0. Introduction

In Higginbotham (1986), I considered two examples of possible non-compositionality in English. One, namely the thesis that complement clauses denote only relatively to what they are embedded in, had been suggested also by others in various forms, and has been debated since. The other, which is the substance of this article, concerned indicative conditionals, as in minimal pairs such as (1)–(2):

(1) Everyone will succeed if he works hard.
(2) No one will succeed if he goofs off.

I observed that the word ‘if’, while interpretable as a conditional connective in (1), could not be so interpreted in (2); for, (2) would then mean that there is no one whose goofing off is, or would be, a sufficient condition for his success, whereas what it actually means is that there is no one whose goofing off is, or would be, compatible with his success. From further data, discussed below, I concluded that the interpretation of ‘if’ was sensitive to the semantic nature of the quantifier within whose scope it fell. But that conclusion conflicts with compositionality, at least as narrowly construed.

The conflict with compositionality, or with what I called the “indifference principle” in my (1986), comes about inasmuch as the interpretation of the subordinate phrase ‘if p’ in (1) and (2) depends upon information not locally available, specifically information about the nature of the quantificational subject. There are different, more or less wide, definitions of compositionality, and such dependency will conflict with some but not all of them (for a survey, see the ms. Higginbotham (2003) and references cited there). In any case, if my original thesis is correct, then the subordinate ‘if’ must “look upstairs” for its interpretation, a possibility that opens the door to an extensive variety of combinatorial systems, which we expect in general not to be exemplified in human language.
My thesis has a counter-thesis, which has acquired something of folkloric status. The counter-thesis is that in both (1) and (2) the conditional is meaningless: the clause that it marks constitutes merely the restriction on the quantifier, as might be made explicit in the paraphrases (1′)–(2′):

(1′) Everyone who works hard will succeed.
(2′) No one who goofs off will succeed.

I will argue that this *riposte* fails in general (even if it appears to succeed for these cases), and that the counterexample still stands. But there will be a further moral to the story. Compositionality can be restored under certain assumptions about the meaning, or the presuppositions, of conditionals. However, I am not aware at present of any way of grounding these presuppositions that is not stipulative.

1. Basic Data

The relevant syntax of indicative conditionals will be taken for granted in what follows. I assume that ‘if’, like ‘unless’, ‘because’, and other subordinating conjunctions, is prepositional in character, taking finite clauses as complements, and that these clauses attach to the right of Verb Phrases. So the relevant structure for (3), for instance, is as in (4):

(3) John will succeed if he works hard.
(4) [[John] [[will succeed] [if[he works hard]]]]

The syntactic structure shown in (4) puts the subordinate clause within the scope of the subject, in this case ‘John’; and indeed subject quantifiers can as expected freely bind pronominals in the subordinate clause. Our concentration here will be entirely on ‘if’ and ‘unless’. (There are, of course, other ways of expressing conditional notions; I am assuming here that we can ignore these without loss of generality.)

On the above assumptions, information about the subject is not locally available to the subordinate element ‘if \( p \)’ at the point where it is interpreted; for the subject lies outside the minimal configuration, consisting of the verb and ‘if \( p \)’, containing it. But then we have the problem posed by (1) versus (2).

The outlines of this problem were, so far as I know, first adumbrated in a few swift remarks in Lewis (1975: 14–15). Lewis did not, at least as I read his work, intend his suggestion, that the subordinate clauses were to be understood as restrictions on the scope of quantifiers, to be universally applicable; that is, applicable to absolutely all conditionals. Rather, it was to apply to cases of what he called “unselective binding,” illustrated for instance by Frege’s example (5):

(5) If a number is less than 1 and greater than 0, then its square is less than 1 and greater than 0.

and by others in Lewis’s important article.
In Higginbotham (1986), I observed that the generalization, that ‘if’ and ‘unless’ are interpreted differently depending upon the nature of the higher quantifier, extended to a contrast between all monotone increasing quantifiers such as ‘every’, on the one hand, and all monotone decreasing quantifiers such as ‘no’, on the other. I was there short on examples, however, which I now supply. Suppose that we are speaking of the 30 students now enrolled in Philosophy 300 at USC, and consider (6):

(6) Most (of these) students will get A’s if they work hard.

where the pronoun ‘they’ is construed as bound to the subject quantifier. Evidently, (6) must be sharply distinguished from (7), the result of absorbing the conditional clause into the restriction:

(7) Most (of these) students who work hard will get A’s.

