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ON THE TRUTH CONDITIONS OF INDICATIVE CONDITIONALS . . .
OR LACK THEREOF?

by

BETH HASSRICK

A dissertation submitted to the Graduate Faculty in
Philosophy in partial fulfillment of the requirements for
the degree of Doctor of Philosophy, The City University of
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Abstract

ON THE TRUTH CONDITIONS OF INDICATIVE CONDITIONALS . . .
OR LACK THEREOF?

by

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This work provides a critical survey of the dominant theories of the semantics of the English indicative conditional. The project is structured so as to bring out and disentangle the intricate presuppositions of two key parties: those who maintain that the semantics of indicative conditionals must be specified in terms of truth conditions (the factualists) and those who claim that indicative conditionals are truth conditionally impaired (the non-factualists). I offer several novel suggestions toward redrawing battle lines.

In Chapter One, I lay out and critically examine the traditional account of indicative conditionals according to which indicative conditionals share the logic--that is, the truth conditions--of the material conditional. I describe the view, show why it's tempting, and compile a roster of *prima facie* objections to it.

In Chapter Two, I look at and raise problems for three attempts to redeem the traditional interpretation of indicative conditionals in the face of the objections adumbrated in Chapter One; one such attempt is concocted by David Lewis (1976), one by Frank Jackson (1979), and one by me.

In Chapter Three, I describe Robert Stalnaker's (1976) proposal that indicative conditionals have non-truth-functional, possible-worlds truth conditions. Because Stalnaker shares (with Lewis, Jackson and others) the factualist conviction that indicative conditionals can be given some sort of truth conditional analysis, I here probe some of the assumptions that underlie this shared conviction.

In Chapter Four, I introduce and the radical hypothesis, advocated most vigorously by Dorothy Edgington

(1986, 1995) and Allan Gibbard (1981), that indicative conditionals simply lack truth conditions. Since the force of this hypothesis depends in part upon the success of its claims against Stalnakerian propositions, I here revisit Stalnaker through the lenses of Edgington and Gibbard.

In Chapter Five, I consider some debts and disadvantages of non-factualism as it has so far been conceived, and I urge that (i) on a suitably deflated understanding of truth, it is unreasonable to deny truth conditions to indicative conditionals, and (ii) on a suitably cheapened notion of propositions, it is unreasonable to deny that indicative conditionals express them.

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My philosophical debts are too numerous to litanize fully here, but I must mention a few key players. My advisor, Arnold Koslow, has been enthusiastically helpful and kind throughout. His philosophical acumen kept me on my analytic toes, while his humanity and realism helped me get the job done with a semblance of sanity. Stephen Schiffer has been completely unstinting with his time, friendship and philosophical virtuoso--not to mention the many cappuccinos to which he has treated me. I am grateful to Hartry Field for sparking my interest in conditionals.

When recalling the dog days of dissertation writing, I shall think with much fondness upon The Glamorous Ladies of Philosophy (a.k.a. GLOP): Margaret Cuonzo, Leanne Habeeb and Ligia Römer. Thanks especially to Leanne for putting her impressive arsenal of organizational machinery (her daily planner, her monthly planner, her electronic organizer, and her brain) at my disposal, and for being such a dear.

My huge loving family and many close friends have been hugely and multifariously supportive. If I counted the ways, the resulting document would be thicker than the dissertation. However, my mother, Betsy Hassrick, cannot

escape mention for her encouragement, good humor, and astonishing mastery of the highly specialized art of inquiring about dissertation progress.

My husband nonpareil, Matthew J. Gartner, has helped me more than he can know. His forbearance, wit, insight, love, succor and devoted friendship fuel my work and my life.

This dissertation is dedicated to my beloved grandmother, Elizabeth Hunter Battista.

FORWARD

In practice 'ifs' are not especially perplexing; we seem to use and understand them with proficiency and ease. Notoriously, however, the enterprise of providing a semantic theory that corresponds to and convincingly explains our 'if'-related linguistic and inferential practices is not managed with such ease; indeed, it has recently bred something of a philosophic furor. The puzzles which initially incite our theorizing about conditionals arise within the context of particular assumptions about, among other things, how sentence-meaning is determined. Arguably, the dominant assumption within contemporary philosophy of language is that the meaning of an indicative sentence (and generally also the content of the intentional state expressed by that sentence) is somehow given by the truth conditions of the sentence. Accordingly, an important question that arises for any sentence, and hence presumably for any conditional sentence, is *what are its truth conditions?* As we shall see in the course of this study, however, truth conditions come in at least a couple of different shapes, and many of the puzzles involving

conditionals shape-shift according to which genre of truth conditions is operative.

The theory-resistance of conditionals presents two related kinds of challenges. First, there are what I consider to be internal challenges. Since every truth conditional account of conditionals has counterintuitive consequences, every truth conditional general semanticist must defend her favored truth conditions against a battery of *prima facie* objections. Meeting internal challenges consists in resolving or explaining away the puzzles that arise, or at least appear to arise, on a preferred conception of truth conditions. Second, conditionals point to a more general challenge; because of their relative intractability, we may exploit conditionals to test our semantic theories and logical formalizations. We may discover either that conditionals favor some theories over others, or that they don't distinguish clearly between theories at all. If we discover the former, we gain some support for the semantic theory or formal system in question. If we discover the latter, we learn either that none of the current programs in the theory of meaning is sufficient, or that there are some linguistic and

inferential phenomena that must simply fall outside the explanatory scope of even our best semantic theories. Let us see what we can discover.

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CHAPTER ONE

THE TRADITIONAL INTERPRETATION OF INDICATIVE CONDITIONALS

We are far from having exhausted the
significance of the few symbols we use.
(R.W. Emerson, "The Poet," 1844)

1.1 Preliminary Remarks

This chapter is chiefly devoted to exploring the thesis that indicative conditional sentences have truth-functional truth conditions.¹ In Section 1.2, I delineate my subject matter by examining the traditional distinction between indicative and subjunctive conditionals. In Section 1.3, I introduce and describe the basic truth-functional structure of the material conditional, represented by the horseshoe symbol ('>') of classical logic. In Section 1.4, I identify what I take to be the central intuitions underlying the thesis that the truth conditions of the material conditional apply to ordinary English language conditionals. Finally, in Section 1.5, I marshal several objections to the truth-

¹ This thesis will later be contrasted with various alternative theses, including that indicative conditionals have possible worlds truth conditions (See Chapter Three), and that they have no truth conditions at all (See Chapters Four and Five).

functional analysis of conditionals. While perhaps none of these objections is decisive against the material account, jointly they represent a formidable minefield for the truth-functional apologists whose arguments I consider in Chapter Two.

1.2 Mood Swings: Why the Indicative Conditional?

Conditionals are statements of the form [If A, then C]. Indicative conditionals are just conditional statements in the indicative mood. But moods are enigmatic creatures, and it's not obvious what criteria we should use for distinguishing between them. According to the conventional taxonomy, the indicative mood is customarily employed to represent actions, states or events as *facts*, whereas the subjunctive mood is customarily employed to represent actions, states or events only as *hypotheses or possibilities*. However, from these broad descriptions it is not clear whether mood is fundamentally to be understood as an epistemic, or a syntactic, phenomenon.

It would help if the semantic function of mood were more clearly understood. For instance, if tense is the grammatical category relating to time, what is the relation of

the grammatical category of mood? J. Lyons (1977, p. 452), suggests that mood relates to the "opinion or attitude" of the speaker. Although O. Jespersen (1924) acknowledges the importance of epistemic attitude, he stresses the role of verb forms in determining mood. His classic discussion of this question well exhibits the tension between the two possibilities:

[Moods] express certain attitudes of mind of the speaker towards the contents of the sentence, though in some cases the choice of mood is determined not by the attitude of the actual speaker, but by the character of the clause itself and its relation to the main nexus on which it is dependent. Further, it is very important to speak of 'mood' only if the attitude of mind is shown in the form of the verb. (1924, p. 313)

It may be important to settle whether mood is determined by epistemic attitude, verb forms, both or neither.² This, as we shall see, is because the possibility of cogently developing the proposal that indicative conditionals are non-fact-stating depends on an epistemic formulation of mood. A purely syntactic formulation of mood will dictate

² V.H. Dudman (1988) and Jonathan Bennett (1988) claim that "would" and "had been" signal tense, rather than mood, and that in fact distinctions of mood do not play any serious role in the modeling of inferences.

that all indicative uses of the conditional will be fact-stating for, according to grammatical orthodoxy, that is just what it is to be "indicative". On the other hand, if we can distinguish between indicative and subjunctive conditionals on epistemic grounds, then we can show in terms of belief why at least some indicative conditionals may not be fact-stating: specifically, we can show that at least some indicative conditionals fail to express beliefs about the way things are. In Chapter Four, I sketch Dorothy Edgington's epistemic criterion for distinguishing among conditionals. Since for now I want only to provide a general rationale for limiting my subject matter to indicative conditionals, it will be alright if the parameters are indistinctly drawn.

Returning to conventional taxonomy, then, subjunctive conditionals are standardly held to make assertions or express beliefs about how things would be or would have been, under certain counter-to-fact conditions; indeed, this is why they are often simply called counterfactual conditionals.³ It is reasonable to distinguish two classes

³ In his essay, "The Contrary-to-Fact Conditional", Roderick Chisholm (1946) declared that he would use terms "contrary-to-fact" and "subjunctive" interchangeably.

of subjunctive conditionals which are equivalent, respectively, to sentences of the following form:

SC1: If Dot were vomiting, Becky would fetch a tissue.

SC2: If Dot had vomited, Becky would have fetched a tissue.

V.H. Dudman (1983) understands SC2 as a past-tense version of SC1, so that SC2 is true if and only if SC1 was true.⁴

In contrast, indicative conditionals are alleged (in accordance with the grammatical definition of what it is to be "indicative") to make assertions or express beliefs about what is (or is probably) the case. So, consider the following array of indicative conditionals:

IC1: If all humans are mortal, mice are smaller than bread boxes.

IC2: If this is urn #1, I am holding a black marble.

IC3: If Dot is not vomiting, she's making shortcake.

IC4: If Dot lives in Manhattan, she lives in Louisiana.

Since, despite resistance from certain parties (see, in particular, V.H. Dudman (1988), Jonathan Bennett (1988) and Michael Pendlebury (1989)), this practice still prevails, I adopt it for now to avoid terminological disorientation.

⁴ Since I now mention subjunctive conditionals to distinguish them from indicative conditionals, I will not say more about classes of subjunctive conditionals here.

For present purposes, it does not matter that IC1 and IC4 are obviously idiosyncratic. Although I will exploit the above sentences in examples later, for now I am merely producing a list to illustrate the time-honored (though possibly impaired in the case of conditionals anyway) distinction between the subjunctive and indicative moods.⁵

Despite differences, it is reasonable to maintain that subjunctive and indicative conditionals are somehow tightly connected. Indeed, both subjunctives and indicatives permit many of the same forms of inference. Brian Ellis (1984) argues that most of the rules of inference Ernest Adams defends for the indicative hold in David Lewis's subjunctive

⁵ One feature which immediately distinguishes the above indicative conditionals from subjunctive conditionals like SC1 is that both antecedent and consequent contain complete indicative sentences which can intelligibly be uttered independently of each other (or of any other sentence). But, *prima facie*, this distinction does not hold between the ICs and SC2, since the antecedent of SC2 surely is a sentence of English, albeit an awkward one. Perhaps this can be explained by showing, *a la* Appiah (1985), that "had" plays more than one role in English. This can be made plausible by noticing that, for sentences like SC1 and SC2, the "if" can always be dropped and word order inverted such that SC1 becomes [SC1*] [Were Dot to throw up, Becky would fetch a tissue] and SC2 becomes [SC2*] [Had Dot thrown up, Becky would have fetched a tissue] with no harm to their respective cognitive values. Now, the antecedent of SC2* is not a complete sentence. But SC2* is equivalent to SC2.

conditional logic. Ellis doubts the connection is contingent and, thus, takes it upon himself to provide a unified theory of subjunctive and indicative conditionals: his view is that counterfactuals are past-tense indicatives.⁶ The principal motivation for omitting subjunctive conditionals from the present discussion is that many of the puzzles that arise for indicative conditionals appear not to arise for subjunctives. Indeed, an inquiry into the problems that attach uniquely to indicative conditionals might help to illuminate why this should be so.

For subjunctive conditionals, one potential set of complications is averted at the outset because there is very little temptation to construe them as material conditionals; represented as such, their false antecedents would make them all trivially true.⁷ P.F. Strawson (1986) bites the bullet here and claims that indeed subjunctives are always true on

⁶ The idea is that if we can explain how the evaluation of a conditional depends on a temporal index, we can avoid proliferating senses of 'if'.

⁷ Alan Ross Anderson (1951) observed that the counterfactual does have one interesting use which does not involve the presupposition of a false antecedent. He imagines a doctor saying "If he had taken arsenic, he would have shown just these symptoms." In this example, that the patient in question presumably is showing "just these symptoms" is being presented as evidence for the truth of the antecedent.

account of their false antecedents. He then gives the explanation of why some are reasonable to assert while others are not in terms of Gricean principles of conversational cooperation.

I think the idea that all subjunctives are true is wildly implausible, and hence I do not address it directly at all. Yet this exclusion should not imperil my general position because I produce abundant evidence that Gricean maneuvers cannot even save the material account of *indicatives*; and, to the extent that my arguments against Gricean defenses of the material account of indicatives are successful, they will apply equally (perhaps even *a fortiori*) to subjunctives.

1.3 What Is the Material Conditional?

According to the truth-functional account, indicative conditional sentences have the truth conditions of the material conditional. Thus, the truth table for indicative 'if...,then' statements is just the standard truth table for ' $p > q$ ' in the sentential calculus, where '>' (the 'horse-shoe') is simply a truth-functional connective, whose

precise significance can be exhibited by the following truth table:

p	q	$\neg q$	$p \ \& \ \neg q$	$\neg(p \ \& \ \neg q)$	$p > q$
T	T	F	F	T	T
T	F	T	T	F	F
F	T	F	F	T	T
F	F	T	F	T	T

For our purposes, the table can be explicated succinctly as follows:

M: 'If p, then q' is true iff 'p' is false or 'q' is true, or, equivalently, iff it is not the case that 'p' is true and 'q' is false.

This characterization of the truth conditions of conditionals is deemed truth-functional because it makes the truth value of 'if p, then q' a function of the truth values of 'p' and 'q'.

Technically, the statement form ' $p > q$ ' is simply an *abbreviation* for the more cumbersome statement form, ' $\neg(p \ \& \ \neg q)$ ', which, via two well-respected logical equivalences (or replacement rules)--one of DeMorgan's Theorems (DeM1: $\neg(p \ \& \ q)$ if and only if $(\neg p \vee \neg q)$) and Double Negation (DN: p iff $\neg\neg p$)--can be converted into the equivalent statement form, ' $\neg p \vee q$ '. Accordingly, ' $p > q$ ' is also equivalent to ' $\neg p \vee q$ '. Upon canvassing an array of possible substitution

instances of the statement form ' $\neg p \vee q$ ', it appears that **M** provides a satisfactory descriptive counterpart to it. How then could there be any question of **M**'s adequacy as an account of ' $p > q$ '?

In a strictly formal sense, there isn't. Of itself, there is nothing inherently disturbing about the material conditional, '>'. Surely we got from ' $\neg p \vee q$ ' to ' $p > q$ ' legitimately.⁸ And, of course, the mere stipulation that ' $p > q$ ' abbreviates ' $\neg(p \ \& \ \neg q)$ ' is unassailable. The only potentially troublesome thesis is that '>' provides an appropriate formalization of the indicative 'if...., then' construction in English. Curiously, the idea that the indicative conditional obeys the logic of the material conditional has persisted in the face of an at least *prima facie* case against it (see 1.5). Before making this *prima facie* case, I now endeavor to bring out some of the attractions of the material analysis.

⁸ After all, since any disjunctive statement is true if at least one of its disjuncts is true, ' $\neg p \vee q$ ' is true if and only if either p is false or q is true. But, in the conditional, p was our antecedent and q our consequent. So, if the conditional ' $p > q$ ' is equivalent to the disjunction ' $\neg p \vee q$ ', we must allow that both the truth of the consequent and the falsity of the antecedent are each individually sufficient for the truth of the conditional.

1.4 The Appeal of the Material Analysis of Indicatives

That formalizations arise out of more ordinary ways of talking and thinking is, I think, a plausible and attractive hypothesis. Still, no formalization is expected to capture all of the complexities of actual reasoning and communication. Indeed, it is a commonplace that language use performs many hugely diverse functions, and that conveying truth-evaluable information is only one of them. It is also commonly held that truth conditional formalizations only reflect the inferential relations between different types of *informative* statements. Thus, whether the indicative 'If..., then' construction can be successfully formalized in terms of truth conditions at all will depend crucially on whether it ordinarily functions to convey information; and *this* remains to be established.⁹

How does the 'If..., then' contribute to, or even determine, the meaning of a sentence? Questions of meaning can only be answered within a theory of meaning. As we have seen, a promising and popular approach is to specify the

⁹ In Chapter Four, I consider what function, *other than* the straightforward conveyance of information, the English language indicative conditional construction may serve.

meaning of indicative sentences in terms of truth conditions--i.e., the conditions which must obtain in order for such sentences to be deemed true or not true. In accordance with this approach, it is regarded as central to the meaning of the sentence "Mary likes cupcakes" that it is true if and only if Mary really does like cupcakes.

Of course, if truth conditions really are needed to explain meaning, then we will also need a theory of truth. Such a theory will be *decompositional*; that is, the truth conditions of any sentence will depend partly on syntactic structure and partly on the reference of terms.¹⁰ The idea is that only thus can we explain the *productivity* of language use (i.e., the ability of speakers to produce and understand an infinite number of novel sentences from a finite base): if I understand "shortbread" and I understand "Mary likes cupcakes", then I will understand "Mary likes shortbread", although I have never before encountered this sentence. This account of sentence meaning for indicative sentences is attractive because it explains productivity,

¹⁰ So, a simple one-place-predication sentence, "Mary has a sweet-tooth" is true if and only if there is some object that "Mary" designates, and the property of sweet-toothedness applies to that object.

but *sans* refinement it also leaves some important phenomena unexplained. What now shall we say about questions, commands, subjunctive conditional sentences, and certain indicative sentences (arguably indicative conditional sentences and evaluative sentences) which seem either to defy this theory, or to fall outside its explanatory scope? I defer these matters until later. For now, I want to commend the explanatory merits of compositional semantics, and show how the intuitions underlying it reinforce the material account of indicative conditionals.

It may be that success with a truth-functional approach to other English language binary constructions--for example, disjunction and conjunction--engenders the temptation to provide a similar analysis for the 'if...,then' construction. It would be tidy if the same theory applied to all binary constructions. In accordance with this tidy theory, the conditional construction is to be understood as a device for constructing a proposition out of two component propositions. It is, in addition, a systematic device: if you understand any conditional, you understand every conditional whose components you understand.

The tidy theory works fairly well for conjunctions and disjunctions. Consider the conjunctive case. Compare, for example, the following two 'and' sentences: [C1] [Dot met Becky and went to the opera] and [C2] [Dot went to the opera and met Becky]. According to the truth-functional interpretation of the conjunction, both sentences are true if and only if both of their conjuncts are true. Therefore, if one of the above sentences is true, then the other sentence is true as well. This may seem odd at first because the two sentences suggest a different temporal ordering of events. Thus, if Dot met Becky and *then* went to the opera, it would be misleading to assert [C2]. However, as I argue in later sections, the Gricean notion of non-conventional conversational implicature convincingly explains the phenomenon of "misleadingness" in this case in a way that preserves the truth-functional equivalence of [C1] and [C2]. That the Gricean apparatus often does not explain apparently similar phenomena in the case of the conditional may be evidence that the conditional does not fit cleanly into the rest of fact-stating discourse. The worry is that indicative conditionals misbehave, not just at

the level of conversation, but at the level of belief as well.

