Whether-conditionals

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Abstract In this paper I look at indicative nested whether-conditionals, sentences like:

If I pass the exam, I will pass whether I pray or not.

The behavior of ‘if’ in these examples is to be contrasted with the behavior of ‘if’ in or-to-if conditionals:

If Mary is at home or at work, then if she is not at home, she is at work.

I argue that no currently available semantics for indicative conditionals can explain both the behavior of ‘if’ in nested whether-conditionals and the behavior of ‘if’ in or-to-ifs. We need a theory that predicts both. While no currently available theory makes the right predictions, one theory comes close—Heim’s rendition of Stalnaker’s semantics (Heim in J Semant 9(3):183–221, 1992). I show how to fix Heim’s view to get the right results for all cases. In sum, the paper argues for a particular development of Stalnaker’s semantics, and shows that whether-conditionals cannot be dealt with on other approaches.

Keyword Semantics of conditionals

1 Introduction

This paper argues for a new theory of the indicative conditional—a modification of Heim’s (1992) account, an account that is itself a variant of Stalnaker’s (1975) semantics. The argument in favor of the new account is that it alone can solve the
problem of accounting both for the triviality of *or-to-if conditionals* (*if* $\phi$ or $\psi$, then if not $\phi$, $\psi$') and for the informativeness of *singular nested whether-conditionals* (*if* $\phi$, then $\phi$, whether or not $\psi$). While the problem is most strikingly brought out by investigating nested whether-conditionals, it is not any peculiarity of the semantics of ‘whether’ that causes it; the problem is with our understanding of the indicative ‘if’.

While the problem is general, and no existing account offers a solution, I will diagnose the source of the problem within the context of Heim’s semantics. In that context, the problem can be understood through the distinction between what I will call the *normal* and the *deviant* behavior of ‘if’. Currently available theories divide into those that predict uniformly normal behavior, and those that predict uniformly deviant behavior.¹ No theory explains both, and yet, I will argue, ‘if’ indeed displays both kinds of behavior, hence the need for a new account, if we think, as we must, that a unified account is preferable to positing multiple ‘readings’ of the indicative ‘if’. Let me sketch very briefly the course of the argument.

In the course of his argument against *modus ponens*, McGee observed that or-to-if conditionals appear to be logically true. McGee proposed that what explains this fact is that *import-export* holds for the indicative conditional (*import-export*: ‘*if* $\phi$, then if $\psi$, $\chi$’ is logically equivalent to ‘*if* $\phi$ and $\psi$, then $\chi$’). But a look at or-to-ifs within the context of Heim’s semantics offers an interesting alternative diagnosis: that the indicative ‘if’ acts as an epistemic context-shifter: the consequent of an indicative is evaluated in an epistemic context enriched by the addition of the proposition expressed by the antecedent. In the case or or-to-ifs, Heim easily predicts logical truth: ‘if $\phi$ or $\psi$, then if not $\phi$, $\psi$’ is true iff ‘if not $\phi$, then $\psi$’ is true in the context which takes ‘$\phi$ or $\psi$’ for granted, and of course this always holds. The diagnosis is interesting because it is conservative: shifting the epistemic context does not guarantee that *import-export* is valid, and indeed *import-export* fails in Heim’s theory. Shifting the context is the normal behavior of ‘if’, on display in McGee’s or-to-ifs.

But ‘if’ does not always behave normally. This abnormal behavior is particularly easy to observe in indicative nested whether-conditionals, sentences like

(1) If I pass the exam, I’ll pass it whether I pray or not.

Here we see that ‘if’, apparently, does not always shift the epistemic context (if it did, (1) would be trivially true, but it is not). This is *deviant* behavior.² So there is a problem: positing normal behavior is required to account for or-to-if examples, and yet gives the wrong result for a particular species of nested whether-conditionals that I will call the *singular* nested whether-conditionals [(1) is an example].

The problem is general: the extant theories of indicatives divide into those that handle or-to-ifs, but fail in the case of singular nested whether conditionals (e.g.

¹ Although important and interesting, I leave out of account non-truth-conditional theories of the indicative conditional in this paper.

² According to the view I will defend, ‘if’ does indeed always shift context, but this shift is sometimes cancelled through presupposition accommodation—hence the appearance, in certain special cases, that the context had not been shifted.
Kratzer 1986; Heim 1992), and those that handle the singular nested whether-conditionals, but fail in the case of or-to-ifs (e.g. Stalnaker 1975).

The rest of the paper proceeds as follows: first, I propose a mechanism that, combined with Heim’s theory, allows us to explain both normal and deviant cases. The mechanism will turn out to involve a peculiar kind of presupposition accommodation. Second, I argue that the mechanism I propose only supplies the desired explanation when combined with one particular theory of indicative conditionals—Heim’s (1992) account. So singular nested whether-conditionals give us an argument in favor of Heim’s semantics (augmented with the special mechanism that I propose). I will call the resulting theory Heim+.

My focus in this paper is on articulating a problem—to explain both normal and deviant cases—and proposing a solution. As it happens, the solution I propose is married to a particular theory of indicative conditionals. So, in the end, I also give an argument in favor of a particular theory—Heim+. Seen from this wider perspective, it is helpful to see the discussion as focusing on two questions: one, whether the semantics of indicatives ought to be built on the basis of Stalnaker’s account, i.e. on the basis of the counterfactual similarity metric, or on some other foundation, the strict-conditional account being the salient alternative; the other question is which version of Stalnaker’s semantics to prefer. In answer to the first question, I argue that the problem raised in this paper can only be handled by a Stalnaker-like semantics for indicatives (Sect. 8). Roughly speaking, the way one ends up with my modification of Heim’s semantics is as follows: only a Stalnaker-like semantics can solve the problem of deviance because a normal theory cannot be fixed to handle deviant cases. But Stalnaker-like theories have trouble predicting normal behavior. The most natural way of fixing Stalnaker’s semantics so that it handles normal cases is the way Heim does it (although, so far as I know, that was not Heim’s motivation). However, Heim’s fix is not enough: if one fixes Stalnaker’s semantics as Heim proposes, one is no longer able to account for the deviant cases. So, in answer to the second question above, I propose a modification of Heim’s view, which I will call Heim+. So solving the central problem simultaneously gives us an argument in favor of a particular semantics for indicatives.

2 Or-to-if conditionals

McGee’s counter-example to modus ponens is as follows. We have two Republican candidates, Reagan and Anderson, and one Democrat—Carter. Reagan is overwhelmingly likely to win, with Carter running in a rather distant second place, and Anderson a very distant third—he barely has a chance. Now, we argue (before the election):

\textit{The 1980 Election}

\begin{enumerate}
\item If a Republican wins, then if it’s not Reagan who wins, it will be Anderson.
\item A Republican will win.
\end{enumerate}
(4) So, if it’s not Reagan who wins, it will be Anderson.

