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All John's Children are as Bald as the King of France: Existential Import and the Geometry of Opposition

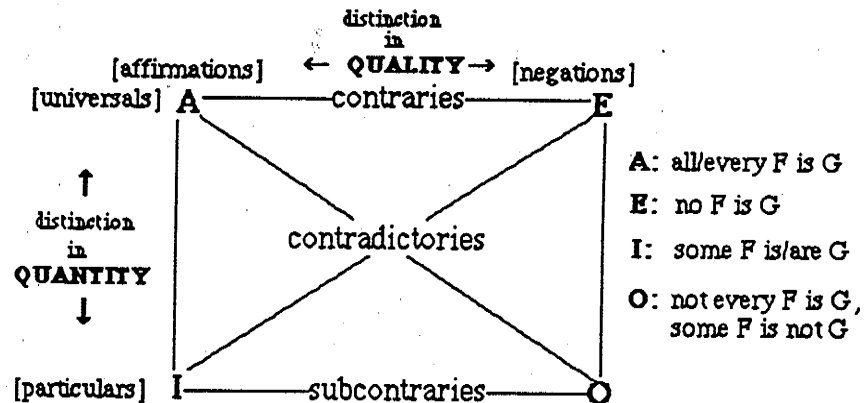
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Anyone who has ever tried to teach or learn elementary logic has had to wrestle their intuition into submission over the truth conditions of universally quantified statements. The sentences in (1a,b) come out vacuously true when John has no children or when there are no seats, and even the apparently contradictory (1c) can be judged true, if uninformative, given current political realities.

- (1) a. All John's children are bald.
- b. Every seat was taken.
- c. Every honest politician takes bribes.

But lest one conclude that 'twas ever thus, we turn to the traditional square of opposition, designed by Apuleius and Boethius a few centuries after Aristotle's writings as a way of schematizing his logic of propositional forms.¹

- (2) The Square of Opposition (cf. Kneale & Kneale 1962, Horn 1989, 1990 for discussion)



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

While Aristotle himself explicitly stressed the two oppositions defined in (3a,b), it has often been regarded as significant that he was rather coy on the

relation specified in (3c) that licenses the inference of *some...* from *all...* (and of *not all...* from *none...*). Nor can we be certain of his attitude toward the subcontraries, beyond his observations that *some pleasure is good* and *some pleasure is not good*—which can be true together—are only verbally opposed (*Prior Analytics* 63b21). But some have gone so far as to see him equating the two particulars: 'On the Aristotelian theory...wherever the affirmative "some are" applies, the negative proposition "some are not" holds also' (Dewey 1938: 182). If this is so, the logical move from A to I becomes untenable, or we would proceed from (4a) through (4b) to (4c):

- (4) a. All men are chauvinists.
b. Some men are chauvinists.
c. Some men are not chauvinists. (= Not all men are chauvinists.)

All men are chauvinists, therefore not all of them are.

The standard view here is that of the great tenth century commentator Avicenna, on which subalternation (unilateral entailment), as in the step from (4a) to (4b), is retained but Dewey's move from (4b) to (4c) is banished from the realms of logic: 'If you say "some men are so-and-so", it is not necessary that some others are not so-and-so. If the proposition is about all, it is also about some' (Avicenna in Zabeeh 1971: 24). And indeed, Aristotle does endorse subalternation at least once: 'For having shown that it belongs to all, we will have shown also that it belongs to some; similarly, if we should show that it belongs to none, we will have shown also that it does not belong to all' (Aristotle, *Topics* 109a3).

But if subalternation is valid, Aristotle's *all* can't be the *all* of elementary logic or, more specifically, of PC, the modern post-Fregean and post-Russellian predicate calculus. For a hard-core Stoic, no pleasure exists. But then (on the modern view) the A statement is vacuously true while its I counterpart is false: you can't get from *all F is G* to *some F is G* if there's no F. Not surprisingly, it was standard procedure in pre-PC logic to recognize existential import for universal affirmatives. This view was largely unchallenged from the early commentators through the medievals to the late nineteenth century. Thus Lewis Carroll (1896: 17-19; 165-71), holding A and I statements to imply existence of the referent of their subject term, describes (5a) as a double proposition, in that it 'contains' (5b) as well as (5c).

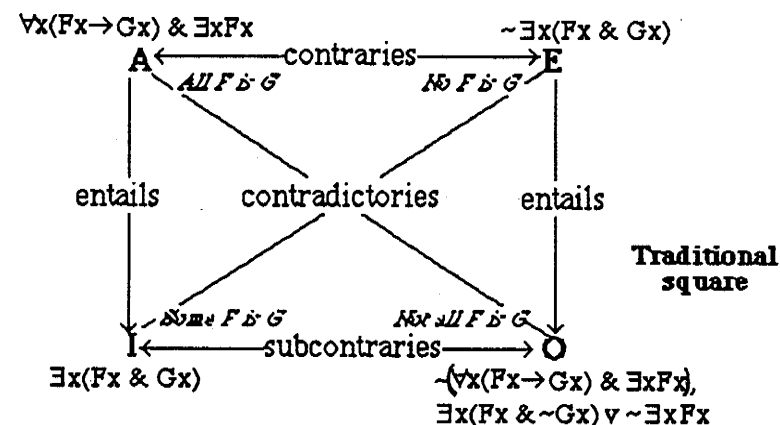
- (5) a. All bankers are rich men. [A]
b. Some bankers are rich men.
c. No bankers are poor men.
(6) a. Some rich men are invalids. [I]
b. Some existing things are rich invalids.
(7) a. No mermaids are milliners. [E]
b. No existing things are mermaid-milliners.

Similarly, (6a) affirms (6b), with the implication that the sets of rich men and invalids are both non-empty. But the universal negative in (7a) 'implies nothing as to the reality of either of the two classes,' merely asserting the emptiness of their intersection.

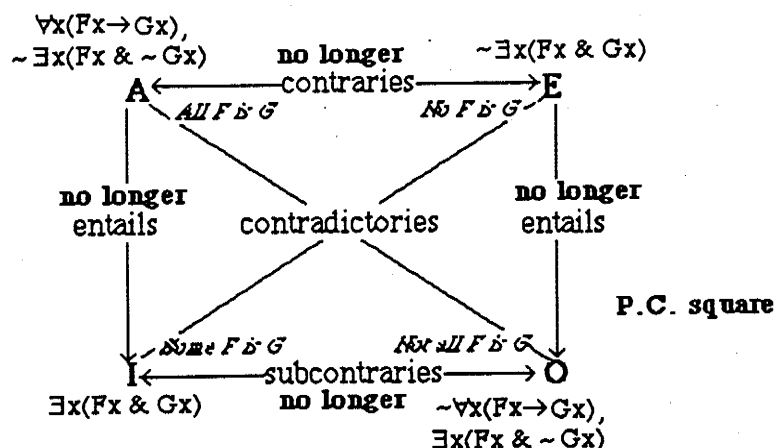
There are at least two basic options for the treatment of existential import for the four classical forms (cf. Strawson 1952, Moody 1953, Thompson 1953, Kneale & Kneale 1962, Sullivan 1967, Horn 1989: §1.1.3 for discussion):

- (8) (i) Traditional view (Apuleius, Boethius, Abelard, Carroll):
Existential import is determined by the QUALITY of the proposition; affirmative (A and I) propositions entail existence, while negative ones (E and O) do not.
(ii) Modern (P.C.) view (Standard first-order Predicate Calculus):²
Existential import is determined by the QUANTITY of the proposition: universals (A and E) have no existential import, while particulars (I and O) do.