On the other hand, there are many instances where the truth-functional analysis of indicative conditionals squares well with intuition. As far as I know, the analysis always applies effectively to non-probabilistic mathematical cases. As we have just seen, truth-functional logic tells us that the statement form ' $p \supset q$ ' is logically equivalent to the statement form ' $\neg p \vee q$ '. And, to be fair, there are many, non-mathematical, English conditional sentences that conform well to this interpretation. Consider, for example, the indicative, [IC2] [If this is urn #1, then I am holding a black marble]. IC2 may be replaced, to much the same effect, with [ID2] [Either this is not urn #1 or I am holding a black marble], and ID2 is true if and only if either 'this is urn #1' is false or 'I am holding a black marble' is true. Such orderly examples serve to reinforce intuitions in favor of the material approach.

Anyone who has ever taken an introductory logic class knows that conditionals are indispensable to reasoning, to argumentation. Accordingly, A. Appiah (1985) and others suggest that to see further why intuitions about inference

produce an urge to propose that 'If A, C' is true iff $\neg(A \& \neg C)$, we need only to consider some standard characterization of validity. Appiah's characterization seems reasonable enough:

V: An inference from the sentences in a set $[S_1, S_2, \dots S_n]$ to R is valid iff it is not logically possible that $(S_1 \& S_2 \& \dots S_n \& \neg R)$.

This characterization of validity may be invoked to reinforce the material account of the conditional in the following way: given the inference rule, *modus ponens* [MP: $P \supset Q, P / Q$], it follows that, if the conditional is truth-functional, it is false if $(P \& \neg Q)$ obtains.¹¹ For suppose we have the following unfinished line of the truth table:

$P \supset Q$

T F

We must decide whether to put T or F under ' $\supset$ '. If we put T, we sanction $[(P \supset Q) \& (P \& \neg Q)]$. But then MP would be invalid by V. So, provided MP is valid, we must put F.

Now, given disjunctive syllogism [DS: $P \vee Q, \neg P / Q$],

¹¹ Actually, without Appiah's additional assumption that if a conditional is truth-functional, then it is a material conditional, truth-functionality is a red herring; given MP, it follows that $P \supset Q$ implies $\neg(P \& \neg Q)$, provided that $P \& Q$ implies Q.

suppose we are asked to fill in the remaining lines of the following truth table:

P	v	Q	/	-	P	>	Q

T	T	T		F	T	T	
T	T	F		F	T	F	
F	T	T		T	F	T	

Assuming DS is valid, we must put T under '>' because it is a condition of this entailment's holding that whenever the disjunction is true, the conditional is too. So, since we are assuming that '>' is a truth-function, we get the three lines of the truth table we need:

P	>	Q

T	T	T
F	T	T
F	T	F

Appiah also maintains that the material conditional is precisely the connective we need to validate conditional proof (CP).¹² CP affirms that whenever R follows logically from a class of sentences $[S_1, S_2, \dots, S_n]$, then $(S_n > R)$ is a logical consequence of the members of the class $[S_1, S_2, \dots,$

¹² Appiah would do better with the humbler claim that '>' is one of the connectives that can be used to validate CP. After all, and as Arnold Koslow has pointed out to me, the intuitionists use CP and their conditional is not material.

S_{n-1}]. As a rule of inference, CP is not uncontroversial, but it is generally regarded as intuitive (see Copi, 1979). Now, given V as our characterization of validity, and assuming CP is acceptable, a conditional is logically true if and only if a material conditional is logically true. (See Appiah, 1985)

And, finally, it may be maintained that, after all, the truth conditions of the material conditional are only supposed to capture the common partial meaning of all conditionals. Thus, the difference between, say, a conditional which asserts a strong causal or logical connection between antecedent and consequent, and one which employs random, unconnected sentences as antecedent and consequent is to be understood as formally analogous to the difference between an 'inclusive' disjunction and an 'exclusive' disjunction.¹³ The truth-functional truth conditions of the wedge symbol represent the whole meaning of the inclusive 'or' and part of the meaning of the exclusive 'or'. Still, the portion of the meaning of the exclusive

¹³ An inclusive disjunction reads 'A or B, and possibly both A and B' (formally, just ' $A \vee B$ '). An exclusive disjunction reads 'A or B and definitely not both A and B' (formally, ' $[(A \vee B) * \neg(A * B)]$ ').

'or' that the truth table for the wedge represents is an indispensable portion.

Similarly, the classical formalization is primarily concerned not with how conditionals differ from each other, but with what they have in common. The material conditional is relatively weak; the horseshoe is defined to capture only the bare minimum in truth-functional terms that is asserted by any conditional.¹⁴ So, all that a material conditional denies is what any conditional denies, namely, that its antecedent is true and its consequent false. Thus, the line goes, conditional sentences of ordinary English are truth-functional, but they are rarely *merely* truth-functional. That is, when ordinary conditionals are symbolized by the horseshoe, only a fragment of their meaning is retained, because the horseshoe captures only the minimal, truth-functional content of English conditionals. Notwithstanding, this minimal, truth-functional content will be deemed essential, indispensable.

¹⁴ Assuming negation is classical, the material conditional is the weakest conditional to satisfy MP and CP.

1.5 Seven Objections to the Material Analysis of Indicatives

Despite these considerations, the material conditional has features which are conspicuously counterintuitive in an account of the indicative conditional. The stock objection to the material analysis of indicatives is that it generates the following two paradoxical results: [P1] [For any P and Q: $Q / P > Q$] and [P2] [For any P and Q: $\neg P / P > Q$]. These notorious results appear to reveal that the material conditional is too permissive with truth to deliver a plausible analysis of ordinary indicative conditional sentences. Both the falsity of a conditional's antecedent and the truth of its consequent are logically sufficient for the conditional to be true. Thus, the conditional IC4 (i.e., if Dot lives in Manhattan, she lives in Louisiana) will be true either if Dot does *not* live in Manhattan or if she *does* live in Louisiana. But, intuitively, we should like to say that, wherever Dot in fact lives, IC4 is just false, or just fatuous, or just *anything but* straightforwardly true.¹⁵

¹⁵ Appiah has suggested that these results alone might be enough to motivate a reexamination of the inference rules which generate them. I have no objection to the relevant inference rules; the question I will be exploring is simply whether there is (or can be) an adequate formalization of the English 'if..., then' construction which involves truth

As far as I know, all serious attempts to salvage the material analysis of indicative conditionals have something to say about [P1] and [P2]. However, Brian Ellis points out a third potentially ugly consequence of the material reading of indicative conditionals; on it, $[(P \supset Q) \vee (Q \supset R)]$ is a logical truth. I shall call this consequence [P3]. In case this is not obvious, here is a small demonstration: Given bivalence, $(P \supset Q)$ is either true or false. If it is false, it can only be because the consequent, Q , is false while the antecedent, P , is true. But if Q is false, then any conditional which employs it as an antecedent (i.e., such as $(Q \supset R)$) must be true, since the falsity of a conditional's antecedent is sufficient for the truth of the conditional. On the other hand, if $(Q \supset R)$ is false, it can only be because R is false while Q is true. But in this case, $(P \supset Q)$ will be true because the truth of a conditional's consequent is also sufficient for the truth of the conditional. If this result is cogent, it could be important because defenses of the material account in terms

conditions.

of conversational and conventional implicatures cannot address it.¹⁶

The material analysis generates a fourth unattractive result, which I shall call [P4]. [P4] is the problem of the indicative conditional sentence which has both a true antecedent and a true consequent, where the antecedent and consequent are utterly unrelated. IC1 is an example of such a sentence. It would seem that human mortality has nothing whatever to do with the diminutive size of certain rodents.. Although [P4] falls under the general "permissiveness" criticism, it receives somewhat less attention in the literature than [P1] and [P2]. I suspect this is because pragmatic attempts to explain away the counterintuitiveness of sentences like IC1 are, if not correct, more plausible than similar attempts to explain away apparently outright paradoxes like [P1] and [P2]; IC1 is highly unassertable, but it may be true nonetheless, and allowing that it is true, though stressful, is somewhat less stressful than allowing that, say, IC4 is true either if Dot does not live

¹⁶ On the other hand, [P3] is not wholly convincing, for if it is granted that $P \supset Q$ has the same truth conditions as $\neg P \vee Q$, we end up with $[(\neg P \vee Q) \vee (\neg Q \vee P)]$ which is a logical truth if anything is.

in Manhattan or if she does live in Louisiana. I think the intuitive difference between [P1] and [P2] on the one hand and [P4] on the other will become clearer when I discuss pragmatic defenses of the material account. In any case, this issue is not central.

As we have already seen, a proponent of the material analysis of conditionals may not allow both 'if A, C' and 'if -A, C' to be false. (See, in particular, my discussion of P2). This well-known result may or may not be explainable in terms of, say, the pragmatics of conversation, and I consider such approaches in the next Chapter. However, it is less well-known that the material account also prohibits the possibility of both 'if A, C' and 'if -A, C' being *improbable*. For example, suppose I am confident that Gore will win the Presidential election in 2000, regardless of who runs against him. Then, I may reasonably deem it improbable that [i][If Madonna runs for president, Gore will not be elected] and likewise improbable that [ii][If Madonna does not run for president, Gore will not be elected]. This much seems uncontroversial. But, given the theorem of the standard probability calculus which states that $p(A > C) + p(-A > C)$ must be equal to one, there

appears to be no satisfactory way to represent our indicative conditionals ([i] and [ii] above) as material conditionals within the context of a probability claim. Let us call this point [P5].

Yet another objection to the unqualified material account of the indicative conditional is that, on it, certain inferences (or implication schemata), such as strengthening the antecedent, transitivity and contraposition should hold, but in fact often fail. Let us call these points [P6a], [P6b] and [P6c] respectively. Strengthening the antecedent,¹⁷ for example, would allow us to infer from

If Dot makes shortcake, Becky is
delighted

to

If Dot makes shortcake and Becky's
children are axed to bits, Becky is
delighted

which would be imprudent. Due to similar counterintuitions, the transitivity $[(P > Q) \ \& \ (Q > R) \ / \ (P > R)]$ of the material conditional cannot be a feature of the indicative

¹⁷ Strengthening the antecedent (also called "weakening") allows us to infer $((P \ \& \ Q) > R)$ from $(P > R)$. (See Bas van Frassen (1976) and Richard Jeffrey (1981) for further discussion of problems related to this rule).

conditional, for it would be worse than ill-advised to infer from

If Becky's children die, Dot makes
shortcake

and

If Dot makes shortcake, Becky's children
lick the bowl

to

If Becky's children die, Becky's
children lick the bowl.

There are also cases where contraposition, which allows us to infer from $(P \supset Q)$ to $(\neg Q \supset \neg P)$, at least apparently fails. If, for example, we contrapose

If Elvis is alive, he is not flourishing

we get the apparently contradictory result that

If Elvis is flourishing, he is not
alive.

Arguably, the unhappiness of this particular example might issue from the presence of an anaphoric connection between the antecedent and the consequent. However, as far as I know, no proponent of the material account has offered an analysis of the effect of anaphora on the logic of the conditional; and, I would argue, if any of the counter-

examples I marshal are defective, the burden of showing how and why lies with her.

Finally, we often reject conditionals with disjunctive antecedents, even though the material analysis would have us regard them as true. Let us call this result [P7]. Consider, for example, the sentence [If either world peace is imminent or nuclear destruction is close at hand, Becky is delighted]. On the idealistic supposition that world peace is in fact imminent, and on the somewhat less idealistic assumption that this pleases Becky, the entire conditional statement must be deemed true; the antecedent is true because any disjunctive statement is true if one of its disjuncts is true, and the consequent is true because in this case there is an *ex hypothesi* causal relationship between the prospect of world peace and Becky's cheerful psychological state. Still, I believe we would ordinarily reject this conditional because the antecedent does not state a single condition which a situation may either satisfy or fail to satisfy. Instead, we treat the two disjuncts as stating two separate conditions which must be entertained separately in our hypothetical deliberations. Moreover, one of these conditions stands in what Pollock

(1976) calls an "antagonistic connection" with the consequent; that is, its truth would actually interfere with the truth of the consequent. The idea of course is that Becky would despair to learn that nuclear destruction is close at hand.

CHAPTER TWO

AN EIGHTH OBJECTION, TWO APOLOGIES, AND ONE LAST TRY

If at first you don't succeed . . .

2.1 Preliminaries

In this chapter, I consider three valiant, but finally unsuccessful attempts to negotiate the minefield of objections to the material analysis of indicative conditionals described in Chapter One (Section 1.5): David Lewis's neo-Gricean defense (Section 2.3), Frank Jackson's implicature-of-robustness theory (Section 2.5) and the attempt to recognize truth-value gaps by conscripting a system of partial logic (Section 2.6). However, in order properly to set up these attempts (particularly the first two), an eighth and final challenge must be laid out (Section 2.2). Unlike (P1)-(P7), the eighth challenge is not aimed directly at the material analysis of conditionals; rather, it emerges as a consequence of Ernest Adams's compelling and widely influential statement of an assertability condition for the indicative conditional. I have saved mention of it for this chapter both because it is qualitatively different from (P1)-(P7) and because it

provides a smooth segue into several important features of David Lewis's account.

2.2 An Eighth Objection: Ernest Adams and Conditional Probability

Ernest Adams (1975) proposed that the assertability of an indicative conditional (i.e., [if A, C]) "goes", or is determined, by the conditional probability of the consequent given the antecedent (i.e., $p(C/A)$). So, in particular, 'if A, C' is assertable iff $p(C/A)$ is high (i.e., close to one). Or, in other words, assert the conditional 'if A then C' if and only if you attach high conditional probability to C given A. It is striking that all parties to the debate agree upon Adams's formulation of the relevant assertability rule, while (with the exception of Dorothy Edgington and Adams himself) resisting the conclusion that the assertability rule alone might suffice to secure a disciplined account of non-compound indicative conditionals.

The thesis that the assertability of a non-conditional indicative sentence ordinarily goes by the absolute subjective probability of truth for that sentence is uncontroversial. The assertability rule for such a sentence

is simply: Assert A only if $p(A)$ is close to 1.¹⁸ For example: assert that Becky is in Wisconsin only if you are reasonably confident that Becky is in Wisconsin. If Adams is right, then, the indicative conditional appears to represent an exception. The truthful speaker considers it acceptable to assert the conditional only if the *conditional* subjective probability of C given A is close to 1. So, in this case: assert that if Becky is in Wisconsin, Dot is there too only if you are reasonably confident that Dot is in Wisconsin given that Becky is.

What is the explanation for the apparently exceptional status of the conditional? Or, are we contriving a distinction without a difference? An initially attractive hypothesis, and one proposed at various points and in various forms by Robert Stalnaker (1968), Brian Ellis (1978) and Richard Jeffrey (1981), is that the conditional is not anomalous after all because conditional subjective probability is just a sub-species of absolute subjective probability. On this view, (If A, C) and (C/A) are deemed equivalent, and thus for the competent speaker $p(\text{If } A, C)$

¹⁸ P is the probability function which represents the speaker's degree of belief in A at the time of assertion.

and $p(C/A)$ will be equivalent. Indeed, the claim that the assertability of 'if A, C' goes by the conditional subjective probability of C given A is, *prima facie* anyway, compatible with the hypothesis that there is a connective, " $\rightarrow$ ", such that $p(C/A)$ is equivalent to $p(A \rightarrow C)$, and that indicative conditionals just have *whatever* truth conditions " $\rightarrow$ " has.¹⁹

Of course, if this explanation is right, then indicative conditionals cannot be material conditionals, for it is apparent that $p(A > C)$ and $p(C/A)$ will be equal only very rarely. Given the truth-functional analysis, and provided $p(A)$ does not equal 0, $p(A > C)$ will equal $p(\neg(A \& \neg C))$. And so, $p(A > C)$ will equal $p(C/A) * p(\neg C/A)$. Hence, normally, $p(A > C)$ will not equal $p(C/A)$. We can now see how Adams's proposal might be construed as a significant obstacle to the material account, for it appears that, if we still want to claim that indicative conditionals are material conditionals, then we bear the onus of either

¹⁹ Stalnaker offered possible-worlds truth conditions for just this connective. However, if the triviality theorems of Lewis (1976) and others (e.g., Carlstrom and Hill (1978) and, most recently, Hajek and Hall (1994)) are successful, such an interpretation of indicative conditionals cannot, as we shall see, do the work it was introduced to do.

persuasively rejecting the highly plausible and widely accepted hypothesis that the assertability of a conditional goes by conditional probability, or of effectively explaining the frequent divergences between assertability conditions and truth conditions that will arise. Thus, if we adopt Adams's thesis, we apparently gain one more compelling piece of evidence against the already afflicted material account.

Although the conjecture that conditional probabilities just are probabilities of conditionals is a natural way of responding to Adams's hypothesis, it is not, as it turns out, tenable. In their essay, "The Hypothesis of the Conditional Construal of Conditional Probability" (1994), Alan Hajek and Ned Hall present an impressive battery of arguments against equating conditional probabilities and probabilities of conditionals. As is well known, David Lewis (1976) invented the original obstacle to this equation.

In "Probabilities of Conditionals and Conditional Probabilities" (1976), Lewis attempts to vindicate the maligned truth-functional account of indicative conditionals. Lewis candidly admits he wants it both ways;

that is, he holds that the indicative conditional has the "deep logic" of the material conditional and that the assertability (or "surface logic") of a conditional goes by the conditional probability of the consequent, given the antecedent. Lewis's approach has two important dimensions. Firstly, he presents an argument intended to rule out the early Stalnakerian response (i.e., the attempt to equate $p(C/A)$ and $p(\text{If } A, C)$) to Adams's hypothesis; the principle of assertability for conditionals is not, it turns out, a special case of the general assertability principle for statements of fact. Secondly, Lewis employs a pragmatic account of conversational implicature in an effort to explain away the purported counter examples to the material account. I shall address these two aspects of Lewis's argument respectively.

2.3 The Triviality Results

Hopes for a straightforward connection between assertability and probability of truth were shattered in 1976 by David Lewis's famous triviality proofs. Lewis provides a *reductio ad triviality* of the assumption that $p(C/A) = p(\text{If } A, C)$. Using the standard Kolmogorov probability axioms and

the assumption that belief revisions are made via conditionalization, Lewis demonstrates that there is no non-trivial probabilistic belief revision model which satisfies the equation of conditional probability with the probability of the conditional.²⁰ The results apply to all probability functions that are closed under conditionalization.

Lewis's original triviality results (1976) show that, from (i) $[p(\text{if } A, C_i) = p(C_i/A)]$ ²¹, it is only possible to get a "trivial" probability function (i.e., with values 0 or 1). Lewis's argument for the triviality result consists in a speedy derivation from (i) to the apparently stronger claim that (ii) $[p(\text{if } A, C_i/C_j) = p(C_i/A \ \& \ C_j)]$ and then a proof that (ii) can only be trivially realized.

²⁰ A rational agent conditionalizes when, on coming to believe that X, she assigns to any proposition Y a probability equal to the conditional probability she previously assigned to Y given X. More specifically, if her degree of belief in an antecedent changes to 1, then she will get a degree of belief in the consequent which is equal to her present conditional degree of belief in the consequent, given the antecedent. A belief revision model is non-trivial if and only if there are at least three pairwise disjoint propositions A, B, and C such that, for some probability function p, p(A) is greater than 0, p(B) is greater than 0, and p(C) is greater than 0. But Lewis's results show that there cannot be three mutually incompatible propositions A, B, and C that all have non-zero probability.

²¹ Where C_i is a set of mutually exclusive and exhaustive sentences compatible with A.