For: (6) is true iff in counting up the students $x$ of whom it is true to say that $x$ will get an A if $x$ works hard, the total amounts to most of them; whereas (7) is true or false depending upon whether, of those students who in fact work hard, most get A’s. So (6) and (7) are logically independent. That is enough to show that the absorption method suggested by Lewis for his cases will not work in general; and as we will see below, it fails also even for the universal and negative existential quantifiers.

Consider now (8):

(8) Few (of these) students will get A’s if they work hard.

again with the pronoun construed as bound to the subject. This example certainly does not mean that few students are things $x$ such that $x$ will get an A if $x$ works hard. We will return to the question what exactly it does signify, but for immediate purposes it is sufficient to note that it is not equivalent to the straightforward (9):

(9) Few (of these) students who work hard will get A’s.

and, even if it were, the problem for compositionality would remain: for the question how, if at all, the subordinating conjunction ‘if’ is to be interpreted could not be locally determined.

As remarked above, and noted in my earlier work, the issue of how to interpret the subordinating connective arises for ‘unless’ as well as for ‘if’. Thus we may contrast (10) and (11):

(10) Every student will get an A unless he goofs off.
No student will get an A unless he works hard.

(10) has it that for every student \( x \), \( x \) will get an A provided that \( x \) doesn’t goof off; but (11) cannot be taken as meaning that for no student \( x \), \( x \) will get an A provided that \( x \) doesn’t work hard.

Now, one is taught in Logic 101 to “translate” ‘unless’ by disjunction ‘\( \vee \)’; and this is OK, but only as it were by accident. The reason it is OK is that, whereas ‘\( p \) unless \( q \)’ pretty clearly amounts to ‘\( p \) if not \( q \)’, the truth-functional schemata ‘\( \neg q \rightarrow p \)’ and ‘\( q \vee p \)’ are equivalent. English ‘\( p \) if not \( q \)’ is not equivalent to English ‘\( p \) or \( q \)’, however, so the translation in question should be abandoned in the setting of a semantic investigation. Even so, if we take ‘unless’-clauses as decomposed or else taken up in some semantic fashion (depending upon how one treats the conditional) as what we might call ‘if + not’-clauses, then the problem posed by (10)–(11) immediately reduces to the previous case, (10) being equivalent to (12), and (11) to (13):

(12) Every student will get an A if he doesn’t goof off.
(13) No student will get an A if he doesn’t work hard.

a pair that poses the same problem as (1)–(2) above.

Before proceeding, I note two peculiarities, or perhaps potential distractions, in the data.

First, there is an interpretation of (8) in which ‘they’ refers to the students in the class (it is not bound to the subject, but simply picks up for its reference the objects satisfying the restriction on the quantifier). On this interpretation, (8) means that few students will get A’s if they (all, or as a group) work hard. The conditional clause then has its usual interpretation, even though the subject quantifier is monotone decreasing. However, this result is in fact expected, because on the interpretation in question, although there is a kind of dependency between the plural pronoun and the quantificational subject, the pronoun is not bound. Hence it is as if the main clause and the subordinate clause were both of them closed sentences. Compositionality is then not an issue, and such cases should be put aside.

Second, a certain care is wanted with paraphrases, because the variability in the interpretation of the antecedent ‘if’- or ‘unless’- clause occurs just when a quantifier in the main clause binds an element within it. When the main clause is quantifier-free, no effect is observed, even if an element occurring both in that clause and the subordinate clause is bound to a higher quantifier. A common, if informal, mode of logical and philosophical paraphrase therefore fails in these cases. For example, we are used to passing routinely between

\[
\text{No } F \text{ is a } G
\]

and
No $F$ has the property that: it is a $G$

or

No $F$ is such that: it is a $G$

but, in the cases under discussion, these paraphrases need not be equivalent to the original. Thus

No one will succeed if he goofs off

((2) above) is not equivalent to

No one has the property that: he will succeed if he goofs off

or to

No one is such that: he will succeed if he goofs off

for these last, unlike (2), really do have it that there is no one whose goofing off is sufficient for his success. The conditional carries its usual import. Compos- itionality, then, is an issue just for (2) and the like.

