

THE LOST PILLAR OF DEONTIC MODALITY*

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Dear Reader, On this first pair of pages is a selection of labeled examples, definitions to keep handy. The paper starts afterwards. Yours, ZZs

- (4) Kratzer's basic definition for modal sentences
For any sentence p , world w , modal base M , and ordering source O :
- 'It must be that p ' is true in w relative to M and O iff
 p is true in all the worlds closest (by O) to w within M .
 - 'It can be that p ' is true in w relative to M and O iff
 p is true in at least one of the worlds closest (by O) to w within M .
- (8) Kratzer's treatment of modal conditionals (to be combined with definition 4)
For any sentences p and q , world w , ordering source O , and modal base M :
- 'If p then it must be that q ' is true in w relative to M and O iff
'it must be that q ' is true in w relative to M^p and O ,
where M^p is the set of all worlds in M that make p true.
 - 'If p then it can be that q ' is true in w relative to M and O iff
'it can be that q ' is true in w relative to M^p and O ,
where M^p is the set of all worlds in M that make p true.
- (9) If Britney Spears drinks cola in public, then she must drink Pepsi.
(10a) If Britney Spears drinks Coke in public, then she must drink Coke in public.
(11) If Britney Spears drinks Coke in public, then she may drink Coke in public.
(12) If Britney Spears drinks Pepsi at 4 a.m., then she must be awake at 4 a.m.
(deontic reading invoking Britney's advertisement contract with Pepsi)
'If Britney drinks Pepsi at 4 a.m., then her Pepsi-contract requires her to be awake at 4 a.m.'
- (15) Kratzer's general treatment of conditionals
For any sentences p and q , world w , ordering source O , and modal base M ,
'If p then q ' is true in w relative to M and O iff
 q is true in all the worlds closest (by O) to w within M^p ,

* An earlier version of this paper entitled "Is a Possible-Worlds Semantics of Modality Possible? A Problem for Kratzer's Semantics" appeared in *SALT XII: Proceedings from Semantics and Linguistic Theory*, held at UCSD in 2002 and in the same year in *Linguistics in the Big Apple: CUNY/NYU Working Papers in Linguistics (LIBA)*, <http://web.gc.cuny.edu/Linguistics/liba/papers/zsolenszky.pdf>. I got the idea for this paper at Anna Szabolcsi's Fall 2001 Semantics Seminar at NYU; Anna encouraged me to work it into a proposal for SALT 2002. For discussion, I thank members of the NYU Fall 2001 Semantics Seminar as well as participants of SALT 2002, LoLa 2006, and the ELTE Logic Workshop Presentation Series. Special thanks go first and foremost to Kit Fine for extensive and incisive written comments at various stages, and to Anna Szabolcsi for uncountable amounts of advice and encouragement; to Stephen Schiffer for thoughtful comments on the present draft; to Zoltán Szabó Gendler for sharpening central examples and ideas; to Roger Schwartzchild for discussion in the initial phase of the project; to anonymous SALT and LoLa reviewers for crucial suggestions. This research was supported by the MTA-ELTE Philosophy of Language Research Group.

where M^p contains all the worlds of M that make p true.

- a. For indicative conditionals, M is typically restricted to worlds that make true certain relevant facts (circumstantial) or what is known (epistemic), while O is stereotypical.
- b. For counterfactual conditionals, M is unrestricted and O is totally realistic (the more a world resembles w overall, the closer it is to w ; this follows Lewis' (1973) proposal to order worlds based on overall similarity).
- c. For the logician's material conditional, O is empty and M is totally realistic (restricted to worlds exactly like w).

(17) Frank's Augmentation-based treatment of modal sentences

(to resolve The Problem through an amendment of definition 4)

For any sentence p , world w , ordering source O , and modal bases M ,

'it must be that p ' is true in w relative to M and O iff

'it must be that p ' is true in all the worlds closest (by O) to w within $M^{p/\neg p}$,

where $M^{p/\neg p}$ is the result of Augmenting M with respect to p and its negation; this amounts to M plus for each M -world, (i) every p -world most similar to it, as well as (ii) every not- p -world most similar to it. $M^{p/\neg p}$ thus leaves p (as well as not- p) open.

(4') Generalized Leibnizian semantics

For any sentence p , world w , contextual factor(s) C ,

- a. 'It must be that p ' is true in w relative to C iff
relative to a (contextually determined) selection criterion S on possible worlds,
 p is true in all the worlds S -selected based on C relative to w .
- b. 'It can be that p ' is true in w relative to C iff
for selection criterion S on possible worlds,
 p is true in at least one of the worlds S -selected based on C relative to w .

(25) (a) $O(p/q)$ is read as 'O(p/q) out of $\{p, \text{not-}p\}$ ' or

(b) $O(p/q)$ is read as 'given that q , O(p/q) out of $\{p, \text{not-}p\}$ '

*I am delighted if you decide to quote this paper—please send me an email if you do.
Comments are welcome. ZZs.*

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1. Introduction

- (1) Britney Spears must drink Pepsi.
- (2) Britney Spears may eat spinach.

Modal sentences like (1) and (2) concern what is necessary or possible and delineating their truth conditions in terms of possible worlds therefore seems natural. The now-standard treatment offered by modal logicians—Kripke (1963) among others—has it that (1) amounts to it being *necessary* that Britney drink Pepsi, the truth of which requires that in every accessible possible world, Britney drink Pepsi, while (2) amounts to it being *possible* that Britney eat spinach, the truth of which requires merely that in some accessible possible world, Britney eat spinach.

English auxiliary verbs signifying necessity include ‘must’, ‘ought to’, ‘have to’ and ‘should’; those signifying possibility include ‘may’, ‘might’, ‘can’, ‘is able to’. Accessibility is relative to a given world, a base world (usually the actual one), with respect to which a sentence’s truth value is determined. The interpretation of modal sentences is relative in a further way: depending on the kind of modality invoked, the accessible worlds should do the following:

- make true what is known (epistemic reading), or
- make true some relevant facts of the base world (circumstantial reading), or
- fulfill what is required (deontic reading), or
- fulfill what is desired (bouletic reading), or
- obey conditions on a “normal” course of events (stereotypical reading), etc.

Thus a *deontic* reading of (1) with respect to the actual world has it that given what is required by a certain law(s) or contract (Britney’s advertisement contract with Pepsi, say), Britney

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must drink Pepsi, that is, she drinks Pepsi in every possible world in which the actual law or contract is fulfilled (where these are the deontically possible worlds with respect to the actual world).¹ The kind of modality invoked depends in part on the choice of lexical item (for example ‘might’ allows an epistemic reading but not a deontic one), and in part on the context of utterance (which can decide even among several deontic readings, say—what is required by U.S. law, by Britney’s contract, or by Britney’s health).

This standard approach to modality has deficiencies which Angelika Kratzer (1977, 1981, 1991) aimed to correct while retaining much of the possible worlds framework posited by the standard analysis. But in the process, she left untouched a stubborn problem that has been plaguing one prominent brand of modal logic, deontic logic—the logic of duties and obligations—since its inception. In what follows, I will first explicate the problem (Section 2) and then identify its source and scope (Section 3). After examining two current—ultimately unsuccessful—attempts to solve the problem (Section 4), I will show that it actually runs quite deep, affecting the semantics for deontic modality across the board (Section 5). The reason: one basic assumption of the possible-worlds architecture, together with a basic semantic constraint are enough to give rise to the problem. This means that tweaking details will be of no help as long as the two basics remain in place. Something has to give—I will give reasons to think we cannot give up on the semantic constraint, which means that the architectural assumption is the odd one out. This means that in the context of deontic modality, the possible-worlds framework is stripped of one of its fundamental tasks. My starting point will be Kratzer’s work, which has had an enduring, definitive influence on the linguistics literature on modality. Readers primarily interested in deontic logic and issues philosophical may skip Sections 3 and 4.1, resuming at Section 4.2.

2. The Problem

The problem, in a nutshell, is this: on Kratzer’s (1981, 1991) analysis, all sentences of the form ‘If p then it must be that p ’ come out true, and so do most sentences of the form ‘If p then it may be that p ’. What makes it a problem is that outlandish sentences like those under (3) come out true. I will refer to this as ‘The Problem’ throughout the paper.

- (3) a. If teenagers drink then teenagers must drink.
(deontic reading invoking, say, U.S. laws)
‘If teenagers drink then U.S. laws require them to do so.’
- b. If teenagers drink then teenagers may drink.
(deontic reading invoking, say, U.S. laws)
‘If teenagers drink then U.S. laws allow them to drink.’
- c. If I file my taxes, then I must file my taxes.
(bouletic reading invoking my desires)
‘If I file my taxes then I want to file my taxes.’
- d. If children don’t eat spinach then children shouldn’t eat spinach.

¹ This surprisingly enduring example is a keeper, not to mention the incredible pop cultural impact it has afforded an early abstract of this paper: for a long time, it remained at hit #11 for a Google search on ‘britney spears coke’. This was in 2001, shortly after Britney Spears, at the peak of her singing career (about to get a #1 power rank from Forbes Magazine), signed a mega-deal with Pepsi, in the midst of rumors that in real life, she preferred Coke to Pepsi.

(deontic reading invoking, say, considerations of health)
'If children don't eat spinach, then eating spinach is bad for them.'

In the light of a variation on Kratzer's analysis (like the double modalization strategy in Section 4.1), The Problem affects only non-epistemic modalities (see Zvolenszky 2006). I will therefore confine the examples to deontic and bouletic modalities. In general, on Kratzer's proposal, whatever one does, it is something one wants to do, and it is something that laws allow and even require one to do. But it is evident that what one in fact does need not always be what one desires, or what is in accordance with laws or considerations about health.

