Toward a dissolution of the proviso problem*

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What is the relationship between presupposition *projection* and presupposition *accommodation*? One simple answer to this question comes from David Lewis (assuming that by 'P comes into existence' he means that P is accommodated):

> If at time t something is said that requires presupposition P to be acceptable, and if P is not presupposed just before t, then— *ceteris paribus* and within certain limits—presupposition P comes into existence at t. (Lewis 1979, p. 234)

According to received wisdom, however, Lewis' answer cannot be correct. More precisely, orthodoxy has it that a reasonable interpretation of Lewis (what I'll call *the identity hypothesis* below) is incompatible with a plausible account of the nature of presuppositions—what following (Geurts 1996) I'll call the *satisfaction theory*. For according to that account (1a) has (1b) as its presupposition.[1] But it is clear that after an utterance of (1a) it is (1c) instead what is accommodated:

(1)   a.   If Paul isn't tired, he will read his Bible tonight.
       b.   If Paul isn't tired, he owns a Bible.
       c.   Paul owns a Bible.

If the identity hypothesis is false, then we are owed an alternative account of the relationship between projection and accommodation. The *proviso problem*

[1]Let me make clear at the outset that I will be very sloppy with the distinction between a sentence ϕ and the proposition expressed by ϕ. According to the satisfaction theory, presuppositions are *propositions*, not sentences. But the discussion becomes significantly easier to handle if one takes *sentences* to be what is presupposed. I will return to this later on. Also, I will use Greek schematic letters as names for themselves, for the sake of legibility, whenever this doesn't lead to confusions.

(Geurts 1996; Geurts 1999) is that of providing an alternative to the identity hypothesis that is compatible with the satisfaction theory of presuppositions. As we will see, the task is not straightforward. But the reasons for that are somewhat different than what is usually supposed.

The purpose of this note is not to provide a *solution* to the proviso problem. Rather, I will provide some reasons for reconsidering the case against the identity hypothesis.[2] Before I do that, I need to do some preliminary work, so that we can see how and why the problem emerges. And before *that*, I need to make a few observations to avoid some possible misunderstandings.

It is sometimes said that the data in (1) is a straightforward counterexample to the satisfaction theory. The datum, according to this story, was that (1a) *presupposed* that (1c), and that the satisfaction theory failed to predict that. But this way of characterizing the data is somewhat question-begging. The datum is that an utterance of (1a) will, in most contexts, license an inference to the effect that (1c) is true. In other words, that from an assertion of (1a) by a speaker one takes to be knowledgeable on the subject, one can reasonably infer that (1c) is true. The move from this observation to the claim that (1a) *presupposes* that (1c) is a *non sequitur*. After all, it would be a substantial claim to say that presuppositions just are part of what one can reasonably infer from an utterance of a sentence. And since the satisfaction theory is an account of what presuppositions *are*, such a claim would beg the question against the satisfaction theorist. All we have in (1) is the following: an utterance of a sentence licenses an inference of something stronger than its predicted presupposition. More work needs to be done in order to see why this is a problem. This I what I will set out to do.

1 Preliminaries

1.1 Communication and context update

According to a prominent picture of communication, conversation takes place against a set of background assumptions that are taken for granted for the purposes of the conversation.[3] For our purposes, we can make the harmless simplification of taking that set to represent the shared information that is mutually recognized among participants in the conversation. This set of assumptions, the *common ground*, can be modeled as a set of possible worlds—the worlds that, according to what information is mutually recognized, could be the actual

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[2]Although I focus here on indicative conditionals, there are other examples—involving existential modals, sentences carrying existential presuppositions, etc.—on which one could build a case against the identity hypothesis. What I say here should hopefully apply, *ceteris paribus*, to other such examples so long as the presupposed material is contextually entailed by the accommodated material. However, for reasons of space, I won't be able to discuss what seem to be cases where the accommodated material is weaker, or cases where there there seems to be evidence that the accommodated material is distinct, yet contextually equivalent, to the presupposed material (see Singh 2007 for a number of interesting examples and discussion). Cases like these raise a host of delicate issues that fall beyond the scope of this paper.

[3]Stalnaker 1978.

world. The point of assertion, in this picture, is to add information to the common ground—to narrow down the set of alternatives in order to figure out what the actual world is like.

If we identify a context with its common ground, we can single out the central question for this picture of communication in the following terms. Given an utterance of a sentence ϕ in a context c, how will c evolve? In other words, how is a context c updated after an utterance of ϕ?