2. Universals

I argued above that the suggestion that conditional clauses be taken as expressing quantifier restrictions was not adequate to explaining the apparent failures of compositionality, because of examples with non-standard quantifiers such as ‘most’ and ‘few’. I turn now to examples intended to show that, even with universal quantifiers, there is a systematic difference between the true conditional and the non-conditional correspondent, with the conditional absorbed into the quantifier restriction.

For an example that, in my opinion, clearly pulls them apart: suppose that the university is going to offer generous pensions to some 20% of its 422 professors, hoping to induce early retirement; but has not yet decided, or even drawn up criteria for deciding, which 20% this will be. Believing as I do that generous pensions will infallibly induce early retirement, I believe (14):

(14) Every professor will retire early if offered a generous pension.

(14) of course implies (15), the result of absorbing the ‘if’-clause into the restriction:

(15) Every professor offered a generous pension will retire early.
But the converse is false: there might be many professors (but even one will do) who we can be sure will not retire early, quite independently of any pension they may be offered.

Similar examples may be constructed for the negative existential, showing that absorption in this case fails too. It may be that I have taken a poll of the professors, and so believe (16):

(16) No professor will retire early if not offered a generous pension.

That will imply (17):

(17) No professor not offered a generous pension will retire early.

But again the converse is false: if Professor X is going to retire early, period, then he is a counterexample to (16). But if he is amongst those offered a generous pension, then he is no counterexample to (17), whose truth or falsehood depends only upon whether any of those in the 80% not offered a generous pension retire early.

Naturally, the above examples very much depend upon the sensitivity of the conditionals to counterfactual situations; or, to put it another way, when a universally quantified English conditional ‘Everything is $F$ if it is $G$’ is equivalent to a universal material conditional ‘$(\forall x) (G(x) \rightarrow F(x))$’, then the result, ‘Everything such that $G$ is $F$’, of absorbing the antecedent into the quantificational restriction will be equivalent to ‘$[\forall x: G(x)] F(x)$’. Similarly, when ‘Nothing is $F$ if it is $G$’ is equivalent to the negative existential ‘$\neg(\exists x) (F(x) \& G(x))$’, then the result of absorbing the antecedent into the quantifier restriction will be equivalent to ‘$\neg[\exists x: G(x)] F(x)$’. Cases where these equivalences do not obtain are responsible for the counterexamples.

Examples can be multiplied; but I want now to take more theoretical steps.


I take up the indicative conditional as suggested by Stalnaker (1968): ‘$q$ if $p$’ is true in $w$ iff ‘$q$’ is true in the closest ‘$p$’-world $w = f(p',w)$ to $w$, or else there are no worlds in which ‘$p$’ is true; and moreover if ‘$p$’ is true in $w$, then $f(p',w) = w$. Writing the Stalnaker conditional as ‘$\Rightarrow$’, we have the validity of (CEM), or Conditional Excluded Middle:

\[(CEM) \ (\varphi \Rightarrow \psi) \lor (\varphi \Rightarrow \neg \psi)\]

a point that will play a major role in what follows. The Stalnaker conditional $\varphi \Rightarrow \psi$ implies the material conditional $\varphi \Rightarrow \psi$, for if the latter is false in $w$ we must have $\varphi \& \neg \psi$ in $w$, contradicting $\varphi \Rightarrow \psi$. The wedge between the material conditional and the Stalnaker conditional is in fact
not very large: we can have \( \varphi \Rightarrow \psi \) true in \( w \) whilst \( \varphi \Rightarrow \psi \) is false in \( w \) only where, in \( w \), \( \neg \varphi \), and in \( f(\varphi, w) = w' \neq w \), \( \varphi \& \neg \psi \). Inversely, the Stalnaker conditional and the material conditional are equivalent in the following three cases: (a) \( f(\varphi, w) \) is undefined (or, alternatively, is a sink state); (b) \( \varphi \) is itself true in \( w \) (in which case \( f(\varphi, w) = w \), by definition); and (c) \( f(\varphi, w) = w' \neq w \) is defined, and \( \psi \) is true in \( w \) and \( w' \). Each of these cases will parley into a case where an \( \text{if} \)-clause can be taken as merely restricting a universal quantifier, as follows. Any sentence ‘Everything is \( F \) if it is \( G \)’, taken as (18):

\[
(18) \quad (\forall x) \ (G(x) \Rightarrow F(x))
\]

will be equivalent to (19):

\[
(19) \quad [\forall x: G(x)] \ F(x)
\]