We can grant that the conclusion is false: if Reagan does not win, Carter will. Further, (2) is surely true. What about (3)? Well, by hypothesis, we do not know that it is true, but we can consistently suppose that it is.\(^3\) So, we have a counterexample to *modus ponens*.\(^4\) But I am interested not in McGee’s argument, but rather in a crucial observation that he made in the course of presenting it.

The Election is not merely a counter-example to *modus ponens*; it also poses an explanatory challenge. Call conditionals of the form ‘if φ or θ, then if it’s not φ, then θ’ or-to-if conditionals.\(^5\) (2) is an or-to-if: given that there are two Republican candidates, it is equivalent to

(5) If Reagan or Anderson wins, then if it’s not Reagan who wins, it will be Anderson.

McGee observes that or-to-if conditionals seem to be logically true. Now, this fact demands explanation. Of course, some theories of indicative conditionals may just deliver this result, and this would count in their favor. But what one would like is some sort of explanation: some general feature that is responsible for the fact that or-to-if conditionals are logically true. McGee provides one answer to this question. He remarks: ‘It appears, from looking at examples, that the law of exportation, ‘if φ and ψ, then θ’ entails ‘if φ, then ψ, then θ’, is a feature of English usage’, and adds that importation (‘if φ, then ψ, then θ’ entails ‘if φ and ψ, then θ’) seems valid as well (1985, p. 465). So McGee, in effect, argues that the best explanation for the logical truth of or-to-if conditionals is the principle of import-export: ‘if φ, then if ψ, then θ’ is equivalent to ‘if φ and ψ, then θ’.

However, there is clearly a jump between our acceptance of ‘if φ or θ, then if not φ, then θ’ as a logical truth, and our acceptance of import-export. To be sure, import-export entails the logical truth of ‘if φ or θ, then if not φ, then θ’, but it is not obvious that the reverse entailment holds. In fact, the semantics of indicatives Heim proposed in (1992) is a theory that accepts ‘if φ or θ, then if not φ, then θ’ as a logical truth, and yet fails to validate import-export. Heim’s theory is of interest in two ways. First, it will help us formulate precisely what is to be learned from McGee’s or-to-ifs—to diagnose the normal behavior of ‘if’. Second, it is the theory a modified version of which I will ultimately defend. Let me sketch it briefly.

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\(^3\) This is a necessary feature of the example. If we knew that a Republican will win, the conclusion would plausibly be true, and not false, as intended.

\(^4\) McGee’s counter-examples have met with some objections. For discussion see, e.g., Lowe (1987), Piller (1996), Katz (1999). I think McGee’s argument is successful, but whether it is will not matter for the argument to follow.

\(^5\) The logical truth of the or-to-if conditional is to be distinguished from the validity of what is often called the or-to-if inference: φ or ψ ⊨ if not φ, then ψ. The or-to-if inference may well be invalid even if the or-to-if conditionals are logically true.
3 Heim’s semantics

I will use two parameters of evaluation: a world of evaluation, \( w \), and an epistemic context, \( c \), which I take to be the set of propositions known, or taken for granted, in the context of utterance.\(^6\) Sometimes, it will also be helpful to speak of the context of evaluation, the pair \( w, c \), consisting of a world of evaluation and an epistemic context.

Let \( \text{sim}(w, \phi) \) be the selection function: for each world \( w \) and proposition \( \phi \), it returns a world \( w' \) such that \( w' \) is the closest \( \phi \)-world to \( w \). Let us stipulate that \( \text{sim}(w, \phi) \) is the function we get by analyzing counterfactuals Stalnaker and Lewis-style: it encodes the metaphysical similarity between worlds. I incorporate the uniqueness assumption, the assumption that for each \( w \), there is a unique closest \( \phi \)-world \( w_0 \). This simplifies exposition, and is harmless in the context of the present investigation. Note that by definition the closeness function is unrestricted: \( \text{sim} \) searches for the closest \( \phi \)-world throughout the universe of worlds. If we want \( \text{sim} \) to search for a closest \( \phi \)-world within some context \( c \), we can do that by asking for the value of \( \text{sim}(w, c \cup \phi) \), where \( c + \phi \) is the union \( c \cup \phi \).\(^7\) So one can read ‘\( \text{sim}(w, c + \phi) \)’ as ‘the closest \( \phi \)-world in \( c \) to \( w' \)’. It is sometimes helpful to speak of the set of worlds in \( c \)—we shall understand by that the set of worlds in which all the propositions in \( c \) are true.

Now let us turn to indicative conditionals. In general, it is helpful to think of ‘if’ as a context shifter: that is, it is helpful to describe the evaluation of ‘if \( \phi \), then \( \psi \)’ as proceeding in two stages: first, ‘if \( \phi \)’ changes the current context of evaluation in some way (by changing the epistemic context \( c \), or the world of evaluation \( w \), or both); next, ‘\( \psi \)’ is evaluated in the new, local, context.\(^8\) Now we can formulate Heim’s semantics (I give Stalnaker’s 1975 view side-by-side to illustrate the differences).

**Stalnaker**

An indicative ‘if \( \phi \), then \( \psi \)’ is true in \( w, c \), iff \( \psi \) is true in \( \text{sim}(w, c + \phi) \), \( c \).

**Heim**

An indicative ‘if \( \phi \), then \( \psi \)’ is true in \( w, c \), iff \( \psi \) is true in \( \text{sim}(w, c + \phi), c + \phi \).\(^9\)

Both theories shift the world of evaluation from \( w \) to \( \text{sim}(w, c + \phi) \). The crucial difference between the two is that, according to Stalnaker, the consequent is

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\(^6\) One can think of the epistemic context as a set of propositions, or as a set of worlds. It will be crucial to the proposal I develop in Sect. 7 that we think of the epistemic context in the first way.

\(^7\) Since \( c \cup \phi \) is not a proposition, but a set of propositions, strictly speaking, \( \text{sim}(w, c + \phi) \) returns the closest world \( w' \) in which all the propositions in \( c + \phi \) are true.

\(^8\) This is a helpful way of thinking about indicative even if one does not adapt Heim’s dynamic view of meaning. The proposal I articulate in this paper is truth-conditional. The choice between dynamic and truth-conditional versions of the view would have to be decided on other grounds. I will not discuss this issue.