On the traditional (8i) position, as developed by Buridan (14th century), any affirmative—including a universal affirmative—will be false if 'the subject stands for nothing.' Further, we know that 'whatever suffices for the falsity of an affirmative...suffices for the truth of the contradictory negative,' just as 'whatever is required for the truth of an affirmative...is required for the falsity of the contradictory negative' (Buridan 1966: 91-92). What follows is that a proposition of A form will have a conjunctive truth definition, while the contradictory O statement will have a disjunctive one.³ Following Moody (1953: 51-52), we can represent the traditional qualitative system with its importing affirmatives and non-importing negatives into modern notation:



On the quantitative P.C. view, where import is entailed by particular propositions of either quality but not by universals, the diagonally opposed propositions remain contradictories. But without import for A (i.e. for \forall), there is no entailment of an import-entailing I, nor can contrariety or subcontrariety be retained; in the square atop the next page, the emptiness of the set denoted by F results in the truth of both A and E, and in the falsity of both I and O. (One feature shared by both approaches is the property of CONVERSION holding for I and E statements: If some men snore, then some snorers are men (and vice versa), and if no women snore, then no snorers are women (and vice versa). A and O statements, on the other hand, are not convertible: if all linguists are geniuses, it does not follow that all geniuses are linguists.⁴ We return to the conversion property below.)



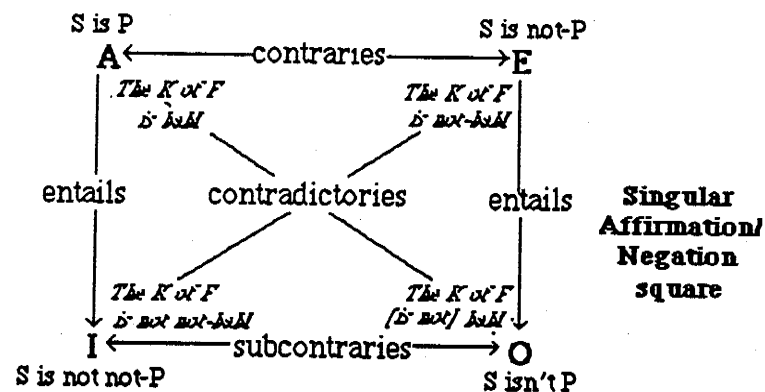
Lacking contrariety, subcontrariety, and subalternation, what we have here is really no square of opposition at all. This has struck most modern logicians as a small price to pay for the rich deductive and inferential schemata made possible within the first-order predicate calculus and its various extensions, and even those who are reluctant to pay it do so under at most mild protest. Thus, Fogelin (1978: 160-64) suggests that while we must, alas, sacrifice the traditional insightful treatments of contrary, subcontrary, and subaltern relations on the altar of logical consistency, we can at least reconstruct these relations within a Gricean framework as conversational implicata. Now, it is quite plausible that there are significant pragmatic correlates of the square of opposition (see Horn 1972; 1989: Chap. 4; 1990 for a partial inventory). But Fogelin's wholesale transsubstantiation of these relations into the pragmatic sphere entirely ignores the fact that the quantifiers are far from the only logical operators that map onto the Square: the traditional Square was recognized by classical and medieval authors to incorporate the binary connectives (see Ashworth 1974: 148, 167), the modals (as in Aristotle's treatment of possibility and necessity), and the quantificational adverbs, as in the table below:

A: (both) p and q	necessary/certain (p)	obligatory (ϕ)	must	always
E: neither p nor q	impossible (p)	forbidden (ϕ)	can't	never
I: (either) p or q	possible (p)	permitted (ϕ)	may/can	sometimes
O: not both p and q	not necessary/poss. not (p)	permitted (not- ϕ)	needn't	not always/sometimes not

Crucially, no issue of existential import arises in these domains, yet the move urged by Fogelin would render the connections between these values and those generating the original square of opposition impossible to forge.

Another classical insight lost on the modern approach is the correlation between quantified or general statements—*All John's children are bald*—and singular definite statements—*The King of France is bald*.⁵ Aristotle took singular affirmations and denials to form their own quadrangles, with term negation

(affirming not-P of the subject S) constituting the contrary and predicate denial (denying P of S) the contradictory of a given affirmation S is P (Prior Analytics I, chapter 46; see Horn 1989: §1.1, §7.2, §7.3 for discussion):

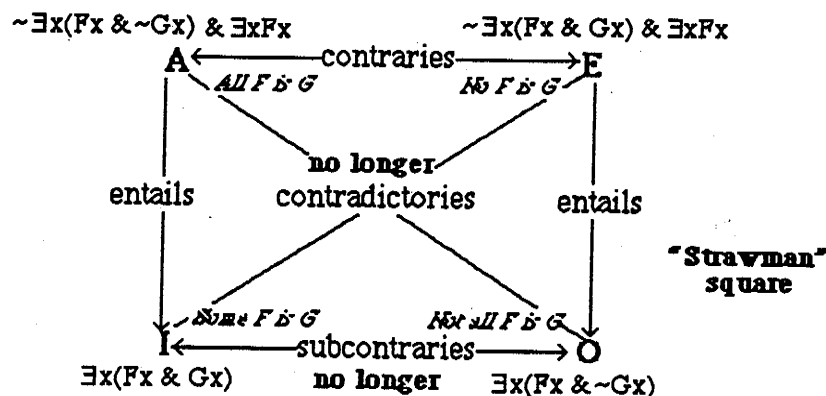


The definite affirmative, like the universal affirmative, is the A position and entails existence. While Russell, and PC semantics ever since, severed the treatment of definites from that of universals—if France is a republic, *The King of France is bald* is automatically false but *All kings of France* is automatically true—for Aristotle and the medievals the two are parallel, as intuition suggests.