Although the proof that (ii) can only be trivially realized is convincing²², the argument from (i) to (ii) is potentially problematic. The *prima facie* implausibility that (ii) should hold notwithstanding, it is clear that whether a speaker asserts (i) or (ii) will depend on her probability function. Thus, it has been objected that Lewis's argument succeeds only if the meaning of 'if...then' remains invariant across contexts; in particular, it must have the same meaning in the context of the probability

²² The right hand side of (ii) is 1 if $i = j$, and 0 otherwise. See Huw Price (1988, pp. 102-103) for an illuminating recapitulation of the structure and ramifications of Lewis's results. Price reconstructs the result that any pair of propositions X and Y are probabilistically independent whenever $p(X \& Y)$ and $p(X \& -Y)$ as follows:

1. Assume $p(x) = p(y)p(x/y) + p(-y)p(x/-y)$.
2. Substitute 'A $\rightarrow$ C' for x and 'C' for y and get that $p(A \rightarrow C) = p(C)p(A \rightarrow C/C) + p(-C)p(A \rightarrow C/-C)$.
3. Assume that $p(x \rightarrow y/z)$ and $p(y/x \& z)$ are equivalent (synonymous if you like).
4. Derive $p(A \rightarrow C) = p(C)p(C/A \& C) + p(-C)p(C/A \& -C)$.
5. Since $p(C/A \& C) = 1$ and $p(A/A \& -C) = 0$, then $p(A \rightarrow C) = p(C)$, from which it follows that $p(C/A) = p(C)$.

The further result (ii) that the probability function has at most four values because there cannot be three incompatible propositions X, Y and Z that all have non-zero probability depends on having first established the above result.

function p_j that is has in the context of the probability function p .²³ But, as long as we are subscripting to the probability function of an asserter, it is unlikely that the subscripted functions will ever, much less always, be equivalent. So, perhaps the assumption of meaning invariance on which Lewis's derivation depends is suspect.

However, this may be the least of Lewis's worries. Despite his own defense of the material interpretation of indicative conditionals (to be assessed in the next section), Lewis's triviality results may be invoked to underpin a no-truth-conditions argument. Let's see how this works.

With Lewis (and many others), I accept as fundamental the thesis, derived from Adams, that $p(C \text{ given } A) = p(A \ \& \ C)/p(A)$. For many (though not for Lewis) this means that conformity to the thesis will be the primary condition of

²³ Lewis insists that unless indicative conditionals have fixed interpretations, disagreements about conditionals and changes of mind with regard to conditionals make no sense. Bas Van Fraassen (1976) was (I believe) the first to protest that Lewis's triviality results hinge on the questionable assumption--according to Van Fraassen, a consequence of Lewis's "metaphysical realism"--that a conditional expresses the same proposition in different belief states. Others have followed suit. (See, in particular, Edgington (1991 and 1994) and Huw Price (1988)).

adequacy for any proposed set of truth conditions for indicative conditionals. So, given any two propositions (A and C), the challenge is to find truth conditions such that your degree of belief in their obtaining matches your conditional degree of belief in C given A. That is, we want to locate a proposition P such that $p(P)$ is equivalent to $p(C \text{ given } A)$ in any consistent belief distribution over the relevant domain in which $p(A)$ is greater than 0. Thus, 'If A, C' will be true when and only when P is true.

But as Lewis has shown, there is no P such that your degree of belief in the truth of P can be systematically equated with your degree of belief that C is true given that A is true. Someone else (or you in another belief state) can consistently believe P to a different degree than she (or you) believes C given A. So, there is no proposition P whose probability in all contexts (belief distributions) is the same as the conditional probability of C given A in the same contexts. So, the upshot of the argument is that there can be no conditional propositions. Insofar as it is propositions to which we attribute truth conditions, this looks like a strong *a priori* argument against the attribution of truth conditions to conditionals.

While Lewis's results clearly prompt this line of argument, Lewis himself does not, as we have seen, subscribe to it.

2.4 The Neo-Gricean Defense

Lewis's initial positive defense of the material account is somewhat less ingenious than his critique of the early Stalnakerian equivalence thesis. In "Conditional Probabilities and Probabilities of Conditionals" (1976) he offers a Gricean²⁴ theory of conversational implicature in order to explain away the problematic results outlined in section 1.5.²⁵ The Gricean idea is, roughly, that asserting 'if A, C' is pointless and/or misleading when the asserter believes the conditional holds solely (or primarily

²⁴ Although this attribution is accurate, it may nonetheless be a little misleading since Grice himself did not think his theory of conversational implicature could (or should) be extended to conditionals.

²⁵ For the record: in a postscript to "Probabilities of Conditionals and Conditional Probabilities" (1986), Lewis relinquishes the Gricean "assert-the-stronger" theory in favor of Frank Jackson's "implicature-of-robustness" theory (Lewis, 1976, p. 99). I relegate this point to a footnote because I think it is illuminating to show why the Gricean line cannot work for the defender of the material account at any rate. I deal with Jackson's theory later in this chapter.

anyway) because A is false or because C is true. The general rule is that, unless we intend to mislead or otherwise deceive,²⁶ we will assert the indicative 'if A, C' only if we intend to express the belief that $p(C/A)$ is greater than $1-e$, where e is very small and p is our own probability function. Lewis's pragmatic story is supposed to make it possible for him to admit that *something* is amiss with, say, IC4 and yet maintain that, strictly speaking, it obeys the logic of the material conditional. In particular, IC4 is highly unassertable, but this is supposed to be consistent with its turning out to be true just in case it has a false antecedent or a true consequent. So, according to Lewis, failure to recognize a logical distinction between high unassertability and falsity is responsible for the general tendency of speakers to label IC4 false without further ado.

Lewis claims that if the antecedent of a conditional is disbelieved, then "the probability of truth [of the conditional] consists mostly of its probability of vacuous

²⁶ I recognize that this characterization does not do justice to the elegance and detail of Grice's theory; however, I think it is sufficient for my present purposes of exhibiting Lewis's application of the Gricean apparatus.

truth" (1976, p. 86). Lewis then appeals to a Gricean constraint on conversation to explain vacuity. In particular, Lewis claims that vacuous conditionals offend against the Gricean maxim of quantity which dictates that we make the most relevant and informative conversational contributions we can. By invoking this maxim, we can now object to assertions of 'if A, C', when the asserter disbelieves A. So, the maxim of quantity explains why it is aberrant to assert 'A > C' when we disbelieve A, and the explanation is given in a way which makes use of the idea that indicative conditionals have truth-functional truth conditions. So, the Gricean explanation *may* work (I'm not convinced) in the case where the conditional is believed chiefly because the antecedent is disbelieved.

But, what about the case in which the conditional is believed chiefly because the *consequent* is believed? Lewis recognizes that we cannot apply the same line of reasoning to such conditionals, and yet he does not offer an alternate line of reasoning.²⁷ Presumably, the maxim of quantity is intended to extend to this case as well, but in order to

²⁷ Whereas the case of vacuous antecedents corresponds to P2, this case corresponds to P1. (See my discussion of the paradoxes of material implication in Section 1.5).

apply Lewis's method for handling conditionals with vacuous antecedents to this case, we will need to remove from the probability of the conditional the factor which reflects the extent to which the conditional is believed chiefly because the consequent is believed. But, if we did this, the assertability of the indicative would not go by the conditional probability.²⁸

Lewis claims that the best he can do to account for the absence of a "marked diminution" of assertability in the case of the probable consequent is "to concede that considerations of conversational pointlessness are not decisive" (1976, p. 88). But, this is just to give away the store! Lewis states that this objection only "reduces the distance between [his] present hypothesis that indicative conditionals are truth-functional and the rival hypothesis that they are non-truth-valued and governed by a special rule of assertability"; however, in the absence of some positive argument which shows that the Gricean apparatus may

²⁸ In case this is not obvious, the factor which reflects the extent to which a conditional has a high probability chiefly because of the probability of the consequent is $p(C) * p(-(A > C)/-C)$, which equals $p(C) * p(A/-C)$. But, this factor cannot be accounted for via the Gricean maxim.

be applied effectively here too, Lewis's position founders. This is not a question of degree, but of principle.

It is not wise for Lewis to allow that his neo-Gricean defense is "not decisive" for, unless we know what is decisive, we will not know why the assertability of the conditional goes by the conditional probability. Of course, there is nothing, in principle, to prevent deep divergences between assertability conditions and truth conditions for some certain class(es) of sentences. My present claim is merely that Lewis has not provided a satisfying explanation of those divergences for the case of the conditional.

2.5 Conventional Implicatures and A Few Problems With Frank Jackson's Approach

Frank Jackson (1979) also defends the material account of indicative conditionals. And, he too accepts Adams's thesis. So, according to Jackson, 'if...,then' has the truth conditions of the material conditional *plus* an assertability rule which requires that $p(C/A)$ is high. Although Jackson's argument is not open to the objections I launched against Lewis's account, it falters for other reasons.

Jackson (1979, 1981, 1987) holds that there is, in English at least, a class of conventional markers of a

"robustness" relation between a sentence S, which is believed to be true, and some background sentence R.²⁹ Specifically, S is robust with respect to R if and only if $p(S/R)$ is high--i.e., at least high enough that coming to believe R would not interfere with believing S. 'Nevertheless' is a marker of robustness because it signals the robustness of a belief in what is being asserted with respect to whatever has gone before.

'Or anyway' is another such marker. Consider the following example from Jackson (p. 122). According to Jackson, the function of 'or anyway' in an utterance of, say, [S] [He lives in Boston, or anyway somewhere in New England] is to show that the conditional probability of [S'] [He lives in Boston or He lives in New England], given that [S''] [He does not live in Boston] holds, is high. That is, anyone who uttered [S] sincerely would continue to believe the disjunction (i.e., [S']) even if she disbelieved, or

²⁹ A marker (or implicature) is non-conventional when the audience can identify it without assuming that it belongs to the meaning or conventional force of what's actually said. For instance, the utterance "I see that your face is free of blemishes today" non-conventionally implies that I think your usual dermatological condition is rather bad. By contrast, a marker (or implicature) is *conventional* if what is signaled or implicated is part of the meaning or conventional force of what's actually said.

came to disbelieve, the first disjunct. So, 'or anyway' tells us that the disjunction is believed *robustly* with respect to the negation of the first disjunct. For instance, the statement 'It's pouring, or anyway raining', is deemed robust with respect to the information that it's not pouring. I happen to believe it's pouring, but should I learn that it's not, I won't abandon my belief that it's raining.

Jackson contends that, in English anyway, markers of a robustness relation are abundant. Moreover, he argues, we need such conventional devices in order "to signal which statements our assertions are relative to" (p. 122). And, Jackson urges us to notice that--at least in the cases of 'nevertheless' and 'or anyway'--signals of a robustness relation have no effect on the truth conditions of sentences in which they occur. Rather, these markers function only to signal an intended contrast. So, for example, 'P or anyway Q' simply has the truth conditions of the certifiable disjunction 'P v Q', despite the fact that performing commutation on, say, [S] above gives us the infelicitous sentence [S*] [He lives somewhere in New England or anyway in Boston]. Commutation remains valid for it is only *that which*

is signaled that fails to commute. Both [S] and [S*] are true if and only if either [He lives in Boston] is true or [He lives somewhere in New England] is true.

Jackson proposes that, in addition to words like 'or anyway' and 'nevertheless', there are certain *syntactical constructions* which indicate the "possible information relative to which we take what we are saying to be robust", (p. 122) and he avers the 'if...,then' in English represents such a construction. In particular, the indicative conditional construction signals robustness with respect to its own antecedent. Accordingly, it is proper to assert "if A, C" when and only when the material conditional, " $A \supset C$ ", is highly probable and robust with respect to A--i.e., when the probability of " $(A \supset C)/A$ " is also high. Now someone who asserts "if A, C" must have not only a high degree of belief in the corresponding material conditional, " $A \supset C$ ", but must have also a high degree of belief in " $A \supset C$, given A". Since $p((A \supset C)/A)$ is equivalent to $p((-A \vee C)/A)$, which is equivalent to $p(C/A)$, we assert conditionals only when we have a high degree of belief in the consequent given the antecedent.

So, according to Jackson, just as the truth conditions of 'or' and 'or anyway' coincide, so the truth conditions of 'if P, then Q' and ' $P \supset Q$ ' coincide. In addition, the indicative conditional construction is analogous to 'nevertheless P' in that the use of 'nevertheless' signifies the robustness of P with respect to some immediately preceding sentence, but the actual sentence, P, in which 'nevertheless' occurs, is true if and only if P is. Thus, the counterintuitiveness of the inference from, say, [If Elvis is alive, he is not flourishing] to [If Elvis is flourishing, he is not alive] is, according to Jackson, attributable to the failure of *that which is signaled* (or conventionally implicated) by the indicative conditional construction to contrapose. But this, he insists, is consistent with the view that a commitment to the truth of the material conditional entails a commitment to the truth of the contraposed material conditional. While 'If P, Q' and ' $P \supset Q$ ' share the same propositional content (i.e., truth conditions), they have different implicatures. In the contraposed-Elvis example above, the theory does not seem to vindicate intuition, but perhaps this is due to a quirk in the example.

In some cases, the implicature of robustness theory works admirably, and represents an improvement over the Gricean position. Consider again the conditional, 'If Dot makes shortcake, Becky is delighted'. This is clearly assertable. However by strengthening the antecedent, we can get the highly unassertable conditional, 'If Dot makes shortcake and Becky's children are axed to bits, Becky is delighted.' Jackson's theory makes good sense of the differing assertability values of these two conditionals: clearly the former conditional is robust with respect to the truth of its antecedent and the latter is not.

Jackson introduces one further parallel worth consideration here. Specifically, Jackson likens the role of the indicative conditional construction to the role of the word 'but' in English; although 'but' signals a contrast, the presence of the signaled contrast it is not a necessary condition for speaking truly. That 'but' and 'and' have the same truth conditions is, for Jackson, uncontroversial. Thus, just as 'but' has the truth conditions of 'and' in addition to an assertability condition which dictates that the 'Q' in 'P but Q' be unexpected given P, so the indicative conditional has the truth conditions of the

material conditional in addition to an assertability condition which dictates that the probability of the consequent, Q , given the antecedent, P , is high.

Although the theory is indisputably clever, it may not ultimately show what Jackson wants it to show.

For starters, it's not clear that 'nevertheless', 'or anyway' and 'but' are properly analogous to the indicative conditional construction. In the case of 'nevertheless', robustness is defined relative to some contextually defined claim(s) earlier in the conversation. In the case of 'or anyway', a disjunction is deemed robust with respect to the negation of the first disjunct. In the case of 'but', there is an implicit reference to the unexpectedness of the second conjunct, given the context afforded by the first. In all of these cases, the reference which is made to the sentence robustly believed is clearly essential. For example, we invoke the truth conditions standardly associated with 'and' in characterizing the content of ' P but Q ', and we invoke the truth conditions standardly associated with 'or' in characterizing the content of ' P or anyway Q '. By contrast, however, it is not at all obvious that reference to the

material conditional is essential in characterizing the content of 'If P then Q'.

To see this contrast, it is perhaps helpful to consider why we generally suppose that the truth conditions of 'and' have something essential to do with 'but'-sentences. It is natural to suppose this simply because it is natural to suppose that the assertability rule for 'but' is composed of two parts. First, we are to assert 'P but Q' only if we believe 'P and Q' and, second, there must be a special kind of contrast between Q and P--namely, Q must be surprising in the context given by P. Moreover, it appears that neither condition is dispensable, for, if we omit either one of them, we do not adequately capture the sense of 'but'. A similar two-part analysis holds for the assertability conditions of 'or anyway'. Thus, it seems that we need two conditions to explain the meaning (in the broadest sense) of 'but'-sentences and 'or anyway'-sentences.

But Jackson himself observes that it follows from the assertability rule that he accepts *alone* that the indicative conditional is assertable only if the speaker believes the material conditional. Seemingly, then, we do not require two conditions to explain the meaning of 'If P, Q'; one of

them is sufficient. And, in particular, since the assertability rule performs the entire job, why not discharge the idle truth-functional truth conditions? In her recent article on the current state of the philosophical debate on conditionals, Dorothy Edgington puts the matter concisely: "There is no evidence that one believes a conditional whenever one believes the corresponding material implication, and then is prepared to assert it only if some further condition is satisfied." (1995, p. 247)

But Jackson professes to hold an explanatory advantage over those who would suggest that Adams's assertability rule is sufficient for understanding the use and behavior of conditionals: "To have assertability conditions best explained by certain truth conditions is to have those truth conditions." (1987, p. 58) No doubt this is ordinarily so. Yet, it makes sense to differentiate between surface logic (assertability) and deep logic (truth-preservation) only when properties of the explanandum dictate such a division. In the case of indicative conditionals, however, it's not clear that there is anything going on that the surface logic alone cannot sufficiently explain. We can postulate a deep logic anyway, but it will at best be explanatorily epi-

phenomenal. As with the Gricean conversational implicature defense, Jackson's defense can only gain a foothold where there is a demonstrable distinction between assertability and *belief*. Jackson was supposed to show us that conditional propositions can be unassertable even when they are *believed* to be true. But often the reason we refrain from asserting certain conditionals is because we *believe* they are false.³⁰

Jackson attempts to trump these considerations with the claim that we require some way of gauging the robustness of ' $P > Q$ ' with respect to its antecedent because we need to be able to depend upon *modus ponens*.³¹ (1979 p. 123) But why should the usefulness of *modus ponens* depend on there being a connective *in English* with the truth conditions of the

³⁰ This is not always the case. The reason I don't assert that *I have a head* is not because I believe it to be false, but because I believe it to be so obviously true that asserting it would be ridiculous. Likewise, the reason I don't assert that *If I have a head, then I have a head* is to avoid silliness, not falsehood.

³¹ So the information conveyed by the antecedent must, among all the other possible pieces of information with respect to which we might want a conditional to be robust, enjoy special standing if the usability of *modus ponens* is to be retained. To secure *modus ponens*, we must only tolerate evidence for A that does not militate against $A > B$.

material conditional? To accommodate *modus ponens*, a conditional, 'If A, C', must be false when A is true and C is false. The material conditional satisfies this condition, as does the biconditional and as does 'A & C'.³² So *modus ponens* is hardly in peril.

2.6 One Last Try: Partial Logic and A Few Problems With It

In this section, I assess the viability of modeling indicative conditionals on partial truth functions. Stephen Blamey's (1986) system of partial logic affords a felicitous framework for conducting this investigation, since it introduces a new connective, namely '/' such that 'A/C' is undefined for the valuations of A and C that raise problems for the material account.³³ Accordingly, I consider the hypothesis that '/' is the correct formal counterpart to the English 'if...,then' construction. Using Blamey's system as an example, I demonstrate that allowing gappy truth-functional truth conditions for truth conditions begets far more trouble than it averts. Since I have already shown

³² Hartry Field pointed out this generally overlooked (though rather obvious) point to me in conversation (1995).

³³ I got the idea to examine this possibility from Frank Doring (1993).

that ordinary conditionals cannot be modeled on *total* truth-functions, my results in these pages serve to expunge altogether the truth-functionalist approach to understanding the semantics of the conditional. Our last-ditch bid to safeguard a role for truth-functionality in our analysis of the English conditional fails. Gaps or no gaps, conditionals do not have truth-functional--or even quasi-truth-functional--truth-conditions.

A "total" truth-functional connective is defined for every combination of values of the elements it connects. Accordingly, if the indicative conditional expresses such a total truth-function, it will be defined for every combination of truth values of antecedent and consequent. Within a bivalent framework, the only plausible total truth-function the indicative conditional can express is the material conditional.