\(^9\) This is a static version based on Heim’s dynamic formulation: \( c + \phi \), then \( \psi = w \in c: \text{sim}(w, c + \phi) + \psi = \text{sim}(w, c + \phi) \) (Heim 1992, p. 196).
evaluated in the original epistemic context, while according to Heim, the consequent is evaluated in a derived epistemic context, \( c + \phi \). As a result, the two theories agree on all cases where the consequent has no modally sensitive material. But if the consequent is itself a conditional, it is modally sensitive. So, crucially, the two theories diverge on or-to-if conditionals. Let me quickly illustrate the divergence.\(^{10}\)

Stalnaker starts evaluating ‘if \( \phi v \theta \), then if \( \neg \phi \), then \( \theta \)’ by shifting the world, but not the context of evaluation: the or-to-if is true if ‘if \( \neg \phi \), then \( \theta \)’ is true in \( \text{sim}(w, \ c + \phi v \theta) \), \( c \). Then the nested antecedent shifts the world of evaluation once again: the or-to-if conditional is true iff ‘\( \theta \)’ is true in \( \text{sim}(\text{sim}(w, \ c + \phi v \theta), \ c + \neg \phi), \ c \). Naturally, on Stalnaker’s semantics or-to-ifs can easily be false, as (2) in McGee’s Election scenario demonstrates. So Stalnaker’s semantics cannot be right.

Now, turn to Heim’s predictions for or-to-ifs. Start with if ‘\( \phi v \theta \), then if \( \neg \phi \), then \( \theta \)’. We begin evaluating the or-to-if by shifting from the context \( w, \ c \) to the context \( \text{sim}(w, \ c + \phi v \theta) \), \( c + \phi v \theta \). But now, since every world in the new context is either a \( \phi \)-world or a \( \theta \)-world, it is clear that ‘if \( \neg \phi \), then \( \theta \)’ will be true in every world in the new context. So or-to-if conditionals come out logically true. What is really doing the work in this reasoning is the assumption that the indicative ‘if’ shifts the epistemic context by updating on the antecedent.

But note that Heim’s semantics does not validate import-export. Here is a toy counter-model. Let \( \neg \phi \) be true at \( w_1, \phi, \psi, \neg \theta \) true at \( w_2, \phi, \neg \psi \) true at \( w_3 \), and \( \phi, \psi, \theta \) true at \( w_4 \). Suppose further that \( \text{sim}(w_1, \phi \& \psi) = w_2 \), and \( \text{sim}(w_1, \phi) = w_3 \) and \( \text{sim}(w_3, \phi \& \psi) = w_4 \). Then \( (\phi \& \psi) \rightarrow \theta \) will be false at \( w_1 \). But \( \phi \rightarrow (\psi \rightarrow \theta) \) will be true at \( w_1 \).

I have suggested in the last section that McGee’s argument against modus ponens gives rise to an explanatory challenge—the challenge to explain the triviality of or-to-ifs. We have seen that McGee answers this challenge with import-export and that Stalnaker’s semantics fails to meet it. Looking at Heim’s theory suggests a different diagnosis: the epistemic context-shifting by the antecedent. One is not forced to accept import-export to explain the triviality of or-to-ifs. If indicative conditionals obeyed import-export, the alternative diagnosis would be of comparatively little interest. But, as I am about to argue, import-export does not hold, and this makes Heim’s account particularly interesting. Heim’s theory, in its present form, cannot account for the cases I am about to introduce either. But I will argue that it, unlike the accounts that incorporate import-export, can be fixed to deal with the problematic cases.

\(^{10}\) Here are the predictions for a generic right-nested conditional ‘if \( \phi \), then if \( \psi, \theta \)’:

**Stalnaker:**

An indicative ‘if \( \phi \), then if \( \psi, \theta \)’ is true in \( w, \ c \), iff ‘if \( \psi, \theta \)’ is true in \( \text{sim}(w, \ c + \phi), \ c \), iff ‘\( \theta \)’ is true in \( \text{sim}(\text{sim}(w, \ c + \phi), \ c + \psi), \ c \)

**Heim:**

An indicative ‘if \( \phi \), then if \( \psi, \theta \)’ is true in \( w, \ c \), iff ‘if \( \psi, \theta \)’ is true in \( \text{sim}(w, \ c + \phi), \ c + \phi + \psi), \ c + \phi + \psi \)
4 Whether-conditionals

Accounting for or-to-ifs is one half of the central problem. In or-to-ifs ‘if’ behaves normally: it shifts the epistemic context. Now let’s turn to the other half—to the deviant behavior of ‘if’ in the singular nested whether conditionals. In this section I will consider an example of deviant behavior. In Sect. 6, I will tackle the general question of when to expect such deviant behavior. Consider the following situation:

Pass/Fail

Ivan’s agnostic friend Joe is preparing for an exam, but fears that ordinary means might not be enough. He is trying to decide whether or not to pray, asking God to help him pass the exam. Joe asks Ivan for advice: should he pray, or not?

Ivan, an atheist, responds:

Ivan’s argument

(6) If you pass, you’ll pass whether you pray or not.
(7) If you fail, you’ll fail whether you pray or not.

So, you shouldn’t pray.¹¹

Ivan’s argument would be pointless if the premises were not informative;¹² and they clearly are.¹³ So what do (6) and (7) really mean? Suppose Joe accepts Ivan’s assertion of (6) and (7)—what does he learn? The most intuitive answer appeals to

¹¹ The argument has a long history. Cf. Cicero, On Fate:

‘Nor will we be blocked by the so called ’Lazy Argument’ (the argos logos, as the philosophers entitle it). If we gave in to it, we would do nothing whatever in life. They pose it as follows: ‘if it is your fate to recover from this illness, you will recover, regardless of whether or not you call the doctor. Likewise, if it is your fate not to recover from this illness, you will not recover, regardless of whether or not you call the doctor. And one or the other is your fate. Therefore it is pointless to call the doctor...’ (Long & Sedley, The Hellenistic Philosophers, 55S, p. 339).

Of course, there is a major difference: the Lazy Argument is fallacious, while Ivan’s argument is not.¹² Pass/Fail appeals to our dynamic intuitions, intuitions about informativeness. But things are the same if we ask instead about our static intuitions—intuitions about what is and is not true in a given context. So consider also Pass/Fail*: Pass/Fail with the stipulation that in fact there is a god who rewards prayers and punishes lack of prayer. Then the initial observation is: (6) and (7) are false in Pass/Fail*.

¹³ The past-tense analogues of (6) and (7) are similarly informative. So, if the exam has already taken place, but the results have not yet come in, Ivan can informatively say ‘If you passed, you passed whether or not you prayed’. But I have found that some informants’ intuitions are that the past-tense analogues of (6) and (7) are trivially true. Perhaps some context-setting might help regain the informativeness intuition. Suppose the exam had already taken place, but Grandma and Grandpa have not yet heard how Joe fared. Grandpa: ‘I am worried about Joe’s exam. I sure hope he studied for it.’ Grandma: ‘Oh, don’t you worry, you know how our Joe is: a bright boy, no problem too hard for him, but always gets so nervous on tests. I am sure that if he passed, he passed whether or not he studied.’—here it seems clear that Grandma is communicating that studying had no influence on passing, though nervousness during the exam might have.
causal influence: (6) and (7) are informative, we would like to say, because they inform Joe that praying has no causal influence on his passing.