I will say that a semantics is *Leibnizian* just in case (i) it specifies a selection criterion to home in on the possible worlds that *count* (in the standard relational analysis due to Kripke (1963), these are the *accessible* worlds, while Kratzer introduces a different selection criterion), and (ii) interprets modal sentences in terms of quantification over the worlds that count.² This means (as it should) that a Leibnizian semantics need not aim at reducing the modal to the non-modal—because the selection criterion may well rely on modal notions. The standard analysis and Kratzer's are both Leibnizian semantics. *The upshot of this paper will be that The Problem cannot be resolved within a Leibnizian framework.* This could be taken to mean one of two things: that we cannot have an account that produces *some* Leibnizian analysis for each modal sentence; or that a Leibnizian framework cannot fulfill all requirements on a unified account of modality. This paper is about what it takes to have the latter, more substantive kind of account, claiming that no such account of the Leibnizian stripe can be attained for deontic (and bouletic) modality.³

Having spotted The Problem in connection with Kratzer's work, I learned that I was not the first to do so: Annette Frank (1997) describes it in her dissertation and proposes her own solution (discussed in Section 4.2). While Frank's is the most promising Leibnizian solution, it ultimately fails. And the reason for its failure illuminates why The Problem does not admit of a Leibnizian solution. In addition, The Problem has been lurking in the background of developments in deontic logic from its early stages—from the 1950's—but it has been brushed off much too easily. In Section 5, I turn to a handful of brief references to The Problem throughout the deontic logic literature. Among these, as far as I know, Jackson's (1985) paper is the only one that takes The Problem seriously. Jackson does propose a workable solution, but it turns out to be a non-Leibnizian one.

Going non-Leibnizian is a rather drastic move, prompting one to wonder if there might be a way to avoid it. We have seen that the Problem involves modal *conditionals* like those listed in (3). Indeed, The Problem arises for Kratzer because an independently motivated semantics she adopts for conditionals ends up interfering with the semantics she posits for modal sentences. According to the account she favors (Kratzer 1991), the antecedents of conditionals serve as domain restrictions. Recently, there has been growing interest in other accounts of conditionals: for example, Dekker (2001) and Abbott (2004) have suggested a return to the classical truth-functional account which treats conditionals as material conditionals; others proposed truth-conditional treatments (von Stechow and Iatridou 2002, Higginbotham 2003, Lycan 2001); and non-truth-conditional accounts have also found defenders (Bennett 2003, Edgington 2003). How these alternatives fare with respect to The Problem is an important issue that calls for further exploration. In this paper, I choose a different

² Leibniz is usually credited with the idea that necessary truth is truth in all possible worlds.

³ My assessment of Jackson's (1985) proposal—at the end of Section 5—is relevant to this distinction between types of accounts.

tack: in Section 5, I will give some general considerations for why The Problem arises irrespective of our choice of account for conditionals.⁴

3. The Source of The Problem

Kratzer (1981, 1991) revises the standard modal analysis in two major ways: First, she distinguishes two dimensions of modal contribution—the modal base and the ordering source. Second, she calls for a revised interpretation of conditionals to replace the classical logic interpretation according to which a conditional’s truth requires that either its first half (antecedent) be false, or that its second half (consequent) be true (see for example Grice 1989). Let me review these revisions in turn.

Recall that the standard modal analysis posits a range of possible worlds accessible from a given base world (call it w). The accessible worlds make up a subset of all the logically possible worlds—those that provide consistent assignments of truth-values to the basic (atomic) statements such as ‘Britney Spears drinks Pepsi’, ‘I file my taxes’.⁵ We can think of the accessible worlds as making up the modal base M with respect to w . The ordering source then imposes a partial ordering on the modal base M : some worlds in M are closer or more similar to w than others; some are equally close or similar to w . The ordering is partial because there are pairs of worlds in M which are not ordered with respect to their closeness to w . Kratzer proposes the following revised truth conditions for modal sentences:⁶

(4) Kratzer’s basic definition for modal sentences

For any sentence p , world w , modal base M , and ordering source O :

- a. ‘It must be that p ’ is true in w relative to M and O iff
 p is true in all the worlds closest (by O) to w within M .
- b. ‘It can be that p ’ is true in w relative to M and O iff
 p is true in at least one of the worlds closest (by O) to w within M .

With clauses (a) and (b), definition (4) in and of itself guarantees a Leibnizian semantics, by (i) specifying a selection criterion for the worlds that count (those worlds within a certain modal base

⁴ The pervasiveness of The Problem can also be discerned from the fact that it extends beyond garden-variety modal conditionals like those in (3), to include teleological modals that have traditionally defied standard accounts of conditionals: so-called anankastic conditionals like ‘If you want to go to Harlem, you must take the A train’, along with its purpose-clause variant: ‘To go to Harlem, you must take the A train’. It is worth noting that The Problem appears in one prominent attempt recently offered to capture the semantics of such modals (von Fintel and Iatridou 2005). Both of the following turning out true: ‘If you want to go to Harlem, you ought to/must go to Harlem’, ‘To go to Harlem, you ought to/must go to Harlem’ (here, too, the deontic reading of ‘ought to’/‘must’ is assumed). There is a key difference, however: unlike the conditionals in (3), these conditionals do ring true. This means that The Problem is not a problem for an account of anankastic conditionals. Still, it remain a problem for deontic and bouletic modality (see Zvolenszky 2006).

⁵ My definitions are equivalent to Kratzer’s, but somewhat simpler. Kratzer, like most others, assumes that statements express propositions, which are, in turn, construed as sets of possible worlds (still, her definitions are in terms of a proposition being true at a world! See 1991, 641) The conception I employ takes propositions as primitive, and construes possible worlds in terms of them (see for example Fine 1973). This conception allows more pared down definitions—they do not mention compatibility and entailment, for example.

⁶ To keep the definition uncluttered, I simplified it so as to assume that there is always a closest world (or closest sphere of worlds). Lewis (1973, 19–21) pointed out that this does not always hold; his amendment could be straightforwardly incorporated in definition (4) by replacing ‘closest’ with ‘sufficiently close’ throughout.

that are closest based on a certain ordering source), and by (ii) cashing out modal sentences in terms of quantification over the worlds that count.

The modal base might be epistemically restricted (what is known in w is true in all worlds in w 's modal base) or circumstantially restricted (some relevant truths of w are true across worlds in w 's modal base). At the same time, the ordering source might be deontic (the more of w 's laws are obeyed in a world, the closer it is to w), bouletic (the more of an agent's or agents' desires in w are fulfilled in a world, the closer it is to w), or stereotypical (the more a world follows a normal course of events, the closer it is to w).

Consider, for example, a deontic reading of (2), invoking Britney's advertising contract with Pepsi (this is an utterance of (2) to the effect that the contract allows that Britney eat spinach). There is, say, no modal base restriction—the modal base comprises all logically possible worlds. The ordering source is deontic—among the worlds in the actual world's modal base, those in which all of the actual contract is obeyed are the closest. Because the contract does not bar Britney from eating spinach, in some of those closest worlds she does eat spinach, so (2) is true based on (4b).

Kratzer (1991) and others (for example, Lewis 1975 and Heim 1982) have recommended a non-classical treatment of conditionals according to which their antecedents serve as restrictions on quantification, in the spirit of generalized quantifier theory. Consider the following core example:

- (5) All porches have screens.

porch restricts the universal quantification to porches only, every single one of which must have screens in order for (5) to be true. On the same model, we can have antecedents of conditionals serve as restrictions on quantification over something like events/occasions; adverbs of quantification such as 'always', 'usually' provide evidence for this (see Lewis 1975); in the absence of such an adverb, there's default universal quantification. This way, (6)'s truth conditions are identical to (7)'s, which is a welcome result; both are true when among the horse-buying events/occasions performed by a man, all of them involve cash-paying by the man for the horse:

- (6) If a man buys a horse, he pays cash for it.
 (7) Always, if a man buys a horse, he pays cash for it.

Modal conditionals (like those in (3)) can receive analogous treatment—but this time, quantification is over possible worlds. The antecedent serves to restrict the modal base, yielding the following truth conditions for modal conditionals.

- (8) Kratzer's treatment of modal conditionals (to be combined with definition 4)
 For any sentences p and q , world w , ordering source O , and modal base M :
- a. 'If p then it must be that q ' is true in w relative to M and O iff
 'it must be that q ' is true in w relative to M^p and O ,
 where M^p is the set of all worlds in M that make p true.
 - b. 'If p then it can be that q ' is true in w relative to M and O iff
 'it can be that q ' is true in w relative to M^p and O ,
 where M^p is the set of all worlds in M that make p true.

To illustrate, let me work out the truth conditions of a deontic reading of (9) invoking

Britney’s advertising contract with Pepsi, assuming that the base world is the actual world and the initial modal base includes all logically possible worlds.

- (9) If Britney Spears drinks cola in public, then she must drink Pepsi.

By definition (8a), the antecedent clause restricts the initial modal base to those worlds in which Britney drinks cola in public (call this modal base M_{COLA}). ‘Britney must drink Pepsi’ is then interpreted with respect to M_{COLA} and a deontic ordering based on the terms of Britney’s Pepsi contract. Because that contract does require that she not be seen drinking a cola beverage other than Pepsi, possible worlds in which she drinks no cola except Pepsi in public fulfill more of the contract than worlds in which she drinks Coke in public (assuming that the worlds are otherwise the same). Hence, some Pepsi-drinking worlds are closer to the actual world than any Coke-drinking (or other cola brand) worlds. In all worlds in M_{COLA} , there is cola-drinking of some sort, so in all of the closest worlds, that cola-drinking is Pepsi-drinking. This is how, on definition (4a), ‘Britney must drink Pepsi’ is true.

Kratzer’s framework is now in place for a straightforward demonstration of The Problem—how the framework cannot but make true the patently false sentences in (3). Recall that all of the sentences are either of the form ‘If p then it must be that p ’ or ‘If p then it may be that p ’; the problematic outcome I am about to illustrate carries over to just about any such sentence. The only exceptions are ‘may’ sentences for which the antecedent restricts the modal base to the empty set. I will demonstrate these results for (10) and (11).

- (10) a. If Britney Spears drinks Coke in public, then she must drink Coke in public.
b. If Britney Spears eats spinach, then she must eat spinach.
(11) If Britney Spears drinks Coke in public, then she may drink Coke in public.