To show that the square is incompatible with import-free universals and protectionist (non-import-free) particulars is not to rule out other alternatives. Strawson, in particular, before carrying us to the happy conclusion, considers and rejects not only (8i,ii) but also (8'i) and (8'ii), described and illustrated below:

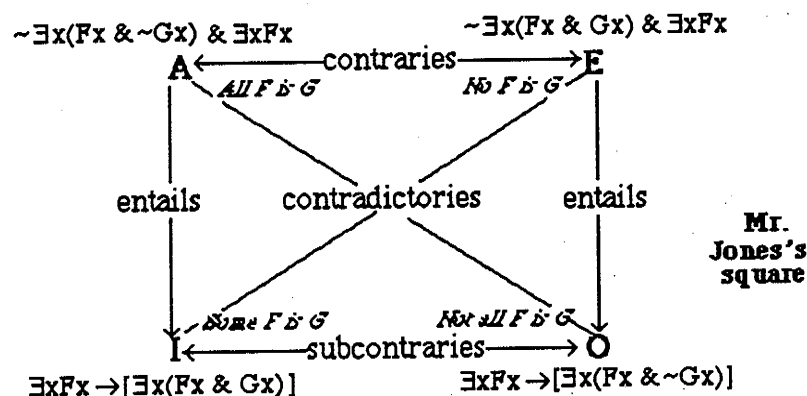
(8') (i) Strawson's strawman

Import all around: universals (A and E) and particulars (I and O) all entail existence of the subject.



(ii) Reverse quantitative (Jonesian) view

The anti-PC line, on which the universals (A and E) entail existence, while the particulars (I and O) do not.



The first of these options allows the retention of contrariety, but doesn't have much else to recommend it. In particular, it renders all four statement types false when the subject fails to denote, in violation of Aristotelian, Russellian, Strawsonian, and every other intuition imaginable. Not surprisingly, (8'i) has never been seriously proposed.

The latter option, that of (8'ii), does support all the relevant classic relations (contrariety, contradiction, subalternation), although it is incompatible with the conversion of O propositions. More serious—indeed, fatal—is its failure to correspond to the way quantified statements are naturally understood. As Strawson (1952: 173) notes, 'It is quite unplausible to suggest that if someone says "Some students of English will get Firsts this year" it is a sufficient condition of his having made a true statement, that no one at all should get a First.'

As it happens, Strawson's proposal for an 'ad hoc patching up of the old system' was independently discovered some years early by an imaginary gentleman of Lewis Carroll's acquaintance. Carroll (1896: 167-68) helpfully records an exchange between himself and Mr. Jones:

(9) CARROLL: "Well, Jones! Have you got your new Club started yet?"

JONES (*rubbing his hands*):

"You'll be glad to hear that some of the Members (mind, I only say 'some') are millionaires! Rolling in gold, my boy!"

CARROLL: "That sounds well. And how many Members have entered?"

JONES (*staring*):

"None at all. We haven't got it started yet. What makes you think we have?"

CARROLL: "Why, I thought you said that some of the Members—"

JONES (*contemptuously*):

"You don't seem to be aware that we're working on strictly *Logical* principles. A *Particular* Proposition does *not* assert the existence of its Subject..."

Another factor underlying Carroll's conclusion that the Jonesian solution 'would be singularly inconvenient for ordinary folk' is the Club Law for E situations stipulating that "No one who has been convicted seven times of forgery is admissible" which must, as Jones cheerfully acknowledges, take the implausible existence of such scoundrels for granted. As Bob Dylan once commented in another connection, "Something is happening here but you don't know what it is—do you, Mr. Jones?"

We now come round to Strawson's final position on existential import. As the discerning reader may have foreseen, this is a presuppositional analysis and it has the following elements:

(10) Presuppositional view (Hart 1951, Strawson 1952)

- Existential import corresponds to a PRESUPPOSITION associated with A, E, I, and O propositions alike.
- In order for any statement of one of the four forms to have a truth-value, to be true or false, it is necessary that the subject-class should have members.' (Strawson 1952: 177)
- The existential statements presupposed by subject-predicate statements [e.g. (11a-c) below] will not themselves count as subject-predicate statements.

- (11) a. All John's children are bald.
b. The king of France is bald.

Crucially, quantified statements like (11a), regardless of quantifier or sign, are subject-predicate statements just as the singular predication in (11b) and thus share the property of presupposing the non-nullity of the subject class.⁶ But this analysis applies only to 'general sentences of common speech' and not to scientific generalizations or other 'law statements' such as those in (12):

- (12) a. All moving bodies not acted upon by external forces continue in a state of uniform motion in a straight line.
b. All trespassers on this land will be prosecuted.

It was presumably this very contrast between the importing (11a) and the import-free (12a,b) that Lewis Carroll had in mind half a century earlier:

Another view is that the Proposition "all *x* are *y*" *sometimes* implies the actual *existence* of *x*, and *sometimes* does *not* imply it; and that we cannot tell, without having it in *concrete* form, *which* interpretation we are to give to it. *This* view is, I think, strongly supported by common usage; and it will be fully discussed in Part II. (Carroll 1896: 196)

Unfortunately, the details evidently proved so thorny to discuss fully that before preparing Part II of his *Symbolic Logic*, Carroll died.

As for Strawson, who picked up the thread without being aware of Carroll's dropping it, the 'law-statements' of the type in (12) are not of subject-predicate form but essentially conditional in character. As noted, they do not presuppose the existence of the subject term, but neither are they vacuously true if the subject term is empty. Just because the traditional line of (8i) is wrong for these cases, it does not follow that the modern P.C. line of (8ii) is right. In fact, given

the counterfactual nature of such laws, the presence or absence of representatives of the subject class is irrelevant to the truth of the conditional claim.

One guide to the variable character of universals, as observed by Vendler (1967) and others, is the form of the universal. In particular, *any* statements tend to be import-free, as in his examples in (13b-d), contrasted with the importing (13a).

- (13) a. Every one of my friends smokes a pipe.
 b. Anybody who is {my friend/a friend of mine} smokes a pipe.
 c. Anybody trespassing the premisses will be prosecuted.
 d. Any perpetual-motion machine would violate the laws of thermodynamics, which is impossible.

For Vendler (1967: 88), an *any* statement is 'open hypothetical' that provides a 'blank warranty for conditional predictions', including counterfactuals: 'The importance of an *any* proposition does not consist in the actual fulfillment of the conditions mentioned in the antecedent and the consequent, but in the very relation of these conditions'. More generally, 'Each and every are at home in existential contexts, while *any* sits pretty in non-existential ones'; *all* is 'existentially neutral', the context determining whether import is assumed.⁷ Vendler's minimal pairs include those in (14), with modality playing a central role:

- (14) a. {Each/Every/#Any} message you sent was intercepted.
 All the messages you sent were intercepted.
 b. {Any/#Each/#Every} message you might have sent would have been intercepted.
 All (the) messages you might have sent would have been intercepted.

Statements like those in (14b) with *any* and non-referential *all* 'cannot be found true as a result of enumerative induction' but represent lawlike propositions which may survive sporadic counterexemplification' (Vendler 1967: 93-4). *Every raven is black*—understood as predicating that every raven in the (general or restricted) universe is black—is falsified by the discovery of a single white raven, while *Any raven is black*—interpreted as 'Any raven that may be selected...'—allows for the random albino exception. All that is promised is that if you pick a raven, any raven, it will turn up black.

As suggested in this paraphrase, one reason for the non-importing behavior of *any* among its universal comrades is that *any*—we refer here to the 'free choice' operator of (15a), not to its negative polarity counterpart in (15b).