While I think that this answer is correct so far as it goes, one can do better. Suppose that we know that that there is one and only one god, but that we are not sure about his character. One possibility is that our god is a god who rewards prayer. Another possibility is that our god is a god who punishes non-prayer. These two are obviously distinct: we can conceive a god who interferes only when someone prays, and also a god who interferes only when someone does not pray. Somewhat less intuitively, we can also imagine a god who rewards non-prayer (a god who rewards self-reliance, so to speak). Likewise, we can imagine a particularly malicious god who punishes prayer. The four possibilities are of course not all mutually exclusive, although some combinations are peculiar—such as the possibility that our god rewards both prayer and non-prayer. Now we can ask: which of these four possibilities does Ivan’s assertion of (6) rule out?

I think the answer is pretty clear: (6) rules out the god who punishes prayer and the god who punishes non-prayer: if there is a god who punishes prayer and Joe passes without praying, he would not have passed if he prayed; if there is a god who punishes non-prayer and Joe prays and passes, he would not have passed had he not prayed. But (6) does not rule out the god who rewards prayer: imagine that Joe prays and passes in a reward-prayer world, but his own studies ensure that he passes, even without divine help. In this case (6) is true. (7), by parallel reasoning, rules out the remaining two possibilities—the god that rewards prayer and the god that rewards non-prayer.

Now let us formulate the central problem: theories that account for or-to-ifs, either through import-export, or through shifting the context, fail to account for our intuitions in Pass/Fail. Let’s consider (6). First, make the following natural assumption: ‘\( \phi \), whether or not \( \psi \)’ is true just in case ‘If \( \psi \), then \( \phi \), and if not \( \psi \), then \( \neg \phi \)’ is true (I’ll call this taking the whether-conditional at face value, see the next section for further discussion). If this is right, then

(6) If you pass, you’ll pass whether you pray or not.

is equivalent to

(8) If you pass, then you will pass if you pray, and you will pass if you do not pray.

But it is natural to suppose that ‘if \( \phi \), then \( \psi \) and \( \theta \)’ is equivalent to ‘if \( \phi \), then \( \psi \), and if \( \neg \phi \), then \( \theta \)’. So, (8) entails

(9) If you pass, then you will pass if you pray, and if you pass, then you will pass if you don’t pray.\(^{15}\)

\(^{14}\) There are at least two ways of thinking about rewards: one may imagine that the relevant god just makes you pass, or one may imagine that the relevant god gives you some extra points—whether the extra points are or are not sufficient to make the passing grade. I will be assuming the first way of thinking about rewards and punishments.

\(^{15}\) Note that Stalnaker’s semantics gets (6) [and so (9)] right. So the situation is curiously symmetrical: Stalnaker gets the deviant readings right, and the normal readings wrong; all the other theories of conditionals get the normal readings right, and the deviant readings wrong.
But now, assuming import-export, (9) is equivalent to

(10) If you pass and pray, then you will pass, and if you pass and do not pray, then you will pass.

And (10) is a conjunction of two conditionals, in both of which the antecedent entails the consequent. So, assuming import-export, (10) is trivially true.

So here is the argument against import-export: on the face value assumption, import-export is inconsistent with our initial observation that (6) is informative in Pass/Fail. By parallel reasoning, import-export is also inconsistent with our initial observation that (7) is informative in Pass/Fail.

Furthermore, Heim’s semantics is also inconsistent with our intuitive judgments in Pass/Fail. So here is the argument against Heim’s semantics: according Heim, (9) is logically true, since it is a conjunction of two instances of ‘if φ, then if θ, then φ’, and ‘if φ, then if θ, then φ’ is logically true on Heim’s account.

The argument against both kinds of theories is really an argument against epistemic context-shifting. If ‘if’ shifts the epistemic context, (9) must come out trivially true, contrary to fact. So the lesson of Pass/Fail is that ‘if’ is sometimes deviant: the antecedent fails to shift the epistemic context.

The argument I just gave is negative: the assumption that ‘if’ always shifts the epistemic context leads to the wrong predictions. But I think we can also see that, in Pass/Fail, we in fact evaluate Ivan’s assertions as if the ‘if’ does not change context. So, suppose that in the actual world, Joe prays and passes. Is it relevant for the truth of (6) whether the actual world contains a god who punishes those who do not pray? Of course it’s relevant! If there is such god, then (6) is false. But that means that some possibilities in which Joe does not pray and fails are relevant to the truth of (6), which is just to say that the consequent of (6),

(11) Joe will pass whether he prays or not.

is evaluated not in the epistemic context c + Joe passes, but in a wider context, in a context which includes some Joe-fails-worlds. It is prima facie plausible that in (6) ‘if’ does not shift the epistemic context at all.

To sum up: in or-to-ifs ‘if’ behaves normally, but in (some) nested whether-conditionals ‘if’ is deviant. The central problem is to explain how normality and deviance can co-exist within one semantic theory. As we have just seen, no theory that accounts for or-to-ifs leaves room for the deviant cases. (And the only theory that gets the deviant cases right, Stalnaker’s semantics, founders on or-to-ifs, as McGee’s examples show). I will offer my solution in Sect. 7. But before I turn to that, I want to consider a possible objection (Sect. 5), and then suggest an empirical generalization that will guide us to solution to the central problem (Sect. 6).

16 Why is epistemic context-shifting normal, and not shifting deviant, rather than the other way around? First, the normal behavior is indeed wide-spread (hence the intuitive appeal of import-export). Second, as we shall see (Sect. 6), the deviant behavior arises only in very special circumstances.
5 Taking whether-conditionals at face value

The argument against import-export and Heim’s theory rested on the assumption that we may take (6) and (7) at face value, that is by postulating that

\[ \text{Face Value} \]

‘\( \phi \), whether or not \( \psi \)’ is equivalent to ‘if \( \psi \), \( \phi \), and if not \( \psi \), \( \phi \)’.\(^{17}\)

So, in principle, one could attempt to block the argument by objecting that Face Value is false.\(^{18}\) The situation with this line of response is rather puzzling. On the one hand, there do not seem to be even the beginnings of a case against Face Value. It just seems unproblematically true. On the other hand, there is a very strong motivation to think that there ought to be something wrong with it. Let me expand on this last point.\(^{19}\)

The objector’s thought goes as follows: there must be something wrong with Face Value because the argument that is being proposed is an argument that purports to elicit a special feature of ‘if’ (its failure to shift the epistemic context in some cases), and if the argument were successful, we should be able to see clear examples of such failure to shift context without having to resort to extravagantly complex nested whether-conditionals. In the absence of such clear examples, the argument that appeals to nested whether-conditionals is bound to look suspect, and Face Value is the link that allows the argument to locate the problem in the behavior of the conditional, rather than in some special feature of ‘whether’. One can say more in response to this objection than merely point to the obviousness of Face Value, but matters are not straightforward.