Once ϕ is added to the common ground, the common ground should entail that ϕ—by this I mean simply that the proposition expressed by ϕ in c should be true in every world in the resulting common ground; in symbols, '$c \models \phi$'. So a good starting point is the hypothesis that the result of updating c with an utterance of ϕ, denoted by '$c + \phi$', is the largest c' subset of c such that $c' \models \phi$. Formally

$$c + \phi = \{w \in c : [\![\phi]\!]_c(w) = 1\}.$$

Admittedly, this working hypothesis is too simplistic. First, it ignores the way in which facts about the conversation itself affect and become part of the common ground. More importantly, the hypothesis leaves aside facts about implicatures. In particular, if ϕ implicates that ψ, the result of updating c with an utterance of ϕ will normally yield a context satisfying ψ. At this point, I will ignore such complications (though I'll have time to come back to this). What matters for our purposes is that from this picture of communication emerges quite naturally an elegant account of presuppositions.[4]

1.2   The satisfaction theory

In order to be felicitously asserted in a context, some sentences impose certain conditions on the common ground. Among these conditions are the sentence's *presuppositions*: information that the context must entail if the sentence is to be used successfully to update the context.[5] More precisely:

> THE SATISFACTION THEORY: A sentence ϕ presupposes that π if for all contexts c, $c + \phi$ is defined only if c entails that π.

Traditionally, the presuppositions of ϕ are encoded in the definition of the interpretation function. That is, $[\![\phi]\!]_c$ is not defined unless c entails the presuppositions of ϕ. But for our purposes it will do to focus on the more general definition.

A nice feature of this account is that the so-called *projection problem*— that of predicting the presupposition of complex sentences as a function of the presuppositions of its constituents—can be clearly formulated: the problem is to provide the definability conditions of a sentence given the definability conditions

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[4]See Heim 1983, 1990, 1992; Stalnaker 1999 as well as Beaver 1992, 1997a,b; Fintel 1997, 2000, 2001b, 2006, *inter alia.*

[5]Recall that I'm identifying contexts with their common ground, or context set. Thus, I will speak of a context entailing a proposition when I should speak of the *common ground* of the context entailing that proposition.

of its constituents. (Note, however, that the satisfaction theory isn't an answer to the projection problem. In principle, different theories of projection could be compatible with this theory of what presuppositions are.)

A not so nice feature of this account is that it seems incomplete. For according to this story, a sentence ϕ cannot be used to update a context that doesn't satisfy its presuppositions. But this flies on the face of the evidence: I can perfectly well use (2) in a context where it is not common ground that Paul owns a piano.

(2)   I can't make it tonight: I promised I'd help Paul move his piano.

Indeed, unless you had reasons for thinking Paul did *not* own a piano, you will accept my utterance of (2). Moreover, you will most certainly *infer* from it that Paul owns a piano.

This so-called phenomenon of *informative presuppositions* has been thought to be an important challenge for the satisfaction theory.[6] But partisans of the satisfaction theory have had something to say about it. The blanket term for what is going on here, they say, is *accommodation*. According to the story, the necessary presuppositions are somehow accommodated by participants in the conversation, who then proceed to update the accommodated context with what was said. And while the most difficult questions concern why this process takes place the way it does,[7] a more tractable question is the one we will be concerned here: what is accommodated?

The satisfaction theorist could, no doubt, claim that this is not the primary concern for a theory of presupposition projection. But the examples discussed by Geurts and others have some claim to be representative of a systematic phenomenon. We all agree that the project we are engaged in rests on a number of idealizations, but the data suggest regularities that call for an explanation. And if a theory of projection cannot be hooked up to a plausible story that accounts for such regularities, then the theory of projection has to go.

1.3   Accommodation

So what can be said about the way in which accommodation works? Accommodation, as Fintel (2006) puts it, is supposed to be 'the process by which the context is adjusted quietly and without fuss to accept the utterance of a sentence that puts certain requirements on the context in which it is processed.' So if a speaker utters a sentence carrying the presupposition that π, then it seems reasonable to expect cooperative participants in the conversation would grant her that π unless they had antecedent reasons for doubting that π, for believing that the speaker has no authority on whether π, or if for some reason or other they think that π should have been asserted.[8] Or, as David Lewis (1979) put it: 'say something that requires a missing presupposition, and that presupposition

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[6]See, e.g. Gauker 1998, as well as the references in Fintel 2006.

[7]For illuminating discussion, see von Fintel, *op. cit.*, as well as Stalnaker 2002.

[8]See Stalnaker 1974.

straightaway springs into existence, making what you said acceptable after all.'
All this suggests a very simple hypothesis about the way accommodation works:
what is accommodated *just is* what is presupposed. This is what I called *the
identity hypothesis*:

> THE IDENTITY HYPOTHESIS: Whenever a sentence is uttered in a context
> that doesn't meet its presuppositions, the context is minimally modified
> to accommodate the sentence's presuppositions.

More succinctly, if we write ϕ_π whenever ϕ presupposes that π, we can
reformulate the identity hypothesis as an extension of our account on how the
context is updated after an assertion to sentences carrying presuppositions. In
particular, we have

$$c + \phi_\pi = c + \pi + \phi.$$

Note that the above should not be taken to mean that any sentence carrying
presuppositions can be successfully used to update a context. The hypothesis,
as I understand it, is only an account of how accommodation works *whenever
it works*. Also note that the same is true of our hypothesis about the way
the context is updated after utterances of sentences with no presuppositions.
There's no guarantee that any sentence can be used to update a context. Our
hypothesis on how updating works is silent on the question of when a sentence
can be used to successfully update a context.