The argument for this goes roughly as follows. Assuming bivalence, there are exactly sixteen equivalence classes of Boolean sentences constructible from A and C. The minimal requirement on a conditional connective within a classical framework is that it accommodate *modus ponens*. Thus, if there is some binary connective, ' $\rightarrow$ ',

representing a formal counterpart to the indicative 'If..., then' construction, then (at the very least) it must satisfy the following two conditions: (1) 'A $\rightarrow$ C' must be false in case A is true and C is false, and (2) 'A $\rightarrow$ C' must be true in case both A and C are true. The connection between these two conditions and *modus ponens* is not hard to see. As regards (1), if 'A $\rightarrow$ C' is true when A is true and C is false, then we can now invoke *modus ponens* to justify inferences from true premises to false conclusions. But of course if we did allow such inferences, we would no longer be within the compass of deduction as we know it. After all, deductive inference just is a form of inference such that the conclusion must be true when the premises are true. As regards (2), if 'A $\rightarrow$ C' is false when both A and C are true, then major and minor premise could not be jointly true, and hence *modus ponens* would be useless. So, conditions (1) and (2) above settle two lines of the truth table defining the conditional connective, ' $\rightarrow$ '.

But two more remain to be determined: (3) false antecedent and false consequent, and (4) false antecedent and true consequent. If we assign 'false' in both cases, we define conjunction, and if we assign 'true' in both cases,

we once again define the material conditional. So, if the conditional is not material, one of the cases must be assigned 'false' and the other 'true'. If we assign 'true' for case (3) and 'false' for case (4), we define the biconditional. On the other hand, if we assign 'false' for case (3) and 'true' for case (4), we render ' $A \leftrightarrow C$ ' logically equivalent to C alone. But if the truth value of A plays no role in determining the truth value of ' $A \leftrightarrow C$ ', then we have failed to define a genuinely binary connective, and hence we have failed to locate a genuinely conditional connective. Since I have already urged that the material analysis of conditionals is untenable, we may have no choice but to reconsider the truth-functional status of the conditional.

Still, there may yet be an alternative to giving up on truth-functionality at this point. It is, after all, conceivable that a suitable formal counterpart to the indicative 'if..., then' construction can be specified within a truth-functional framework if we abandon strict bivalence. In particular, we may define and incorporate a third value, or we may permit truth-value gaps. Such endeavors would accord well with the increasingly popular

suggestion that we entertain an incomplete, or defective, truth-table for the conditional. Several psychologists who study how people reason hypothetically have recently endorsed this suggestion in light of data that subjects overwhelmingly decline to evaluate indicative conditionals with false antecedents in terms of truth and falsity at all; instead, experimental subjects tend to dismiss such cases as "irrelevant".³⁴

It may then be that (subjunctive conditionals aside of course) the conditional construction is almost always inappropriate, or inapplicable, to situations in which the antecedent is understood to be false.³⁵ Perhaps a formal semantics for the conditional which leaves the connective, '-->', undefined for certain valuations could accommodate these findings from within the familiar, convenient and theoretically elegant truth-functional framework. *Prima facie*, this represents a promising approach. Let's examine it more closely.

³⁴ See, in particular, Byrne (1989), Cosmides (1989) and Evans (1982).

³⁵ If A, then A represents an exception. Although it is not noted in any of the psychological studies I have seen, surely subjects agree that If A, A is true, no matter what the truth value of A is.

Blamey's system includes counterparts for all of the usual truth-functional operators (i.e., '&', 'v', '>', '- ', '≡') and also for the two partial connectives, 'xx' and '/'. The system retains all of the classical definitional equivalences.³⁶ Note that, in the following display, '*' represents not a third value but a truth value gap:

<u>A</u>	<u>-A</u>	<u>A</u>	<u>C</u>	<u>A & C</u>	<u>A v C</u>	<u>A xx C</u>	<u>A ≡ C</u>	<u>A > C</u>	<u>A / C</u>
T	F	T	T	T	T	T	T	T	T
*	*	T	*	*	T	*	*	*	*
F	T	T	F	F	T	*	F	F	F
		*	T	*	T	*	*	*	*
		*	*	*	*	*	*	*	*
		*	F	F	*	*	*	*	*
		F	T	F	T	*	F	T	*
		F	*	F	*	*	*	T	*
		F	F	F	F	F	T	T	*

Since, for defined arguments, the table entries for '/' match precisely the defective truth table suggested by reports from psychology (because it interprets A/C as undefined for false antecedent cases), I now examine the hypothesis (hereafter, H) that '/' yields a correct semantics for the English conditional.

Its sensitivity to experimental data aside, H is immediately compelling because it cancels both paradoxes of

³⁶ For example, the defining conditions for 'A > C' are the same as the defining conditions for '-A v C'.

material implication; now neither the falsity of the antecedent nor the truth of the consequent suffices to establish the truth of A/C . In addition, contraposition, disjunctive syllogism and strengthening the antecedent become not invalid, but merely non-valid, inference forms. As regards contraposition, the only valuation that makes A/C true, leaves $\neg C/\neg A$ undefined. As regards disjunctive syllogism, when A and C are both true, $\neg A/C$ is undefined and, as regards strengthening the antecedent, when A and C are both true, and D (i.e., the element which strengthens the antecedent) is false, then $(A \ \& \ D)/C$ is undefined.

The price of adopting H , however, exceeds the returns. For one thing, no plausible interpretation of H can satisfactorily delineate the margin between valid and non-valid patterns. To show this, it will be helpful to consider two possible renderings of H and to examine why neither of them is suitable. Blamey suggests that what H really amounts to is determined in part by the definition of implication underlying it.³⁷ I assess two reasonable formulations of implication and conclude that neither gives us the results we want. Beyond this, however, I illustrate

³⁷ See Blamey (1986), p. 6.

that the deeper problems with invoking partial logic for our purposes do not emanate from the underlying definition of implication employed at all, but rather from the assignment of truth conditions *per se*.

All tenable notions of implication require us to reject arguments from true premises to untrue (i.e., false or undefined) conclusions. When this minimal requirement is the *only* requirement, we get the weakest version of implication possible. However, such a weak definition of implication is unacceptable because it renders 'A/C' equivalent to the conjunction of A and C. And to concede this result would be to deny that the 'if..., then' has a *unique* formal counterpart, and thus to relinquish the whole project.

While the minimal definition of implication is too permissive, Blamey's stronger notion is too restrictive. It turns out that, if we accept this stronger notion of implication, we undercut the only reason we had for formalizing the conditional construction as the partial truth function, '/', in the first place. Blamey's rendering of implication requires that a set of premises *x* implies a conclusion *y* if and only if (i) whenever all the premises in

x are true, y is true and (ii) whenever y is false, at least one of the premises in x is false. In itself, this definition is innocuous enough, but from the point of view of modeling inferences with conditionals it is unsatisfactory. It makes both *modus ponens* and *modus tollens* nonvalid. When A is undefined and C false, then neither premise of the *modus ponens* argument with a false conclusion is false as required by condition (ii). When A is true and C undefined, we make an analogous case against *modus tollens*.³⁸

³⁸ Blamey's first condition is not up for grabs. However, it is possible to formulate weaker versions of his second condition which, when spliced with the first condition, generate definitions of implication on which the validity of *modus ponens* and *modus tollens* is preserved. The possibilities are as follows:

- 1) Whenever the conclusion is *, some premise is either F or *.
- 2) Whenever the conclusion is *, some premise is *.
- 3) Whenever the conclusion is either F or *, some premise is either F or *.
- 4) Whenever the conclusion is F, some premise is either F or *.

As far as I know, there are no notable advocates of any of these splicings. In any case, all of the resulting systems will be subject to the objections I raise in the discussion that follows.

Notwithstanding, there are deeper problems with a deeper source. The real culprit is not the notion of implication in play, but the assignment of truth-functional truth conditions. To elucidate, I now mention a few difficulties besetting H that are neither dependent upon nor affected by the underlying notion of implication. One such problem with adopting H in any form is that now *modus tollens*, though not technically invalid, will never have an application. This is because A/C is either undefined or false whenever -C is true. However, an inapplicable argument form is as good as none at all.³⁹ And, indeed, our desperation to find truth conditions for conditionals in the first place stems, in part anyway, from the desire to uphold valid inference patterns so that we may use them!

Another problem with H is that, like the material interpretation of conditionals, it generates intuitively unacceptable substitution instances. For example, the conditional [If Oswald did not shoot Kennedy, then someone else did] is presumably true, but because of its false (I

³⁹ Not that we couldn't get by without *modus tollens*.

assume) antecedent, H renders it undefined.⁴⁰ Intuitively, however, we should like to say that, so long as any conditional has a truth value, this one is uncontroversially true. Certainly, anyone aware of Kennedy's assassination will accept the conditional.

Furthermore, strengthening the antecedent can produce an undefined conditional when intuition requires a false one. Suppose the conditional [If Mary cooks, I'll eat] is true because both antecedent and consequent are true and I am not suffering from severe stomach cramps (or any other ailment which would prevent me from enjoying Mary's victuals). H renders the conditional [If Mary cooks and I am suffering from severe stomach cramps, I'll eat] undefined because of its false conjunctive antecedent. But, again, so long as any conditional has a truth value, we should like to say that this one is false.

Finally, the equivalence of $\neg(A/C)$ and $A/\neg C$ is counter-intuitive. By rejecting the statement [If the highway is icy, the sky has cleared up] one does not thereby commit to [If the highway is icy, the sky has not cleared up]. All

⁴⁰ The now ubiquitous Oswald-Kennedy conditionals originated with Ernest Adams (1970).

that is required for the denial of the first conditional is that one accept the weaker conditional claim [If the highway is icy, then the sky may still not have cleared up].

And this is just a sampling, for once we understand the structure of these examples, we have a formula for constructing indefinitely many of them.

CHAPTER THREE

THE STALNAKERIAN ALTERNATIVE

Such reasoning is only true
If we accept the classic view,
Which we have no right to assert
According to the introvert.

(W.H. Auden, The Maze, 1947)

3.1 Preliminaries

Robert Stalnaker (1976) has crafted an ingenious account according to which indicative conditionals enjoy possible-worlds truth conditions. In this chapter, then, I explore the Stalnakerian suggestion that a disciplined truth conditional account of the indicative conditional can be given without adverting to truth-functionality at all. In Section 3.2, I briefly review the origins of Stalnaker's proposal, and attempt to locate it within the logical space so far afforded by this study. In Section 3.3, I flesh out the proposal in detail, and prepare the groundwork for a critical revisitation of Stalnaker in Chapter Four.

One aim of this chapter within the context of my entire project is to complete--i.e., make exhaustive--my survey of the truth conditional approaches available in the current literature. If, as I shall ultimately argue, Stalnaker's

approach cannot be successfully made out--or at least not successfully made out as a genuinely truth conditional approach--the pressure to pursue some non-truth-conditional alternative becomes fierce.

3.2 The Shape of the Stalnakerian Project

Stalnaker's theory of indicative conditionals is a descendant of David Lewis's (1973) theory of counterfactuals. Lewis proposed the following possible worlds truth conditions for the 'if..., then' of counterfactual conditionals: 'If A were the case, then C would be the case' is true at possible world I just in case C is true at all accessible worlds closest to I at which A is true; and if there is no accessible A-world, then the counterfactual is vacuously true. As formal analysts for the counterfactual 'if..., then' Lewis introduces the variably strict binary operator $@ \rightarrow$.⁴¹ The logic of $@ \rightarrow$ is appealing because it neither ratifies nor depends upon the validity of the implication schemata that proved so

⁴¹ See Lewis (1973), p. 16. As I am now chiefly concerned with introducing Stalnaker's account of indicative conditionals, I leave out many details.

unruly on the truth-functional account we examined in Chapter One.

Although there is nothing intrinsic about possible worlds semantics that would prevent an extension of Lewis's proposal to indicative conditionals, Lewis (at the expense of semantic unification) gives a separate account for indicatives. For these, as we have seen, Lewis recommends the truth conditions of the material conditional and adopts Jackson's theory of robustness to explain divergences between truth conditions and the assertability of the conditional as given by the corresponding conditional probability (Adams's hypothesis). In his article, "Indicative Conditionals" (1976), Robert Stalnaker makes a impressive gesture in the direction of semantic unification for conditionals by developing a possible worlds semantics that accommodates indicative conditionals. Before launching into the details, a few preliminary remarks are in order.

Stalnaker wisely rejects the traditional truth-functional interpretation of indicative conditionals. Nevertheless, he declines to give up on truth conditions altogether. I concur with Lewis (1976, p. 85) that worries about compound statements with embedded conditionals, in

conjunction with respect for principles of methodological conservatism, dictate that we consider and exhaust the truth conditional options before resolving to pursue a non-truth-conditional "fresh start." Assuming, then, that the truth-functional approach is, as I have argued, irreparably defective, Stalnaker's maneuver to formulate non-truth-functional truth conditions for the indicative conditional is a prudent and strategically attractive next move.

It will be helpful to notice that from the outset Stalnaker carves up the logical space in a way that down-plays the theoretical options. Although he is sensitive to the existence of other options, he frames his argument in terms of a contrast between two dominant responses to the puzzles that arise on the material account. We may, as per Grice, Lewis and Jackson, attempt to explain away seeming paradox by augmenting the material analysis of conditionals with pragmatic principles of conversational or conventional implicature. Or, alternately, we may, as per Stalnaker himself, produce and defend non-truth-functional truth conditions for the indicative 'if..., then' construction in English.

In a footnote, Stalnaker acknowledges other possible approaches. For example, we could retain a truth-functional schema and furnish a three-valued truth table for the indicative conditional; now, whenever, the antecedent is false, we assign the neutral value to the conditional. I considered and rejected this option when I discussed Blamey's system of partial logic. Alternatively, we could "interpret the indicative conditional as a conditional assertion rather than the assertion of a conditional proposition." (1975, p. 136) While it is at this point still far from obvious what such an interpretation might finally look like, I will in Chapters Four and Five investigate the prospects for developing such a view.

As it turns out, some of Stalnaker's reasoning may be applicable to a no-truth-conditions approach to understanding conditionals. In the above-mentioned footnote, Stalnaker allows that interpreting indicative conditionals as conditional assertions is "the most promising and plausible alternative" to his own account, but contends that "to make it precise, ... one needs much of the framework of a pragmatic theory" (Stalnaker 1975, p. 137) that he develops. I return to the pragmatic component of Stalnaker's theory in

Chapter Four, when I assess this "promising and plausible alternative" in more detail.

Stalnaker shares some basic premises with the truth-functional apologists. For instance, both accounts rely on the assumption that ordinary inference aims at more than preserving truth; we are, thus, bound to go astray if we expect our analysis of semantic entailments to parallel our analysis of reasonable inference. But whereas the Grice-Lewis-Jackson strategy is to vindicate intuition by showing how there can be valid arguments which are not reasonable inferences, Stalnaker aims to vindicate intuition by showing how there can be reasonable inferences which are not valid arguments.

3.3 The Possible Worlds Proposal

Consider the following persuasive line of reasoning:

'Either Oswald shot Kennedy or somebody else did.
Therefore, if Oswald didn't do it, somebody else did.'

Although Stalnaker recognizes the force of such reasoning, he nonetheless proclaims the argument formally invalid. His task in "Indicative Conditionals" (1976) is to elaborate an account within which the invalidity of this argument can be

made compatible with its striking plausibility. It is to this end that Stalnaker recommends a division of labor between semantics and pragmatics. Broadly characterized, semantic considerations are to govern relations between propositions, whereas pragmatic considerations are to govern relations between speech acts. In accordance with this general distinction, Stalnaker fashions a more fine-grained distinction between strict semantic entailments and reasonable inferences, and argues that while the premise of the above argument does not *entail* the conclusion, it is nevertheless generally *reasonable to infer* the conclusion from the premise.

An inference is *reasonable* if and only if, in every context in which the premises are both assertable and accepted, the conclusion too will be assertable (and presumably accepted). On the other hand, the premises of an argument *entail* its conclusion if and only if it is impossible for the conclusion to be false, given that the premises are true.⁴² Now, making a reasonable inference is not (or is not *only*) a matter of recognizing and employing

⁴² As far as I can tell, Stalnaker's characterization of entailment is equivalent to a standard non-technical characterization of validity.

valid forms. Indeed, there is no special use for a distinct notion of reasonable inference if such inferences always coincide with entailments.⁴³ Stalnaker's task, then, is to demonstrate how it is possible for an inference to be reasonable when the truth of the propositions expressed by the premises does not entail the truth of the proposition expressed by the conclusion.

That the content of a sentence often depends on context is a commonplace.⁴⁴ Stalnaker subscribes to this commonplace, but adds that the relation between context and content is reciprocal. That is, the content of an utterance may affect the context of that utterance as well. Moreover, it is the influence of semantic content on context that gives rise to the purported breach between semantic entailments and reasonable inferences. But this is an abstract point about the *structure* of Stalnaker's project; I highlight it now because I want to return to it in Chapter

⁴³ Since entailment relations relate propositions whereas inferential relations relate beliefs and speech acts, the distinction remains intact. However, in the event of perfect coincidence, the distinction is of no help in resolving the present conundrum.

⁴⁴ Sentences containing indexicals provide the clearest cases: for example, the content of "I shall never forgive you" depends upon who is speaking and to whom.

Four when I examine Edgington's claim that the 'truth-conditions' for indicative conditionals which emerge from this picture fail to engage any stable notion of truth, and hence are conditions for 'truth' in name only. In the meantime, however, in order to make sense of this reciprocity claim, Stalnaker's notion of 'context' must be made precise.

A context, or context set, is a set of possible worlds. Possible worlds truth conditions result from construing propositions as functions from contexts into truth values, where a possible world is an alternate state of affairs, a way the world might have been (or might be). The performance of certain rational activities, such as supposing, predicting and deciding, depends on our ability to envisage possible worlds--i.e., to consider what would change, or be different, under a different set of circumstances. Accordingly, effectively communicating the content of our suppositions, predictions and decision-making tactics requires that those participating in the discourse at hand are envisaging alike possible worlds.

But how do we arrive at a commonly shared set of possible worlds? Apparently, a common set of worlds arises

by default out of commonly shared background information; whichever worlds are not *precluded* by this *background* information are the worlds in play. Stalnaker describes this information as *whatever* common ground is assumed by the speaker: "It is this information which he uses as a resource for the communication of further information, and against which he expects his speech acts to be understood" (1976, p. 141). Thus, the presumed common ground provides the context, and whatever is not incompatible with this context constitutes the relevant set of possible worlds. Since context partially determines what it is reasonable to infer, it is now easy to see how reasonable inferences may fail to align with entailments. Entailments relate propositions independently of their acceptance, or presumed acceptance, whereas what it is reasonable to infer depends on what background information is taken for granted among conversational participants.⁴⁵

As we have seen, Stalnaker's semantic analysis of conditionals involves defining a proposition as a function

⁴⁵ Or presumed by the speaker to be taken for granted.

from possible worlds into truth values.⁴⁶ Accordingly, he proposes a semantic rule (or formal specification of truth conditions) for calculating the truth value of any particular conditional. Assuming that 'If A, B' asserts that B is true in the world as it would be if A were true, Stalnaker's function takes A and the actual world (the arguments of the function) into a possible world in which A is true. Formally, a conditional, 'If A, B', is "true in a possible world I just in case B is true in possible world $f(A,i)$ " (1976, p. 143).

But, how do we determine which world is the world as it would be if A were true? Even given the requirement that, in assessing a conditional, we envision the A-world (a world in which A is true) which is closest, or most similar, to the actual world, there remains much room for dispute. Identifying the relevant respects of similarity between possible worlds and the actual world (about which we may after all be inadequately informed) is messy business.⁴⁷

⁴⁶ For the purposes of his analysis, Stalnaker takes the notion of possible worlds and the principle of bivalence for granted.

⁴⁷ David Lewis in his book on counterfactuals (1973) claims that the trouble with Stalnaker's selection function is that it lacks any mechanism for choosing between

Still, we may at least allow that every world is more similar to itself than to any other world, and thus we may demand that, whenever the antecedent of a conditional is true in the actual world, our selection function should select the actual world. Beyond compliance with this rudimentary principle, however, relevant respects of similarity are, according to the Stalnakerian analysis, determined by context.