whenever, for each object \( \alpha \), either (a') ‘\( G(\alpha) \)’ is false in every world; or (b') ‘\( G(\alpha) \)’ is true in every world; or (c') neither (a') nor (b'), but, if \( w' = f(\neg G(\alpha), w) \) and \( w' \neq w \), then ‘\( F(\alpha) \)’ holds in \( w \) and \( w' \). Intuitive examples of the equivalence of (18) and (19) following from (a') and (b') include Frege’s (5), and any similar mathematical case. Those following from (c'), but not from (a') or (b'), are cases where a true consequent would remain true in situations where the antecedent were true; where, as we might say, the truth of the consequent is not counterfactually dependent upon that of the antecedent. Illustrations tend to run to joke status, as in (20):

\[
(20) \quad \text{We are Siamese if you please; and we are Siamese if you don’t please.}
\]

We consider a further case, as in (21):

\[
(21) \quad \text{Every book on that shelf is boring if it has a red cover.}
\]

One is ready to regard (21) as equivalent to (22):

\[
(22) \quad \text{Every book on that shelf with a red cover is boring.}
\]

And it would appear that such is the case because we know in advance that giving a book a red cover does not alter its contents, so does not affect whether it is boring. Let \( b \) be a book on that shelf with a blue cover. In the closest possible world, whatever it is, in which \( b \) has a red cover, it is boring or not, just as it is boring or not as things are. But then it seems that (21) should be false if there are non-boring books on the shelf whose covers are not red, although they might have been! Let \( b \) be such a book. Then ‘\( b \) has a red cover \( \Rightarrow \) \( b \) is boring’ is false, whereas ‘\( b \) has a red cover \( \neg \) \( b \) is boring’ is true; so \( b \) is a counterexample to (21), but not to (22); whereas what we want is that they should be equivalent.
If the intuition about (21)–(22) is correct, then the conditions (a‘)–(c‘) above do not quite exhaust the cases in which we are prepared to take (18) and (19) as equivalent. A further step is wanted. I introduce, as a technical device, the notion that \( \varphi \) is counterfactually irrelevant to \( \psi \) in \( w \) if either \( \varphi \) is necessarily false, or \( (\varphi \Rightarrow \psi) \leftrightarrow \psi \) holds in \( w \); and that \( \varphi \) is counterfactually irrelevant to \( \psi \) if irrelevant in \( w \) for every \( w \). Extending this notion to open sentences, I will say that \( \varphi(x) \) is counterfactually irrelevant to \( \psi(x) \) if \( \varphi(a) \) is counterfactually irrelevant to \( \psi(a) \) for every \( a \). I propose the generalization (I):

(I) If \( \varphi(x) \) is counterfactually irrelevant to \( \psi(x) \), then (18) and (19) are equivalent, for every \( w \).

(The converse of (I) is false, as it may just happen that (18) and (19) are equivalent because \( \varphi(a) \) and \( \psi(a) \) both fail as things are, whereas both hold in \( w' = f(\varphi(a),w) \).) Evidently, mathematical universal conditionals, and in fact all cases falling under (a‘)–(c‘) above, will show counterfactual irrelevance. But so will examples like (21) (assuming it quite impossible that the color of a book’s cover should have any influence on whether its contents are boring). On the other hand, it is the counterfactual relevance of antecedent to consequent that points up the difference between (14) and (15), repeated here:

(14) Every professor will retire early if offered a generous pension.
(15) Every professor offered a generous pension will retire early.

To assess the truth value of (14), we must know whether professor Y, who is not offered a generous pension, and does not in fact retire early, would have retired early had she been offered one. Nothing like that is at stake for (15).

I think that we tend to reject (or perhaps simply to find baffling) indicative conditionals with false antecedents, where it is manifest that the antecedent is counterfactually irrelevant to the consequent. If so (although this exceeds what is given simply through the Stalnaker conditional), then the counterexamples to (21), like those for (22), will be just the books with red covers that are not boring, so that (I) is vindicated.