As before, I assume that the actual world is the base world, that the initial modal base includes all logically possible worlds, and that the reading (in the given context of utterance) is a deontic one invoking Britney’s Pepsi contract, requiring that she not drink a non-Pepsi cola beverage in public. Clearly, both (10a) and (11) ought to come out false, given that the contract does not even allow, let alone require, that Britney drink Coke in public. But we get different results when we apply definitions (8) and (4). This time, the antecedent restricts the initial modal base to worlds in which Britney drinks Coke (by 8a)—call this modal base M_{COKE} ; then all worlds that remain in M_{COKE} violate the contract to some degree. Against M_{COKE} , we need to compute the truth conditions of ‘Britney must drink Coke’. Among the worlds still in M_{COKE} , those deontically closest to the actual world will be worlds in which only the ‘cola-drinking in public’ clause of Britney’s contract is violated, but the others are upheld. But those closest worlds of M_{COKE} will still all be worlds in which Britney drinks Coke. Therefore, by definition (4a), ‘Britney must drink Coke’ is true relative to M_{COKE} and the ordering based on Britney’s actual contract, and hence (10a) is true. Further, if there is at least one world left in M_{COKE} (it seems trivial that there be a Coke-drinking world among the logically possible ones), then by definition (4b), ‘Britney may drink Coke’ is true and thus (11) is true.⁷ A parallel derivation for (10b) shows that because the antecedent restricts the

⁷ If the resulting modal base were empty, we could consider the following solution, suggested by Zoltán Szabó Gendler (personal communication, 2003): Let us posit that sentences like (10a) *presuppose* that M_{COKE} contains at least one world that is close enough to the actual world with respect to the ordering imposed by Britney’s Pepsi-

modal base to spinach-eating worlds (by 8a), the consequent will be true in every one of those worlds, making (10b) true (based on 4a). This is just as bad an outcome as the previous two—Britney’s Pepsi contract is, after all, altogether silent about her spinach consumption, neither requiring it, nor restricting it.

As long as we have a non-empty modal base, the above pair of derivations goes through quite generally, for any deontic (and bouletic) sentences of the form ‘If p then it must be that p ’ and ‘If p then it may be that p ’, rendering such sentences logical truths within Kratzer’s framework; and such status is clearly unwarranted—the fact that I do something does not mean that I want to do it, or that I am allowed or required to do it.

Kratzer (1991, 645) briefly noted an analogous problem concerning epistemic readings of modal sentences, but she did not seem to recognize the real scope or impact of The Problem. By contrast, Frank was fully aware of it and formulated it in the following general terms “any deontic conditional *if p then [it must be that] q where p implies q will come out true, even if q is not ‘prescribed’ by the deontic ordering source” (1997: 2.2.3). Indeed, (12) (below) is clearly false, for Britney’s advertisement contract does not specify when she should be awake. But on Kratzer’s analysis, (12) receives a treatment much like that of (10a) and likewise comes out true:*

- (12) If Britney Spears drinks Pepsi at 4 a.m., then she must be awake at 4 a.m.
(deontic reading invoking Britney’s advertisement contract with Pepsi)
‘If Britney drinks Pepsi at 4 a.m., then her Pepsi-contract requires her to be awake at 4 a.m.’

The source of The Problem is easy to pinpoint: in Kratzer’s framework, there are two truth-conditionally nonequivalent ways to achieve a modal base in which all of the closest worlds make true some sentence p : either p is the antecedent of a conditional, or ‘it must be that p ’ is true. In the Kratzerian framework, we cannot tell these two scenarios apart. As a result, ‘if p then it must be that p ’ cannot but be true, because antecedent and consequent are indistinguishably represented. Parallel reasoning carries over to the ‘may’-sentences as well (as long as the restricted modal base is nonempty)—in ‘if p then it may be that p ’, the antecedent ends up implying the consequent. This is due to definition (8), which instructs us to glean modal conditionals’ truth value at the base world based on just two sorts of information: the non-modal truths of other worlds, the accessibility-ordering structure of the worlds, and restricting our attention to only those worlds that make the antecedent true. The source of the problem already suggests a direction for a solution: we need to make sure that the two distinct scenarios are in fact distinguishable in the framework. Representing the antecedents of conditionals as restricting the modal base is an independently plausible move (see for example Lewis 1975, Heim 1982, and Kratzer 1991) and later on we will see that revising it will not help with The Problem (see Section 6). This leaves us with the option of revising what it takes

contract. (“In the case of a deontic modality, ‘close enough’ means that there must be a possible world where the relevant actions are in approximate conformity with the relevant norms.”) (10a) then “comes out as not true because of the violation of the presuppositions of the consequent.”

The non-emptiness presupposition is quite reasonable. It cannot dispose of The Problem, however, because there is no reason to think that the modal base for (10a) would be empty. The fact that Coke-drinking flies in the face of the Pepsi-contract does not leave the following sentence with an empty modal base, rendering it untrue: ‘If Britney drinks Coke then she should change her ways’. In addition, in the case of (10b) and the upcoming (12) (‘If Britney drinks Pepsi at 4 a.m., then she must be awake at 4 a.m.’), a variation on The Problem, neither the antecedent, nor the consequent involves a violation of the contract, so the modal base is definitely non-empty. As a result, appealing to an empty modal base will not allow us to explain the falsity of (10a) and (12).

for ‘it must be that p ’ to be true.

We are about to examine and ultimately reject two Leibnizian alternatives to Kratzer’s analysis. Beforehand, let me explain why The Problem calls for a revised modal semantics, rather than a non-semantic solution. Suppose we tried positing a pragmatic constraint according to which the truth of a modal conditional of the form ‘if p then it must be that q ’ requires that p leave it open whether q .⁸ This non-semantic solution would allow us to maintain that (10)-(12) are not true after all—on the grounds that they fail to satisfy the pragmatic constraint in question, with the *antecedent already settling things with respect to the consequent*. Frank (1997: 4.1.3; see also 2.2.2) argues that such a constraint fails to generalize to all instances of The Problem—because some modal conditionals of the form ‘if p then it must be that p ’ have decidedly true deontic readings (even if most such readings are outrageous). For an example, substitute for p ‘you are seated during flights’, and assume airline regulations as the deontic ordering source. Frank notes that the naturalness of such examples improves further if we replace ‘must’ with ‘is obliged to’, so the consequent becomes ‘you are obliged to be seated during flights’. She concludes that “the observed tendency of deontic *must*, to be preferably uttered relative to a context where the fact denoted by its complement is not yet ‘settled’, has more to do with the pragmatic conditions associated with notions of *demand* vs. *obligation* rather than with the semantics of *obligation* proper (1997: 4.1.3).”

4. Two Leibnizian Solutions

In advocating an account of conditionals according to which antecedents serve as domain restrictions, Kratzer (1991) seems to aim for a unified account of conditionals—modal and nonmodal alike. A special treatment for modal conditionals (embodied in definition 8), gets in the way of this unification project. Many linguists (Schwarzchild, personal communication 2000; see also Frank 1997: 2.2.2-3) have tried to capture Kratzer’s goals by treating modal conditionals as doubly modalized: conditionals in general are implicitly modalized, while modal consequents introduce a second modal contribution. This amendment does indeed accomplish Kratzer’s unification goal better than her own proposal. But does it dispose of The Problem? Section 4.1 explores this question, arriving at a negative answer.

Frank develops a dynamic semantic account of modality in the context of which she suggests a solution specifically targeting The Problem (1997: 4.1.3-4). In effect, she suggests that whenever we encounter a modal claim of the form ‘it must be that p ’, the modal base with respect to which the claim is evaluated, should leave open whether or not p is true. Thus if the original modal base made p true, then it should be augmented so we get a modal base that leaves p open. On this strategy, the problematic sentences of the form ‘if p then it must be that p ’ are no longer vacuously true. The second half of this section assesses this solution, finding that it comes at a hefty price: a closely related problem (which I will call the Flipside Problem) inevitably emerges. Further, the link between The Problem and the Flipside are indicative of what is fundamentally wrong with Leibnizian solutions. Section 5 deals with the aftermath of this finding, generalizing the source and nature of The Problem further. My overall criticism of Leibnizian solutions is largely independent of technical details of specific accounts of modality; I have therefore tried to keep the discussion as nontechnical as possible.

⁸ Even if this were posited as a *semantic* constraint, Frank’s objection listed in this paragraph would still apply. See also Section 4.2 about the Flipside Problem.

4.1. The Double Modalization Strategy

In the spirit of Kratzer's (1991) unified semantics for conditionals, differences among material, counterfactual, deontic, epistemic, and other conditionals should be due to differences in the contextually contributed modal base and ordering source. The backbone of this idea is that conditional antecedents are always restricted quantifiers. This makes conditionals implicitly modalized: an antecedent provides further restriction on an initial modal base with respect to which an implicitly quantified consequent is evaluated. For example, (13) is analyzed as implicitly quantifying over Britney's Vanilla Coke-sampling scenarios—in *every* such scenario, Britney keeps her Vanilla Coke consumption a secret.

(13) If Britney Spears has tried Vanilla Coke, she has kept it a secret.

The initial modal base is plausibly epistemic (including worlds that are consistent with what the speaker, or what the public knows), and the ordering source stereotypical (the more a world follows a normal course of events, the closer it is to the base world). This way, (13) is equivalent to (14):

(14) If Britney has tried Vanilla Coke, she surely/necessarily has kept it a secret.

But (14) itself involves a modal operator, the epistemic 'necessarily', which we expect to be implicitly present in (13) as well.

These considerations call for the following definition:

(15) Kratzer's general treatment of conditionals

For any sentences p and q , world w , ordering source O , and modal base M ,

'If p then q ' is true in w relative to M and O iff

q is true in all the worlds closest (by O) to w within M^p ,

where M^p contains all the worlds of M that make p true.

- a. For indicative conditionals, M is typically restricted to worlds that make true certain relevant facts (circumstantial restriction) or what is known (epistemic restriction), while O is stereotypical.
- b. For counterfactual conditionals, M is unrestricted and O is totally realistic (the more a world resembles w overall, the closer it is to w ; this follows Lewis' (1973) proposal to order worlds based on overall similarity).
- c. For the logician's material conditional, O is empty and M is totally realistic (restricted to worlds exactly like w).

Once we have a general account of modality on the one hand (definition 4), and conditionals on the other (definition 15), it seems reasonable to combine those to analyze modal conditionals like (9), repeated below:

(9) If Britney Spears drinks cola in public, then she must drink Pepsi.

Assuming an epistemic modal base M and a stereotypical ordering source S for the conditional, the antecedent further restricts M to M_{COLA} , the cola-drinking worlds among M (by 15a); and we must further restrict our attention to the most normal of M_{COLA} worlds: $M_{\text{COLA/NORMAL}}$ (because of S). Next, we need to employ definition (4a) to check the truth of ‘Britney must drink Pepsi’ in each of the $M_{\text{COLA/NORMAL}}$ worlds. For Kratzer, this task would have involved checking if Britney drinks Pepsi in the $M_{\text{COLA/NORMAL}}$ worlds (by 8a). By contrast, on the double modalization analysis, the task involves checking for each $M_{\text{COLA/NORMAL}}$ world v , whether in the deontically closest worlds *among those within v ’s modal base N* , Britney drinks Pepsi (by 4a). (Exactly what worlds does N include? I will turn to this crucial detail shortly.)