As we have seen, Stalnaker represents a context set as a particular set of possible worlds among which a speaker means to distinguish (and means to have her audience distinguish). In making a conditional statement, then, a speaker ordinarily considers only those worlds within the context set. With this in mind, Stalnaker proposes the following constraint on the selection function: "If the conditional is being evaluated at a world in the context

alternative worlds when the worlds under consideration are tied with respect to similarity to the actual world. For example, there is no single closest world in which kangaroos have no tails. In some possible worlds, tailless kangaroos leave the tracks in the sand that they actually leave, and in other worlds they don't. While the former such worlds are more similar to the actual world with respect to the tracks themselves, the latter possible worlds are more similar to the actual world with respect to *how* tracks are imprinted. So, overall similarity determines a set of equally similar worlds, and not a unique closest world.

set, then the world selected must, if possible, be within the context set as well" (1976, p. 144).

Although this principle aids in the coherent ordering of worlds,⁴⁸ it is essentially a pragmatic, rather than semantic, constraint because it is grounded in certain intuitions about the uses to which conditional statements are typically put. The idea is that unless conditional statements obey this constraint, they cannot effectively be directed toward the various hypothetical reasoning processes (for example, supposing, predicting, strategizing, deliberating and making hedged bets) that they are in fact normally directed toward. Moreover, violation of this pragmatic constraint in ordinary discourse undermines a speaker's ability to communicate the substance of these reasoning processes. The following is an application of the constraint that demonstrates this point. Suppose it is an open question whether Oswald killed Kennedy. Still, given that it is established that *whoever* killed Kennedy, he or she did it with a gun, we may further count it as established that *if* Oswald did it, *he* did it with a gun. This

⁴⁸ The principle dictates that all worlds within the context set are more similar to each other than to any worlds outside of it.

intuitive bit of reasoning illustrates the effect of observing the constraint; when a speaker says 'If A', all the information she accepts as true in the actual situation is assumed to obtain in the hypothetical situation in which A is true as well.

Stalnaker points out that the selection function will often reach outside the context set for subjunctive conditionals. After all, use of the subjunctive mood conventionally indicates that presuppositions are being suspended. Choice of the indicative mood, on the other hand, conventionally indicates that presuppositions are to be retained. The pragmatic constraint will thus apply to indicative conditionals without exception and from this it follows that it will be appropriate to use the indicative conditional construction only in a context which is compatible with the truth of the antecedent.⁴⁹ Now we can see why Stalnaker suggests that "open conditional" is a more perspicuous term than "indicative conditional": the antecedent must be left "open" (i.e., not regarded as false)

⁴⁹ Note that counterfactual conditionals never conform to this constraint. By definition, such conditionals have antecedents which are understood to be counter-to-fact, or false.

because the context set is the set of possible worlds consistent with what the speaker and her audience mutually presuppose to be true of the actual world, and Stalnaker's pragmatic constraint on selection requires the antecedent to be compatible with the context set.

The final element of Stalnaker's account is the following generalization about appropriateness conditions for making disjunctive assertions: "a disjunctive statement is appropriately made only in a context which allows either disjunct to be true without the other" (1975, p. 147). Unless a speaker gives some explicit indication that she means for her utterance to be excepted from this generalization, it will be inappropriate, because misleading, to assert 'A or B' on the basis of acceptance of one of the disjuncts alone; and, unless she can produce an account of the communicative purpose that a particular infraction of the generalization is supposed to serve, such a disjunctive utterance will be inappropriate because pointless.⁵⁰ So, in general, the context of utterance must

⁵⁰ An utterance of 'A or B or both' violates the generalization, but may nevertheless be appropriate. It is not misleading, because it explicitly signals that it is to be regarded as an exception. In addition, adding the third disjunct may serve the purpose of revealing something about

be such that both 'A and not-B' and 'B and not-A' are understood to be open possibilities.

Recall the original puzzle. How can there be reasonable inferences which are not valid argument forms? Out of the various components described above--i.e., the notion of a proposition and of a context set, the semantic analysis of conditionals, the pragmatic constraint on the selection function, and the generalization about appropriate conditions for making disjunctive assertions--Stalnaker constructs the machinery he needs to address this puzzle. So, before critically examining certain troublesome features of Stalnaker's apparatus--particularly, the relationship between Stalnaker's proposed selection function and his pragmatic notion of a 'context set'--I want to look at the consequences of this formal analysis for one of the criticisms raised in Chapter One against the truth-functional analysis of conditionals. In particular, I want to look at an argument form which a proponent of the material interpretation of indicatives must regard as valid, even

the context of utterance. Whereas 'A or B' leaves open whether the context of utterance is compatible with 'A and B', 'A or B or both' explicitly affirms that the context is compatible with 'A and B'.

though this interpretation generates counterintuitive substitution instances. To the extent that an account can, without generating new puzzles and problems, avoid or explain any of the puzzles and problems that arise when ordinary conditionals are understood to have the truth conditions of the material conditional, I believe it represents, at the very least, a refinement.

So, to see how Stalnaker's machinery may be brought to bear on a particular case, consider again the argument form, disjunctive syllogism: 'A or B, therefore, if not-A, then B'. Stalnaker purports to show that, while this is usually a reasonable inference pattern, it is not a formally valid argument. First, let's situate within the present framework the claim that disjunctive syllogism is a reasonable inference pattern. To establish this, Stalnaker must demonstrate that every context in which a statement of the form 'A or B' (say, 'Either Oswald did it or somebody else did') is assertable and accepted, is a context which entails the correlative conclusion ('If Oswald didn't do it, then somebody else did'). Provided that such a disjunctive premise is in fact assertable and accepted, it follows from the generalization about the appropriateness of disjunctive

assertions that the context is compatible with 'Not-A & B' ('Oswald didn't do it and somebody else did'). Of course, if the context is compatible with the conjunction of 'Not-A' and 'B', it is independently compatible with each conjunct; so, the context is compatible with 'Not-A', the antecedent of the conditional conclusion. Now in accordance with the pragmatic constraint on selection functions, "if a proposition *P* is compatible with the context and another proposition *Q* is accepted in it or entailed by it, then the conditional *if P, then Q* is entailed by it as well." (1975, p. 148) The conditional, 'If not-A, then A or B' must be accepted in this case because 'A or B' is accepted and 'Not-A' is compatible with the context; and, finally, this conditional entails the conditional conclusion of the argument, 'If not-A, then B'.

This reasoning illuminates Stalnaker's claim that the inference from 'A or B' to 'If not-A, then B' is usually a reasonable one. In particular, it demonstrates that the indicative conditional and the material conditional often agree in their *assertion* and *acceptance* conditions.⁵¹

⁵¹ Despite Stalnaker's ultimate rejection of the truth-functional account of conditionals, he here makes some headway toward explaining its allure. The emphasis on cases

However, the foregoing does not shed any direct light on the more controversial claim that our sample argument ('A or B, therefore, if not-A, then B') is formally invalid, and thus that the indicative conditional and the material conditional diverge in their *truth* conditions.

So, let's now revisit the source of this latter claim. To see the difference between the truth conditions of an indicative conditional and the corresponding material conditional, we must consider "acts and attitudes other than assertion and acceptance." (1975, p. 148) We might, for example, look at when it is reasonable to *deny* a conditional. So, the following is a variant of the scenario Stalnaker describes to make this point. Suppose I am reflecting upon the conditional, 'If Oswald didn't do it, then I did.' Since I believe I am innocent, I'm likely to reject this statement. However, because I suspect Oswald *is* the culprit, I cannot reasonably reject the disjunctive statement, 'Either Oswald did it or I did.' But now, since

wherein assertion conditions coincide while truth conditions diverge is unusual since, as we have seen, the traditional approach to explaining the plausibility of the equivalence claim emphasizes cases wherein assertion conditions diverge and then attributes these divergences to some pragmatic component of discourse which has no bearing on the coincidence of truth conditions.

the disjunction is equivalent to the material conditional, it seems I cannot reasonably reject the corresponding material conditional either. Thus, Stalnaker maintains that an indicative such as 'If Oswald didn't do it, then I did' and its material 'counterpart' must express different propositions with different truth conditions. In addition, Stalnaker claims that parallel arguments can be constructed to show that hypothetical syllogism and contraposition are "in general, invalid." (1975, 149)⁵²

The central complaint that has been lodged against Stalnaker's proposal--by Dorothy Edgington and Allan Gibbard--is that his 'truth conditions' are conditions for truth in name only. To get to the bottom of this complaint, it will be helpful to introduce the thesis, championed most strenuously by Edgington and Gibbard, that indicative conditionals lack truth conditions of any kind. This

⁵² Since argument *forms* are always either determinately valid or determinately invalid, it's not clear what Stalnaker means by "in general". Probably all he means is that contraposition fails for some but not all A, B. It's possible that Stalnaker here inadvertently neglects to heed the distinction between inference and implication. Whereas inferring is something reasoners do, implying is something sentences do. Interestingly, Jackson invites a similar confusion when he claims that the "inference" from 'not-A' to 'If A, then B' is "valid". (1987, p. 18)

thesis, which I will be calling the non-factualist thesis, is the subject of Chapter Four, and the way in which my discussion of it constitutes a framework for further evaluation of Stalnakerian truth conditions will be made plain there.

3.4 Factualism or Non-factualism? Where Is the Battle Line?

Before proceeding into non-factualist territory, I want to take stock of where we are in the dialectic, and provide a backdrop for where we will end up.

So far, we have looked at the extant truth conditional views of indicative conditionals. But are these the only possible truth conditional views? This question cannot be fruitfully addressed without first settling on the properties that qualify a view as a distinctly truth conditional view. What at bottom is it to be a factualist about indicative conditionals anyway? First, we want to locate what all factualists have in common--or, perhaps better, what the minimal conditions for being a factualist are. Second, we want to distinguish different stripes of factualism by considering what further properties our factualists have been prone to want--or anyway to

presuppose. For these purposes, it will be helpful to construct a sort of check list of possibilities.

Minimally, I should think that a factualist of any stripe must say that indicative conditionals have (or at least often have) *truth values*; that is, whatever truth and falsity ultimately come to, these notion apply in some way or other to indicative conditionals. Even this minimal requirement can be understood in at least a couple of different ways, for there may be a single truth predicate which applies equally to indicative conditionals, the components of indicative conditionals, and the rest of truth-evaluable language, or there may be a plurality of truth predicates, perhaps applicable variously to different discourses or to different constructions. Ultimately, I think our factualist will be constrained to opt for the former understanding, for if she opts for the latter, it will be at the expense of semantic homogeneity, and if she gives this up, it's hard to see what insisting on the application of truth values buys her (see 5.3, footnote 68). So, I append the minimal requirement for being a factualist with the caveat that there be some systematic logical

connections between indicative conditionals, their components, and the rest of truth-evaluable language.

Beyond this, the factualist might also like to require that indicative conditionals express propositions and/or that they are possible objects of belief. She might, for example, assume that truth-evaluability will itself get spelled out in terms of propositionhood or believability. So, what kind of factualist one is will depend in part upon what one presupposes about the connection (or lack of connection) between truth, propositionhood and belief. If truth is understood minimally (see 5.3), no connection between truth-evaluability and propositionhood need be assumed; likewise, the connection between a sentence's truth-evaluability and its potential as an object of belief may be largely severed (again, see 5.3). However, a certain breed of factualist will deny the sufficiency of minimalist truth conditions out of hand precisely because she believes that what makes a sentence truth-evaluable in the first place just is its ability to express a proposition, and further that propositions just are possible objects of belief. On this view, by transitivity, a sentence earns a truth value by being a possible object of belief; the

notions of truth-evaluability, or truth-aptitude⁵³, proposition and belief are thus inextricably connected. As I see it, then, there are at least a couple recognizable stripes of factualism that have not yet been clearly distinguished in the literature on indicative conditionals.

To the extent that our non-factualist sets up her argument in contrast to factualism, she must say which strand(s) of which stripe(s) she objects to. As we will see throughout Chapter Four, however, the two dominant critics of factualism--Edgington and Gibbard--simply assume that there are necessary connections between truth-aptitude, propositionhood and belief. Thus they rest their case against truth conditions via a case against propositions, and their case against propositions hinges, in turn, on considerations having to do with belief.

In Chapter Five, I attempt to defuse, or at least relocate, the debate between the factualist and the non-factualist by sorting out these myriad strands. At the same time, I indicate a couple of directions for a move to more

⁵³ I borrow this locution from Frank Jackson, Graham Oppy and Michael Smith (1994). To say that a sentence is truth-apt is just to say that it is a suitable candidate for a truth value.

neutral ground. In particular, the introduction into the debate of minimalist truth conditions (a la Hartry Field) and pleonastic propositions (a la Stephen Schiffer) provides fresh avenues of inquiry and resolution. With the notions of minimal truth and pleonastic proposition on the open market, much of the blood can be drawn out of the factualist versus non-factualist debate. The debate can only be fully reënaged when both factions lay their cards on the table and say exactly what they mean by proposition such that indicative conditionals must either express or fail to express them, what makes a sentence truth-apt, and so on.

Despite appearance so far, I will ultimately come down on the side of factualism. However, the factualism I suggest will likely not resemble what Lewis, Jackson, Stalnaker or any other proponent of truth conditions for the indicative conditional have had in mind. Given Schiffer's characterization of propositions (see 5.6), indicative conditionals clearly express them. But, of course, this may not be the view of proposition that the non-factualist whose position hinges on the denial that indicative conditionals can express propositions has in mind, and it may not be what

the proponents of conditional propositions have in mind either.

Likewise, given only minimalist truth conditions, it is clear that indicative conditionals have them. However, this may merely suggest that it is in relation to a more full-blooded notion of truth that our factualist and our non-factualist alike have drawn their battle lines. For instance, a factualist may hold that the reason indicative conditionals are truth-evaluable (their minimal requirement) is because there is an analytic connection between truth and belief (that to believe something just is to believe it's true) and further that indicative conditionals are possible objects of belief. A non-factualist may share the assumption that to believe something is to believe it's true, but deny that indicative conditionals are possible objects of belief. Such a non-factualist will incur the debt of describing what distinguishes genuine beliefs from certain mental states that look and feel much like beliefs, but can't be. In 5.5, I strain to imagine how such a debt might be paid.

CHAPTER FOUR

THE REST OF THE CASE AGAINST TRUTH CONDITIONS

Now under what circumstances is a conditional true? Even to raise this question is to depart from everyday attitudes. (W.V.O. Quine, Methods of Logic, 1952)

4.1 Preliminaries

Inasmuch as indicative conditionals are resistant to all manner of truth conditional analysis, the non-factualist proposal certainly earns a hearing. After all, it is not on the face of it obvious why the condition of one factual claim on the basis of another factual claim should itself be a factual claim. I think the idea that indicative conditionals belong to the class of non-fact-stating discourse is at least initially intelligible; and, I think it is worth investigating in light of the tremendous difficulties involved in providing a tenable truth conditional account. In this chapter, then, I conduct this investigation by digging through the claims of the two dominant advocates of the view that indicative conditionals simply do not have truth conditions: Dorothy Edgington (Section 4.2) and Allan Gibbard (Section 4.4). It may at first seem odd that my

critique of Stalnaker's approach (Section 4.3) is wedged between these two sections; however, the sequence is natural because my discussion of Edgington's project provides the framework for this critique, and Gibbard's argument elaborates and cements it.

4.2 Edgington's Initial Case Against Truth Conditions

In her recent survey essay, "On Conditionals" (1995), Dorothy Edgington provides a vast and impressive review of contemporary thinking about conditionals. She also recapitulates part of the no-truth-conditions position she introduced nearly a decade earlier in her essay "Do Conditionals Have Truth Conditions?" (1986) Since Edgington's earlier work is aimed more squarely at our present interests, the discussion in this section will concentrate on the case against truth conditions argued for there; inevitably though it will be informed by my familiarity with her more current preoccupations.

Edgington claims to rule out the possibility of both truth-functional truth conditions and possible-worlds truth conditions for the indicative conditional. If Edgington's critical arguments are successful then, assuming truth-

functional and possible-worlds truth conditions are the only kinds of truth conditions available or worth considering, Edgington effectively rules out the possibility that indicative conditionals have truth conditions at all.⁵⁴

Edgington advances her positive thesis, that conditionals belong to the class of non-fact-stating discourse, to fill the ensuing void. Her general claim is that an assertion within the scope of an assumption is not ultimately reducible to a straightforward assertion because the element of supposition involved is indispensable. Edgington writes that "there is no proposition such that asserting *it* to be the case is equivalent to asserting that B is the case given the *supposition* that A is the case." (1986, p. 178). To accept a conditional is to accept the consequent within the scope of the supposition that the antecedent holds; but, argues Edgington, this description of acceptance is not properly captured or explained by any of the truth conditional candidates in the offing. Although truth conditional analyses have the clear practical

⁵⁴ I omit any discussion of Edgington's critique of the truth-functional account of indicative conditionals because my own critique (see Chapters One and Two) overlaps with and expands upon it.

advantages of preserving systematic logical connections between components of indicative conditionals and conforming to a compositional semantic theory (see 1.4 and 3.4), they all rely on the mistaken precept that the element of supposition involved in reasoning about conditionals is ultimately eliminable.

Edgington, however, does not here precisely identify the motivation for her claim that a consequent within the scope of an assumed antecedent cannot constitute some sort of truth-evaluable proposition. Or, rather, she identifies two different kinds of motivations, but equivocates about which is decisive. The no-truth-conditions thesis is motivated both by the elimination of the truth-conditional candidates and by positive considerations having to do with the structure of our reasoning about conditionals. But it is unclear from Edgington's own description of her project which of the following disjuncts we should emphasize: either conditionals are not suitable candidates for truth-evaluability because the task of finding truth conditions for them is insuperable (egg), or they lack truth conditions because they are not suitable candidates for truth-evaluability in the first place (chicken). And, although I presume Edging-

ton would prefer the latter slant on her project, her arguments chiefly support the former.⁵⁵

Of course, I am not suggesting that these two claims are incompatible; indeed, they are complementary. But, in this case, it would be helpful to know the relative status of the chicken and the egg question in order to evaluate fairly Edgington's proposed solution(s). Though perhaps not framed perspicuously, I believe the most compelling question raised by Edgington's essay is whether there is any philosophical reason, *aside from* the purported failure of the truth conditional accounts and the touted success of Adams's hypothesis, for thinking there can be no genuine conditional propositions. And, in this respect, I think Edgington unwittingly misdiagnoses the most interesting facet of her own project. In particular, she presents her claim about the non-fact-stating function of conditional statements negatively as a necessary consequence--"I conclude, therefore"--of eliminating the truth conditional

⁵⁵ This presumption is not without grounds. At the outset of her essay, Edgington asserts that "the mistake philosophers have made, in trying to understand the conditional, is to assume that its function is to make a statement about how the world is (or how other possible worlds are related to it), true or false, as the case may be." (1986, p. 176).

candidates. Edgington's conclusion would be better served, however, by fleshing out how it is that conditional statements do function such that it is not only feasible, but also enticing, to conceive of them positively as part of non-fact-stating discourse. Is the non-truth-conditional (or non-factualist) position just a default position? If not, then what special properties beyond mere recalcitrance do indicative conditionals possess? If such conditionals are not fitted to state facts, why not? And, what are they fitted to do?

The best I can do to fill in Edgington's claim that "the linguistic or mental act of supposing is ineliminable from conditionals, and they cannot be reduced to straight assertions or beliefs" (1986, p. 200) is as follows: Acceptance of a conditional relies on simulated belief, indeed often involving the suspension of strong disbelief, in an antecedent. But simulating belief and suspending disbelief are not themselves sub-species of genuine belief. Yet, it seems that without this element of simulated belief, it is impossible to decide whether any particular conditional should be accepted or rejected. Something like this is, I suspect, the source of Edgington's

indispensability claim. After all, I may well have a strong view that if A, B and yet be agnostic, or even highly doubtful, about the truth of A. For example, I do in fact accept that if Dot lives in Manhattan, then she lives in New York State, even though I have no opinion whatsoever about where Dot lives, and moreover may not even be presently acquainted with anyone named Dot. In this case, then, forming a judgment about the conditional depends upon feigning belief in a proposition (i.e., the antecedent) that lacks status as a genuine member of my actual belief set. Although I don't know whether this is the sort of analysis Edgington has in mind, it is one possible approach to elevating non-factualism beyond its present default status. I return to it in Chapter Five (5.5).