The notion of counterfactual irrelevance perhaps belongs to the pragmatics, not the semantics, of conditionals. As noted by Kai von Fintel and Sabine Iatridou (2002) (though not in the present terms) some cases of counterfactual irrelevance of consequent to antecedent lead to anomaly. So, for instance, ‘Every coin is silver if it is in Jones’s collection’ is weird, even if it is known that Jones, as a matter of principle, only collects silver coins; likewise the “accidental generalizations,” such as ‘Every coin is silver if it is in my pocket’. (Of course, universal conditionals such as ‘Every coin in Jones’s collection/in my pocket is silver’ are fine.) At the same time, the notion of counterfactual irrelevance is properly semantic, as it respects necessary equivalence; i.e., if \( \varphi_1 \) is counterfactually irrelevant to \( \psi_1 \) in \( w \), \( \Box(\varphi_1 \leftrightarrow \varphi_2) \), and \( \Box(\psi_1 \leftrightarrow \psi_2) \), then \( \varphi_2 \) is counterfactually irrelevant to \( \psi_2 \) in \( w \).
I should add a word about the assessment of counterfactual irrelevance in particular cases. Suppose $C$ is a two-headed coin, and consider the conditional, ‘If $C$ is tossed, it will not land tails’. The conditional is true, even if $C$ is not tossed. But suppose $C$ is not tossed. Then it does not in particular land tails; and it would appear that, by our definition, ‘$C$ is tossed’ is counterfactually irrelevant to ‘$C$ will not land tails’. To restore counterfactual relevance, we should understand the conditional as: ‘If $C$ is tossed, then it will land as a result of that toss, and it will not land tails’. The consequent is then false as things are, but true in counterfactual situations, so that there being a toss of $C$ is then counterfactually relevant to the consequent. (Similar remarks go for the case of (29)–(30), discussed below.)

To summarize this section: I have assumed that the Stalnaker conditional ‘$\rightarrow$’, with its characteristic principle (CEM) of Conditional Excluded Middle, interprets the English conditional ‘if’, and I have probed the source of divergences and equivalences between ‘$\rightarrow$’ and the material conditional ‘$\to$’. Besides the equivalences that follow simply from the relevant semantics of these connectives, I have suggested that we accept the Stalnaker conditional and the material conditional as equivalent in all cases where the antecedent is counterfactually irrelevant to the consequent; i.e., those in which, the antecedent being false, the consequent has the same truth value in the world $w$ of evaluation and the closest world $w'$ in which the antecedent is true. (Alternatively, one might simply set these cases aside.) I turn now to the evaluation of the counterexamples to compositionality, on the assumptions in force.

4. Compositionality and (CEM).

Having, if I am right, vindicated the independence of the conditional meaning for cases like (14), we are brought back to the problem posed by the inequivalent (16) and (17). (16) in particular cannot, it would appear, be understood as in (23):

$$\neg \forall x (F(x) \text{ if } G(x))$$

But, as not being offered a generous pension is at least potentially counterfactually relevant to retiring early (for we need to know whether professor X, who did in fact retire early, would have done so had he not been offered a generous pension), (16) is not equivalent to (17) either.

Thus we are brought, I believe, to an obvious hypothesis. We may decompose ‘For no $x$, $F(x)$ if $G(x)$’ as ‘For all $x$, not ($F(x)$ if $G(x)$)’, and note, by the general principle (CEM) that characterizes the Stalnaker conditional, that the latter is equivalent to ‘For all $x$, (not $F(x)$ if $G(x)$)’. By this double transformation, (16) is then equivalent to (23):

$$\neg \forall x (\neg (F(x) \text{ if } G(x)))$$
Every professor will not retire early if not offered a generous pension.

But now in this expression, the link between the ‘if’-clause and the main clause is rightly expressed by ‘⇒’. But that means that (16) can be understood as in (22) after all!

We have, then, the following dilemma: either (i) the intuitive inequivalence of (16) and (17) is an illusion, or (ii) (CEM) is mistaken, in that it makes them equivalent. We generalize to other cases before proceeding to address it.

The trick that we just pulled with ‘no’ can be pulled with any monotone decreasing quantifier. The lexicography of quantifiers, as Frege taught us, is that they map concepts into truth values (or, in natural languages, as Frege also observed, ordered pairs of concepts into truth values; I will confine the exposition here to the unrestricted case, the extension to restricted quantifiers like ‘every student’ being immediate). Recasting this lexicography in model-theoretic terms, a quantifier $Q$ on a non-empty domain $D$ is monotone increasing if for any subsets $X$ and $Y$ of $D$, if $X \subseteq Y$ and $Q(X) = \text{True}$, then $Q(Y) = \text{True}$; and it is monotone decreasing if, whenever $Y \subseteq X$ and $Q(X) = \text{True}$, $Q(Y) = \text{True}$. So for each monotone decreasing $Q$ there is a unique monotone increasing $Q'$ such that for all $X$:

$$Q'(D-X) = Q(X)$$

Consider in this light the puzzling example (8), repeated here:

(8) Few students will get A’s if they work hard.