The above treatment has it that conditionals with modal consequents are *doubly modalized*: in addition to the overt modal in the consequent, the plain conditional itself comes with a covert (usually epistemic) modal. The modal operator of the consequent is then embedded in the scope of the modal operator of the entire conditional. This natural move renders definition (8)—custom-tailored for modal conditionals—superfluous. In the light of (15), (8) does seem *ad hoc*: why, after all, would we want to *avoid* appeal to definition (4) (for simple conditionals) in the semantics of modal conditionals?

Moreover, definition (8) is independently problematic. By itself, it is limited to capturing basic modal conditionals only; it becomes problematic, however, when combined with (15) to capture more complex conditionals like the counterfactual reading of (16):

(16) If Britney Spears had ordered cola for lunch, she should have ordered Pepsi.

(Assume, as before, a deontic ordering based on the terms of Britney’s Pepsi contract.) By (15b), Britney’s cola-ordering worlds are ordered based on their overall similarity to the base world. But by (8a) and (4a), those same worlds must *simultaneously* be ordered based on how well they fulfill the terms of Britney’s Pepsi contract. We thus have two potentially conflicting ordering sources. After all, Britney’s actual cola-drinking habits need not (and probably do not) always agree with the terms of her Pepsi contract; so the most similar worlds need not be deontically the most ideal. Not only is it mysterious how these two conflicting ordering sources would be balanced against each other to yield a single world ordering; no such consolidated ordering would be plausible. For more extensive discussion, see Frank (1997), Sections 2.2.2-3 and 4.1.4.⁹

By contrast, we can naturally combine definitions (15) and (4) to analyze (16) in much the same way as (9) has been analyzed a few paragraphs back: the already modalized conditional’s similarity-based ordering is computed separately, prior to computing the embedded consequent’s deontic ordering. The lesson then is that modal conditionals are not special conditionals; they just have special consequents (to be treated in accordance with definition 4). Every conditional itself is modalized (as reflected in 15), and conditionals with modal consequents are therefore doubly modalized. *This double modalization alternative thus differs from Kratzer’s two-dimensional treatment in replacing definition (8) by (15).*

⁹ Frank (1997: 2.2.3) argues that the distinction between ordering source and modal base is unnecessary. We can get by without ordering sources, by having deontic/bouletic/stereotypical restrictions on modal bases in just the way that epistemic and circumstantial restrictions apply to modal bases. My arguments in Section 4 carry over to Frank’s formulation as well. I will nevertheless continue appealing to ordering sources—to keep the discussion straightforwardly related to the now-familiar Kratzerian framework. In Appendix 1, I discuss Frank’s account without ordering sources which is also the more general alternative, favored by philosophers.

Next we should see how the double modalization alternative fares with respect to The Problem. To that end, we will first return to the analysis of (9). Recall the last phase: checking for each $M_{\text{COLA/NORMAL}}$ world v , whether Britney drinks Pepsi in the deontically closest worlds among those within v 's modal base N . The crucial question is whether there is a restriction on the modal base N for each v . In particular, should some N for some v include worlds outside of M_{COLA} ? If the answer is 'yes', then N would include worlds in which Britney does not drink cola at all; some such worlds fulfill Britney's contract just as well as the deontically most ideal Pepsi-drinking worlds do and are therefore among the deontically closest worlds to v . But then 'Britney must drink Pepsi' comes out false with respect to v (by 4a): for surely, the advertisement contract has not committed Britney to drinking Pepsi whenever she is in public (it is consistent with her contract that she not drink at all while in public, or that she opt for a healthy alternative such as juiced wheatgrass). This means that the deontically closest worlds include ones in which Britney does not drink anything, as well as worlds in which she drinks wheatgrass juice. And this, in turn, makes (9) false (by 15a). But (9) follows from Britney's Pepsi contract and hence should intuitively be true. To mend things, *we have no choice but to make the modal base restriction from the antecedent carry over to the modal base of the consequent*. That is, N is restricted to M_{COLA} , an outcome we can achieve by positing a circumstantial restriction on N , based on the restriction due to the antecedent.¹⁰ Indeed, it is quite natural to expect a restriction like this to carry over to an embedded clause.

Now The Problem straightforwardly crops up, for (10a) (repeated below) is still automatically true:

(10a) If Britney Spears drinks Coke in public, then she must drink Coke in public.

The antecedent restricts the initial modal base to M_{COKE} ; we then need to evaluate the consequent with respect to each normal M_{COKE} world. In each case, the Coke-restriction carries over to the modal base for 'Britney must drink Coke in public'; we have seen that getting things right with the garden-variety conditional (9) imposes this requirement. Thus deontically the closest worlds within the modal base are always worlds in which Britney drinks Coke. 'Britney must drink Coke' therefore comes out true (by 4a), making (10a) true (by 15a). We are back to square one.

In sum, while the double modalization alternative constitutes an overall improvement on Kratzer's two-dimensional analysis, so far, it offers no relief with respect to The Problem. What if we made the analyses of (9) and (10a) different in the following respect: for (9), the antecedent's restriction is retained for the modal base N with respect to which the consequent is evaluated; but for (10a), we get rid of the restriction. I will examine this option in Section 5, showing that it involves going non-Leibnizian.

4.2. Frank's Modal Base Augmentation

¹⁰ Frank (1997: 2.2.3) comes up with a solution along these lines, proposing a different, anaphoric mechanism for carrying over the antecedent restriction to the consequent. She further shows that in addition to the antecedent restriction, the normalcy restriction (due to the conditional's ordering source) also has to carry over, so N is restricted to $M_{\text{COLA/NORMAL}}$. (See 1997: 4.1.1 and also 1997: 4.3.) While her point is not crucial to the present discussion, it is worth noting that she has thereby created a slew of new, problematic examples related to The Problem. For the following will automatically be true: 'If Britney drinks cola then things will proceed normally' and 'If Britney drinks cola then things must proceed normally'. More generally, any sentence of the form 'if p then things will/must/may proceed normally' is guaranteed to be true.

Kratzer’s analysis, along with the double-modalization improvement on it, can be translated into a dynamic semantic framework in which contextually and anaphorically supplied restrictions stand in for modal bases and ordering sources. In her dissertation, Frank works out the details of this and introduces a strategy—by appeal to a special kind of context reduction—that is custom-tailored to address The Problem (1997: 4.1.4). To keep the present discussion independent of a dynamic semantic framework, I will formulate an analog of context reduction—to be called Augmentation—within Kratzer’s framework and its variant, the double modalization alternative. I will then compare ways in which Frank puts Augmentation to use (see also Appendix 1). My aim is to show that not only is Frank’s application of Augmentation to solving The Problem *ad hoc*; the apparent solution is also limited and ultimately unsuccessful. It amounts to plugging just one hole in an irreparably leaking boat; put a stopper in that one hole, and the water gushes in at another.

Intuitively, context reduction amounts to removing from the context of discourse a piece of information p that had previously been considered given or part of the common ground. This way, p is left open, and both p and not- p scenarios may come under consideration. The Kratzerian analog of context reduction can be described as modal base Augmentation: in our case, the process of removing a restriction p (if any) from the specification of a modal base. What the Augmentation of a modal base M with respect to p does when every world of the modal base is a p -world: it produces a more inclusive modal base $M^{p/p}$, which includes any world that is most similar to some M -world as far as circumstances apart from p are concerned.¹¹ To take an example, suppose we start with the already familiar circumstantially restricted modal base M , so each world in M has Britney sign an advertisement contract with Pepsi. Now, if we Augment this modal base with respect to ‘Britney signs an advertisement contract with Pepsi’ (call this ‘contract’), then the result is $M^{\text{contract/no-contract}}$: a modal base that includes not only the original M -worlds, but also every no-contract-world that is most similar to some M -world.

More generally, modal base Augmentation—call it Augmentation, for short—does something like the reverse of what a restriction on a modal base accomplishes. In the case of a restriction with respect to p , we *exclude* worlds that make p false. In the case of Augmentation with respect to p , we *include* p -worlds as well as not- p -worlds—adding to the modal base (i) any additional not- p -world that is most similar to some world already in the modal base, and (ii) adding any additional p -world that is most similar to some world already in the modal base. When every world of the modal base is a p -world, no worlds are added on count (ii): because the most similar p -worlds are the ones already included in the unaugmented modal base (this was the case with $M^{\text{contract/no-contract}}$). Similarly, when every world of the modal base is a not- p -world, no worlds are added on count (i).

Just how much the modal base is augmented depends on how minimal we want the modal base Augmentation. Frank (1997: 4.2.2) rejects a minimality constraint on modal base Augmentation, so I will not employ it in the formulations here; but the problems I raise do not hinge on the rejection of such a constraint. The more minimal we want the Augmentation, the more fine-grained and detail-sensitive we need to make the similarity relation on which Augmentation crucially relies. This is only the tip of the iceberg when it comes to spelling out an appropriate notion of similarity.¹² I will be entirely silent on the nature of this notion, as my aim is to show that

¹¹ Of course, not every instance of modal base Augmentation results in the inclusion of additional worlds. At the extreme, Augmentation with respect to a logical truth or a contradiction does not alter the modal base. For example, Augmentation on M with respect to either ‘if p then p ’ or ‘if p then not- p ’ yields M itself.

¹² The semantics of counterfactual conditionals famously relies on a notion of comparative similarity between worlds,

decisive problems with Augmentation lie elsewhere.

Besides appealing to Augmentation to address The Problem, Frank also recruits Augmentation to resolve various kinds of inconsistencies in specifying modal bases. (Kratzer (1981, 1991) resolves these inconsistencies with the help of ordering sources.) In Appendix 1, I describe these applications in some detail, discuss motivations behind them, and bring out crucial differences that set them apart from the application of Augmentation to The Problem.

Here then is the definition of Augmentation, intended to revise the semantics of *simple* modal sentences (definition 4):.