It is an assumption of Edgington's project that the antecedent of an indicative conditional must always be treated as "epistemically possible" by the speaker. This assumption follows from the way she characterizes the distinction between subjunctives and indicatives. To use a slightly modified version of Edgington's own example, suppose the carpet I am now examining appears blue to me while the curtains I am now examining appear red to me. In

the subjunctive, I might believe that if the carpet had been red, it would have matched the curtains. In the indicative, however, I must admit that if the carpet is red, then I am hallucinating, dreaming or suffering from color blindness. So, in the subjunctive, I am not required to consider the possibility that my current perceptions might be mistaken; indeed, it makes no sense to choose the subjunctive construction unless I believe I am reasoning with the knowledge that I am *not* mistaken. On the other hand, I cannot even consider what I think about the indicative conditional without adopting (at least provisionally) the assumption that my proper senses have betrayed me. Thus, Edgington recognizes two distinct contexts in which suppositions may be made, and proposes that conditionals be taxonomized as indicative or subjunctive on the basis of how the speaker treats the antecedent, rather than on the basis of grammatical form. Of course a speaker's epistemic posture toward the antecedent of a conditional will generally coincide with the grammatical construction she uses, but now grammatical form will not be decisive. Insofar as there may be subjunctives masquerading as indicatives and/or indicatives masquerading as subjunctives,

it is, I think, a virtue of Edgington's account that she offers a non-grammatical, epistemic criterion for discriminating among conditionals.

As we have already seen, the Gricean explanation of highly unassertable conditionals breaks down in a way that similar explanations of unassertable disjunctions and conjunctions do not. Edgington invents an "opinion poll" to exhibit the contrast between conditionals and disjunctions in this respect. The poll's "results" then provide a convenient segue into an account of what a person is in fact doing when she rejects a conditional that, in accordance with the material account, must be recognized as true. I have devised an analogous poll of my own.

Suppose a sincere subject, who prides herself on the consistency of her beliefs, is asked to respond to the following set of statements:

- (1) The Democrats will make a comeback in the year 2,000 (D).
- (2) The Democrats will not make a comeback in the year 2,000 (-D).
- (3) Either (2) is true OR ____ (fill in the blank) (- D v ____).
- (4) If the Democrats make a comeback in the year 2,000, then the federal budget for

social services will be significantly decreased (If D, F).

Our hypothetical subject registers the following responses:

(1) "Disagree", (2) "Agree", (3) "Agree" and (4) "Disagree".

However, according to the material account, our subject has just endorsed an inconsistent set of judgements. Rejecting (4) is equivalent to accepting the conjunction of D and -F.

But, as we have already seen, our subject denies D. So, insofar as it is plain our subject does not hold contradictory opinions, we must admit the truth-functional account is deficient as a representation of the English "if...,then" construction.

Edgington claims that examples such as this one reveal that the expected Gricean contrast between what may properly be asserted, given the cooperative principles governing conversation, and what may properly be believed, given the logic of the material conditional, is not discernible in the case of the conditional.⁵⁶ Our proud and sincere subject will not alter her responses upon being shown the truth

⁵⁶ That is, the subject does not appear to be flouting any of the Gricean maxims in this case. On the other hand, when, say, a highly unassertable disjunction is true according to the truth-functional account, it is possible to isolate some aspect of Grice's Cooperative Principle that has been violated.

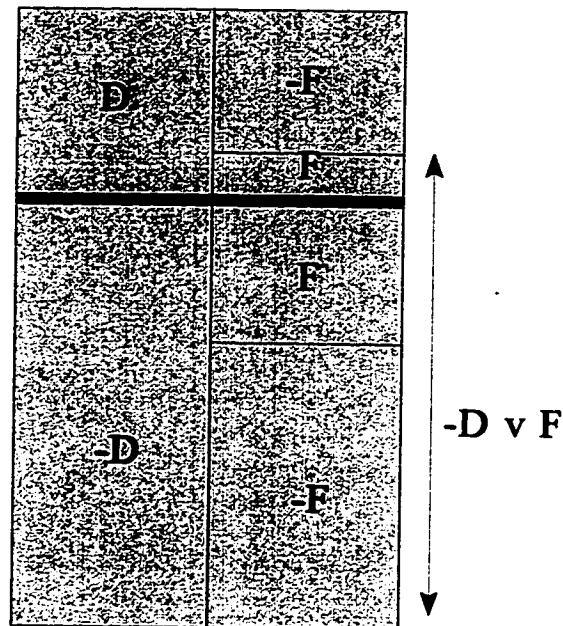
table for '>'. What then is she thinking? And, can we describe her interpretation of the "if...,then" in (4) in such a way that she will not be saddled with an inconsistent set of opinions? The hypothesis that our subject's responses to (2) and (4) are compatible is plausible on the face of it; however, since it fails to square with the classical approach to valid inference, it is important to buttress the hypothesis with an alternative picture of what conditional judgements consist in. We want a theory that equips us to recognize what our subject is doing when she defends (2) and denies (4), and we want that theory to respect her basic rationality.

Perhaps the consistency of our subject may be salvaged by construing conditional judgements probabilistically.

Edgington describes, in probabilistic terms, what it is to judge that if A, B. She writes:

To judge it probable that $A > B$ is to judge it improbable that $A \& \neg B$. To judge it probable that if A, B is not only to judge it improbable that $A \& \neg B$, but to judge this to be less probable than $A \& B$. 'Is B likely given A?' is the question 'Is $A \& B$ nearly as likely as A?' (p. 184)

So, in assessing (4) our subject assumes D and ignores or suspends the possibility that $\neg D$.⁵⁷ As per Edgington, the following diagram is a representation of how likely our subject considers each of the possibilities (p. 184):



Vertical height represents probability. Since our subject disregards the possibility of $\neg D$ when she considers the conditional 'if D , then F ', only the information above the

⁵⁷ For Edgington, someone who is absolutely certain of--i.e., attaches a subjective probability of one to--the claim that the Democrats will not make a comeback, has no use for an *indicative* conditional beginning with "if the Democrats make a comeback". Presumably, it is moot that her critique of the truth-functional account does not apply to such indicative conditionals because such conditionals serve no purpose in practice anyway.

thick horizontal line is relevant to her judgement regarding the likelihood of (4). So now when she ponders F , it appears very improbable indeed. Yet this has no bearing on our subject's primary commitment to $\neg D$ and, therefore, also to $\neg D \vee F$ --which is of course equivalent to $D > F$. According to our diagram, $\neg D$ is highly probable and thus $\neg D \vee F$ (that is, $D > F$) must be at least equally highly probable.⁵⁸ Happily, all of these judgements are preserved on the current account. At the same time, the consistency of our subject is not compromised; in considering (4), she abstracts away not only from $\neg D$, but also from all judgements which are inferred from $\neg D$. This, then, is how our subject may legitimately accept (2) while rejecting (4).

The broad structure of Edgington's argument is transcendental in form: If conditionals *did* have truth conditions, then uncertainty about any given conditional would be uncertainty about the obtaining of those truth conditions. However, Edgington purports to demonstrate that uncertainty about conditionals is not tantamount to

⁵⁸ Except when the subjective probability of $F = 0$, our subject will attach a higher probability to $\neg D \vee F$ than to $\neg D$ (which in this case is of itself already highly probable).

uncertainty about the obtaining of truth conditions, and, thus, she concludes, conditionals do not have truth conditions. A suitable counter-proposal would of course specify what uncertainty about conditionals does consist in, and presumably Edgington's probabilistic suggestion is designed to play that role.

After arguing that conditionals are not truth-functional and sketching her alternative picture, Edgington endeavors to show that Stalnaker's possible worlds account of conditionals is in even worse shape than the truth-functional account. She provides what she terms a "tetra-lemma" to the effect that if conditionals did have truth conditions, then they would have to be truth-functional. Her reasoning here involves an application of the transitivity relation; in particular, she compares a possible-worlds account of conditionals with the material account of conditionals, and provides a demonstration to the effect that whenever divergences arise between ordinary usage and one of the truth-conditional interpretations, intuition favors the truth-functional analysis over the possible-worlds analysis; and, moreover, whenever the truth-

functional analysis conflicts with Edgington's positive proposal, intuition favors her positive proposal.

The so-called "tetralemma" is the weakest element of Edgington's argument; fortunately, however, the cogency of her general position does not depend crucially on it. So, after presenting the tetralemma and remarking upon a couple of its troublesome features, I show that Edgington's central claim--i.e., that conditionals lack truth conditions of any kind--does not hinge on the success of this piece of reasoning; or, at least, it does not hinge on Edgington's peculiar construction of it.

The tetralemma: On the assumption that conditionals do have truth conditions, the probability of a conditional must be the probability that those truth conditions are satisfied. Given two statements, A and B, the following combinations of truth values are possible: A and B may both be true, A may be true while B is false, A may be false while B is true and A and B may both be false.⁵⁹ Now suppose conditionals have non-truth-functional truth

⁵⁹ Obviously, this characterization of the possibilities takes only two-valued truth tables into consideration.

conditions. Edgington assesses the consequences of the following four assumptions independently:

Assumption 1: A conditional has non-truth-functional truth conditions when A and B are both true.

Assumption 2: A conditional has non-truth-functional truth conditions when A is true and B is false.

Assumption 3: A conditional has non-truth-functional truth conditions when A is false and B is true.

Assumption 4: A conditional has non-truth-functional truth conditions when both A and B are false.

If Assumption 1 is true, then the truth of the conditional 'if A, B' must depend on *more* than the truth values of A and B. From an epistemic perspective, it must be possible for a consistent agent to believe A and to believe B, and yet to remain unsure about whether 'if A, then B'. On Assumption 1, then, the connection between A and B in 'if A, then B' must be a relatively strong one, as in 'A *because* B' or 'A *before* B'.

But this consequence of Assumption 1 conflicts with Edgington's positive proposal which requires an agent who is certain about A and certain about B to judge that A & B is

just as likely as A. Moreover, Edgington argues, the consequence is unattractive from an intuitive perspective. While someone who is certain of both A and B has no obvious use for the indicative conditional, 'if A, B', she is nevertheless in a position to correct someone who denies that conditional. So, Assumption 1 cannot be sustained. In accordance with both the truth-functional account and Edgington's probabilistic account, the acceptability of A and B must be sufficient for the acceptability of the conditional, 'if A, B'.

According to Edgington, it follows from Assumption 2 that an agent may be certain that A is true and certain that B is false, and yet agnostic about the conditional, 'if A, B'.⁶⁰ Again, however, this result cannot be reconciled with either Edgington's positive proposal or with intuition. After all, an agent who is certain that B is false can only be certain if she believes B is false in the context of all propositions she already takes to be true. In accordance with both the truth-functional account and Edgington's

⁶⁰ It is not at all obvious why this should be thought to "follow". It surely does not do so directly. Once I finish laying out the structure of Edgington's "tetralemma", I consider what is going on here.

probabilistic account, affirmation of 'A & -B' must be sufficient for the denial of the conditional, 'if A, B'.

What about the consequences of accepting Assumption 3? According to Edgington's characterization of an agent's reasoning about 'if A, B', whenever B is certain, A & B is just as likely as A. However, on Assumption 3, the truth-value of 'if A, B' may not be possible to determine with only the information that B is true. That is, there must be some situations in which a reasonable agent may maintain the truth of B and yet demand further information before settling on a truth value for 'if A, B'.

Assuming that Edgington has already established truth-functionality for the cases where A is true, we need now only consider the cases where A is false. If a conditional has non-truth-functional truth conditions when A is false and B true, then there must be some other condition which, when satisfied, would render the conditional true.

According to Stalnaker, this further condition is that B must be true in the closest possible world to the world in which A is true. But while this is necessary for the truth of 'if A, B', an agent may not have enough information about the A-world to know whether the condition is satisfied.

Edgington endeavors to illustrate the absurdity of this view by describing a reasoning process based on it:

...I complain to John that he has not replied to my letter. He says he did-- he posted the reply some weeks ago. I am not sure whether to believe him. Let A be 'He posted the reply' and B be 'I didn't receive it. [By assumption 3, I should reason like this: 'I didn't receive the letter. Suppose he posted it: then the conditional is true. But suppose he didn't post it: this, together with the fact that I didn't receive it, is not sufficient for the conditional. It depends (say) on whether in the closest possible world in which he *did* post it, I still didn't receive it. And I can't be sure of that.

So, as with Assumptions 1 and 2, Assumption 3 conflicts not only with the truth-functional analysis of conditionals, but also with Edgington's probabilistic account and common-sense.

Finally, Edgington undertakes to show the untenableness of Assumption 4. Suppose truth-functionality breaks down when A and B are both false. Then, on the assumption that 'if A, B' is nevertheless a suitable candidate for truth-evaluability, some factor other than the mere falsity of both A and B must be present in order for the conditional properly to be deemed true.

Here is a variant of Edgington's example: suppose we know that Dot and Becky spend every Thursday evening together, but we have no idea how they amused themselves last Thursday evening. The possibilities are infinite; they may have gone to the movies, they may have gone drag-racing, they may have stayed in and eaten cold pizza, etc. Yet, wherever they in fact went, we know that if Dot was there, Becky was there as well. Even if they had an unusually busy night, only a infinitesimal handful of the indefinitely many possibilities could actually be realized. For instance, they could not have flown to Paris for dinner and gone to the theater in New York and gone drag-racing in Decatur. Thus, for all but a few of the innumerable conditionals we can compose of the form 'if Dot did X, Becky did X' (and 'if Becky did X, Dot did X') both antecedent and conclusion will be false. But given that we already know that, wherever Dot and Becky went, they went together, it is hard to see what further information we might need in order to be convinced of the conditional. The truth-functional account does not demand any further information, and on Edgington's thesis all that is required for the acceptability, or assertabili-

ty, of 'if A, B' is that 'A & B' be as likely as A.⁶¹ So, once again, on the assumption that conditionals do have truth-conditions, Edgington concludes that intuition favors the truth-functional analysis over any account that insists some further condition (or conditions) must be satisfied before a conditional may be evaluated.

Presumably, the idea is that, given the dual hypotheses that (i) conditionals have truth conditions and (ii) an understanding of classical truth-functional relations is not sufficient for the acceptance or denial of any particular conditional, then at least one of the assumptions 1-4 must hold; evidently, though, none of them does. Edgington maintains this result lands us in a "paradox". It could be objected, however, that this air of paradox is at least partly manufactured by the curious way in which Edgington represents the relations between (i) and (ii) and the

⁶¹ The best Edgington can do to imagine what a proponent of a non-truth-functional, truth-conditional account might say about this case is as follows: perhaps the truth-value of the indicative conditional cannot be determined without information about the counterfactual case. For example, suppose Dot and Becky did not go drag-racing in Decatur; perhaps we should still need to know whether if Dot had gone drag-racing, Becky would have gone too.

assumptions, and between assumptions 1-4 and their "consequences".

First, the assumptions are not stated perspicuously. Although any one of the assumptions could be used to illustrate this point, let's look at Assumption 1. Assumption 1 states that a conditional has non-truth-functional truth conditions when A and B are both true. But this is surely an idiosyncratic way of framing things. Presumably, if a conditional has truth conditions at all, then it has *whatever* truth conditions it has *regardless* of the individual truth values of A and B. But the assumptions are expressed as if the same conditional might have one kind of truth conditions when, say, A and B are both true and another kind of truth conditions when, say, A is true and B false (or when A false and B true, or when A and B are both false). This is awkward indeed. For one thing, it involves adding a step to our procedure for evaluating conditionals. Now, we must consider the truth values of A and B to determine which *kind* of truth conditions to employ in our assessment of any particular conditional; and, only then can we engage the truth conditions to ascertain the truth value of the conditional.

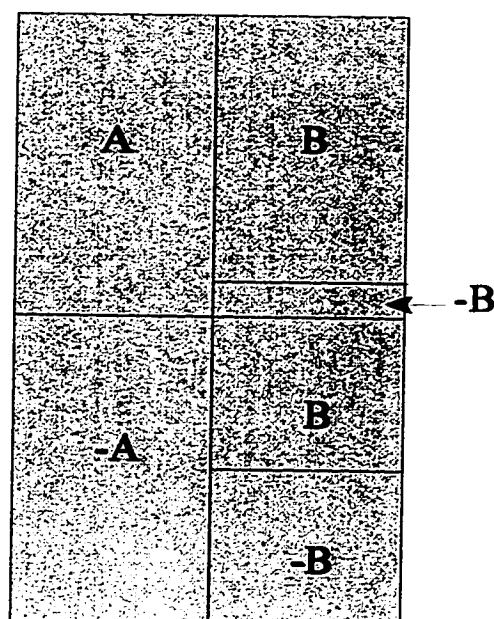
Edgington's move from assumptions 1-4 to their "consequences" is also suspect. Epistemic considerations which are absent from the assumptions have somehow crept into Edgington's discussion of the consequences. In particular, none of the four assumptions involves the notion of certainty; yet, in her description of the consequences of accepting the assumptions, Edgington makes extensive reference to this notion. Clearly, then, the 'consequences' are not obtained directly from the 'assumptions'. . However, instead of simply discarding the purported consequences, I want to make explicit and defend (for the sake of argument) what I take to be the central assumption underlying Edgington's analysis. Let's examine.

Consider again Assumption 2: a conditional has non-truth-functional truth conditions when A is true and B is false. To reject truth-functional truth conditions for the conditional is, in this case, to reject the idea that the truth of the A and the falsity of B are *sufficient* for the falsity of the conditional, 'if A, B'. Now, if we insist that 'if A, B' has truth conditions anyway, it must be because we think that some factor *other than* the respective truth values of A and B determines the truth value of a

conditional. This is where the epistemic considerations enter. Edgington assumes, rightly I think, that truth conditions that make sense of facts about judgement will be deemed pretheoretically preferable to truth conditions that do not. If conditionals have truth-functional truth conditions, then all I need to know in order to make a judgement about any particular conditional is the truth values of its constituent parts; but, if they have non-truth-functional truth conditions, then there is something else I need to know. Thus, Edgington holds that it "follows" from Assumption 2 that an agent may be certain A is true and certain B is false, and yet remain unsure of the conditional. As long as the truth of A and the falsity of B are not sufficient for the falsity of 'if A, B', *knowledge* of the truth of A and the falsity of B cannot be sufficient for the *denial* of the conditional.

However, even if her appraisal of the consequences of adopting any one of the above assumptions is misguided, or otherwise flawed, Edgington contends there remains at least one critical case that no non-truth-functional truth conditions can make sense of. Although this case too relies on the notion of certainty, it is less mysterious because

Edgington does not present it as a consequence of any of the assumptions 1-4. Suppose I am uncertain regarding the truth-values of A and B. I then learn from a cagey but credible source that $\neg(A \ \& \ \neg B)$ is very likely. In the absence of a preexisting belief that $\neg A$, this information is sufficient for me to resolve that 'if A, B' is very likely. Edgington suggests a way to accommodate this fact about judgement in a way that no non-truth-functional truth conditions can; at the same time, however, her proposal does not involve the troublesome truth-functionalist claim that ' $\neg(A \ \& \ \neg B)$ ' entails 'if A, B'. Again, Edgington's alternate interpretation of what is going on in such a case can be elucidated diagrammatically as follows (p. 197):



In contrast, the non-truth-functional truth-conditionalist cannot make sense of the above case because, for her, the information that $\neg(A \ \& \ \neg B)$ cannot be sufficient for acceptance of the conditional. After all, if it is sufficient, then truth-functional truth conditions are all we need.

