers to ungrammaticality or babbling. Be that as it may, I can only close by asserting without the slightest justification – or better yet by presupposing – that the last words on conditional perfection have now been spoken.

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³¹ Any doubt that ol' Stagira Slim was a master of the art of the bluff should be dispelled by this remark cited by William Baldwin (*A treatise of morall philosophie*, 1547):

"Aristotle ... being asked what vantage a man might get by lying, he answered: 'to be unbelieved when he telleth truth'." (first citation under 'unbelieve' in OED)

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