First, note that the ‘whether’ is not essential. The argument against import-export and Heim’s theory could as well be formulated by appeal to nested even-ifs. So, consider

(12) If you pass, you’ll pass even if you don’t pray. (uttered in Pass/Fail)

It seems that (12) is informative, just as (6) is, and, intuitively, for the same reason (its felicity of course depends on it being taken for granted that praying is more likely to help passing than not praying). But (12) is predicted to be trivially true both by import-export and by Heim’s theory.\(^{20}\) So we cannot get around the central problem by postulating a semantics for whether-conditionals that diverges from Face Value.

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\(^{17}\) Note that I am not here attempting to arrive at the meaning of whether-conditionals compositionally, and so derive Face Value. For an analysis that does derive such an equivalence, as well as for further details on the syntax and semantics of whether-conditionals and other related constructions, see Rawlins (2013).

\(^{18}\) Note that the argument against Heim’s view does not in fact need Face Value to go through. All one needs is the very weak assumption that ‘\( \phi \), whether or not \( \psi \)’ is trivially true in a context that takes \( \psi \) for granted. Then Heim would still predict (6) to be trivially true in Pass/Fail.

\(^{19}\) Thanks to my anonymous reviewer for urging these concerns on my attention.

\(^{20}\) The standard view on even if conditionals is something like this:

1. ‘\( \psi \), even if \( \phi \)’ is true in \( w, c \), just in case ‘if \( \phi \), then \( \psi \)’ is true in \( w, c \).
2. ‘\( \psi \), even if \( \phi \)’, uttered at \( w, c \), carries the presupposition that

(a) 1. the context \( c \) is partitioned by some salient partition \( R = R_1, R_2, \ldots R_n \), that is ordered by some salient relation > (let’s say \( R_1 > R_2 > \cdots > R_n \)).
(b) 2. \( \phi = R_n \). (alternatively, perhaps \( \phi = R_j \), for some \( j \leq n \))
(c) 3. ‘if \( R_i \) then \( \psi \)’ is true in \( w, c \), for all \( R_i < \phi \).
But there still seems to be a difficulty: can’t we replicate the deviant behavior with plain vanilla nested conditionals? If we accept *Face Value*, we are accepting that

(6) If you pass, you’ll pass whether you pray or not.

is equivalent to

(8) If you pass, then you will pass if you pray, and you will pass if you do not pray.

which in turn is equivalent to

(9) If you pass, then you will pass if you pray, and if you pass, then you will pass if you don’t pray.

But if this is so, then why, one ought to ask, does one need nested whether- and even if-conditionals to demonstrate the point? Isn’t (9) itself sufficient to make the argument? But it appears that our intuitions with regard to (9), and especially with regard to its conjuncts,

(13) If you pass, then you will pass if you pray

and

(14) If you pass, then you will pass if you don’t pray.

are not nearly as strong as our intuitions about (6). This divergence in intuitions is interesting, but I think that it can be explained. Let’s focus on (13).

Note first that (13) is awkward because not maximally informative. There are two sorts of case in which Joe passes: cases that involve praying and cases that do not involve praying. And it goes without saying that if Joe prays and passes, then he will pass if he prays. So really what one would like to say in place of (13) is:

(15) If you don’t pray and pass, then you will pass if you pray (too).

I find (15) felicitous in Pass/Fail, especially with an added focus on ‘don’t’. But not everyone has that intuition. Perhaps comparing (15) with the following might help:

(16) If you pass without the aid of praying, then you will pass if you pray, too.

This seems perfectly felicitous, and it is clear that it is equivalent to (15).

So it seems clear that the effect of deviance can be replicated with nested conditionals involving ‘even’ and ‘too’, though it is still hard to get with unadorned

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Footnote 20 continued
For a review of the semantics of ‘even’, see Giannakidou (2007). For more on ‘even if’, see Lycan (2001), Barker (1994), Bennett (1982). Note that the precise semantics of ‘even if’ does not matter much for the point I wish to make here: (12) would still come out trivially true in Pass/Fail.
nested indicatives. But it would be a mistake to think that ‘whether’, ‘even’ and ‘too’ are markers of deviance. As we shall see in the next section some nested whether-conditionals are not deviant (and neither are the corresponding varieties with ‘even’ and ‘too’).

6 Singularity

So far, we have had some examples of the deviant behaviour of ‘if’, but the general question remains: just when is ‘if’ deviant? To get a handle on the phenomenon of deviance, it would be very helpful to know under what circumstances it arises. Here, again, it is rather tempting to suppose that there is something special about whether-conditionals that is responsible for this. However, this temptation is to be resisted. So consider this nested whether-conditional, uttered in Pass/Fail:

(17) If Joe passes, he’ll throw a party whether his neighbors like it or not.

I think it is clear that the truth of (17) does not depend on whether Joe will throw a party whether his neighbors like it or not in worlds in which he fails the exam. Supposing that his neighbors’ sensitivity to loud music prevents him from throwing a party at one of those worlds does not stand in the way of (17)’s truth. Rather, the truth of (17) depends only on what happens in worlds in which Joe passes, and his neighbors are cooperative, and on what happens in worlds in which Joe passes, but his neighbors are not cooperative (note that I am in effect employing import-export here). (17) is normal, not deviant.

What lesson are we to draw from (17)? Clearly, the following generalization, by which we might have otherwise been tempted, is false:

False Generalization (‘blame the ‘whether’’)

All nested whether-conditionals are deviant: the evaluation of the consequent proceeds in a non-shifted context.

The False Generalization, if true, could be the beginning of an explanation of deviance that appealed to some special feature of ‘whether’. But (17) speaks against the False Generalization. I suggest, instead, that what distinguishes (6) from (17) is that in (6) the antecedent is identical with the nested consequent. Let’s call nested whether-conditionals with this feature singular. Singular nested whether-conditionals are sentences of the form ‘if φ, then φ, whether or not ψ’. I propose the following empirical generalization:

Singularity

All and only singular nested whether-conditionals are deviant: the evaluation of the consequent proceeds in a non-shifted context.²¹

²¹ I am focusing on nested whether-conditionals here. But the generalization extends immediately to nested even-ifs and plain nested indicatives: these are singular when the nested consequent is identical to the antecedent.
Let me stress that Singularity is a purely empirical generalization, and should be accepted (or rejected) by studying our actual use of nested whether-conditionals. I propose that we assume that it is singularity that is responsible for deviance, and try to explain how this might come about.