How few (or how many) constitute few may be a matter of opinion, context, or whatever. In any case, let the coinage ‘Not-few’ be introduced as the corresponding monotone increasing quantifier, such that ‘Not-few things are not $F$’ is equivalent to ‘Few things are $F$’. Applying (CEM), (8) will then be equivalent to (25):

(25) Not-few students will not get A’s if they work hard.

The dilemma of (16) and (17) thus presents itself with respect to (8) and (25): I am unable to convince myself whether (25) is indeed equivalent to (8), or just anomalous: see also below.6

What we have seen, if the views advanced here are correct, is that in many cases the compositionality of conditionals can be restored, not indeed by making the clauses introduced by ‘if’ or ‘unless’ part of the quantifier restriction, but rather by what I have called a kind of decomposition and transformation of the sentences in question. For the monotone decreasing quantifiers such as ‘no’, suppose that the syntactic structure that is the input to semantics for (26) is as in (27).
We interpret in the usual way (from bottom up), taking the conditional as in Stalnaker. Despite initial appearances, the correct compositional result is obtained, but only by exploiting the controversial law (CEM) that characterizes the Stalnaker conditional. (26) will be equivalent to (28):

(28) Every student will fail to get an A if he goofs off.

5. (CEM) Presupposed?

I have noted that (CEM) is a controversial assumption. For an account of conditionals without it, we may consider an interpretation inspired by Lewis (1973) (who, however, had different views about its application), accepting what he there calls the Limit Assumption; that is, we take \( \varphi \Rightarrow \psi \) as true in \( w \) iff \( \psi \) holds at every closest world in which \( \varphi \) is true. Then Conditional Excluded Middle may fail. Define counterfactual irrelevance as above, with ‘every closest world’ replacing ‘the closest world’. Then the analogue of (I) may again be suggested. However, we now admit cases in which ‘Nothing is \( F \) if it is \( G \)’ need not amount to ‘Everything is not \( F \) if it is \( G \)’.

The examples that we have given to this point are not examples that, in the most intuitive sense, support Conditional Excluded Middle. Thus we are not ready to say, in typical settings, that either Professor X will retire early if offered a generous pension, or Professor X will not retire early if offered a generous pension, or that either student Z will not succeed if she goofs off, or student Z will succeed if she goofs off. We may regard both as open questions. But there are cases where, again on the most intuitive level, Conditional Excluded Middle applies.

For example, suppose a bowl on the table containing a large quantity of peanuts, enough to supply everyone at the Philosophy reception. Each particular person is either allergic to peanuts, or else not. So, for each person \( x \): either, if \( x \) eats those peanuts, \( x \) will have an allergic reaction to them; or, if \( x \) eats those peanuts, \( x \) will not have an allergic reaction to them. Now, I know that allergy to peanuts is rare, and so am confident in saying (29):

(29) Few people (at the reception) will have an allergic reaction if they partake of those peanuts.

Obviously, this is to be distinguished from (30):

(30) Few people (at the reception) who partake of those peanuts will have an allergic reaction.
(Note that, even amongst those people with no allergy who do not partake of the peanuts, and so *a fortiori* do not have an allergic reaction to them, the consequent, more fully unpacked as ‘they have an allergic reaction as a result of partaking of those peanuts’, is something to which the truth of the antecedent is counterfactually relevant. It is not a conjunction, but rather the single sentence, ‘There is a partaking of the peanuts by x which is not followed by an allergic reaction’ that is false as things are, but true in the counterfactual situation.) But now the question is whether (29) amounts to (31):

(31) Most (or: Not-few) people will not have an allergic reaction if they partake of those peanuts.

or, perhaps more tendentiously, (32):

(32) There are few people (among those at the reception) such that their partaking of those peanuts is a sufficient condition for their having an allergic reaction to them.

If the answer to this question is affirmative, then we may propose that conditionals ‘\( Q \) things are \( F \) if \( G \)’, where \( Q \) is monotone decreasing, are anomalous if Conditional Excluded Middle fails (for some values of the variable), otherwise equivalent to ‘\( Q' \) things are not \( F \) if \( G \)', where \( Q' \) is the monotone increasing quantifier corresponding to \( Q \).