2   The proviso problem

I claimed earlier that the satisfaction theory predicts that a conditional like (1a)
(which I repeat below for your convenience) carries (1b) as its presupposition:

(1) a. If Paul isn't tired, he will read his Bible tonight.
     b. If Paul isn't tired, he owns a Bible.
     c. Paul owns a Bible.

If this is right, then the identity hypothesis cannot be correct, for on the face of
it what is accommodated after an utterance of (1a) is (1c). The *proviso prob-
lem* is to provide an alternative account of how projection and accommodation
interact:

> THE PROVISO PROBLEM: Provide an alternative to the identity hypoth-
> esis, compatible with the satisfaction theory, that makes the right pre-
> dictions.

Now, you might object that I haven't fully spelled out a theory of projection,
so that there might be implementations of the satisfaction theory according
to which (1b) is not what is presupposed by (1a). That might be right, but
I will argue that, under plausible assumptions, the satisfaction theorist will be
committed to such a prediction. If my arguments are sound, it will turn out that

the proviso problem is not just a problem for a particular theory of projection that complements the satisfaction theory,[9] but for the satisfaction theory itself.

After trying to convince you that a satisfaction theorist must predict that (1b) is what is presupposed by (1a), I will go on to present Bart Geurts's case for the insolubility of the proviso problem.[10] If Geurts is right, it may turn out that the difficulty comes not from the identity problem, but from the satisfaction theory itself.

2.1 Predictions

For now, I want to remain neutral on what the right analysis of the indicative conditional is going to be. So I will simply let 'ifϕ, ψ' stand for the indicative conditional with ϕ as antecedent and ψ as consequent. I will also say that ϕ *entails* ψ—in symbols, $\phi \models \psi$—whenever for all contexts c, if $c \models \phi$, $c \models \psi$.

An assumption I need to make, however, is that a conditional[11] is entailed by its consequent. That is, I need to assume that $\psi \models (\text{if}\phi, \psi)$.[12] The reason is simple: otherwise, we couldn't do justice to the fact that whenever $c \models \pi$, an assertion of ifϕ, ψ_π in c does not require accommodation. I now need to make two observations. First, note that (3a) below induces accommodation of (3b).

(3) a. If Paul is a devout Catholic, he will read his Bible tonight.
  b. If Paul is a devout Catholic, he owns a Bible.

Also, note that a context entailing (3b) would admit (3a) without any accommodation taking place. Second, notice that that after a successful assertion of a sentence ϕ, the updated context must satisfy all the presuppositions of ϕ. That is, $c + \phi_\pi \models \pi$. It follows that whatever is accommodated after an utterance of ϕ will entail the presuppositions of ϕ (modulo c).

Now, let $\Pi(\text{if}\phi, \psi_\pi)$ denote the presupposition of ifϕ, ψ_π. Note that the observations above concerning (3) suggest that ifϕ, π entails $\Pi(\text{if}\phi, \psi_\pi)$. I now need to make an empirical assumption, viz. that for all c, $c + \text{if}\phi, \psi_\pi \models \text{if}\phi, \pi$. This is suggested by the data in (3); moreover, given our assumption that π

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[9]This was how the problem was originally formulated by Geurts 1996. Of course, Geurts uses the term 'satisfaction theory' to refer to a specific implementation of what I call the satisfaction theory. Hopefully this won't lead to any misunderstandings.

[10]Geurts 1996; Geurts 1999.

[11]By 'conditional' here I mean *indicative* conditional. From now on I will simply omit this qualification.

[12]Any monotonic analysis of the conditional will satisfy this, as do Kratzer-style treatments of the indicative. Moreover, it seems to me that even non-monotonic analyses, like the one in Schlenker 2004, also meet this condition. Of course, this restriction leaves out so-called NTV analyses of the conditional, but I can live with that.

Note that this assumption is *not* equivalent to the claim that the *material* conditional $\psi \rightarrow (\text{if}\phi, \psi)$ is valid. To anticipate: if we let '>' stand for the Stalnaker conditional (Stalnaker 1975), we have that $\psi \models (\phi > \phi)$, even though there are contexts c such that $c \not\models \psi \rightarrow (\phi > \psi)$. This last bit should be clear. All one needs is $w \in c$ such that $w \models \pi$ even though $w \not\models \phi > \pi$. And for this—see (6) below—all we need is that there be a ϕ-world closest to w in which π is false. This observation is enough to dismiss one of the objections raised by Geurts to an implementation of the satisfaction theory. See Geurts 1999, pp. 105f.

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entails if ϕ, π, it is also compatible with the data in (1). If this is right, then it follows that a sentence of the form if ϕ, ψ_π presupposes that if ϕ, π. For it would be perverse for a theory of projection to predict that the presupposition of a sentence χ is logically weaker than ξ even though, for all contexts c, $c + \chi \models \xi$.