7 The solution: Heim+

Let’s take stock. Sometimes nested indicatives behave normally, and ‘if’ shifts the epistemic context—as shown by (2) in the Election. Sometimes nested indicatives behave deviantly, and ‘if’ somehow fails to shift context—as shown by (6) and (7) in Pass/Fail. These two cases pull our semantic theory in opposite directions. That’s the central problem. Finally, in the last section, I proposed an empirical generalization: only singular whether-conditionals are deviant. I would like now to offer a theory that accounts for these facts. The theory consists of three components: (1) Heim’s semantics for indicatives, (2) the open consequent presupposition for indicatives, and (3) a peculiar kind of presupposition accommodation mechanism. None of the three components has much independent support, so my argument is best seen as an inference to the best explanation for the three-part package. In this section I will argue that the fact that only singular whether-conditionals are deviant suggests very naturally parts (2) and (3) of the package. In Sect. 8, I will argue that given (2) and (3), the acceptance of (1)—Heim’s semantics—is inescapable: no other currently available semantics for indicatives will do.

First, I propose that we, for the time being, adopt Heim’s semantics:

\[ \text{Heim} \]

An indicative ‘if } \phi, then } \psi \text{’ is true in } w, c, \text{ iff } \psi \text{ is true in } \text{sim}(w, c + \phi), c + \phi

Now recall that the deviance of (6) consisted in that

\[ (6) \quad \text{If you pass, you’ll pass whether you pray or not.} \]

is evaluated in such a way that we evaluate ‘you’ll pass whether you pray or not’ in a wider context—not in c + Joe Passes, but in c. Here, ‘if’ fails to shift the epistemic context.

Let’s take singularity our guide: when the consequent of ‘if } \phi, then } \psi, \text{ whether or not } \theta \text{’ is identical with the antecedent, i.e. when } } \phi = \psi, \text{ we are forced to evaluate } \psi, \text{ whether or not } \theta \text{’ in c, rather than in } c + \phi. \text{ Here is a natural hypothesis that seems like a step in the right direction: when we evaluate (6), we first, as we ought, update the context with the antecedent: we move from } w, c \text{ to } \text{sim}(w, c + \text{Joe passes}),

\[ \text{Note that it is very natural to think that singularity extends also to those nested whether-conditionals ‘if } \phi, \text{ then } \psi, \text{ whether or not } \theta \text{’ in which } \phi \text{ entails } \psi. \text{ I do not have the data to test this generalization. However, the arguments below would not be affected if it turned out deviance is more wide-spread.} \]
c + Joe passes. But now, suppose that indicative conditionals carry the following presupposition:

**Open consequent presupposition**

‘if $\phi$, then $\psi$’, evaluated in $w$, $c$, presupposes that $c$ contains $\psi$-worlds and that $c$ contains $\neg\psi$-worlds. $^{23,24}$

How does this help with evaluating (6)? Once we have updated the context with ‘Joe passes’, the open consequent presupposition is no longer satisfied by $c + Joe$ passes, because that presupposition demands that the context contain worlds in which Joe passes, and worlds where he does not. I propose that we appeal here to presupposition accommodation. First, what is presupposition accommodation? $^{25}$

For example, suppose that our current context $c$ is agnostic as to whether Joe is married, and also agnostic as to whether he has children. Now, someone says:

(18) If Joe is married, his children are at home.

The consequent carries the presupposition that Joe has children. Now, we have a choice. We can object to (18) with something like, ‘Hey, we didn’t know that Joe had children!’; or we can take (18) to be informative, that is, we can accept the assertion of (18). And there is no doubt that we often do just that. Two questions: first, how can we accept (18), given that the presupposition is not satisfied by the context of utterance? Second: what is it that we learn when we accept (18), or put differently, how do we update the context?

The answer to the first question is pretty uninformative: the answer is that we need to posit a new mechanism, presupposition accommodation. The mechanism works as follows: when $\phi$ is uttered in a context $c$, and $\phi$ carries a presupposition that $\psi$, and the context does not satisfy $\psi$ (that is, some worlds in $c$ are $\psi$-worlds, and some not), we pragmatically restrict the context to $c + \psi$, and evaluate $\phi$ in the new, restricted context. The result of the update is $c + \psi + \phi$.

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$^{23}$ Although there is not much evidence for the open consequent presupposition, it has one strong argument in its favor: as von Fintel (1998, pp. 8–9) shows, it allows us to solve the problem of non-counterfactual subjunctives (aka the Anderson sentences like ‘Had the patient taken arsenic, he would be showing just the symptoms he does in fact show’). von Fintel calls it ‘consequent variety’, but suggests that it is weaker than a presupposition—merely a ‘presumption’. I am not sure what presumptions are, and so stick with the status of presupposition.

$^{24}$ An anonymous reviewer proposed the following counter-example to the open consequent presupposition: ‘If Ramsey’s theorem holds for two colors, it holds for any finite number of colors’. The conditional is felicitous, and yet there are no possible worlds in which the consequent is false. I think such examples show little. Examples involving necessarily true antecedents could, in the same fashion, be considered counter-examples to the open antecedent presupposition for indicatives, and yet this presupposition is firmly established: in our present state of knowledge, no indicative beginning with ‘if Kennedy is alive,...’ is felicitous. Perhaps such examples are to be treated by postulating epistemically possible yet metaphysically impossible worlds. That said, I do not claim to have an outright argument for the open consequent presupposition. In the present context, I am putting it forward as part of a package that best explains the data (viz. the deviant behavior of ‘if’).

$^{25}$ For more on presupposition accommodation, see von Fintel (2008).
There is one more important detail that (18) brings out. When we accept the assertion of (18) in the context that is agnostic about the existence of Joe’s children, we in fact have two ways in which we could update.

We can accommodate \textit{globally}. We can first update the context with ‘Joe has children’. The result of this will be the following update: $c \rightarrow \text{Joe has children} + \text{If Joe is married, his children are at home}$. The result is a context in which it is certain that Joe has children.

We can also accommodate \textit{locally}. We can first shift to the context $c \rightarrow \text{Joe is married}$ (beginning to interpret the conditional), and then accommodate. The result is a context in which it is not certain that Joe has children, but certain that if Joe is married, he has children. (one can say: it is as if we accommodated globally, but not the presupposition of the consequent, but a different, conditional proposition: if Joe is married, he has children).

Now let’s come back to (6). First, observe that in the case of (6), we cannot accommodate the open consequent presupposition globally. Were we to do it, our labor would immediately have been lost, since, once we update by the antecedent of (6), the context would again be one that does not satisfy the open consequent presupposition. So we must accommodate locally.