- (15) a. Any ravens are black. (Free-Choice [FC] *any*)
 Can ANY ravens fly?
 b. I didn't see any ravens. (Negative polarity item [NPI] *any*)
 Can any pigs fly?

Some have taken *any* to be an unambiguous universal relentlessly demanding wide scope with respect to its (negative or modal) trigger. These UNIVOCAL WIDE-SCOPE UNIVERSALISTS include Reichenbach (1947: §21), Quine (1960: §29), Horn (1972: Chapter 3), Lasnik (1972), Kroch (1974), LeGrand (1975), and Eisner (1994). Others, convinced by distributional evidence marshaled by Klima (1964) and others, have echoed De Morgan (1862) in treating NPI *any* as an existential, while retaining the universal account of FC *any*. Among the AMBIGUISTS are Horn (1972: Chapter 2), Ladusaw (1979), Linebarger (1980), and

Carlson (1980, 1981). Unfortunately, the diagnostic evidence has tended to point in various directions at the same time, leading one desperate scholar to endorse a two-*any* approach in one chapter of his 1972 UCLA dissertation only to propose a unified universalist theory in the next chapter. As Vendler (1967: 79) has aptly remarked, 'The meaning of *any* is a many-splendored thing.'

What is crucial for our purposes is a set of patterns that serve to distinguish *any* from true universals. First, while FC *any* (like NPI *any*) co-occurs with end-of-scale adverbials *whatsoever* and *at all*, universals do not:

- (17) a. I didn't see {anybody/*everybody/*somebody} whatsoever.
 b. {Anybody/*Everybody/*Somebody} whatsoever can come to the party.
 c. {No/*Few/*Many/*All} contestants at all will qualify for a prize.
 d. If {anybody [NPI or FC!]/*everybody/*somebody} at all can do it, I can.

Second, FC *any* does not float off object or subject NPs, while universals do:

- (18) a. I can see them {all/each/both/*some/*any/*either}.
 b. They {all/each/both/*some/*any/*either} can see me.
 c. They can {all/each/both/*some/*any/*either} see me.

Third, *any* occurs in free-choice imperatives without universal force:

- (19) a. Pick any card.
 b. Promise her anything, but give her Arpège.

Notice that (19a) is not a command to pick every card. Nor does the 1960's commercial recalled in (19b) urge the consumer to promise to buy every item sold (while following through only with the sponsor's); the sense is rather that it doesn't matter what, if anything, you promise her, as long as you get her our perfume.

Related to this observation is the distribution of *not just any* as an anti-indiscriminative free-choice indefinite. In typical contexts like those in (20), card-carrying universals are barred from entry (*#Just everyone can't come*).

- (20) a. Not just ANYone can come.
 b. Just ANYone can't come.

It is also worth noting that while the free-choice manifesto in (21a) is clearly distinct from the corresponding NPI construction in (21b) representing the credo of the New Celibacy,

- (21) a. I don't want to go to bed with just anyone anymore. I have to be attracted to them sexually. (Marta, in the 1994 film Barcelona)
 b. I don't want to go to bed with anyone anymore.

it is also distinct from a true universal: promiscuity is not panphilia. Thus, we have the three-way contrast in (22):

- (22) a. I wouldn't marry anyone. [renounces MATRIMONY]
 b. I wouldn't marry everyone. [renounces POLYGAMY]
 c. I wouldn't marry (just) ANYone. [renounces INDISCRIMINACY]

Based on such considerations, I have carried the banner in recent work (Horn 1997) for the tribe of (QUASI-)UNIVOCAL EXISTENTIALISTS—the label is a trifle inaccurate, but catchier than the apter ‘indefinitists.’ For this creed, *any* is an indefinite determiner with no intrinsic quantificational force whose use is bound up in some way with the hearer’s free choice among a set of alternatives. Glossing over some substantive differences among approaches, we can compile the following annotated inventory list:

- (23) Hamilton (1858) (*any* is a QUODLIBETIC operator that “means, primarily and literally (even) one, even the least or fewest”)
 Jespersen (1933) (*any* is a “pronoun of indifference” indicating ‘one or more, no matter which’)
 Vendler (1967) (*any* as signal of non-presuppositional context, indicating CHOICE or “a BLANK WARRANTY FOR CONDITIONAL PREDICTIONS”)
 Davison (1980) (*any* is a univocal existential that may convey a generic meaning through conversational implicature)
 Sommers (1982) (“*any* is not a word of quantity in its own right but a distribution indicator that goes proxy for either ‘some’ or ‘every’”)
 Haspelmath (1993) (*any* patterns with cross-linguistic free-choice indefinites)
 Kadmon & Landman (1993) (*any* is a Kamp-Heim indefinite lacking quantificational force that triggers widening/strengthening)
 Jennings (1994) (*any* is essentially non-quantificational and non-specific; see below)
 Lee & Horn (1994), Horn & Lee (1995) (NPI *any* and FC *any* are ordinary and generic indefinites, respectively, that incorporate a scalar endpoint, i.e. *any* = *a* + *even*)
 Zwarts (1995) (*any* as non-veridical operator: PS *any* occurs in those non-veridical contexts that are downward entailing [cf. Ladusaw 1979], FC *any* in those that are upward entailing or non-monotonic)
 Israel (1996) (*any* + CN expressions are associated with a scalar model and interpreted with respect to a set of alternative values; the widening that Kadmon & Landman attribute to *any* is ‘a pragmatic byproduct of its scalar semantics’)
 Horn (1997) (Similar to Horn & Lee 1994 but with special emphasis on the indiscriminative character of FC *any* and the anti-indiscriminative character of *not just any*)

The counterpart of anti-indiscriminative *not just any* is what I have dubbed the DILATED PARTICULAR construction, in which an indefinite (*a(n)* or *some* + CN) is self-corrected to a free-choice *any* in a context in which an undilated particular or indefinite might appear too specific and an bare *any* would be unacceptable. Jennings (1994: 189-94) refers to this as SUPPLEMENTARY *any*, providing the attested and constructed examples in (25); some additional citations are given in (26) (for more, see Horn 1997).

- (25) a. I think she went to Lake Chapala deliberately to find a man. Any man.
 b. I am standing here only until a policeman, *any* policeman, turns up.
 c. I am looking for a bicycle, *any* bicycle, that works.
 d. She hoped that someone, anyone—man or woman—would see her...
- (26) Caudell hoped someone, anyone would speak up and greet her by her her right name.
 (Harry Turtledove (1992), *Guns of the South*.)

The graffiti was intense, and brilliant; an angry, aggressive plaint of garish color on almost every surface. Somebody see me! Anybody!
 (Robert B. Parker (1995), *Thin Air*)

Since early summer...Bob Dole has been trying to do something, anything, to alter the shape of a Presidential campaign whose basic configuration has not changed since the end of the primary elections.

(“No Easy Explanations for Dole’s Perot Gambit”, New York Times, 25 Aug. 1996)

Today’s tirade was about [New York Giants’ coach] Reeves trying to blame someone, anyone, for the poor performance of Maddox in New York and explain the questionable decision to bring him here.