You may have noticed that I have tacitly assumed that the projection of presuppositions behaves 'compositionally'. In particular, I made the following assumption: if ψ and χ carry no presuppositions, then ϕ presupposes that π iff $\phi[\psi/\chi]$ presupposes that $\pi[\psi, \chi]$, where $\phi[\psi/\chi]$ stands for the result of substituting all occurrences of χ within ϕ by ψ. But this should come as no surprise, given that the satisfaction theory takes presuppositions to be encoded in the semantics, so that the projection problem becomes a particular instance of the more general problem of providing a compositional semantics for English.

2.2 Geurts's challenge

If all this is right, then the identity hypothesis is in trouble. But according to Bart Geurts, the problem is not peculiar to the identity hypothesis. Instead, it reveals a fundamental problem for the satisfaction theory, viz. that the satisfaction theory is incompatible with any plausible account of how accommodation works.

To see why, suppose the satisfaction theorist has an alternative to the identity hypothesis that accounts for why an utterance of (1a) induces accommodation of (1c) instead of the predicted presupposition (1b), and consider now the following sentence:[13]

(4)   Giorgio knows that if Paul isn't tired, he owns a Bible.

Given the assumption that 'knows' is factive, (4), as well as (1a), carries (1b) as its presupposition. So it is hard to see how the hypothesis would not apply in this case and predict that (4) induces accommodation of (1c)—contrary to the facts.

The challenge can be put forward as a dilemma. Let H be a hypothesis linking projection and accommodation that is compatible with the satisfaction theory, and consider a sentence ψ, predicted by the theory to have if ϕ, π as its presupposition. Either H predicts that π is accommodated or it doesn't. If it does, then H makes the wrong predictions about what is accommodated after an utterance of (4)—for such an utterance would not induce accommodation of the consequent of the predicted presupposition, (1b). If it doesn't, then it makes the wrong predictions about what is accommodated after an utterance of (1a)—for such an utterance *does* induce accommodation of the consequent of the predicted presupposition (1b). Either way, the hypothesis is inadequate. It follows that the satisfaction theory is incompatible with a theory of accommodation.

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[13]Forget for a moment how unusual it would be for anyone to utter something like (4). Perhaps Giorgio has good reasons for thinking that anybody who hasn't bought a Bible hasn't been able to sleep in the past few days. Perhaps a group of Parisian fanatics decided to torment everybody who hasn't bought a Bible by not letting them sleep. The only way to get a night's sleep in Paris is to buy a Bible from them.

You might balk that this is a false dilemma. After all, there might be no reason to suppose that a hypothesis linking projection to accommodation should be blind to what the uttered sentence is. In other words, you might think there is no reason to suppose that any theory linking projection to accommodation will automatically predict that two sentences carrying the same presupposition will induce accommodation of the same proposition. If that is indeed your complaint, then I think you're absolutely right. But before we go down that path, I suggest we revisit the data we started with. I think the identity hypothesis has a lot more going on for it than it is usually thought.

3 The identity hypothesis revisited

Recall what we started with: the claim that a sentence predicted to have a conditional as its presupposition induced instead accommodation of the consequent of that conditional. In particular, the difficulty for the satisfaction theory was the observation that (1a) was predicted to have (1b) as its presupposition, even though (the critic claimed) it induced accommodation of (1c). I hope you are convinced by now that the satisfaction theory *does* in fact predict that (1a) carries (1b) as its presupposition. I also hope you will be convinced, by the end of this section, that (1a) does *not* induce accommodation of (1c): that instead, it induces accommodation of its predicted presupposition, (1b). This would of course vindicate the identity hypothesis. And it would dissolve the proviso problem.

But don't get me wrong. I was being a bit dramatic when I said that (1a) does not induce accommodation of (1c). Indeed, I might have misled you into thinking that my claim was the following outlandish one: that after an utterance of (1a) in a 'normal' context, it would be *unreasonable* to infer that (1c) is true. But that is certainly not what I want to claim. I say that an utterance of (1a) does license an inference to the effect that (1c) is true. And yet I want to say that what is *accommodated* after an utterance of (1a) is (1b). I now need to convince you that I haven't lost my mind.

3.1 A conjecture

The proviso problem starts with the observation that after an utterance of (1a), the updated context entails (1c). That is, the observation is simply that updating c with an utterance of a sentence of the form ifϕ, ψ_π yields a context entailing π. (Remember that I'm using 'ψ_π' to indicate that ψ presupposes that π.)

How is this a problem for the identity hypothesis? The identity hypothesis, as I stated it above, was a hypothesis about how the context evolved after an utterance of a sentence with certain presuppositions. More precisely, the hypothesis stated that

$$c + \phi_\pi = c + \pi + \phi.$$

But the identity hypothesis is compatible with the observation above. Indeed, given our definition of update, the identity hypothesis would not be in trouble if we could show that $c + \mathsf{if}\phi, \pi \models \pi$. In other words, it would be enough to show that $\mathsf{if}\phi, \pi$ entails π modulo c.