What of conditionals with quantifiers that are neither monotone increasing nor monotone decreasing, ‘exactly three’, for instance, or ‘between 4 and 17’, or ‘some odd number of’? It appears to me that the conditional is satisfactorily interpreted as the conditional connective in contexts where (CEM) holds, but is anomalous otherwise. Thus, for instance, it is unclear to me what ‘Exactly three students will pass unless they goof off’ is supposed to mean, whereas ‘Exactly three people at the reception will have allergic reactions unless they avoid those peanuts’ is pretty clear.

To summarize:

1. The problem of the compositionality of quantified conditionals is genuine: it cannot, save in a few accidental cases, be dismissed by absorbing the antecedent ‘if’-clause into the quantifier restriction.
2. If we may assume (I), thus putting aside the cases of counterfactual irrelevance, then, on the Stalnaker semantics with (CEM), quantified conditionals with monotone increasing and monotone decreasing quantifiers submit to the same treatment.
3. Waiving (CEM) as a general principle, but retaining the rest of the Stalnaker semantics, it seems that the cases where (CEM) may intuitively be assumed are all compositional, even for quantifiers that are neither monotone increasing nor monotone decreasing.
We may therefore suggest the generalization (II):

(II) (Assertions of) quantified conditionals whose quantifiers are not monotone increasing presuppose (CEM).

Compositionality (for this restricted class of cases, at least: we have not in this note considered multiple quantification) is then restored. However, (II), and for that matter (I) above, have a stipulative character that invites further inquiry.  

Notes

1. A restricted quantifier $Q$ is monotone increasing if ‘$Q \ F$ are $G$’ and ‘All $G$ are $H$’ together imply ‘$Q \ F$ are $H$’, and monotone decreasing if ‘$Q \ F$ are $G$’ and ‘All $H$ are $G$’ together imply ‘$Q \ F$ are $H$’. See further below for the model-theoretic characterization of these notions.

2. I use the symbols ‘$\forall$’ and ‘$\exists$’ ambiguously, for the unrestricted and the restricted universal and existential quantifiers, respectively.

3. Kai von Fintel and Sabine Iatridou (2002) have independently observed the significance of (CEM) for compositionality.

4. A word about notation. I will continue to use English letters ‘$p$, ‘$q$, ‘$F$, etc. within quotation marks for schemata and parts of schemata in the sense of Quine; but in speaking of formulas as given in a formal language for the Stalnaker conditional I use Greek letters ‘$\varphi$, ‘$\psi$, etc., and avoid quotation marks or quasi-quotes.

5. More generally, where $\varphi$ is counterfactually irrelevant to $\psi$ for the reason (c’) above (that is, where $\psi$ is true in both the actual and the counterfactual situations), $\varphi$ will still always be counterfactually relevant to the conjunction $\varphi \ & \psi$, because that conjunction will be false as things are, but true in the counterfactual situation where $\varphi$ is true. Indeed, (i) and (ii) below, where the consequent contains the antecedent as a conjunct, although they are indeed odd things to say, do not strike me as bizarre in the way that the examples in the text do:

(i) Every coin in my pocket is silver if it is in my pocket.

(ii) Every coin in Jones’s collection is silver if it is in Jones’s collection.

However, in the example of the two-headed coin given in the text, counterfactual relevance is restored in that the consequent is true in the actual and counterfactual situations for different reasons, a matter that the purely formal definition in the text of course cannot capture.

6. I have used “decomposition” above for expository purposes only: the proof that (8), assuming (CEM), is equivalent to (25) can be given directly.

7. I am assuming Quantifier Raising, with the trace ‘$t_i$’ interpreted as a variable.

8. This note is adapted from part of a paper prepared for the Michigan meeting on Linguistics and Philosophy, held at Ann Arbor, Michigan, November 2002, Paul Pietroski and Ernest Lepore commenting. I am grateful to the organizers and
commentators, and to Kai von Fintel for discussion of his work with Sabine Iatridou on the issues considered here. Discussions with my students in Linguistics 536 at USC, and comments by Utpal Lahiri and Barry Schein, were also very helpful. An earlier version appeared in volume I of USC Working Papers in Linguistics.

References