(“After Maddox Is Cut, Reeves Goes on the Defensive”, NYT, 20 Aug. 1996)

With fortunes at a low ebb, the team desperately seeks some spark, any spark, in slalom and giant slalom.

(“Marolt’s Return Boosts U. S. Skiers”, Denver Post, 17 Nov. 1996)

Parents—your kids are armed and dangerous. And they want someone, anyone, to do something about it.

(“Gun” sights in on kids, weapons”, *Orange County Register*, 9 Dec. 1993)

According to the [Camden, N.J.] police, one dominant street gang that has controlled much of the city’s cocaine and heroin trade made it a requirement for new members to murder someone...anyone—as part of of its initiation.

(“Urban Paralysis—a special report”, NYT 19 May 1996)

Jennings (1994: 191-92) provides the following description of the dilated particular:

What this use illustrates...is a general feature of ‘any’, not brought out in Vendler’s account, that to use it is to warrant an expectation that a certain sort of challenge will receive the reply ‘even that one’. Consider whatever scale you please (some scale may have been situationally suggested) on which to place policemen: slovenliness, fastidiousness, brutality, ineffectualness, dishonesty, scrupulousness. Consider the policeman that you would place at the extreme of the chosen scale. That one will do... A bicycle howsoever rickety? What about this penny farthing that I’m taking to the museum? That will do...The universality of ‘any’...does not always entail representation as a universal quantifier and is derivative in character, deriving by monotonicity along all chosen scales. If even the oldest (least comfortable, most perilous, etc.) bicycle will do, then a bicycle in less extreme position (newer, more comfortable, safer) will also do.

Indeed, the entry for *any* (I.1.c) in the on-line OED assumes an analysis in which universality is a derived effect rather than a stipulated semantic property:

In affirmative sentences [*any*] asserts concerning a being or thing of the sort named, without limitation as to which, and thus constructively of *every* one of them, since every one may in turn be taken as a representative: thus ‘any chemist will tell you’...

We conclude that FC *any* is not a universal operator—nor, indeed, an existential—but a non-specific indiscriminative scalar indefinite. The fact that *any* statements lack import thus should not lead us to expect that universals do as well.

Returning now to true universals and the question of THEIR existential import, the tradition of Strawson and Vendler is carried on (or independently rediscovered) by Julius Moravcsik (1991: 427-28), who invites us to ponder the ploy of the wily door-to-door salesman who attempts to inveigle a suburban housewife into buying a certain toy—let's say a hand-held missile launcher—for her son. The salesman's clincher is the line

(27) But all other children in this neighborhood have this toy.

Given the fact that her son is the only kid around, the standard logical (P.C.) housewife is constrained to concede that the salesman's claim is (vacuously) true. The Strawsonian housewife fares little better, finding (27) neither true nor false ("Sir, the question of the truth-value of your assertion does not arise, since the subject expression fails to denote.") Our sympathies lie with "the good Aristotelian housewife," who throws the salesman's arrant falsehood back in his face, since the entailment of subject-term is not satisfied ("You are a liar. There are no other children in this neighborhood.")

The faithful reader of Strawson (1952) and Vendler (1967) will not be surprised to encounter Moravcsik's finding that the Aristotelian housewife's response generalizes successfully to the examples in (28) but does not extend to such "lawlike statements" as those in (29).⁸

- (28) a. All coins in my pocket are made of copper.
b. All beavers live in Europe and North America.
(29) a. All brothers are siblings.
b. All trespassers will be prosecuted.
c. All students with an I.Q. over *n* qualify for membership in Mensa.

The rules, laws, or principles motivating such import-free universals may be scientific or human, including laws of nature or of mathematics, definitions, judicial edicts, or official regulations. But the universals of (28), (29), (30) have same logical form, so existential import is part of pragmatics (Moravcsik 1991: 441). The proposed analysis (ibid.: 433) is an independent recasting of the Strawsonian-Vendlerian formulation:

Universally quantified generalizations expressing something lawlike obey the interpretation of modern symbolic logic, while those expressing something non-lawlike obey the Aristotelian interpretation. The interpretation of the lawlike ones is: 'if anything is A, then it is also B.'

There are other formal and semantic parameters that correlate with this central [\pm LAWLIKE] feature, but Moravcsik argues they are not reliable diagnostics. Thus, the role of predicate is significant, but can be overridden. Given what we assume about the nature of migration as it affects natural kinds, we take (30a) to report a lawlike (and hence import-free) universal; deleting the quantifier yields a generic bare plural whose interpretation will be roughly the same.

- (30) a. All snow-geese migrate to Labrador.
b. In the winter, all gangsters from New Jersey migrate to Florida.

But the same predicate in (30b) will ordinarily be understood as signaling a non-lawlike empirical claim (given the non-naturalness of the 'gangster' kind), and here the universal operator is not deletable (Moravcsik 1991: 435-56).

The presence of a definite article—*all (of) the* + CN—often signals non-lawlike and hence Aristotelian universals; in fact the sales pitch in (27) strikes many as marginal without it (vs. '*all the other children...*'). But this factor cannot be decisive either, Moravcsik maintains, in the light of deictic sentences like (31a) and (31b), each of which is non-lawlike and importing in the absence of a definite article, while (31c) is lawlike and import-free despite its presence.⁹

- (31) a. All (of the) students here are hardworking.
b. All creatures in this room are marsupials.
c. All of the students over 6'6" automatically make the team.

Following Strawson, Vendler, and Moravcsik, we can construct a conspectus of universal statements illustrating the dichotomy discussed above:

(32) Conspectus: two varieties of universal statements

EMPIRICAL UNIVERSALS [+ existential import]	LAWLIKE UNIVERSALS [− existential import]
Aristotelian/Strawsonian: entail or presuppose existence of subject set; <i>All F are G</i> is about the Fs	P.C.: neutral with respect to existence of subject set; <i>Any F are G</i> is about the F-G connection
<i>every, each, all (of the)</i>	<i>all (?of the), any</i> (if universal at all)
subject-predicate in nature (and in logical form?)	conditional in nature, typically with counterfactual force
determiner mandatory (#(<i>All</i>) <i>seats are taken</i>)	determiner usually optional ((<i>All</i>) <i>ravens are black</i>)
no exceptions tolerated	admit exceptions, <i>ceteris paribus</i>
range over present entities	range over present/past/future entities
range over actual entities	range over possible as well as actual entities

There is a natural connection between the lawlike property of a given statement and its lack of existential import: if it cannot be presupposed that there are any Fs, the only way to rule out the existence of Fs that are non-Gs (and thus to confirm the truth of $\forall x(Fx \rightarrow Gx)$) is to assume the existence of a causal connection between F-ness and G-ness.