This is precisely what I want to show. Before eyebrows start raising, though, let me make clear what I do *not* want to show. I do not want to show that *in general*, for all contexts c and sentences ϕ and π, $\mathsf{if}\phi, \pi$ entails π modulo c. Let me say that a context c collapses a conditional $\mathsf{if}\phi, \pi$ just in case $c + \mathsf{if}\phi, \pi \models \pi$.[14] What I want to show is that this *sometimes* happens in a *non-trivial* way. Let me make clear what I mean. First, note that if $c + \mathsf{if}\phi, \pi = \emptyset$, then trivially $c + \mathsf{if}\phi, \pi \models \pi$. Also, note that saying that c collapses a conditional $\mathsf{if}\phi, \pi$ is just saying that

(5)   Every world $w \in c$ such that $[\![\mathsf{if}\phi, \pi]\!]_c(w) = 1$ issuch that $[\![\pi]\!]_c(w) = 1$.

But if $c \models \neg(\mathsf{if}\phi, \pi)$, or if $c \models \pi$, then (5) will be trivially true. So of course there are contexts that collapse conditionals. I will show, however, that some contexts can collapse a conditional in neither of these trivial ways. For now, I will just formulate my conjecture:

> CONJECTURE: Updating a context c with a sentence that presupposes $\mathsf{if}\phi, \pi$ yields a context that entails π just in case c collapses $\mathsf{if}\phi, \pi$.

I now have two tasks at hand. First, I need to show that with a plausible analysis of the conditional we can have contexts that collapse some conditionals in non-trivial ways. Second, I need to show that my conjecture is plausible. I will take each in turn.

3.2   An assumption about conditionals

What would it take for a context c to collapse a conditional in a non-trivial way? As you may have guessed, it depends on how you end up analyzing the indicative conditional. To take an example, suppose you analyze the indicative conditional by giving it the truth-conditions of the material conditional, which I denote by '$\rightarrow$'. Then any context c in which no world is such that $\neg\phi$ and $\neg\pi$ are true together will collapse $\phi \rightarrow \pi$. And this can happen without (5) being true, and with $c + (\phi \rightarrow \pi) \neq \emptyset$, so a context c can collapse a material conditional in a non-trivial way.[15] However, for reasons that will become apparent below (and because I have no intention of endorsing a material conditional analysis of the indicative conditional), I want to focus my attention instead on another analysis of the indicative conditional.

The analysis I have in mind is roughly the one offered in (Stalnaker 1975), the so-called *Stalnaker conditional*. I will not argue for it being the right analysis

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[14]Note that the notion I have in mind is simply that of contextual entailment: a context c collapses a conditional just in case the conditional entails the consequent modulo c. Talk of 'collapsing' is just a less roundabout way of saying the same thing for the case at hand.

[15]For completeness, here's an example: Let $c = \{w_0, w_1\}$, with p true in both w_0 and w_1, and q true only at w_0. Then $c + (\mathsf{p} \rightarrow \mathsf{q}) \models \mathsf{q}$, but $c \not\models \neg(\mathsf{p} \rightarrow \mathsf{q})$, $c \not\models \mathsf{q}$ and $c + (\mathsf{p} \rightarrow \mathsf{q}) \neq \emptyset$.

of the indicative. It is no doubt one of the major contenders, and I hope that something like it will turn out to be correct. I leave it to others to determine whether it is in fact the best.[16]

The Stalnaker conditional, which I denote by '>', has the following truth conditions—I here follow (Heim 1992):

(6) $\llbracket \phi > \pi \rrbracket_c = \lambda w.(\forall w' \in \mathsf{sim}_{c,\phi}(w))(\llbracket \pi \rrbracket_c(w') = 1).$

What the right analysis of the function $\mathsf{sim}_{c,\phi}$ is going to be is a matter of further discussion. One thing we must say about it is that for all $w \in c$, $\mathsf{sim}_{c,\phi}(w) \subset c$. We could have this simply be stipulated by the semantics, or have it be a presupposition introduced by the indicative mood. The details don't really matter at this point. Neither does what the right compositional story as to how the components of a conditional sentence combine in order to give these truth-conditions or other turns out to be.[17] For our purposes, we can gloss '$w' \in \mathsf{sim}_{c,\phi}(w)$' as follows: w' is (one of) the most similar world(s) to w, in respects determined by c, where ϕ is true.

With this hypothesis in place, I can now show that the first part of my story is true: that there are contexts c that collapse a conditional $\mathsf{if}\,\phi, \pi$ in a non-trivial way. To do that, I will show that this holds for the Stalnaker conditional. But note that all I need for this is a context c such that for all worlds $w \in c$ such that $\llbracket \pi \rrbracket_c(w) = 0$ we have:

(7) $(\exists w' \in \mathsf{sim}_{c,\phi}(w))(\llbracket \pi \rrbracket_c(w') = 0.$

That is, we need that for any world in which π is false, there be a ϕ-world w' in c that is most similar to ϕ in which π is false. For this means that any world w in c such that $\llbracket \phi > \pi \rrbracket_c(w) = 1$ will be such that $\llbracket \pi \rrbracket_c(w) = 1$. Moreover, this is compatible with there being worlds in which $\phi > \pi$ is true.