(17) Frank's Augmentation-based treatment of modal sentences

(to resolve The Problem through an amendment of definition 4)

For any sentence p , world w , ordering source O , and modal bases M ,

'it must be that p ' is true in w relative to M and O iff

'it must be that p ' is true in all the worlds closest (by O) to w within $M^{p/\neg p}$,

where $M^{p/\neg p}$ is the result of Augmenting M with respect to p and its negation; this amounts to M plus for each M -world, (i) every p -world most similar to it, as well as (ii) every not- p -world most similar to it. $M^{p/\neg p}$ thus leaves p (as well as not- p) open.

Let me illustrate on (10a) (repeated below) how (17) resolves The Problem:

(10a) If Britney Spears drinks Coke in public then she must drink Coke in public.

The very fact that the consequent is about Britney's drinking Coke, erases any Coke-drinking and non-Coke-drinking restrictions on the modal base. Thus the initial restriction due to the antecedent (in accordance with 15) is lifted as we get to evaluating the consequent, and (10a) is no longer true.

Beyond this success, what motivation is there for (17)? In effect, it amounts to saying that non-modal circumstances are never relevant to requirement (or laws or desires) calling for or forbidding that those circumstances obtain; after all, (17) serves to dispose of any details that match what the requirement in question involves. Britney's drinking Coke is never relevant to whether she should or should not drink Coke. More generally, non-modal circumstances (about what happens in a world) are never relevant to corresponding requirements—about what should or should not happen. This is not to say that non-modal circumstances are not *in any way* relevant to requirements, which may well be our verdict about 'even if' conditionals.¹³ In the case of conditionals like (9) (repeated below), *the very idea of a conditional requirement or law suggests that the antecedent (about Britney's drinking cola in public) is relevant to the consequent's taking effect (that Britney is required to drink Pepsi under the circumstances described).*

(9) If Britney Spears drinks cola in public, then she must drink Pepsi.

This clause of Britney's advertisement contract does not require her to *always* drink Pepsi, just that she do so *whenever the antecedent is fulfilled*; otherwise, she is free to engage in a wide range of drinking activities that do not involve Pepsi, like drinking juiced wheatgrass, and also a variety of

see Lewis (1973). The major issue there is figuring out what the nature of the similarity relation is supposed to be.

¹³ The semantics of 'even if' conditionals plausibly makes the antecedent irrelevant to the consequent in a deontic reading of 'Even if Britney drinks Coke, she must drink Pepsi'. See Frank (1997: 2.2.2).

non-drinking activities like taking a nap or eating spinach.

In sum, *non-modal circumstances (as antecedents in conditional law constructions) can be relevant to requirements and do sometimes interact with them.* Points of exception are requirements of the form ‘It must be that *p*’ where *p* is implied by the circumstance in question. (17) is a rule formulated exclusively for capturing the desired exceptions. But are there reasons for positing exceptions beyond the need to circumvent The Problem? In the absence of further justification, (17) constitutes ad hoc patchwork, rather than a genuine solution to The Problem. And the reasons are not there. One might think otherwise, citing the very observation underlying The Problem: just because something happens need not mean that laws allow or require it; non-modal circumstances *need not* be sufficient for corresponding laws or requirements. But (17) captures a different claim—that non-modal circumstances can *never* be sufficient for corresponding laws/desires. Not only is this claim unsupported; there does not seem to be anything wrong with the idea of non-modal circumstances determining corresponding requirements. We are about to see this based on (18) and (19):

- (18) If Gollum finds the One Ring, then he must find the One Ring.
(deontic reading invoking laws of nature in effect in Middle-earth)
‘If Gollum finds the One Ring, then Middle-earth laws of nature require that he find it.
Basis for (18): determinism prevails in Middle-earth; what happens there is bound to happen.
- (19) If Annie Hall makes a U-turn then she should not be making a U-turn.
(deontic reading invoking traffic laws)
‘If Annie Hall makes a U-turn, then what she is doing violates traffic laws.’
Basis for (19): When Annie gets behind the wheel, every maneuver of hers constitutes a traffic violation.

Someone who thinks that determinism holds in the context of *The Lord of the Rings*, might be committed to (18), claiming that it does follow from any event or action that the relevant laws of nature require it. The point is not that determinism is true—in reality, or in a certain story—only that it is a *coherent* position, and according to it, facts *are* sufficient for corresponding claims about necessity. It is this link between facts and requirements that is severed by Augmentation. Similarly, with a pessimistic view about Annie Hall’s driving ability, we might say (19) as a special instance of what we think is generally true of her: that every driving maneuver of hers is a traffic violation. From this it follows that if she makes a U-turn then she should not be doing so. That is to say, given certain background facts linking events and corresponding laws—information about determinism, or Annie’s driving skills—facts do allow for conclusions about corresponding requirements. Crucially, such background information would justify (18) and (19) without justifying their consequents by themselves: it is not as though based on the relevant background information, we want to accept the truth of ‘Gollum must find the One Ring’ or of ‘Annie must not make a U-turn.’ Admittedly, such a background setup is not common; but this is due to issues unrelated to semantics (see the end of Section 3). Further, such a background setup is definitely coherent, possible and sometimes even natural. An analysis of modality should therefore accommodate it. *Even if determinism is false, semantic analysis is not the place to rule it out.* Nor is it the place to rule out the existence of a perpetual traffic violator.

A straightforward way to accommodate (18) and (19) would be to make the Augmentation step in (17) optional, so we could skip Augmentation in selected cases. But this is a problematic move. An optionality amendment would fail to secure an illuminating and systematic account of modality, leaving open when to apply Augmentation and when not. As things now stand, we would have nothing except the following guideline: use Augmentation when and only when it makes the truth-conditions come out intuitively right. Without independent characterization of the conditions for applying Augmentation, this is no more substantive than the following rule for computing truth-values: for any sentence, flip the truth-value ‘true’ to ‘false’ whenever the sentence is intuitively false, and leave it as ‘true’ when the sentence is intuitively true. This optionality maneuver was one we have already encountered with respect to the double-modalization account. Jackson’s (1985) crack at The Problem also parallels such a maneuver; in the upcoming Section, I will argue that such a maneuver involves going non-Leibnizian.

By excluding the possibilities of determinism and a perpetual traffic violator, (17) runs into a counterpart of The Problem, to which I am about to turn. Originally, The Problem exposed the following commitment of Kratzer’s analysis: sentences of the form ‘if p then it must be that p ’ invariably come out true. Frank responds by positing (17), according to which such sentences—as well as those of the form ‘if not- p then it must be that p ’ are no longer true. Frank’s move goes overboard in two ways. First, for Frank’s (1997: 4.1-3) analysis without ordering sources, sentences of the form ‘If not- p then it must be that p ’ are false *even if a law requiring p is in effect*. For example, according to a certain, not implausible set of background considerations about driving safety, there ought not to be any “no speed limit” roads. Relative to such a deontic claim, the following should be intuitively true:

- (20) If there is no speed limit on the Autobahn linking Bonn and Cologne, then there should (still) be one.
 (deontic reading invoking considerations about driving safety, including the one ‘every road should have a speed limit’)
 ‘Given considerations about safe driving, a speed limit should be in effect on the Bonn-Cologne Autobahn, if there isn’t one (already).’

Nonetheless, (20) turns out to be false on Frank’s analysis. Here is why. The falsity of (20) is due to Frank’s application of Augmentation to resolving inconsistencies: antecedents that violate laws make those laws inert with respect to the assessment of the conditional in question (for more details, see Appendix 1). *Consequently, sentences of the form ‘if p then it may be that p ’ are invariably true*. For example, Frank’s analysis has it that in the context of a deontic backdrop which includes, among other things, a law prohibiting murder, the intuitively false (21) comes out true:

- (21) If there is murder then there may be murder.
 ‘If there is murder then the laws allow murder.’

(20) and (21) are already quite devastating; but they could be fixed by reintroducing ordering sources in addition to modal bases. There is, however, a second, more general problem facing (17), for which ordering sources offer no help. Indeed, I will argue that this new problem—the Flipside Problem—does not admit of a solution any more than The Problem does: *going Leibnizian means we are either stuck with The Problem, or with the Flipside, but we cannot resolve both*.

The Flipside Problem is this: sentences of the form ‘if p then it must be that p ’ are *never* true when their consequent is not already true. But beyond (18) about determinism, there are plausibly true instances of such conditionals, some of which are listed in (22) below.

(22) The Flipside Problem

- (a) If The Dalai Lama is angry, then he should be angry.
(deontic reading invoking considerations about reasonable reactions)
‘If The Dalai Lama is angry, then (given his even temper) he must have his reasons.’
- (b) If Yogi Bear works then he has to work/is obliged work.
(bouletic reading invoking Yellowstone ranger John Smith’s demands)
‘If Yogi Bear works, then (given his extreme laziness) his actions must have been prompted by John Smith’s desires.’
- (c) If Bart Simpson listens to Bartók, then he must/is obliged to do so.
(bouletic reading invoking, say, Marge’s desires)
‘If Bart Simpson listens to Bartók, then (given his musical proclivities) his action must have been prompted by Marge’s demands.’

For (22a), assume as background that The Dalai Lama is extremely mild-mannered, so he does not get angry unless he has very good reasons for doing so. The antecedent restricts the modal base to worlds in which The Dalai Lama is angry (by 15a). Augmentation then removes this restriction (by 17), so the modal base against which we evaluate the consequent includes worlds in which he is not angry. Then ‘The Dalai Lama should be angry’ is false (by 17), making (22a) false (by 15a). Exactly parallel steps show how (22b) and (22c) also come out false. But intuitively, each should be true. It does not help to make Augmentation optional, because we would then need to provide a general principle for when to apply Augmentation and when not; and no such principle has been given. In Section 5, I will argue that providing such a principle amounts to going non-Leibnizian.

Two further considerations make the Flipside Problem even more pointed. (17) prevents us from so much as *representing* background claims of the sort we have seen in (22). But (22a) would be a plausible way of rendering a claim about The Dalai Lama’s character: that he does not get angry without having good reasons for it. This point draws further support from the classical-logic correspondence between *if*-conditionals and *only if*-conditionals (see Dekker 2001). Based on this, (22a-c) are equivalent to the even more natural (23a-c), which make entirely plausible general claims about The Dalai Lama, Yogi Bear, and Bart Simpson, respectively.

- (23) (a) The Dalai Lama gets angry only if he has to.
- (b) Yogi Bear works only if he has to.
- (c) Bart Simpson listens to Bartók only if he has to.