But, paradox or no, the "tetralemma" may not be essential to the success of Edgington's overall position. Perhaps non-truth-functional truth conditions can be eliminated for other, and more interesting, reasons. When, in the next section, I attempt to untangle Edgington's critique of Stalnaker's possible-worlds truth conditions, I consider this possibility.

4.3 Stalnaker Revisited

It might be objected, on Stalnaker's behalf, that Edgington's general argument against non-truth-functional truth conditions fails to address a special feature of his project that serves to exempt him from the above-mentioned difficulties. In particular, although Stalnaker rejects the validity of disjunctive syllogism as an argument form, he does deem reasonable the inference from 'A or B' to 'if $\neg A$,

B' in instances where the disjunction is assertable. Presumably, then, he would also admit as reasonable the inference from ' $\neg(A \ \& \ \neg B)$ ' to 'if A, B' in cases where the negated conjunction is assertable. Now suppose I lack any relevant information regarding the truth-value of 'A', but learn on good authority that ' $A \ \& \ \neg B$ ' is false. On Edgington's account, I do not require any further information in order legitimately to judge that 'if A, B'. But, on a general possible-worlds account more information may be required because the possibility remains that 'A' is false and that the nearest A-world⁶² is a $\neg B$ -world.

As we have seen, however, Stalnaker purports to elude this potential complication by placing an epistemic constraint on possible worlds: only those worlds which are deemed epistemically possible by both speaker and hearer on a given occasion of utterance are relevant to the assessment of an indicative conditional.⁶³ But now, since *ex hypothesi* I have just learned that ' $A \ \& \ \neg B$ ' is false, no epistemically possible A-world can also be a $\neg B$ -world, and

⁶² The nearest A-world is the world that Stalnaker's selection function selects for A.

⁶³ This operative set of possible worlds is termed a 'context set'.

thus by default the nearest suitable possible-world must be a B-world after all. In other words, the news that $\neg(A \ \& \ \neg B)$ narrows the context set such that no $\neg A$ -world which is also a $\neg B$ -world is germane to my evaluation of the conditional. But, in this case, the conditional I am now considering is not the same conditional I was wondering about before I learned that $\neg(A \ \& \ \neg B)$.

Stalnaker's possible-worlds truth conditions are described in terms of the information that constrains context sets, and thus context sets may vary greatly both among speakers and even from moment to moment for the same speaker; given new information, formerly relevant worlds may vanish abruptly into irrelevance. Of course, it may be an advantage of Stalnaker's account that evaluation of an indicative conditional is deemed subject to contextual elements; but, while Edgington readily allows that such information-relativity "gets acceptance right" (p. 198), she doubts that Stalnaker's proposal really involves truth conditions. According to Stalnaker, the 'truth conditions' of a conditional, say 'if A, B', depend on a speaker's context set at the time of utterance; but now, argues Edgington, whenever a change is made in the speaker's

context set, 'if A, B' will express a different proposition.

Edgington's argument against truth conditions presupposes that, if conditionals did have truth conditions, then 'if A, B' could be accepted in one state of information and rejected in another without undergoing a corresponding shift in truth conditions. But Stalnaker, while insisting that conditionals do have fixed and determinable truth-values, cannot plausibly explain the possibility of genuine disagreement about the truth-value of any particular conditional. Edgington describes the situation as follows:

If one party is certain that if A, B and another is not (but regards A as possible), they *cannot* be disagreeing about the obtaining of the same truth conditions. They *must* be equivocating. For the former's context set must rule out A & -B, and the latter's must not. The set of possible worlds in play is different in the two cases. Contrary to appearance, it is rather that one asserts that P, and the other doubts that Q. (1986, p. 199)

Suppose two gossips (Dot and Becky) are considering the conditional 'If Mary comes to the party, Bill's ex-wife, Connie, will pitch a fit'. Both Dot and Becky think the antecedent is an open possibility, but while Dot regards the consequent as open as well, Becky simply regards it as true

(perhaps because she thinks Connie always finds *some* excuse to become hysterical at parties). Now suppose that when Dot considers what she *would* believe if she believed the antecedent, she gets the result that Connie will not pitch a fit and so she rejects the conditional. Since Becky already believes that Connie will pitch a fit as a matter of course, she accepts the conditional. An argument ensues.

In this case, Stalnaker cannot allow that the feuding parties are really at odds about any particular fact in the world, even though they will surely insist they are. To safeguard his notion of conditional proposition, Stalnaker must posit an error theory to explain such cases; he must hold that the disputants are merely confused, merely miscommunicating, and not really disagreeing. The appearance of disagreement arises because Dot and Becky conflate the proposition actually expressed with propositions that they think to themselves when they utter the conditional.

To make the situation even more vivid, suppose Dot learns (in Becky's presence) that the consequent is true. Suppose that mid-argument Connie herself phones up to announce that she is *planning* to pitch a fit. Dot will surely describe herself as coming around to Becky's view, as

having a change of mind about the conditional in question. But Stalnaker must say that this new information leaves unaffected what Dot thinks of the truth value of the proposition initially expressed by the above conditional sentence; the proposition in play before Connie rang will remain false for Dot, although Dot herself will likely fail to realize this. Granted, the proposition expressed when Dot utters the same conditional sentence now will be judged true, but it will, according to Stalnaker, be a different proposition than the one expressed (and judged to be false) prior to the phone call. While it will seem to Dot and Becky that the topic of debate has not changed, Stalnaker must maintain that it has because for him any departure from the original context set will affect the truth conditions of the conditional.

Edgington thinks this sort of example shows that Stalnaker's 'truth conditions' do not meet even the minimum requirements for truth conditionality, and thus that they are truth conditions in name only. While I think that *so stated* this objection is misguided, it does point toward the more powerful objection regarding the appearance of

disagreement.⁶⁴ Moreover, to the extent that Stalnaker's formulation of 'truth conditions' for the indicative conditional relies totally on individual epistemic states to correctly determine context of utterance, any standard application of truth conditions to make generalizations about the abstract structure of arguments is undermined.

Edgington does not object to a radically information-dependent account of indicative conditionals; indeed her own account is equally as information dependent. Rather, she doubts such an account can legitimately involve conditions for *truth*. But, while Edgington initially professes neutrality regarding the nature of truth, here she criticizes Stalnakerian 'truth' for excluding attributes commonly associated with the notion; in particular, she

⁶⁴ An analysis of context-dependent sentences need not involve a new concept of truth or of propositions, as Edgington suggests. After all, the truth conditions of a sentence such as 'I shall never forgive you' are partially determined by context because of the indexicality of 'I' and 'you', but in this case there is no worry that recognizing and explaining how context determines meaning (via reference) threatens to undermine our ordinary concept of truth. Unlike the case of 'I shall never forgive you', the indices Stalnaker builds into the meaning of indicative conditionals are *concealed*; the problem about disagreement arises because--as in the above example of Dot and Becky's disagreement--parties to a dispute will generally fail to recognize the existence of the hidden indices--even when brought explicitly to their attention!

maintains that truth should at least retain its "role as the ideal upshot of epistemic enquiry." (p. 199) Apparently, if truth conditions for the conditional cannot be formulated in such a way that allows the notion of truth they employ to serve at least this modest function, then the motivation for preferring conditions for truth over conditions for acceptance loses much of its force. At any rate, it is hard to see how 'truth conditions' which depend so essentially on the epistemic states of agents can be distinguished from mere acceptance, or assertability, conditions.

Having already established that there are many intuitively unacceptable conditionals whose unacceptability is incompatible with the truth-functional account, the results of Edgington's further arguments against Stalnaker's possible worlds account cast us into theoretical oblivion unless we can formulate either a non-truth-conditional account that reflects our inferential practices or a truth-conditional account that requires even less from a truth predicate than that it preserve truth-functionality. The main problem with the latter alternative is that it is not obvious that less demanding truth conditions could involve any ordinary notion of truth at all; at the very least, it

may be misleading to adhere to the term 'truth' in connection with such attenuated conditions.⁶⁵ Before addressing these two alternatives, it will be helpful to look at Allan Gibbard's (1981) case against conditional propositions.

4.4 Allan Gibbard's Case Against Conditional Propositions

In "Two Recent Theories of Conditionals" (1981) Allan Gibbard raises a serious problem for Stalnaker's account of propositions. Indeed, Gibbard's now oft-cited argument poses a challenge to the claim that indicative conditionals express propositions at all. If Gibbard is right that there are no conditional propositions, then there will be nothing for truth conditions (of any stripe) to attach to, and hence Stalnaker's project will be foiled. Although Gibbard's example is in some ways similar to the example I formulated above to illustrate the problems Stalnaker faces in explaining disagreement, it is worth rehearsing independently since it explicitly exposes the features of Stalnaker's program that beget these problems.

⁶⁵ In Chapter Five, I will consider possible reasons for and implications of adopting minimalist truth conditions.

Gibbard's example shows that one person can accept 'If A, C' (and reject 'If A, not-C'), while another person can accept 'If A, not-C' (and reject 'If A, C') and yet neither party need be making a mistake; neither party need be missing any relevant fact pertaining to the matter at hand. It should be noted that Gibbard's result is only a threat to propositional theories, such as Stalnaker's, that rely on the assumption that the principle of conditional non-contradiction (i.e., the assumption that 'A $\rightarrow$ C' and 'A $\rightarrow$ $\neg$ C' are inconsistent) holds for the English indicative conditional. Let's look at the example:

Sly Pete and Mr. Stone are playing poker on a Mississippi river boat. It is now up to Pete to call or fold. My henchman Zack sees Stone's hand, which is quite good, and signals its contents to Pete. My henchman Jack sees both hands, and sees that Pete's hand is rather low, so that Stone's is the winning hand. At this point the room is cleared. A few minutes later Zack slips me a note which says "if Pete called, he won," and Jack slips me a note which says "if Pete called, he lost...." I know that these notes come from my trusted henchmen, but do not know which of them sent which note. I conclude that Pete folded. (1981, p. 231-232)

So, the two conditionals in question are (i) 'If Pete called, he won' and (ii) 'If Pete called, he lost.' Given

the information available to Jack and Zack respectively, it is clear that both (i) and (ii) are assertable. Knowing that Pete held the losing hand, Jack appropriately asserts (ii). But knowing that Pete knew Stone's hand, Zack appropriately asserts (i). Neither Jack nor Zack is asserting anything false, for neither has any relevant false beliefs about the matter at hand. Since neither is asserting anything false, then if they are making truth-evaluable assertions at all, they must both be making true assertions. So, if their assertions express propositions at all, then they must both express true propositions. But insofar as the principle of conditional non-contradiction holds, (i) and (ii) cannot both be true.

Something has got to give, but what? Stalnaker is committed to the existence of conditional propositions, and the principle of conditional non-contradiction is essential to his possible-worlds account of propositions. Assuming that (i) and (ii) express propositions, they will both involve the same selection function since the contexts are the same. Or, are they? It seems that the only move Stalnaker can make (consistent with the claim that indicative conditionals express propositions) is to deny that the

contexts are the same. But this does not turn out to be a very attractive move. Let's see why.

Recall that for Stalnaker contexts are defined in terms of the presuppositions shared by the speaker and her audience, and propositions are functions from contexts into truth values. If relevant presuppositions are not shared, different selection functions will be in play. Suppose then that the context in which Zack asserts (i) invokes a selection function @, whereas the context in which Jack asserts (ii) invokes a selection function *. In this case, the resulting Stalnaker conditionals will be of the form ' $A \rightarrow_{@} C$ ' and ' $A \rightarrow_{*} \neg C$ ' respectively. Now Stalnaker can say that (i) and (ii) only express contradictory propositions when the selection function is invariant, and in the above case it is not. This may solve Stalnaker's problem on a superficial level, but it compounds it on a deeper level.

That different contexts determine different propositions is unproblematic. However, in this case, the features of context that prevent ' $A \rightarrow_{@} C$ ' and ' $A \rightarrow_{*} \neg C$ ' from contradicting each other are not known by me (the audience). Whatever contextual differences there are arise

from the different selection functions invoked by Zack and Jack.

In fact, unbeknownst to Zack and Jack, Pete never called. I reason that had Jack and Zack known that Pete did not call, neither would have had any use for a thought beginning "If Pete called". So as long as I trust both of my henchmen, which *ex hypothesi* I do, I must conclude that Pete folded. This is because, while I accept what both Zack and Jack tell me, I cannot actually believe that both conditionals are true.

Notwithstanding, if I knew all the relevant circumstances surrounding how Zack and Jack gathered their information, I would know that Pete had the losing hand and hence I would believe that if Pete called, he lost.⁶⁶ And of course, if I did believe this, then presumably I would reject the conditional, "If Pete called, he won." But I don't. I still believe what Zack told me when he said that

⁶⁶ This is why Michael Pendlebury (1989, p. 182) claims that Jack has the objectively true belief. According to Pendlebury, the problem is not that there is no correct thing to think, but that Zack (and I) do not have enough information. However, as Edgington (1995, p. 294) remarks, Pendlebury's argument points at most to the informational asymmetry of Gibbard's example. Edgington herself devises a perfectly symmetric example in which the "Gibbard phenomenon" clearly arises.

if Pete called, he won. What are we to make of this at least seemingly paradoxical result?

Gibbard himself holds that the upshot of this example (and others like it) is that indicative conditionals do not express propositions. Apparently, my belief that C is true on the supposition that A is true cannot be systematically equated with my belief that something is true simpliciter. So, in this case at least, it seems there is no (non-trivial) correct thing to think about the conditional. The upshot might be put another way: if, as Edgington claims, "where there is truth, there should be an ideal thing to think", then (by modus tollens) there must be no truth to be had here.

In his discussion of Gibbard's example, Stalnaker (1984, pp. 109-113) suggests (without ultimately endorsing) that perhaps the paradox may be resolved by understanding indicative conditionals as indexicals. For instance, I may, without inviting paradox, accept what you say when you utter "I am twenty-two years old" and yet deny that I am twenty-two years old. "I am twenty-two years old" and "I am not twenty-two years old" are only contradictories when

interpreted relative to the same context, and different speakers generate different contexts.

The parallel claim for indicative conditionals would be that, relative to the same context, 'If A, C' and 'If A, -C' are contradictories. But since epistemic states affect context in this case, then insofar as you and I are in different epistemic states, the context in which you assert 'If A, C' will be different from the context in which I deny 'If A, C' (and affirm 'If A, -C'). Still, unless we can discover what proposition the indicative conditional expresses (and specify more precisely what contextual factors go into determining this) the suggested parallel will not be of much use. In the case of "I am twenty-two years old," we can say what proposition is being expressed because there is a clear rule relating the pronoun 'I' with the speaker; and this rule allows us to specify how the same proposition might be expressed by different speakers. Thus, if Dot says "I am twenty-two years old" I learn that Dot is twenty-two years old, whereas if I say "I am twenty-two years old" I know I'm lying.

This is where the parallel breaks down. Although Stalnaker asks "When Zack says 'if Pete called, he won,'

what (beyond the material conditional) do I learn?" (1984, p. 110), his own account does not, as far as I can tell, offer a clear answer. Relative to a single context (say the context in which Zack was speaking) it is hard to see what rule will assign contrary propositions to the sentences "if Pete called, he won" and "if Pete called, he lost". At any rate, Gibbard presents further argument which shows that the pursuit of such a rule, especially along Stalnakerian lines, may be in vain.

Assume the conditional "if Pete called, he won" expresses a context-relative proposition *P* such that I may be said to believe *P* if and only if I am inclined to believe that Pete won upon learning that he called. Now suppose I have no idea whether Pete folded, called and lost or won, but I am curious to know whether it's true or false that *if Pete called, he won*; so I ask a friend (say Bill) who witnessed the game. Consider now a random possible world *I* which is compatible with the context in which I make my inquiries. If Bill affirms the conditional, *P* will be true in world *I*, but if he affirms the opposite conditional (*if Pete called, he did not win*), *P* will be false in *I*. So now it appears that the conditional "If Pete called, he won"

expresses one proposition when denied, and another when asserted.

As we have seen, Stalnaker (1975) stresses that the most important aspect of context is the common knowledge, or presumed common knowledge, of the participants in discourse. But in this case it seems that the essential feature of the context that determines which proposition is expressed by a given utterance is the conditional probability the speaker attaches to C given A (He won, given that he called), and if that were common knowledge, the use of the conditional would be pointless. Or such at any rate is the non-factualist conclusion.

CHAPTER FIVE

CONDITIONAL PROPOSITIONS, TRUTH APTITUDE AND BELIEF

'A proposition is a queer thing!' Here we have in germ the subliming of our whole account of logic. The tendency to assume a pure intermediary between the propositional signs and the facts.

(Ludwig Wittgenstein, Philosophical Investigations, Proposition 94, 1958)

5.1 Preliminaries

We must now face the aftermath of having exhausted and discharged all extant truth conditional approaches to the semantics of the indicative conditional. We could, on the basis of the foregoing arguments, simply decree that indicative conditionals belong (by default) to some mysterious realm of non-fact-stating discourse and call it a day. But I think there is more work to be done. In Chapter Four, I presented a compelling case for the claim that indicative conditionals cannot express propositions. In this Chapter, I present a less extensive, but I think equally compelling case for the claim that indicative conditionals must express propositions, and I offer some suggestions for broaching the resulting impasse.

In Section 5.2, I raise an obvious objection to any naive non-factualist account of conditionals: The Gibbard phenomenon aside, there just are cases of objectively "correct" and "incorrect" conditionals. While such cases need not represent an insurmountable obstacle to the non-factualist position, they will demand an explanation. But, since the non-factualist has cut herself off from the semantic notions of 'truth', 'proposition' and 'fact', she will be constrained to find some new conceptual apparatus in which to couch her explanation. I wish her luck. In Section 5.3, I consider a much overlooked approach to getting truth conditions for indicative conditionals; it turns out that, unlike the breeds we have examined so far, strictly minimalist truth conditions do not have ugly semantic consequences when applied to indicative conditionals. Still, it might be objected that minimalist truth conditions beg the vital question of whether indicative conditionals are apt for truth in the first place. But, in Section 5.4, I show how this question can be mooted by devising an independent account of the conditions that must be satisfied in order for a sentence to be properly deemed truth apt, and by arguing that indicative

conditionals satisfy these conditions. In Section 5.5, I explore how a sufficiently tenacious non-factualist might argue that one of the conditions for truth aptitude advanced in 5.4 is not satisfied after all. In Section 5.6, I attempt to reframe the terms of the debate in a way that both appreciates the non-factualist's worries and sanctions a univocally factualist rendering of indicative conditionals. This is accomplished in part by offering a radically cheapened account of the notions of 'proposition' and 'fact' that underlie the debate (Section 5.6).

5.2 The Correctness Phenomenon

There clearly is a distinction between when it is correct and when it is incorrect to assert C on the condition that A in many central instances. I term this the "correctness phenomenon", and hold that an adequate non-factualist characterization of indicative conditionals must offer some accounting of it. Consider the following two sentences:

- (i) If it's a triangle, it has three sides.

and

- (ii) If it's a triangle, it has nine sides.

Intuitively, we should like to say that (i) and (ii) are true and false respectively, regardless of the referent of "it". At the very least, there surely is an objectively "correct" thing to say in this case. However, the non-factualist has effectively cut herself off from the vocabulary of truth and facts ordinarily summoned for bringing out such differences. To say merely that (i) is assertable whereas (ii) isn't seems too weak.

It could be objected that the above example is not fair because (i) is (arguably) purely analytic and *a priori*, and we saw very early on that in such cases (definitional and mathematical) the material analysis is adequate. That is, the counter examples to the adequacy of the material analysis arise only for the substantial class of indicative conditional sentences whose antecedents and consequents are not analytically linked. However, this does not undercut our present challenge to the non-factualist as long as we can conjure a pair of contrasting conditionals whose antecedents and consequents are only contingently connected, but where the "correctness phenomenon" nevertheless clearly arises; and such conditionals it turns out are rather easy

to come by. Consider, for example, the following two sentences:

(iii) If it rains, the matches are canceled.

and

(iv) If it rains, the matches are not canceled.