I hope you're convinced by now. For completeness, however, let me provide you with an explicit example of a context c that collapses a Stalnaker conditional in a non-trivial way. Let $c = \{w_0, w_1, w_2\}$, with p true only at w_0 and w_1, and q true only at w_0. Let $\mathsf{sim}_{\mathsf{p},c}(w_0) = \{w_0\}$, and $\mathsf{sim}_{\mathsf{p},c}(w_1) = \mathsf{sim}_{\mathsf{p},c}(w_2) = \{w_1\}$. Then c collapses $\mathsf{p} > \mathsf{q}$ in a non-trivial way, since $c + (\mathsf{p} > \mathsf{q})$ is not empty, and neither $\neg\mathsf{p}$ nor q is entailed by c.

3.3   Dissolving the problem

Suppose for a moment that my conjecture above is true. That is, suppose that updating c with a sentence predicted to have a conditional presupposition will yield a context satisfying the consequent of that conditional just in case c collapses that conditional. Then the proviso problem would be dissolved, for we could hold on to the identity hypothesis and still account for the empirical

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[16]For discussion, see Edgington 1995.

[17]Indeed, nothing in what I say is incompatible with a Krazter-style analysis of the conditional that yields the desired truth-conditions.

datum that an utterance of (1a) licenses an inference to the effect that (1c) is true.

How can we tell whether a context c collapses a conditional $\mathsf{if}\,\phi, \pi$? The most straightforward way of doing it would be by updating c with $\mathsf{if}\,\phi, \pi$ and checking whether $c \models \pi$. But this will not work for reasons that have to do with an objection I will have to deal with below. Fortunately, something else will do.

It is here, incidentally, that the difference between the Stalnaker conditional and the material conditional becomes relevant. As you may have noticed, it is easy to show that any context that collapses the material conditional $\phi \to \pi$ will be a context that entails the material conditional $\neg\phi \to \pi$. For if any world in c in which π is false is a world in which $\phi \to \pi$ is false, then every $\neg\pi$-world will be a ϕ world. So if a context c collapses $\phi \to \pi$, in no world in c can both $\neg\phi$ and $\neg\pi$ be true together. But clearly, an utterance of (1a)—'If Paul isn't tired, he will read his Bible tonight'—in a context c will license an inference to the effect that Paul owns a Bible *even if* there are worlds in c in which Paul is both tired and doesn't own a Bible. Note, moreover, that the same isn't true of the Stalnaker conditional. As the example at the end of section 3.2 shows, some contexts c can non-trivially collapse a conditional $\phi > \pi$, even if there are worlds in c in which both ϕ and π are false.

Let me go back to the question of how to determine whether a context collapses a Stalnaker conditional. Consider, again, a conditional like (1a)—which I abbreviate by $\mathsf{if}\,\phi, \psi_\pi$. Take a 'normal' context c and take a world $w \in c$ such that $[\![\pi]\!]_c(w) = [\![\phi]\!]_c(w) = 0$. Now take a ϕ-world in c that is most similar to w. I submit that it will *not* be a π world. For, to take the case at hand, a world similar to one where Paul doesn't own a Bible in which he isn't tired will be a world in which he (still) doesn't own a Bible. Why would having things differ enough to make it possible that Paul isn't tired have an influence on whether Paul owns a Bible? To reiterate: imagine a world in which Paul doesn't own a Bible. It is only reasonable to expect the similarity relation in a normal context to be such that the worlds most similar to that in which Paul isn't tired are still worlds in which he doesn't own a Bible.

This, I take it, provides enough support to the idea that the relevant conditionals (those in which there is no perceived 'connection' between the antecedent and the consequent in most contexts) are indeed collapsed by most 'normal' contexts. And this helps explain why an utterance of (1a) seems to license an inference to (1c). Also notice that the cases where it seems that the consequent of the presupposed conditional is accommodated are cases where there is a perceived lack of 'connection' between the antecedent and the consequent. I would be surprised if the little argument I gave above would not go through with any such conditional.

4 Addressing Geurts's challenge

I anticipated a fairly natural objection to my conjecture. It runs as follows. I claim that, in the particular case at hand, most normal contexts would collapse

the conditional (1b). But this would mean that updating a normal context c with an *assertion* of (1b) would yield a context satisfying (1c). And that would be crazy: it would be unreasonable for me to conclude that Paul owns a Bible on the basis of an assertion of (1c). Note that this amounts to the same problem raised by Bart Geurts. Remember (4) above:

(4)   Giorgio knows that if Paul isn't tired, he owns a Bible.

As Geurts points out, (4) has the same presupposition as (1a). So I seem to predict that after an utterance of (4) it would be reasonable for me to infer that Paul owns a Bible. And that, again, would get the facts wrong.

To respond to this objection, I need to revisit one simplifying assumption I made earlier on. But first, I will make a quick observation about the implicatures of conditionals.

4.1   The implicatures of conditionals

It has been observed that a conditional like (8) can carry the implicature that if you don't buy the Bible, I will not stop bothering you:

(8)   If you buy this Bible, I will stop bothering you.