But things are more complicated still. The familiar cases of accommodation are cases where the context (global or local) is \textit{restricted}—updated by some proposition (as with (18)). But in our case, the open consequent presupposition cannot be accommodated by restricting the (local) context $c + \text{Joe passes}$—our problem is that the context is already too restricted. I suggest that in this case, we accommodate up, instead of down: we accommodate not by restricting the context, but by expanding it.\footnote{Do we have examples of accommodation by expansion? Perhaps we do. When one believes that $P$, and someone else asserts that $Q$, such that $Q$ presupposes $\neg P$, one can only accommodate by expansion, if one accommodates at all.}

\textbf{Up-accommodation of the open consequent presupposition}

If ‘if $\phi$, then $\psi$’ is evaluated in context $w$, $c$, and $c$ entails $\psi$, the context is, through presupposition accommodation, expanded to $c-\psi = c \setminus \{\psi\}$.\footnote{Note that here it is crucial that $c$ is a set of propositions, rather than a set of worlds. If we removed all the $Q$-worlds from $c$, we would be left with the empty set, in cases where up-accommodation is triggered by the failure of the open consequent presupposition. The issue here is related to the problem of making counterfactual assumptions discussed by Veltman (2005). In fact, the two issues might just be one.}

It is important to point out that, while it suffices for the cases we are concerned with, the formulation just given may need to be revised. So, for example, consider the possibility that $c-\psi$ entails $\psi$. The above definition suggests that in such a case we still do not succeed in accommodating the open consequent presupposition, and so presumably irremediable presupposition failure would result. But it may well be the case that in such cases we in fact successfully accommodate. If so, the up-accommodation mechanism would have to be complicated further.\footnote{Note also that if we wanted up-accommodation to guarantee that the resulting context satisfies the open consequent presupposition, there would of course be, in principle, many ways to do it: if a set of}
To sum up my proposal so far: I am proposing that we enrich Heim’s theory. Accepting open consequent presupposition and up-accommodation gives us the following theory, call it Heim+:

Heim+

1. Truth-conditions:
   An indicative ‘if $\phi$, then $\psi$’ is true in $w, c$, iff $\psi$ is true in $\text{sim}(w, c + \phi)$, $c + \phi$

2. Presuppositions:
   An indicative ‘if $\phi$, then $\psi$’, evaluated in $w, c$, has the presupposition that $\psi$ is open in $c$, i.e. that $c \not\models \psi$ and $c \not\models \neg \psi$.

3. Presupposition Accommodation:
   When the open consequent presupposition is not satisfied by the local context, the local context accommodates up: $c \Rightarrow c - \psi$.

Heim+ is just like Heim in non-singular cases (e.g. (17) and (2)), and so Heim+ gives us the right results in the Election, and for or-to-if conditionals generally. But Heim+ also gives us the right result for Pass/Fail: (6) and (7) trigger the presupposition accommodation mechanism, and their consequents are evaluated in expanded local contexts. This resolves the central problem.

To illustrate, here is how Heim+ handles (6). Let’s evaluate (6), step by step, in Pass/Fail.

(6) If you pass, you’ll pass whether you pray or not.

1. we update the context $w, c$, to $\text{sim}(w, c + \text{Joe passes})$, $c + \text{Joe passes}$.
2. we encounter the open consequent presupposition failure, trying to evaluate ‘Joe will pass, whether he prays or not’, in $\text{sim}(w, c + \text{Joe passes})$, $c + \text{Joe passes}$. So we accommodate up to $\text{sim}(w, c + \text{Joe passes})$, $c$.
3. we evaluate ‘Joe will pass, whether he prays or not’ in $\text{sim}(w, c + \text{Joe passes})$, $c$. Pass/Fail is god-agnostic. So suppose first that $\text{sim}(w, c + \text{Joe passes})$ is a world with a god who punishes non-prayer: if you don’t pray, he makes you fail. Then ‘Joe will pass, whether he prays or not’ will be false in $\text{sim}(w, c + \text{Joe passes})$, $c$. On the other hand, suppose that $\text{sim}(w, c + \text{Joe passes})$ is a world without a god, then ‘Joe will pass, whether he prays or not’ will be true in $\text{sim}(w, c + \text{Joe passes})$, $c$.

So, (6) is informative: it tells Joe that god does not punish non-prayer (and similarly for other possibilities—rewarding prayer, etc.). Heim+ handles both deviant and normal cases.

In the next section, I will address the question whether other theories of the indicative can be similarly fixed with the addition of presupposition/accommodation.
mechanism of the sort described in this section. But first I would like to address a criticism of the present proposal.  

Consider

(19) Whether or not Oswald shot Kennedy, somebody shot Kennedy.

Supposing *Face Value*, (19) is equivalent to a conjunction of ‘if Oswald shot Kennedy, somebody shot Kennedy’ and ‘if Oswald did not shoot Kennedy, somebody shot Kennedy.’ The first of these conditionals is trivial, but focus on the second. If (19) is uttered in a context in which it is taken for granted that somebody shot Kennedy, then

(20) If Oswald did not shoot Kennedy, somebody shot Kennedy.

fails the open consequent presupposition, and thus, according to the proposal laid out above, should make possible presupposition accommodation, which in the present context would mean removing the proposition that somebody shot Kennedy from the epistemic context of utterance. But if we do remove that proposition from the context, and if we stick with the Heim’s theory of the indicative, then the nearest world in which Oswald does not shoot Kennedy is very likely to be a world in which no one does. It appears, therefore, that according to the proposal on the table (20) is likely false, and therefore (19) as well. Yet (19) seems true.

I do not have the full story, but I think what is going on in such cases is this. When the presuppositions of indicative conditionals fail, the subjunctive mood is mandatory. Thus, in the context in which it is taken for granted that Oswald killed Kennedy, the indicative ‘If Oswald did not kill Kennedy, ...’ is not available because its presupposition is not satisfied. Only the subjunctive ‘Had Oswald not killed Kennedy,...’ is available. Similarly for open consequent presupposition failure. In the context in which it is taken for granted that Kennedy was shot, (20) is not available. What is available is the subjunctive:

(21) Had Oswald not shot Kennedy, somebody else would have.

which is plausibly false. In sum, my diagnosis is this: were (20) available in the context, the presupposition/accommodation mechanism would predict its falsehood, but it is not in fact available.