So far, we have seen that the one Leibnizian solution to The Problem that successfully resolves it—by appeal to Augmentation—lacks independent motivation on the one hand, and also generates further problem cases on the other: the Flipside Problem. We have already seen that it is no coincidence that disposing of The Problem by means of Augmentation leads to the Flipside Problem: The Problem had been due to an unwanted link between non-modal circumstances and corresponding requirements in Kratzer’s analysis. Removing this link by means of Augmentation

amounts to *never* allowing a link between non-modal circumstances and corresponding requirements. The Flipside Problem shows that this is not right either. The remainder of the paper explicates further the relation between The Problem and the Flipside, aiming to establish that getting rid of both problems requires a non-Leibnizian solution.

5. The Problem Generalized

The hallmark of Leibnizian frameworks—like Kratzer’s, Frank’s, and others’—is that they treat modal claims (norms, laws, requirements, or obligations) as different beasts than non-modal claims. The former are interpreted in terms of quantification over the possible worlds that count (whether they be the accessible ones, or the closest among the accessible ones). And the truth of a modal sentence is a function of the (non-modal) goings-on of the worlds. Precisely this is embodied within a generalized version of definition (4).

- (4') Generalized Leibnizian semantics
For any sentence p , world w , contextual factor(s) C ,
- a. ‘It must be that p ’ is true in w relative to C iff
relative to a (contextually determined) selection criterion S on possible worlds,
 p is true in all the worlds S -selected based on C relative to w .
 - b. ‘It can be that p ’ is true in w relative to C iff
for selection criterion S on possible worlds,
 p is true in at least one of the worlds S -selected based on C relative to w .

In the standard relational modal semantics, the selection criterion is accessibility (Kripke 1963). When the context of utterance is such that we get a deontic reading invoking Britney’s Pepsi-contract, then the worlds selected based on contextual factors are those worlds in which Britney’s Pepsi contract is obeyed. For Kratzer, the selection criterion involved an additional component: an ordering of the accessible worlds. In the just-mentioned context, the worlds selected are those worlds within a circumstantially restricted modal base that obey Britney’s contract to the greatest degree.¹⁴

The Problem and the Flipside have put demanding requirements on our choice of a selection criterion: The Problem forces us to accommodate scenarios in which intuitively, certain non-modal circumstances *are not* sufficient for corresponding requirements. At the same time, the Flipside forces us to accommodate scenarios in which intuitively, certain non-modal circumstances just like those featured in The Problem *are* sufficient for corresponding requirements just like those featured in The Problem. This pair of desiderata puts conflicting demands on a Leibnizian framework in which a requirement simply *is* its fulfillment in the S -selected worlds. How could we have a *uniform* selection criterion that would simultaneously do justice to our intuitions about the Problem-conditionals as well as the Flipside-conditionals? The tension here is an exact parallel of the conflicting demands imposed by a Problem-conditional like (10a), and a garden-variety conditional like (9). To put the issues differently, it is in the nature of non-modal circumstances and requirements that the latter are sometimes independent of the former in certain ways (as demonstrated by The Problem) and sometimes dependent on them (as demonstrated by the Flipside

¹⁴In a neighborhood semantic framework (Scott 1970, Montague 1970), S is taken to select a neighborhood of possible worlds.

Problem and garden-variety conditionals). The representation of non-modal circumstances and modal claims should therefore leave open the possibility of dependence, without requiring it. This is an impossible task for the representational apparatus of any Leibnizian framework.

It is well to consider another way of construing the commitment made by a Leibnizian semantics. It is customary to construe a model for modal logic (a Kripke model) as consisting of

- a set of indices (possible worlds),
- a base world—one of the indices,
- a binary relation on the indices (what we previously called a selection criterion), and
- a valuation function assigning a truth value relative to each index to each atomic sentence.

Crucially, a Leibnizian semantics construes all modal sentences as non-atomic. They are not assigned truth values with respect to each world by a valuation function; instead, their semantics is given by (4'). One way to go non-Leibnizian is by giving up on (4) for deontic modality and treating modal and non-modal claims alike in that atomic sentences of both stripes are assigned truth values (relative to indices) by a valuation function. The Problem and the Flipside are pushing us in just this direction—so I will argue in this section.

For over fifty years, logicians have been subjecting deontic readings of modal conditionals to intense scrutiny. But The Problem has not received the kind of weight that the numerous paradoxes of deontic logic have. In this section, I aim to show that within deontic logics, The Problem arises generally, with minimal and quite plausible assumptions. Jackson's (1985) paper stands out with the exceptional weight it places on The Problem. But ultimately, Jackson's proposal turns out to be a non-Leibnizian solution.

The makings of The Problem were already present at the inception of deontic logic, introduced under that name in an eponymous essay by von Wright (1951), who later recalled his initial observation ...

... that the normative notions of permission, prohibition, and obligation seemed to conform to the same pattern of mutual relatedness as quantifiers and basic modalities. I thought this observation worth a separate paper, and so I wrote "Deontic Logic" and sent it to the then editor of *Mind*, Gilbert Ryle, who promptly published it. (von Wright 1999, 28)

Von Wright's is a propositional logic, without quantifiers. Therefore, conforming to the "same pattern of relatedness as quantifiers and basic modalities", means a Leibnizian framework is presupposed: one in which modality is understood in terms of quantification over possible worlds. Having 'O' stand for a one-place modal operator for deontic necessity, $O(p)$ is true just in case it is true in all of the deontically most ideal worlds.

At the next juncture, our task is to figure out what to do with modal conditionals—conditional obligations—like (9), repeated below:

(9) If Britney drinks cola in public, she must drink Pepsi.

The advertisement contract does not impose an absolute obligation on Britney—that she must drink Pepsi all the time. Her obligation to drink Pepsi becomes effective in circumstances when she drinks cola in public. Deontic logic thus has to face a decision: how should absolute obligations of the form $O(p)$ and conditional ones involving p be related to one another? This in turn involves answering the question: how should the modal and the conditional parts of (9) be

represented? Three forms have been considered:

- (24) (a) $O(\text{if } p \text{ then } q)$
(b) $\text{if } p \text{ then } O(q)$
(c) $O(q / p)$
read as: ‘It ought to be that q given p ’

Von Wright (1951) originally suggested (24a), but Prior pointed out a problem with that approach, namely that it gives rise to a “deontic analogue of the paradox [...] of strict implication”: “the doing of what is forbidden commits us to the doing of anything whatsoever” (1954, 64). If, say, murder is forbidden, then every one of the deontically most ideal worlds makes true a conditional of the form ‘if murder occurs then q ’, no matter what we substitute for q . But then ‘ $O(\text{if murder occurs then } q)$ ’ is true for any q . Von Wright (1956) used this particular paradox to motivate so-called dyadic deontic logics, which capture conditional obligations without recourse to a two-place conditional connective. Instead, a dyadic system would represent conditional laws with the help of the two-place structure in (24c).¹⁵

Notice that in Prior’s argument about the Paradox of Strict Implication, the conditional is assumed to be a material conditional—which is vacuously true when its antecedent is false. This account of conditionals leads to the same paradox for the (b) alternative as well: again, if the deontically closest worlds all make the antecedent false (no murders occur in them, say), then any conditional of the form ‘If murder occurs then $O(q)$ ’ (given the false antecedent) is true for any q . These considerations prompted Kratzer (1981, 1991) to introduce ordering sources, so that the deontically most ideal among the accessible worlds could be ones where murder occurs, violating the absolute obligation prohibiting murder.

Why is it important to home in on worlds that satisfy the antecedent of the conditional obligation? In the case of (9), why should we be looking at worlds in which Britney drinks cola? Because there is one very attractive link that suggests itself between absolute obligations and conditional ones: *conditional obligations are just like absolute obligations in worlds in which their antecedents obtain*. This is supposed to be at the foundation of the semantics for conditional obligation. Given our choice of the dyadic operator $O(_ / _)$, we can introduce ‘ $O^*(-)$ ’ as the one-place ‘ought’ operator for absolute obligations.¹⁶ The semantic expectation then amounts to this:

Semantic expectation linking conditional and absolute obligations:

In p -worlds, a conditional obligation $O(q/p)$ functions the same way as an absolute obligation $O^*(q)$ would.

We should not confuse this semantic expectation with the syntactic rule (or derivation) of Detachment, which parallels the semantics: for worlds in which our premises include some conditional obligation (say, (9)) and its antecedent (that Britney drinks cola), we can derive an absolute obligation involving the consequent (that Britney must drink Pepsi):

Detachment:

$O(q/p)$, together with p , entail $O^*(q)$

¹⁵ Two dyadic logic classics are van Fraassen (1972), and Lewis (1974).

¹⁶ Of course, we could define $O^*(_)$ in terms of the two-place O as $O(_ / A \supset A)$.

Detachment is a special case of modus ponens on the (24b) alternative, but not on the other two options. Jackson claims that “[d]etachment is plausible. If it ought to be that Attila goes to jail given that he has raped and pillaged, and he has raped and pillaged, then it ought to be that Attila goes to jail.” (Jackson 1985, 191) Tomberlin (1989, 110) concurs: such inferences have to be valid “...for statements of conditional obligation to play a genuine role in the normative guidance of conduct”.

Still, it is important to distinguish Detachment from the semantic expectation about a link between conditional obligations and absolute ones. The reason: the semantic expectation is even more general. For example, in van Fraassen’s (1972) framework Detachment cannot be derived (see Tomberlin 1989); nonetheless, he adheres to the semantic expectation:

There is a rudimentary semantic criterion that yields another axiom and rule. The intuitive meaning of ‘given A’ is such that, if a sentence ends with it, then *any possibility that does not satisfy A is irrelevant to the evaluation of that sentence*. Thus, the evaluation of $O(A/B)$ cannot depend on $H(A)$ [the set of attainable states in which A holds] as such but at most on $H(A \& B)$ [the set of attainable states in which both A and B hold]. (van Fraassen 1972, 421; emphasis added)¹⁷

This semantic expectation linking conditional and absolute obligations, together with the assumption of a Leibnizian framework suffices to give rise to The Problem. This pair of tenets jointly guarantee the truth of conditionals like (10a):

(10a) If Britney Spears drinks Coke, then she must drink Coke.