This so-called phenomenon of *conditional perfection* has received substantial attention in the literature.[18] However, the phenomenon is less wide-spread than it was initially thought. What is less controversial, however, is that a conditional like (8) implicates that I will not stop bothering you *no matter what*. That is, although there are other things you could do to have me stop bothering you (bribe me, for instance, or call the police), your buying the Bible is one way of preventing me from doing something that I would most likely continue to do.

We need a story on how to predict this implicature. Following (Fintel 2001a), we treat $\mathsf{if}\phi$ as a scalar item, with associated scale $\{\mathsf{if}\phi,$ 'under all relevant conditions'$\}$. More precisely, given a set of alternatives $\mathcal{A}$, the claim is that there is a scale associated with $\mathsf{if}\phi$, viz. $\{\mathsf{if}\phi, (\forall\psi \in \mathcal{A})(\mathsf{if}\psi)\}$. Thus, an assertion by s of $\mathsf{if}\phi, \pi$ implicates that $\neg\mathsf{K}_s(\forall\psi \in \mathcal{A}(\mathsf{if}(\psi, \pi)))$,[19] where '$\mathsf{K}_s$' stands for '$s$ knows that'. In other words, it implicates that there is some $\psi \in \mathcal{A}$ such that $\neg\mathsf{K}_s(\mathsf{if}\psi, \pi)$, which in turn entails $\neg\mathsf{K}_s\pi$—that s doesn't know whether π.[20] (This is because, by assumption, π entails $\mathsf{if}\phi, \pi$.)

We now have the basis for a response to the objection I mentioned above. That is, we have an account of how a an utterance by s of a sentence of the form $\mathsf{if}\phi, \pi$ implicates that s doesn't know that π is true 'no matter what'—in other words, that the speaker doesn't know whether π. This will be enough to address the objection, but it will also help us address Geurts's challenge.

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[18]For discussion and references, see Fintel 2001a.

[19]Cf. Sauerland 2004.

[20]It is important not to read '$\neg\mathsf{K}_s\pi$' as 's doesn't know that π', for the factivity of 'knows' would make this entail that π is true.

4.2   Updates and implicatures

At this point, it is worth reconsidering a simplifying assumption we made at the beginning. Recall that we defined $c + \phi$, where ϕ was 'presupposition-free', in a straightforward way, viz.

$$c + \phi = \{w \in c : [\![\phi]\!]_c(w) = 1\} = c \cap [\![\phi]\!]_c,$$

and we pointed out that this seemed to go against the desideratum that if ϕ implicates that ψ, updating c with ϕ yields a context in which ψ holds. Unfortunately, in order to address the worry at hand we need to take into account facts about implicatures. So let me make a few notational adjustments. I will use '$c \oplus \phi$' to refer to the result of updating c with an utterance of ϕ so that it also satisfies all the uncancelled implicatures of ϕ. Again, a good approximation for sentences ϕ that carry no presupposition and have no implicatures is that

$$c \oplus \phi = c + \phi.$$

Now that this distinction is in place, we can see that there is room for thinking that c can collapse a conditional $\mathsf{if}\phi, \pi$ even though $c \oplus \mathsf{if}\phi, \pi$ does *not* entail π. For recall from above that an utterance of a conditional of the form $\mathsf{if}\phi, \pi$ by s implicates that $\neg \mathsf{K}_s\pi$. In other words, we saw that for all c, $c \oplus \mathsf{if}\phi, \pi$ does *not* entail π. So if I'm right, we have a case where $c + \phi$ differs from $c \oplus \phi$. Indeed, my suggestion is that what we have here is a case where in order to update c with an utterance of ϕ a repair strategy of sorts must be in place, pretty much in the same way that a context satisfying ϕ can sometimes be updated with an utterance of $\neg\phi$ via some kind of repair strategy. How this takes place is something I have little to say about. But a plausible hypothesis is that an utterance of $\mathsf{if}\phi, \pi$ in c when c collapses $\mathsf{if}\phi, \pi$ induces revision of the similarity relation so that for some $w \in c$ such that $[\![\pi]\!]_c(w) = 0$ we have that $[\![\mathsf{if}\phi, \pi]\!]_c(w) = 1$.

This has all been a bit quick. But the punchline is quite simple. Updating a context with an utterance of $\mathsf{if}\phi, \pi$ will, *ceteris paribus*, yield a context that does *not* satisfy π. This is compatible with the claim that $c + \mathsf{if}\phi, \pi$ does entail π, for we have good reasons for thinking that updating c with an utterance of ϕ cannot be simply equated to $c + \phi$, once we take into account facts about implicatures. For example, updating a context with an assertion of

(9)   Paul ate some of the broccoli.

will normally yield a context satisfying

(10)   John didn't eat all of the Broccoli.

even though a context c in which an assertion of (9) would be felicitous would normally be such that $c + (9)$ does not entail (10). And this is relevant for the case at hand, for the reason why an utterance of $\mathsf{if}\phi, \pi$ conveys that π isn't true 'no matter what', is that the conditional implicates that the speaker doesn't know whether π.