So why does it seem that (20) is assertible in our present state of knowledge? I suggest it is because we have a difficulty distinguishing between two kinds of context. In one context, it is taken for granted that Kennedy was shot. In that context, (20) is not assertible because of presupposition failure. The mandatory switch to subjunctive trumps the accommodation mechanism I describe. In a second context, it is not taken for granted that Kennedy was shot. In that context, (20) is assertible and informative. The trouble is that it is not always clear to us whether a given conversation about Kennedy’s death proceeds in the first or in the second kind of context. So when someone strikes up a conversation about Oswald and Kennedy with a leading assertion of (20), we are likely to suppose that in conversation with
this particular speaker Kennedy’s death (or his having been shot, in any case) is not
taken for granted, however obvious it is to other participants in the conversation that
Kennedy was in fact shot. So in the natural context in which (20) is asserted, it is not
taken for granted that Kennedy was assassinated—and thus the presupposition
accommodation mechanism I described is never engaged.

8 Why Heim?

Now we have an explanation of deviance: singularity triggers a mechanism of
presupposition accommodation via the open consequent presupposition. We have
just seen how the mechanism, combined with Heim’s semantics, handles Pass/Fail.
But the mechanism itself is theory-neutral, and can be combined with any semantic
theory of indicative conditionals. So the next natural question is: can our success
with Heim+ be replicated by fixing up other theories with the proposed mechanism?
I think that the answer is no, but I do not have a general argument that would rule
out success in every case. Instead, I will illustrate two cases of failure—I’ll show
that McGee+ and Kratzer+ fail to make the right predictions in Pass/Fail.

McGee’s theory goes as follows.

McGee

An indicative ‘if $\phi$, then $\psi$’ is true in $w$, $c$, iff ‘$\psi$’ is true in $w$ under the set of
hypotheses $c + \phi$.\footnote{Here is how McGee explains it: ‘It is not hard to modify the Stalnaker semantics so that it has the right
logical features, instead of a simple notion of truth in a world, we develop a notion of truth in a world
under a set of hypotheses. To be simply true in a world is to be true in that world under the empty set of
hypotheses. If there is no world accessible from $w$ in which all the member of $\Gamma$ are true, then every
sentence is true in $w$ under the set of hypotheses $\Gamma$. Otherwise we have the following: An atomic sentence
is true in $w$ under the set of hypotheses $\Gamma$ iff it is true in the possible world most similar to $w$ in which all the
members of $\Gamma$ are true... Finally, ‘$\phi \rightarrow \psi$’ is true in $w$ under the set of hypotheses $\Gamma$
iff $\psi$ is true in $w$ under the set of hypotheses $\Gamma \cup \{\phi\}$’. (McGee 1985).}

The recursive definition of ‘true under the set of hypotheses $\Gamma$’ is in the footnote.
But the basic idea is this: ‘An atomic sentence is is true in $w$ under the set of
hypotheses $\Gamma$ iff it is true in the possible world most similar to $w$ in which all the
members of $\Gamma$ are true... Finally, ‘$\phi \rightarrow \psi$’ is true in $w$ under the set of hypotheses $\Gamma$
iff $\psi$ is true in $w$ under the set of hypotheses $\Gamma \cup \{\phi\}$’ (McGee 1985).

McGee’s theory looks superficially like Heim’s, but there is a core difference,
that comes out most clearly if we trace what McGee says about right-nested
indicatives. Take an arbitrary right-nested indicative

(22) if $\phi$, then if $\psi$, then $\theta$. 
McGee says that (22) is true in w, c just in case ‘if ψ, then θ’ is true in w on the hypothesis that c + φ, which, in turn, is true just in case θ is true in w on the hypothesis that c + φ + ψ— that is, just in case the closest c + φ + ψ-world to w is a θ-world. Contrast this with Heim’s prediction that (22) is true in w, c just in case θ is true in sim(sim(w, c + φ), c + φ + ψ), c + φ + ψ. Heim and McGee both shift the epistemic context, but Heim (like Stalnaker) also shifts the world of evaluation. (McGee’s ‘if’ also shifts the world of evaluation—θ is evaluated in the closest c + φ + ψ-world, but McGee shifts the world of evaluation only once, at the end of a chain of ifs). It is easy to see that this allows McGee to validate import-export, which was indeed his goal in devising the semantics.

Now, we can modify McGee’s semantics just as we did Heim’s. The result will be McGee+. What predictions does McGee+ make in Pass/Fail? McGee+ gives the wrong result. Here is the argument. Consider Pass/Fail**, which is just Pass/Fail together with the knowledge that there are no gods. Joe ought to think both (6) and (7) true, no matter which world in c is actual. That’s because Pass/Fail** has no gods that listen to prayers. But not according to McGee+. Here is the idea. Recall:

(6) If you pass, you’ll pass whether you pray or not.

Now, McGee+ suggests we evaluate (6) as follows:

1. (6) is true in w under the set of hypotheses c just in case ‘you’ll pass whether or not you pray’ is true in w under the set of hypotheses c + Joe passes.
2. We encounter open consequent presupposition failure, and shift from the set of hypotheses c + Joe passes to the set of hypotheses c.
3. We evaluate ‘you’ll pass whether or not you pray’ in w under the set of hypotheses c.

Now, if w is a world in which Joe does not pass (certainly a possibility), then ‘Joe will pass, whether he prays or not’ will be false in w, c. That’s the wrong result. What is responsible for failure? I think the answer is pretty clear: the problem is that when the presupposition accommodation mechanism is triggered, McGee+ reverts to the original context of evaluation w, c. Heim+, by contrast, reverts to sim(w, c + Joe passes), c. In other words, what allows Heim+ to get things right is that Heim+ shifts the world of evaluation. McGee+ does not shift the world of evaluation, and so gives the wrong result.

Similar remarks apply to strict-conditional approaches, like Kratzer’s theory. Strict-conditional theories come in different varieties, but for our purposes I’ll adopt the following bare-bones account:

Kratzer’s semantics

‘if φ, then ψ’ is true in w, c just in case ’ψ’ is true in w, c + φ for every w in c + φ.

Again, let’s consider Pass/Fail**, and go through the reasoning:

1. (6) is true in w, c just in case ‘you’ll pass whether or not you pray’ is true in w, c + Joe passes for every w in c + φ.
2. We encounter open consequent presupposition failure, and shift from the context $c + \text{Joe passes}$ to the context $c$.

3. We evaluate ‘you’ll pass whether or not you pray’ in $w, c$, for every world in $c$.

So ‘Joe will pass, whether he prays or not’ will be false in $w, c$, because $c$ contains worlds in which Joe does not pass.

To sum up. The argument in favor of Heim+ is of course far from complete. But the failure McGee+ and Kratzer+ points to the crucial role that the shifting of the world-parameter plays in Heim+. If the shifting of the world-parameter is indeed essential, then Heim+ is the right theory.

9 Conclusion

Now we have a theory, Heim+, that accounts for both normal and deviant behavior of ‘if’. It needs two new principles: open consequent presupposition, and up-accommodation. Both are controversial, and both in need of further investigation. Nevertheless, if both are accepted, we have a solution to the problem of deviance and an argument for a new semantics of indicative conditionals.

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