The explanation is simple, we have already encountered it in connection with Kratzer’s framework: (i) if we are only allowed to consider Coke-drinking worlds for the evaluation of an obligation conditional upon Coke-drinking (this follows from the semantic expectation), and (ii) if the ubiquity of Coke-drinking across the worlds that count is sufficient to establish an obligation about Coke-drinking (as a Leibnizian semantics assumes by taking on board (4’), then the obligation is inevitable.¹⁸ It does not matter how we cash out the syntax and semantics of conditional obligations. In particular, our choice of treatment for conditionals will not make a difference. This is why I am pessimistic about the prospects of disposing of The Problem in frameworks that treat conditionals differently from Kratzer.

Deontic logicians therefore have had to confront The Problem. The following two remarks are characteristically evasive and weak:

A [...] point of criticism concerns the formula $O(B/B)$. This is almost always true... ‘Rightly understood’ of course, it is true; if we have put ourselves in a situation in which a certain ideal can no longer be attained, then doing the best one can will involve not attaining that ideal. No use crying over spilt milk. (van Fraassen 1972, 437)

... I wondered about the normative status of unalterables. Sometimes it seemed to me that it would be best to say that if a state of affairs is unalterable for a person at a time, then that state of affairs has no normative status for the person at the time. ... My impression then (and now) is that the cost of [the resulting] complexity exceeds the alleged benefit of getting a more intuitive truth value assignment for unalterables. I prefer to say

¹⁷ Lewis (1974) adopts the same semantic criterion.

¹⁸ We could make all this conditional on having a non-empty modal base of possible worlds. That will not make a difference, however; see footnote 7.

that whatever is unalterable for a person at a time is therefore, somewhat degenerately, obligatory. There is no need to be concerned about all the obligations thereby induced. Since these things occur in every world accessible to the relevant individuals, it will be impossible for them to fail to fulfill these obligations, no matter what they do. (Feldman 1990, 329)

This kind of aloofness about The Problem is peculiar given that a paradox right in its neighborhood—the Paradox of Gentle Murder (Forrester 1984)—has been commanding logicians’ attention. The paradox goes like this: if the laws require p and p entails q , then we get the result that the laws require q . For example, we may well suppose that the deontic background requires: If Jones is murdered then it ought to be that Jones is murdered gently. Suppose Jones is murdered. Then by Detachment, the murder ought to be gentle. But if Jones is gently murdered, then he is murdered *simpliciter*. By a cornerstone of modal logic, Entailment, however (‘if p entails q , then $O^*(p)$ entails $O^*(q)$ ’), the gentle murder requirement yields the plainly false ‘it ought to be that Jones is murdered’. Schematically:

Entailment: if p entails q , then $O^*(p)$ entails $O^*(q)$

p entails q	‘If Jones is murdered gently then Jones is murdered’
$O^*(p)$ entails $O^*(q)$	‘Jones ought to be murdered given that he ought to be murdered gently’ (by Entailment)

In Section 3, we have already mentioned Frank’s generalized version of The Problem: “any deontic conditional *if p then [it must be that] q* where p implies q will come out true, even if q is not ‘prescribed’ by the deontic ordering source” (1997: 2.2.3). This comes down to the following pattern:

p entails q	‘Britney eats Doritos’ entails ‘Britney eats MSG’
$O(q/p)$	‘If Britney eats Doritos, then she must eat MSG’

Notice how strikingly close the two schemas are! And I submit that the latter is at least as perplexing as the former (and then some). For in the gentle murder case, an *obligation* (that Jones ought to be murdered gently), yields a stunning obligation, ‘ $O^*(q)$ ’ (that Jones ought to be murdered). By contrast, in the case of the The Problem, given the semantic constraint linking conditional and absolute obligations, the *nonmodal circumstance* (that Britney eats Doritos), yields a stunning obligation, $O^*(q)$ (that Britney must eat MSG).

Jackson stands out with his bold acknowledgment of The Problem’s importance and weight. He subsequently emphasizes that his proposal steers clear of it:

... ‘It ought to be that there are spies and I catch some given there are spies’ strikes us as false, as does ‘It ought to be that there are spies given there are spies’. (The fact that some theories of conditional obligation would make the latter true is an *objection* to them...) (Jackson 1985, 181; emphasis in the original)

Our account allows $O(A/A)$, as well as $O(\sim A/A)$ to be sometimes true and sometimes false ... this seems right. ‘It ought to be that I tell the truth given I tell the truth’ seems true, while ‘It ought to be that Hitler exterminated millions of Jews given he exterminated millions of Jews’ seems false. By contrast, the standard view makes $O(A/A)$ always true. (*ibid.* p. 191)

Jackson’s solution, however, turns out to be a non-Leibnizian one, which gives up on (4’). This serves to reinforce my conclusion, rather than deflecting it. Inasmuch as Bart Geurts (2004) makes a convincing case for a way of handling The Problem, his alternative account, too, will be a non-Leibnizian one, for reasons that parallel those in connection with Jackson’s account. I describe and critique Geurt’s proposal in Appendix 2 and will now turn to Jackson’s.

Jackson makes a strong case for the claim that obligations are to be interpreted relative to alternatives.¹⁹ For absolute obligations, this means the following. ‘It ought to be that I tell the truth’ is construed as ‘It ought to be that I tell the truth out of {‘I tell the truth’, I do not tell the truth’}, which is true if and only if the closest worlds in which I tell the truth are better than the closest worlds in which I do not. In general, “obligation will be construed as relative to the class consisting of the proposition in question and its negation” (Jackson 1985, 187–88).

With respect to conditional obligations, Jackson has two choices:

- (25) (a) $O(p/q)$ is read as ‘ $O(p/q)$ out of $\{p, \text{not-}p\}$ ’ or
 (b) $O(p/q)$ is read as ‘given that q , $O(p/q)$ out of $\{p, \text{not-}p\}$ ’

The difference between the two options is crucial: it is an analogue of the choice we had to make in Kratzer’s framework about whether to retain the antecedent’s modal base restriction when evaluating the rest of the conditional. (Kratzer opted for retaining it, and The Problem ensued; Frank decided against it, and the Flipside Problem appeared.)

At this juncture, we witness the one evasive step Jackson takes within his otherwise rigorously argued paper. He considers conditionals like the following:

- (26) (a) It ought to be that I do not have cancer given I have cancer.
 (b) It ought to be that I am alive given that I am dead.
 (c) Given that Genghis drank ten doubles of whiskey a day, it ought to be that he drank nothing.
 (d) It ought to be that I play some sport given that I engage in no physical activity at all.²⁰

These conditionals are naturally read as true, providing motivation to look beyond worlds where the antecedent obtains. In other words, we should opt for (25a). To quote Jackson, “... sometimes when considering ‘It ought to be that A given B ’, we need to consider possibilities where B is false—*pace* one of the intuitions lying behind the standard semantics for $O(A/B)$ ” (*ibid.* p. 191). *The intuitions mentioned are what was embodied in the semantic expectation about modal conditionals we had discussed above. And that expectation calls for (25b).* Indeed, in the continuation of this passage, Jackson concedes that (25b) is the applicable option in cases apart from those in (26):

But I grant that these cases [in 26] are unusual. Typically, B is such that it would still be the case whether or not A or its alternative are—‘I ought to go to the party given I have promised to’, here were I to have promised, I

¹⁹ See also Sloman (1970), who makes the further suggestion that we distinguish deontic ‘ought to’ from ‘must’ on the grounds that intuitively, ‘you must pay your bills’ imposes a stronger requirement than ‘you ought to pay your bills’.

²⁰ My example (20), which I used to lead up to the Flipside Problem in Section 4.2, makes the same point. (20) was: ‘If there is no speed limit on the Autobahn linking Bonn and Cologne, then there should be one’. This is plausibly true if we think that road safety requires speed limits everywhere. But Frank’s Augmentation-based proposal makes (20) false.

still would have whether or not I fulfill my promise—and in such cases when comparing A with its alternatives were B the case, we will in effect be comparing AB with A^1B , A^2B [alternatives in which B obtains], and so on. Possibilities where [not- B] will not come into it. (*ibid.*)

Buried within this passage is a crucial feature of Jackson's account. He can cash out conditional obligations either along the lines of (25a) or (25b). For conditionals like those in (26) as well as (10a), the only appropriate choice is (25a), with a non-constraining antecedent. In the more common cases, like (9), the only appropriate choice is (25b). But to make this very pair of points, *we need independent appeal to the status of the conditionals in question*, whether or not they are supposed to hold. And that information lies outside a Leibnizian framework which assumes (4'), thereby equating obligations with universal fulfillment of them across the worlds that count. In worlds in which Britney drinks Coke is she obligated to drink Coke (given her contract)? The answer is 'no', so we had better select (25a) here. In worlds in which Britney drinks is she obligated to drink Pepsi (given her contract)? The answer is 'yes', so we had better go for (25b) here. In worlds in which I am sedentary, am I required (given health considerations) to play some sport? Again, the answer is 'yes', so we had better select (25b) here. *In short, our justification for which of two accounts of conditional obligation apply in a particular case relies on independently available intuitions about the truth value of that particular modal sentence.* All that Jackson has done is secure two readings (based on (25a) and (25b)) for conditionals across the board: one, (25b), that is plausible, and another, (25a), that is (99 percent of the time) wide of the mark. Jackson wants more than room for ambiguity—for each conditional, he is aiming to deliver the intuitively plausible reading and that one only. Given the independent appeal to what the intuitive truth value of a modal conditional is, (4') cannot be *all* there is to the truth of a modal conditional; but going beyond (4') means going non-Leibnizian.

The Flipside Problem strengthens the above argument even further.

- (22a) If The Dalai Lama is angry, then he should be angry.
(deontic reading invoking considerations about reasonable reactions)
'If The Dalai Lama is angry, then (given his even temper) he must have his reasons.'

Recall that the basis for (19) was: when Annie gets behind the wheel, every maneuver of hers constitutes a traffic violation. (10a) and (22a) are both of the form 'if p then it must be that p '. But (22a) is like garden-variety conditionals in calling for the antecedent's restriction to be retained, in accordance with (25b). But then we cannot think (10a) requires special treatment on account of its odd form. The contrast between (10a) and (9) shows something deeper: non-factual circumstances do not always suffice for corresponding requirements (witness (10a)) but may sometimes do so (witness (22a)). But making this very point requires that we construe requirements holding or not holding as something above and beyond their ubiquitous fulfillment across the worlds that count.