<div align="center">13</div>

Crucially, however, I need to assume that this implicature does not arise when instead of being asserted the conditional is *accommodated*. But that doesn't seem implausible.[21] After all, ordinary Gricean reasoning cannot be put to work when something is presupposed rather than asserted. Moreover, since what is accommodated is a proposition rather than a sentence, it seems odd to even talk of implicatures here.

How is this relevant for addressing Geurts's challenge? All I've done so far is provide an explanation for why updating a context with $\text{if}\,\phi, \pi$ does *not* yield a context that entails π.[22] But as Geurts's challenge points out, we still need to account for why an utterance of $K_a(\text{if}\,\phi, \pi)$ also yields a context that does not entail π. Fortunately, there's an account of embedded implicatures that allows us to make the desired prediction. Let me spell this out.

4.3 Embedded implicatures

First observe that an utterance of (4) suggests that Giorgio doesn't know whether Paul owns a Bible. More generally we have:

(11) $K_a(\text{if}\,\phi, \pi) \rightsquigarrow \neg K_a \pi,$

where, again, '$\neg K_a \pi$' should be read as 'a doesn't know whether π', in order to block the inference from the English 'a doesn't know that π' to π. To predict this, we only we only need to make a very plausible assumption, namely that if a scalar item τ with associated scale Σ has an occurrence in sentence ϕ, then a sentence of the form $K_a \phi$ has $K_a \phi[\sigma/\tau]$ as an alternative whenever $\sigma \in \Sigma$. With this in place, we can appeal to a natural account of embedded implicatures (Sauerland 2004) in order to make the desired prediction.

First, an utterance of $K_a(\text{if}\,\phi, \pi)$ by s will have $\neg K_s(K_a(\pi))$ as a primary implicature.[23] Given the assumption that the speaker is opinionated—i.e. that for a suitably restricted class of sentences, $K_s \phi \vee K_s \neg \phi$ holds—we get $K_s(\neg K_a \pi)$, which is what we wanted, for it entails $\neg K_a \pi$.

Now, you may (rightfully) complain that there is no need to suppose that the speaker is opinionated. Even if the speaker makes clear that he knows very little about what a knows, one gets the sense that an utterance of $K_a(\text{if}\,\phi, \pi)$ will still *not* license an inference to π. But it is not hard to see why this is so. Even if the opinionated speaker assumption can't be justified, we can infer given the other ingredients that $\neg K_s(K_a \pi)$. And this by itself is enough to meet the challenge.

4.4 Final steps

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[21] It is crucial here that the material triggering the implicatures is not in the asserted sentences, as it is in the case of factive verbs.

[22] Recall now that I'm using 'updating' in the general sense, so that it shouldn't not be equated with + as defined above, but with $\oplus$.

[23] Again, cf. Sauerland 2004.

Here's how. First, consider the following question: Why are some conditional collapsed by most 'normal' contexts? Presumably, the reason has to do with what we take to be a general claim, viz. that there is no reason to accept them unless we're confident of their consequent. That is, we take such conditionals ifϕ, π to be such that whether one learns that ϕ is irrelevant to one's opinion on whether π. Let me call this the *default assumption*.

If I am right, and what makes most contexts collapse some conditionals is that the default assumption is in place, then it should come as no surprise that an utterance of $K_s(\text{if}\phi, \pi)$ does not yield a context entailing π. For as we saw before, such an utterance would implicate that $\neg K_s K_a \pi$.[24] Hence, from an utterance of $K_a(\text{if}\phi, \pi)$ by s we can infer that s doesn't believe that there is no reason for believing ifϕ, π other than believing π. This is enough to make participants in the conversation withdraw the default assumption. For it is now common belief that the speaker doesn't take the default assumption to be true, thus inducing a revision of the context so that the resulting context is now compatible with the falsity of π.

5 Concluding remarks

I've claimed that, once we see what the satisfaction theory of presuppositions amounts to, the proviso problem can only be seen as a challenge to provide an account of how projection and accommodation interact. In particular, the proviso problem can be seen as a counterexample to the identity hypothesis. I have argued, however, that the problem should be reconsidered, *provided* we endorse an analysis of the conditional along the lines of (Stalnaker 1975).[25] If I am right, the data that underlies the proviso problem has been misdescribed. More precisely, if I am right, it turns out that the identity hypothesis isn't threatened by the data in (1). For we have good reasons for thinking that, in most contexts, accommodating with (1b) will yield a context entailing (1c), which is enough to dissolve to the problem.

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[24] Again, we must be careful here with facts about factivity: $\neg K_s K_a \pi$ should be taken to be compatible with the falsity of π.

[25] What if one endorses a different line of analysis of the indicative conditional? In that case, the main ideas of the last section can still be put to use to provide an answer to Geurts's problem within the theory of accommodation sketched by David Beaver 1997b, and further refined in Heim 2006. I provide some of the details in Pérez Carballo 2006.

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