Another approach to the dichotomy outlined in (32) involves a focus on the role of aboutness in (a): ordinary empirical universals involve a predication on a (quantified) subject, while lawlike universals are not subject-predicate in nature. This distinction has been posited for singular (non-quantified) statements in a variety of frameworks, but most explicitly under the rubric of CATEGORICAL vs. THETIC judgments in work initiating with Brentano ([1874/1911] 1973) and his student Marty, a tradition later revived by Kuroda (1972) and Sasse (1987, 1996);

of (37a, a'), the stressable *some* of (37b, b') blocks *there* and allows individual-level predicates in the sense of Carlson (1977):

- (37) a. Some ('sm') salesmen walked in. [WEAK, CARDINAL]
 a'. Sm cats are available.
 (There are some CATS available.)
 b. {Some/SOME} salesmen walked in. [STRONG, PARTITIVE]
 b'. Some (*sm) cats are intelligent.
 (*There are some cats intelligent.)

As de Jong & Verkuyl (1985) point out (cf. also de Jong 1987), it would seem that properness (or presuppositionality) entails strength, but not vice versa. Thus, all proper NPs (*the CN*, *most CN*, *some of the CN* [corresponding to Dutch *sommige*], *none of the CN*), which get partial interpretations within a Barwise-Cooper-type semantics, are strong. Weak NPs (*no CN*, *a CN*, *some CN* [Dutch *enkele*], *many CN*, *few CN*) are always improper and get full interpretations. But while some strong NPs (*all CN*, *not all CN*) are improper and get full interpretations, de Jong & Verkuyl view the standard interpretation of these universals as improper to be incorrectly based on their 'marked' use for making conditional claims (*All ravens are black*) representing 'law-like' generalizations, rather than on their standard use for making contingent claims (*All seats are taken*) based on observations. Thus, they conclude, universals are in fact always proper, permitting us to reduce strength to properness.

This reduction, however, is only possible if we ignore the right side of the table in (32). To say that the STANDARD use of universals is to make contingent (empirical, non-lawlike) claims is not to say that this is their ONLY use. This point is recognized by Lappin & Reinhart (1988) and Reinhart (1995), who argue that the properness (or presuppositionality) of ordinary *all*-statements should not, pace de Jong & Verkuyl 1985 and de Jong 1987, be accommodated by building existential entailments or presuppositions into the semantic interpretation of strong NPs but rather by altering the assessment procedures of the statements in which they occur. Whenever the assessment of a sentence must begin with a scan of the N' set of a given NP—essentially, for just those statements that are not analytically true or false—the assessment breaks down if the set is empty. The sentence is then marked as anomalous, empirically irrelevant or undefined.

But this approach has flaws of its own. While Lappin & Reinhart (1988) correctly predict the anomaly of (38a) and the truth of (38b), as they point out, there is no obvious way to block the activation of an N' scan for the non-analytic but lawlike statements of (39), which will hence be incorrectly predicted to be as unassessable as (38a) in the contingent absence of trespassers and ravens.

- (38) a. All American kings were born in Philadelphia.
 b. All American kings are American kings.
 (39) a. All trespassers will be prosecuted.
 b. All ravens are black.

At least for the universals, presuppositionality (properness) is a sometime thing. When we move to the particulars, the natural step here is to superimpose the categorical/thetic distinction onto the strong and weak construals of *some* + CN and analogous NPs. This move is directly prefigured in the tradition of Milsark

himself, who has written recently (Milsark 1990: 853, citing Lumsden 1988 and Milsark 1974):

Strong NP subjects generally enforce an interpretation in which their VPs are taken to be 'predications' in [that] the VP is somehow *about* the subject. Weak NPs, on the other hand, enforce an interpretation in which the proposition is a neutral description of an event in which the entity denoted by the subject has no special topic-like status.

Extrapolating from Milsark (1974), Milwark (1977), Keenan (1987), de Hoop (1991, 1995, 1996), Partee (1995), McNally (1996), and Musan (1996), we can construct the following table:

(40) Strong particular NPs	Weak particular NPs
* or # with existential <i>there</i>	OK with existential <i>there</i>
stage-level or individual-level predicates	stage-level predicates only
partitive or proportional	cardinal
non-symmetric/non-intersective	symmetric/intersective
presuppositional	non-presuppositional
quantificational (tripartite) structures	indefinites bound by existential closure

Some of these correlations are less perfect than others. Thus, it is not quite precise to claim that all partitives are strong; there are some of us who would disagree with that proposition. The position that presuppositional particulars are non-symmetric or non-intersective is essentially identical to Land's observation (1876: 290) that taken as a categorical *Some mortals are children of Jupiter* is distinct from *Some children of Jupiter are mortals*, and both are distinct from the (thetic) proposition *There are some entities that are mortal and children of Jupiter*, despite the persistent classical and modern tradition of regarding I propositions as simply convertible.

The key is in the difference between what is said (or entailed) and what is presupposed. The presuppositional distinction between the categorical propositions *Some F are G* and *Some G are F* will not have truth-conditional consequences, but the former is about the Fs and the latter about the Gs¹⁰; the corresponding distinction between categoricals based on *most* or *all* NPs will differ truth-conditionally. Thus, as McCawley (1993: 177-78) observes, the claim that some Buddhists are vegetarians is not identical to the claim that some vegetarians are Buddhists, although one is true if and only if the other is true. (The contrast is more salient when we move to the partitive version—*Some of Bill's friends are implicated* vs. *Some of the implicated are Bill's friends*—and, as we might expect, it tends to disappear when we replace the individual-level with a stage-level predicate: *Sm seniors are linguistics majors* = *Sm linguistics majors are seniors*.) But from the truth of *Most politicians are crooks*, that of *Most crooks are politicians* does not follow.¹¹

Another subtle contrast between strong (categorical) and weak (thetic) particular NPs relates to the propensity of the former to license inferences concerning the complement of the designated subset. To say that some cats are

intelligent is to suggest that not all of them are, but to say that some (sm) cats are available doesn't seem to say anything about any others. Similarly, as against the simple existential assertion of the weakly construed *Sm salesmen walked in*,

[*Some salesmen walked in*] carries a strong suggestion that some other group, by contrast, remained outside or is in some other way excluded from the situation described. The meaning of *some* in such cases might be paraphrased "some (but not others)." In this reading the sentence is very nearly synonymous with [*Some of the salesmen walked in*]. (Milwark 1977: 18)

Milwark's 'strong suggestion' is promoted by de Hoop (1991: 279) to entailment status. 'For the strong reading of *some* in [*Some cats are in the garden*],' she writes, 'we get a partitive reading *some of the cats*, which also SAYS something about the cats that are not in the garden' (emphasis added). For the two *some*'s of Milsark (and Postal) she provides these formal translations:

- (41) a. $\text{||some||}_{\text{exis}}(N) = \{X \subseteq E : |N \cap X| \geq 2\}$
 b. $\text{||some||}_{\text{part}}(N) = \{X \subseteq E : |N \cap X| \geq 2 \ \& \ |N - X| \neq \emptyset\}$

But it is clear from the cancellation contexts of (42) that de Hoop's analysis is untenable, and that the contrast between (41a,b) must be recast as a claim about defeasible conversational implicature and not about entailment (see also Abbott 1993, Ladusaw 1994).