It is a platitude that beyond a certain point, explanation cannot go any deeper. In the case of accounting for the semantics of deontic discourse, we reach bedrock one step earlier than logicians and linguists had thought.

Appendix 1

Anette Frank (1997) puts Augmentation to use in two ways—resolving inconsistencies in modal

base restrictions, and handling The Problem. In what follows, I will describe the former in some detail, in order to bring out crucial differences between the two applications. Below are two ways in which inconsistent restrictions can arise:

- *Antecedent–fact conflicts*: for counterfactual conditionals, the antecedent is inconsistent with actual facts which could be part of a circumstantial modal base. That is, we have a conflict between facts.
- *Antecedent–law conflicts*: conditional laws may have antecedents that conflict with some basic law, as we see in what Kratzer calls a variant of the Good Samaritan Paradox, more widely known as the Paradox of Strict Implication. Consider a pair of laws such as: ‘There must not be murder’ and ‘If there is murder, a jury should convene’. The conflict is brought out when we consider murder scenarios—which violate the first law. Intuitively, the second law is still in effect, requiring that a jury convene.²¹

In each of these situations, the standard modal analysis (which appeals to modal bases but not ordering sources) would put inconsistent restrictions on the modal base, thus making it empty. But that leads to an unpalatable outcome: against an empty modal base, all ‘must’-sentences are vacuously true (due to universal quantification over worlds), and all ‘can’-sentences, vacuously false (due to existential quantification). This is clearly not what we want in the antecedent-fact conflict or the antecedent-law conflict.

To account for inconsistencies, Kratzer (1981, 1991) appeals to the notion of an ordering source, which would order worlds within a modal base without requiring that the closest worlds maximally fit the specifications. This way, we are not faced with an empty modal base—if the closest worlds all violate the law prohibiting murder, or leave one of several desires unfulfilled, those are still the worlds we consider, since they come closer to the base world than others included in the modal base.

Because Frank wants to get by without ordering sources (see footnote 9), she appeals to an alternative account, in terms of Augmentation (1997: 4.2–3). First, she distinguishes two kinds of contributions to the modal base restriction: the factual and the non-factual. Roughly, the former is a counterpart of Kratzer’s modal base restriction (epistemic or circumstantial), while the latter is a counterpart of Kratzer’s ordering source (deontic or bouletic). When combined, the two kinds of contribution result in a complete modal base restriction to yield a modal base of worlds. Importantly, Augmentation can now work in two ways to achieve consistent modal base restrictions: if there is conflict between previous factual restrictions and a factual antecedent, then Augmentation reduces the previous factual restrictions; if there is conflict between previous non-factual (for example normative) restrictions and a factual antecedent, then Augmentation lifts the previous non-factual restrictions.

Handling the antecedent–fact conflict: for counterfactual conditionals (like (16) above), Augmentation erases factual restrictions that are inconsistent with the counterfactual antecedent (Frank 1997: 4.3). There is nothing surprising or contrived about employing Augmentation along

²¹ The Good Samaritan Paradox has various formulations (see for example Feldman 1986) and more generally, there has been considerable variation in how deontic paradoxes are labeled. Kratzer points out that a paradox arises when we try to formulate the two laws simultaneously: the conditional law about the jury convening in case of murder is supposed to be independent of the ‘no murder’ law but it is not; any conditional law of the form ‘If there is murder then p ’ is automatically true when combined with the basic law prohibiting murder. Thus we get preposterous conditional laws like ‘If there is murder, then the murderer should be knighted’.

Von Wright (1956) uses this particular paradox to motivate so-called dyadic deontic logics. See Section 6 about this paradox—under the label of Paradox of Strict Implication—and about dyadic frameworks.

these lines. After all, invoking alternative states of affairs in which not all of reality holds is precisely what counterfactual conditionals are about. The very meaning of these conditionals licenses that we disregard certain facts.

Handling the antecedent–law conflict: evaluating a conditional of the form ‘if murder occurs then p ’ prompts us to add the occurrence of murder to the facts already restricting the modal base. This creates a conflict with a non-factual modal base restriction—that murder is prohibited. Augmentation allows us to omit this law and achieve a non-empty modal base (Frank 1997: 4.2.1). The conditional law requiring a jury in murder cases continues to restrict the modal base, so it includes only those murderous worlds in which juries convene. Again, there is nothing odd or artificial about this application of Augmentation. Laws are not always obeyed; that is why it is not contradictory to posit the “conflicting” pair of laws in the Paradox, to cover scenarios in which the absolute law prohibiting murder is violated. When the violation does take place (or is hypothesized), the conditional law steps in to require a jury, while the absolute law is no longer a source of guidance. Hence, disregarding the latter in connection with murder-scenarios is a natural move. (This approach generates a new problem for Frank, which she does not address (See 20 and 21 above).

It is important to note that these two applications of Augmentation can be viewed as instances of a unified treatment. The phenomena and the strategies for Augmentation are related in the two cases. For not only does the Augmentation-based solution encompass all applications, but an alternative solution in terms of ordering sources (as seen in Kratzer), also takes care of the examples in one fell swoop. Moreover, these applications of Augmentation are quite natural.

By contrast, Frank’s (1997) application of Augmentation to The Problem stands apart from these other applications: the phenomena are different; the Augmentation strategy itself is different; and the rule to accomplish Augmentation lacks motivation independently of The Problem. To see all this, let me examine Augmentation in the context of the Problem more closely (see also Section 4.2).

First, The Problem does not involve a conflict between facts or laws; instead, we have patently false conditionals that amount to logical truths within Kratzer’s theory. (A more general problem about unwanted consequences also arises: whenever the modal base includes p , ‘it must be that p ’ is automatically a consequence.) It is not surprising then that Frank’s strategy for dealing with The Problem is also different (1997: 4.1.3-4): The goal is not to remove a conflict that would lead to an empty modal base; instead, *we need to Augment the modal base when evaluating a modal sentence of the form ‘it must be that q ’ to make sure that the modal base does not establish q or its negation.* (See definition (17) above.)

Second, there is a crucial structural difference between how Augmentation is intended to resolve inconsistencies, and how it is intended to resolve The Problem. In the former application, the modal base against which we evaluate the consequent depends in part on the antecedent, and in no part does it depend on the consequent. By contrast, in the latter application, the modal base against which we evaluate the consequent of a conditional is itself in part determined by the consequent. For example, when evaluating (10a), the very fact that the consequent is about Britney’s drinking Coke erases Coke-drinking and non-Coke-drinking restrictions on the modal base. Another way to approach the same point is that Frank’s proposed solution to The Problem is unique in that it is non-compositional in a way that other applications of Augmentation are compositional: in the case of The Problem, and there only, whether Augmentation applies depends in part on the consequent.

Third, definition (17) is also unusual in that it calls for a revision of *factual* restrictions. For other applications of Augmentation, we have already noted that only counterfactual conditionals license factual revision. Other conditionals (in connection with the antecedent-law conflict) license non-factual revisions only—allowing that laws or desires be suspended. Outside the context of counterfactuals, the factual revision that Frank calls for is without precedent.

Appendix 2

Bart Geurts (2004) points out that if we treat if-clauses as quantifier restrictions (as Kratzer (1991) suggested), then we get distinct readings depending on whether the if-clause restricts an overt or a covert quantifier. Consider the two truth-conditionally different readings of the following conditionals with the adverbial quantifier ‘often’:

- (24) If Beryl is in Paris, she often visits the Louvre.
- (a) Overt reading: Often, if Beryl is in Paris she visits the Louvre.
(the if-clause restricts the domain of the overt ‘often’, which quantifies over trips to Paris)
- true if, say, Beryl has made 4 trips to Paris, and on three of those trips, she visited the Louvre once, and on the fourth trip she did not go to the Louvre at all.
- (b) Covert reading: If Beryl is in Paris, she visits the Louvre often.
(the if-clause restricts the domain of a covert quantifier over trips to Paris, whereas ‘often’ quantifies over events more finely grained than trips, say days within a given trip.)
- (b)’s truth requires that Beryl make multiple, frequent visits to the Louvre *every time* she goes to Paris.

Geurts thinks that this sort of ambiguity is quite general. Some conditionals allow one reading only (for example, the word order in (24b) allows only an overt reading). But it may still happen that for two structurally identical conditionals, each has a single natural reading that is distinct from the other’s: one is overt, the other, covert. Indeed, this is his diagnosis for the pair of conditionals in (9) and (10a), repeated below:

- (9) If Britney Spears drinks cola in public, then she must drink Pepsi.
(10a) If Britney Spears drinks Coke in public, then she must drink Coke.

According to Geurts, the natural reading for (9) is the overt one, whereas for (10a), the covert one (in which the Coke-drinking in the antecedent does not restrict the domain of ‘must’). In Section 3, I argued that given that in the case of (9), our modal base for the consequent is narrowed by the antecedent, then by parity of reasoning, the same should happen in the case of (10a), giving rise to The Problem. Geurts finds my argument “ill-founded if not downright spurious”, because he thinks that I did not take into account the covert reading that is the natural one for (10a) and instead, I considered only an overt reading for both (9) and (10a).

Here is why I think my argument and conclusion hold ground. First, Geurts does not properly motivate the existence of covert readings in the case of modal conditionals. He gives a

convincing demonstration of the overt/covert ambiguity in the case of adverbial quantifiers, makes a far weaker case for nominal quantifiers, and by the time he gets to the modal case, his main justification is this: (10a) cannot be assigned the overt reading because that would make it a tautology whereas intuitively, it should not come out true at all, let alone tautologous; so (10a) must have another reading, a covert one. He is basically saying that the covert reading cannot but be there, because otherwise, our account of modality is in trouble. This puts the cart before the horse. The plausibility of his proposal is further weakened by the fact that he does not have a good story for why the overt reading of (10a) is missing, or goes undetected, and why only the false reading is present—to match our intuitions and to avoid The Problem.

Second and more important, even if we grant that modal conditionals sometimes have covert readings, the crucial question to consider is: what kind of account will tell us when we need those covert readings? I submit that we will need a non-Leibnizian account—for reasons that parallel those in connection with Jackson’s (1985) proposal (discussed at the end of Section 5). So far, all Geurts has done is posit an ambiguity. He has not explained on what grounds to *choose* the covert reading for (10a) and the overt one for (9). Appealing (as he must) to what are the intuitively correct truth conditions for (9) and (10a) involves citing data that lie beyond a Leibnizian semantics.

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