- (42) SOME (of the) cats are in the garden,
 {and the OTHERS may be there too.
 {and for all I know ALL of them are.
 —in fact, they (probably) ALL are. }

With this emendation, the contrast noted by Milwark and de Hoop is real and must be accounted for. Why is it that the strong/categorical (43a) implicates (43b), while the weak/thetic (44a) fails to implicate (44b)?

- (43) a. Some cats are intelligent.
 b. [For all I know] some cats aren't intelligent. (= not all cats are intelligent)
 (44) a. Sm nice cats exist.
 b. [For all I know] some nice cats don't exist. (= not all nice cats exist)

The relevant process is the licensing of an upper-bounding scalar implicature via the exploitation of Grice's first quantity maxim, my Q Principle (Horn 1984, 1989), or—to return to our guru—the analogous regularity that Strawson (inspired, to be sure, by a conversation with his colleague 'Mr. H. P. Grice') depicts as '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).

That last parenthetical is far from a mere throw-away. The utterance of ...W..., containing an unembedded occurrence of a weak or low 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 (see Horn 1984, 1989). Thus each of the following ordered n-tuples of items constitutes a Q-relevant scale such that the affirmation of any low or intermediate value will implicate, ceteris paribus, that (for all the speaker knows) the stronger value(s) on its left could not have been substituted *salva veritate*.

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

Turning to the quantificational determiners, we find that <all, most, many, some> taken CATEGORICALLY (with the existential import presupposition satisfied) form a Q-relevant scale, yielding in particular the result that the affirmation of ...some_K... will indeed implicate that the speaker is not in a position to affirm ...all_K... (where the subscript denotes the categorical interpretation, as in (42) or (43)). But the P.C. variable-binding operators \forall and \exists do not form a scale, in that no unilateral entailment obtains between ...all _{θ} ... and ...some _{θ} ... (where the subscript denotes the thetic construal, as in (44)).¹² That is,

- (46) K: Given that there are Fs,
 a. All of them are Gs
 b. Some of them are Gs
 (47) θ : (Whether or not there are Fs),
 a. There are no Fs that aren't Gs (If something is an F, it's a G)
 b. There exist Fs that are Gs

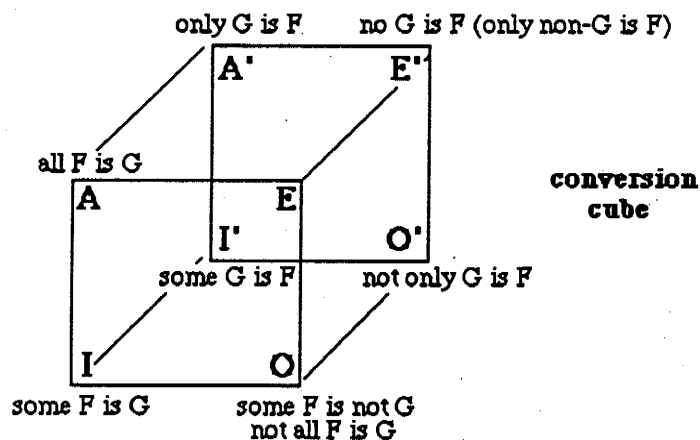
Further, even when a thetically construed *Sm F G* affirmation is made in a context permitting the assumption that Fs exist—*Sm salesmen walked in*—the non-topicality of the F set and the incommensurate nature of the *sm* (*some_{\theta}*) statement as a simple assertion that $F \cap G \neq \emptyset$ vs. the *all_{\theta}* statement as a lawlike assertion about the inevitable G-ness of whatever is F will serve to remove the grounds for deriving an inference of ~*all_{\theta}*... from a claim about *some_{\theta}*...

The standard modern understanding of the traditional statement forms is reflected in Quine's assumption that there are a variety of equivalent and interchangeable translations or 'phrasings' of the four forms. His phrasings (Quine 1982: 95) are given in the unparenthesized glosses below to which I have added the parenthesized counterparts to fill out the chart in the same Quinean spirit.

- | | |
|--|---|
| <p>(48) A: All F is/are G
 (There are no Fs that aren't Gs)
 If anything is an F it is a G
 Every/Any F is a G
 Only G are F</p> | <p>E: No F is/are G
 Nothing is both an F and a G
 (If anything is an F it's not a G)
 There are no FG
 FG do not exist</p> |
| <p>I: Some F is/are G
 Something is both an F and a G
 There (is an FG/are FG)
 FG exist
 (Not only G are F)</p> | <p>O: Some F is/are not G
 (Something is both F and non-G)
 (There are F that aren't G)</p> |

It has been the purpose of this study to demonstrate that all phrasings are not equal, and that the form and the content of a given predication are both relevant for the determination of what is said and of what is presupposed in saying it.

The inclusion of the highlighted formula among the renderings of the A statement form may appear in need of at least brief elucidation, which is all it can receive here. We have seen that traditionalists (following (8i)) and modernists (following (8ii)) have concurred in taking I and E propositions to be simply convertible (at least if the presuppositional asymmetry is ignored), while neither A nor O propositions permit conversion. But in fact, as recognized by the medievals from Peter of Spain (Mullally 1945: 106-7) to John of Holland (Bos 1985: 27) and especially Walter Burley ("De exclusivis," §11 in Pinborg 1981 and De Rijk 1985), *All snorers are men* does in fact convert—not to *All men are snorers*, but to *Only men are snorers*. In fact, the evidence from conversion allow us to three-dimensionalize the square into a cube of opposition:¹³



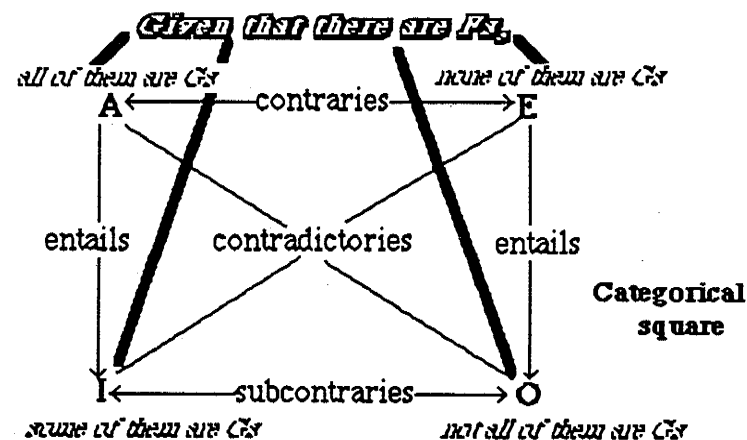
As detailed in Horn (1996), we can exploit the conversion of *all* and *only* statements to show that the apparent positive presupposition (Horn 1969) or entailment (Atlas 1991, 1993) of an *only* statement is just the existential import of the converse universal categorical. If no mortal can make a tree, and the set of tree-makers is non-null, then the truth of the positive component of the *only* sentence follows automatically. No addendum to the lexical semantics of *only* need be stipulated to derive (49b) from (49a), given the independently motivated treatment of existential import within the corresponding universal.

- (49) a. Only God can make a tree.
 b. God can make a tree.
 c. No one other than God can make a tree.
 d. {x|x can make a tree} $\neq \emptyset$

And we further predict that (50a) is precisely as anomalous, and for precisely the same reason, as (50b):

- (50) a. #Only Democrats believe Bill, and (perhaps) (even) they don't.
 b. #All John's children are bald, but (perhaps) he has no children.

What remains is to try to pin down the small matter of existential import. We have followed Peter Strawson (and J. P. N. Land) in taking import to constitute a presupposition for some—namely, categorical—instances of any of the four statement types, or indeed of any quantified statement as such, as opposed tothetic indefinites and lawlike conditionals. As we have seen, it is just for such categorically understood statements that the square of opposition can be reconstructed:



But contra Strawson, the relevant notion here is a pragmatic and not a semantic inference. While we have agreed with Julius Moravcsik in taking the presence of absence of existential import as a pragmatic matter, it does not follow for us, as it does for him, that we must therefore abandon logical form. Rather, what we have here is a prime candidate for the relevance-theoretic doctrine of EXPLICATURE in the sense of a pragmatically determined component of propositional content (Sperber & Wilson 1986, Carston 1988). Unfortunately, the details of how this proposal might be implemented will have to await another occasion.

I know that all my incontrovertible arguments for biting the neo-Strawsonian bullet on existential import have been entirely convincing—and I hope that this proposition is not just vacuously true.

Notes

Earlier versions of some of this material were presented at a workshop on predication at the University of California, Santa Cruz (November 1994) and as a colloquium sponsored by the University of Pennsylvania Institute for Research in Cognitive Science (March 1996). I am indebted to my hosts and interlocutors at Santa Cruz, Penn, and the CLS for helpful comments and suggestions.

¹It is traditional to use copular expressions to exemplify the four statement types, but nothing hinges on this practice; (1c) is just as much an A statement as are (1a,b) or the abstract glosses for the square in (2). I shall also follow tradition in using F and G as indiscriminately singular, plural, or mass terms.

²An early representative of the quantitative position is Venn (1881: 127-28). Keynes (1884: 117-21) juxtaposes Venn's line with the informal intuition that 'EVERY proposition implies the existence of its subject' and the contrary stance on which 'NO proposition LOGICALLY implies the existence of its subject' [emphases added] before opting for agnosticism.

³It was presumably for this reason that Abelard (11th c.) insisted on the 'not every' rather than the 'some...not' version of the O proposition; it is at least plausible that we might take *Non omnis homo est albus* ('Not every person is white') to be true in the absence of people, while it much harder to make the same case for *Quidam homo non est albus* 'Some person is not white' (de Rijk 1956: 177-78).

⁴For Aristotle, A statements are 'partially convertible' in that from *All pleasure is good* it follows that *Some good [thing] is a pleasure*. Of course, this rests on the existential import built into (8i); cf. Kneale & Kneale 1962: 58. As we shall see below, universals are indeed convertible, but not to universals; rather, they convert to exclusives (statements with *only*).

⁵This classical parallelism persisted as far as Leibniz, who assimilated singular predications to universal statements and endorsed existential import for both (Kneale & Kneale 1962: 323-24).

⁶It would be grotesque to maintain that anyone saying "all the books in his room are by English authors" had made a true statement if the room referred to were empty of books' (Strawson 1952: 148).

⁷An alternative seating arrangement for the natural language representatives of A statements and of the \forall operator is independently proposed by Kirwan (1978: 214-15):

The truth of 'Any *f* is a *g*' does not require that there be an *f*, whereas the truth of 'All the *fs* are *gs*' does require that there be an *f*. [Parenthetical with examples from Strawson 1952 omitted—LH]...Though 'any' and 'all the' clearly diverge in truth-conditions, 'every', 'each', and 'all' sit rather uneasily between them, and often it is unclear whether or not they have existential import.

⁸Curiously, Moravcsik seems not be among these faithful readers. He does not refer to Vendler and cites Strawson only for the truth-value gap approach to existential import (our (10)), neglecting to mention that the relevant chapter on "Subjects, Predicates, and Existence" (Strawson 1952: 152-94) is devoted to the very contrast under Moravcsik's own microscope. Moravcsik (1991: 433, n. 3) does credit Strawson for acknowledging the import-free behavior of lawlike statements, but only "in conversations in the early 1980's" after Moravcsik himself had formulated the intuition a decade before. (Examples (27)-(31) in the text all come from Moravcsik (1991).)

⁹See, however, Hofmann (1992) for more on *all CN* vs. *all the CN*. For Hofmann, the presence or absence of the article is indeed essential; he reads *All the Fs are Gs* as asserting 'I am saying of the *Fs* that all of them are *Gs*'.

¹⁰Crucially, the fact that *Some F are G* can only be TRUE if there are *Fs* is irrelevant to whether the utterance of *Some F are G* PRESUPPOSES that there are *Fs*. Just as an affirmative singular categorical like *The king of France is bald* entails AND presupposes that there is a king of France, and just as an affirmative cleft like *It was the knave of hearts that stole the tarts* entails AND presupposes that someone stole the tarts, so too will *Some salesmen walked in entail* and (on the categorical or strong interpretation) presuppose that salesmen exist.

¹¹McCawley (ibid.) takes these facts to argue for a treatment of import-carrying quantifiers—those 'that carry a pragmatic presupposition that the domain over which the variable ranges is non-empty'—as involving restricted quantification; his characterization. He further argues that the relation in question must be one of pragmatic presupposition and not merely conversational implicature, given its immunity from cancellation.

¹²The same facts hold on the negative side: the scale $\langle no(ne), few (of the), not all \rangle$ will be defined when these operators are taken categorically or quantificationally; thus e.g. *Not all snorers are men* will implicate that for all the speaker knows some snorers are in fact men.

¹³The traditional square is asymmetrical with respect to lexical reification, in that the O vertex tends not to receive direct lexicalization (Horn 1972: Chapter 4; Horn 1989: §4.5). That is, many languages share the facts of English in which the A, I, and E vertices host lexical determiners (*every, some, no*), binary connectives (*both...and, either...or, neither...nor*), frequency adverbs (*always, sometimes, never*), and so on, while the O vertex is represented by lexically complex expressions with free negation. Thus, there is no determiner **nall* ('not all', 'some not'), no connective **noth* ('not both') or **nand* ('or not'), no adverb **nalways* ('not always'). I have proposed a Gricean explanation for these gaps: if the assertion of the I operator licenses the Q-

inference that the corresponding O value (the contradictory of A) holds, no dedicated lexical realization of O is necessary. Against this background, we can observe from the conversion cube that the lack of a lexicalized form **nonly* corresponding to 'not only' (the conversion partner of *not all, some not*) will receive a parallel explanation.

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