Now suppose the local Tennis Club adheres strictly to a policy of canceling matches in the event of rain. With reference to this particular club, then, it would seem that a sincere utterance of (iii) would reveal knowledge of certain pertinent facts about club policy, whereas a sincere utterance of (iv) would expose ignorance of those facts.

How can such a contrast be expressed from within a theory that denies truth conditions, eligibility for propositionhood and fact-stating capacity to indicative conditionals? The onus is on the non-factualist to posit and defend some norm of appraisal besides truth at which our conditional statements may be seen as directed, and which they can in some disciplined way either satisfy or fail to satisfy. Adams's assertability condition delivers some discipline, but it cannot answer the present challenge since it ties assertability to individual epistemic states, and does not further require that those states be grounded in,

caused by, or representative of, anything extrinsic to an individual subjectivity. So, a crucial step toward the construction of a viable non-factualist account is the development of a plausible notion of correctness that does not incorporate a truth predicate.

5.3 Minimalist Truth Conditions

Edgington and others have, perhaps too impetuously, presented the non-factualist position as involving the wholesale rejection of truth conditions. In this section, I explore the possibility that giving up the letter of the no-truth-conditions claim, by allowing that indicative conditionals have minimalist--or deflationary--truth conditions, may not do any serious harm to the spirit of the non-factualist program.

In his paper, "Deflationary Truth and Factually Defective Discourse" (1994), Hartry Field urges that "purely disquotational" truth conditions may be intelligibly attributed to indicative conditionals in a way compatible even with the claim that such conditionals belong to the class of non-fact-stating discourse. Field characterizes "deflationism" as the view that truth is at bottom dis-

quotational." This means that, in its purely disquotational use, (i) 'true' as understood by a given person X applies only to utterances that X understands (so that if we don't understand a sentence, we cannot understand the attribution of truth conditions to it) and (ii) for any utterance u that x understands, the claim that u is true is cognitively equivalent for X to u itself. (1994, p. 405) Thus, to say some sentence S is true is to impart no information about the sentence over and above whatever S alone already conveys. If correct, this view of truth immediately ousts the generally accepted view that the relation between an utterance (or a mental state) and its truth conditions (or propositional content) applies as much to other people's utterances and mental states as to our own. Field thus writes that

.... accepting deflationism requires dethroning truth conditions from the central place in the theory of meaning and the theory of intentionality that Frege and Russell and many others have given them. (1994, pp. 408-409)

I am not now concerned with whether deflationism in this, or any other, form is correct. Rather, I want to consider whether, *given deflationism*, the factualist versus

non-factualist debate about conditionals can be made sense of. Doing so, will help us further identify some of the perhaps tendentious presuppositions that debate rests on.

Field defends deflationism against the hypothetical charge (as far as I know, no one has actually made this charge with any seriousness) that the deflationist cannot make sense of a distinction between discourse that is fully factual and discourse that is "factually defective". Among the kinds of discourse that can be plausibly viewed as falling under the latter category, Field includes indicative conditionals.⁶⁷

Assuming adherence to classical logic, the disquotational schema (T) entails that every declarative sentence is either true or false. But so far those who have maintained that indicative conditionals belong to a class of non-fact-stating discourse have also maintained that they lack truth values. And herein lies the surface tension between deflationism and the view that indicative conditional utterances do not play a role that is

⁶⁷ He also includes discourse involving vague terms, discourse involving referentially indeterminate expressions and evaluative discourse. Each receives a separate treatment.

essentially fact-stating. The surface tension may be rather easily alleviated, but the initial and deeper worries will remain. One remaining deeper worry, which I address in the next section, is whether indicative conditionals are apt for truth in the first place. For the radical deflationist a pressing worry might be how to give some positive sense to a distinction between fact-stating and non-fact-stating discourse--specifically, how with such a lean notion of truth to express what is non-factual about indicative conditional utterances. I will not go out of my way to assist the deflationist on this point.

It is, as Field has pointed out, "by no mean obvious that an account that gives these utterances a role that is not primarily fact-stating must say that the epithets 'true' and 'false' do not apply to them." For one thing, the non-factualist might allow attributions of truth and falsity (construed disquotationally) to all conditionals, but add that such attributions will simply share--indeed, inherit--the non-factual nature of the original utterance.

So, a coherent non-factualist position need not be constructed to rest on the wholesale rejection of truth conditions after all; the non-factualist can endorse dis-

quotational truth conditions for indicative conditionals while recommending that other terms be developed for characterizing the recalcitrance (or "factual defectiveness" if you like) of indicative conditionals. Adopting disquotational truth conditions in this way is consistent with the criticisms of the truth-functional view so far marshaled. This suggests that the non-factualist may be troubled not by the systematic attribution of truth conditions *per se*, but by some failure of the notion of truth underlying those truth conditions.⁶⁸

My aim in raising these issues is to point to an overlooked approach to getting truth conditions for indicative conditionals. The non-factualist can now use the

⁶⁸ One remaining question is whether the deflationist can, with her rather limited resources, embrace (or anyway explain) non-factualism. If the only notion of truth in play is the one given by the disquotation schema, how can we tell when someone is a non-factualist? And, relatedly, how can we express what is non-factual (or, more modestly, and as Field seems to prefer, "not-fully-factual") about the conditional utterances in question? Field has made a few sketchy suggestions (1994, pp. 447-451) for how a deflationist might give sense to the proposal that conditional utterances are "not-fully-factual". However, I will not attempt to make out those suggestions here since the problem for which they represent potential solutions only arises for a radical deflationist, like Field, who holds that the notion of truth given by the disquotation schema is the only one we need.

disquotation schema to formulate a version of non-factualism that allows indicative conditionals to have truth values without thereby committing to the deflationist's claim that the notion of truth given by the disquotation schema is *the* correct one. In other words, the non-factualist need not be a deflationist to accept certain purely disquotational applications of 'true' and 'false'. Indeed, allowing such applications for conditionals while requiring a more robust truth predicate for utterances whose fact-stating status is not in question would be an alternate way to represent the distinction between fact-stating and non-fact-stating discourse: instead of simply attributing truth conditions to some utterances and denying them to others, our non-factualist might say that some utterances get the truth conditions given by the disquotation schema alone and some get these (trivially) plus *more*. Of course, the *more* would require some spelling out.⁶⁹

⁶⁹ Indeed, spelling out "the more" should be among the highest priorities on the non-factualist's agenda. But so far there is a paucity of viable proposals for doing so. Crispin Wright (1992) holds that statements from different discourses possess different kinds of truth, and hence that there is a plurality of truth predicates. However, if the non-factualist about indicative conditionals hopes to spell out what she has in mind along similar lines, it will be at the expense of semantic unification--for even assuming

The non-factualist may reason as follows. Schema (T) may be maintained in application to conditionals in a weak deflationary sense, but that cannot be understood as partially defining a property. However, in the realm of the fact-stating, there is some property which is present in statements we accept as true and absent from statements we reject as false. Whatever this property is, it will be detectable in ordinary 'true' indicative sentences, but curiously missing from indicative conditionals.

To recapitulate, the present suggestion amounts to this: the non-factualist about conditionals has recourse to truth conditions after all. Insofar as attributions of truth can be interpreted disquotationally, those attributions will simply share the non-factual character of the original conditional utterances. If this is right, the

conditionals are intrinsically non-fact-stating, how are we to understand them when embedded in paradigmatically factual discourse, or when they occur as components of arguments that contain statements from various discourses? Consider, for example, the following hybrid compound statement (or argument): *I am 6' tall, and if I'm 6' tall, I'm taller than Hillary Clinton, and therefore I'm taller than Hillary Clinton*. If the embedded conditional gets a different truth predicate than the two non-conditional statements that flank it, what semantics do we give the compound? Or, relatedly, how are we to understand the inferential properties of the conditional within the context of the whole argument?

austere letter of the non-factualist claim that indicative conditionals simply lack all manner of truth conditions must be given up. To preserve the spirit her program, the ambitious non-factualist will be constrained to either develop other terms for characterizing the factual defectiveness of indicative conditionals or a more robust notion of truth conditions.

However, our non-factualist might not be so easily threatened; in particular, she might object that the reckless application of minimalist truth conditions, though harmless in itself, simply sidesteps the deep question of whether indicative conditionals are apt for truth in the first place. It is to this question which I now turn.

5.4 An Account of Truth Aptitude

Can the claim that conditionals are not evaluable in terms of truth and falsity really be sustained? This question can only be addressed relative to some normative account of truth-aptitude--relative, that is, to some general specification of what conditions need to be satisfied in order for a sentence to be deemed indigenously suitable for evaluation in terms of truth and falsity. Only

once some plausible criteria are in place, may we consider whether they are satisfied in the case of the indicative conditional.

Although the no-truth-conditions hypothesis enjoys endorsement from a distinguished philosophical contingent--Ernest Adams, Anthony Appiah, Dorothy Edgington, Alan Gibbard and Isaac Levi, to name a few--as far as I can tell, none directly addresses the issue of what makes a sentence a good candidate for truth-evaluability in the first place. Certainly, indicative conditionals display surface indicia of truth-evaluability: we *do* affirm and deny them, we argue for and against them, they go grammatically into that-clauses, they serve as components of (at least apparently) valid arguments and so on. Thus, I think the viability of the non-factualist undertaking will depend in part on the extent to which it is possible to make sense of how it is that conditionals *seem* intuitively to be of a piece with the rest of fact-stating (and truth-evaluable) discourse, yet somehow aren't after all. I think such efforts must go largely unrewarded, and in what follows I say why.

I concur with Crispin Wright (1992) and Paul Boghossian (1990) in some moods, that one desideratum of the notion of

truth that underlies any notion of truth-aptitude is that it conform to the most central "platitudes" associated with it. In their recent discussion of this issue, Frank Jackson, Graham Oppy and Michael Smith (1994), attempt to sort out just what those central platitudes are. I have culled from their discussion a triad of necessary and sufficient conditions for the *truth aptitude* of a sentence. In what follows, I develop a case for the conclusion that indicative conditionals satisfy these conditions..

Say that a sentence, *S*, is truth apt if and only if:

- (1) It conforms to certain norms for appropriate usage within a linguistic community (*Discipline Condition*).
- (2) It possesses certain syntactic features; in particular it admits of coherent embedding within conjunction, disjunction, negation and propositional attitude constructions (*Syntax Condition*).
- (3) It can express the content of a user's belief; that is, it is a possible object of belief (*Belief condition*).

The issue now is whether indicative conditional sentences satisfy all three of these conditions. My suspicion is that satisfaction of (3) alone is sufficient for the truth-aptitude of a sentence because, properly described, it will involve the prior satisfaction of (1) and

(2) anyway. So, following a few very general remarks about conditions (1) and (2), I will concentrate on the implausibility of denying that indicative conditionals satisfy condition (3).

There is a strong *prima facie* case in favor of the satisfaction of condition (1). We usually understand in practice how to use ifs; there are clear occasions for using and forbearing to use the conditional construction. The success of Adams's assertability rule for conditionals further attests to the satisfaction of the discipline condition. After all, the assertability rule tells us precisely when it is appropriate to use an 'if...,then' sentence: when we attach high subjective probability to the consequent, given the antecedent. Of course, subjective probabilities are generally regarded as "degrees of belief", and thus it may be that the discipline condition is not wholly separable from the belief condition. We will have to keep this in mind when we investigate the belief condition. In the meantime, it seems plain that the discipline condition is satisfied.

What about condition (2)? Trouble with coherently embedding conditionals may seem to testify against satisfac-

tion of the syntax condition. Often compounds of conditionals are far out, *non sequitur*, difficult to comprehend; they appear to malfunction in ways that other compounds don't. Edgington points out, for example, that "Either (if A, B) or (if C, D)" is a "virtually uninstantiated" form of thought. She adds that "[a]n agile mind will leap to the challenge and instantiate it--but once you've seen the results, you see why we have no use for such thoughts." (1995, p. 283) But that we have "no use" for certain forms of thought cannot really be evidence against their satisfaction of the syntax condition. After all, the conjunction of, say, 'Becky is blonde' and 'Dot is a Democrat' iterated 4,896 times is surely both uninstantiated and useless, but there is no doubt that the resulting sentence has a truth value.

Also, according to Edgington, conditionals in the antecedents of other conditionals present difficulties. Granted, some are harder to interpret than others; try, for example, to decipher 'If Dot cooks if Becky cooks, then Mary cooks.' But this is hardly a "virtually uninstantiated" form of thought; consider, for example, 'If Dot cooks if (i.e., whenever) Becky cooks, then Mary is sure to become

envious.' Finally, there is dispute over how to negate a conditional: as $\neg(\text{if } A, C)$ or as $\text{if } A, \neg C$?⁷⁰

Certainly conditionals can be syntactically awkward, but it will require more than the mention of a few bewildering cases to justify the conclusion that they fail in general to satisfy the syntax condition. After all, many conditionals are coherently embeddable. Conditionals with disjunctive consequents often come in handy, and are also readily grasped. It takes no special skill or exertion to decipher 'If Dot is cooking, either Becky is in Detroit or Becky is cooking too.' Propositional attitude embeddings provide especially strong evidence for the coherent embeddability (and corresponding believability) of many conditionals: 'Mary believes Dot is cooking' and 'Mary believes that Dot is cooking if Becky is cooking' seem clearly to be on a par. As with the discipline condition, we suspect the syntax condition is not separable from the belief condition.

⁷⁰ Stalnaker advocates the latter interpretation of conditional negation, though the former has adherents too (see Appiah, 1985). As I noted in my discussion of partial logic, the two cannot plausibly be interpreted as equivalent. Recall the example: by rejecting the statement 'If the highway is icy, the sky has cleared up,' one does not thereby commit to the statement that 'If the highway is icy, the sky has not cleared up.'

And, again, we will keep this in mind when we examine condition (3). For now, it seems reasonable to allow that conditionals satisfy condition (2) in a large number of central cases.

Might the satisfaction of conditions (1) and (2) be enough? Paul Boghossian (1990) argues that ethical statements and conditionals can, without generating unhappy semantic consequences, be given minimalist truth conditions. But his characterization of what features a sentence must have in order to qualify for minimalist truth conditions requires satisfaction of only the syntax condition and the discipline condition, and leaves out the belief condition; it is thus a statement of minimal truth aptitude. Now, whether there is a better way to characterize truth aptitude will depend on whether there are any platitudes associated with truth that the manifestation of the appropriate syntax and discipline fails sufficiently to reflect. Hence, whether the assignment of minimalist truth conditions is tolerable will depend upon whether there is a connection (platitudinous and analytical) between truth aptitude and belief.

This brings us to condition (3), the belief condition.

One could reasonably maintain that there is an analytical connection between truth-aptitude and belief because to believe something just *is* to believe *that it is true*.

Whether a sentence can be used to express the content of a user's belief is, as Jackson, Oppy and Smith point out, a substantial (i.e., not a minimal) matter:

It is part of our concept of a belief that we form beliefs, and particularly beliefs about contingent matters of fact, as a result of *inter alia* perceptual interaction with the world. This reflects the more general truism about belief that it is a state designed to fit the facts. (1994, p. 296)

If belief is a state "designed to fit the facts", then it must attach to entities that are of a kind to be evaluated in terms of truth and falsity: propositions.

I assume it is not complete coincidence that proposition-expressing sentences are typically declarative in form. We do not, in common parlance, speak of believing that *Ooops!* or that *Shut the door* or that *What shall I say?* and nor do we ordinarily regard such utterances as truth-evaluable, as part of our fact-stating repertoire. On the other hand, common parlance does at least appear to substantiate the truth-evaluability, and concomitant believ-

ability, of normative and indicative conditional utterances. For example, we do speak of believing that *Capitol punishment is wrong* and that *If he calls, I'll hang up immediately*. But, as we have seen on numerous occasions, common parlance, though influential, is not decisive. And, as we have also seen, there are well-known (and less-well-known) philosophical motivations for thinking that there are no normative or conditional facts, and thus for thinking that there are no satisfactory standards by which to judge our normative and conditional utterances as either true or false.

Here's the structure of the argument as I see it so far. Assume belief is "a state designed to fit the facts". Grant also that one of the conditions for the truth-aptitude of a sentence is that it can be used to express the contents of a user's belief. It will follow that if there are no conditional or evaluative facts, then the states corresponding to our conditional and evaluative utterances, indeed states which we normally describe as beliefs, cannot really be beliefs because they do not play the right functional role. So, again, whether a sentence is truth apt is a substantial matter.

5.5 A Possible (If Implausible) Non-Factualist Rejoinder

If, despite the considerations just raised in Section 5.4, the non-factualist wanted to press the claim that indicative conditionals are not truth-apt because they cannot express belief contents, how might she proceed? In this section, I outline one hypothetical--though I think ultimately unworkable--response.

So far, the non-factualist's results have been largely negative. Her strategy for eliminating the truth conditional opposition has been defensive; the only evidence she has for thinking that conditionals might belong to a realm of non-fact-stating discourse is evidence *against* particular factualist programs. In this section, then, I undertake to lay out a small part of what I think the no-truth advocate must say (and avoid saying) in order to elevate her position beyond its present default status. Specifically, I will explore how a non-factualist might, despite much *prima facie* evidence to the contrary, maintain that indicative conditionals are not proper objects of belief. Whether the grass is really greener on her side of the fence remains to be seen.

On the face of it, it would seem that we all entertain a multitude of beliefs in conditionals, and that beliefs in conditionals are most frequently expressed in conditional sentences. It seems to me, for instance, that I *believe* [If it's raining, it's best to have an umbrella] and [If the book is overdue, a fine is in the works] and so on. Moreover, all natural languages (that I know of) contain some unique construction for expressing this distinctive strain of epistemic commitment.. So, in particular, we want to examine the relationship between the semantics of conditional sentences and the properties of conditional beliefs. We will find that a psychologically-oriented non-factualist needs to distinguish beliefs in ordinary sentences from beliefs in conditionals (or genuine beliefs from ersatz beliefs, as the case may be). To make her case, the non-factualist will be constrained to hold that conditionals are not straightforwardly fit for this task; and, this will just be to say that conditional beliefs are not straightforward beliefs.⁷¹

⁷¹ Certainly they are mental states, and likely also beliefs *of some sort*, but the no-truth-conditions theorist will, as we shall see, be constrained at least to hold that we cannot properly construe them as beliefs *in propositions*.

Are we under some collective and systematic error about what we believe? To answer this, we need to examine the idea that conditional beliefs differ from beliefs *simpliciter*; one possibility is that, to the extent that they can properly be called beliefs at all, perhaps they are second-order beliefs. A comparison with conditional agreements may help to bring out the structure of this suggestion. Consider, then, the following four sentences:

- (i) I will feed the cat..
- (ii) The cat is on the mat.
- (iii) If you feed the dog, I will feed the cat.
- (iv) If the dog is in the bog, then the cat is on the mat.

(i) and (ii) express an ordinary agreement and an ordinary belief respectively. If I utter (i) I must either feed the cat or break my agreement. In contrast, if I utter (iii), and you fail to feed the dog, I am completely off the hook. (iii) expresses a conditional agreement, which (unless the condition is fulfilled) is really no agreement at all. If the condition goes unfulfilled, nothing is required of me, no obligation is incurred.⁷² If the condition is fulfilled, the conditional agreement is transformed into an agreement

⁷² As far as the requirements of the 'agreement' itself are concerned, that is. Certainly I have a general obligation not to let the pets go hungry!

simpliciter--(iii) becomes (i). That is, if I agree to (If A, C), then, if A, I agree to C.

Is the relationship between (ii) and (iv) analogous? (iv) expresses a commitment to believe (ii) under certain conditions, but it does not represent a belief *simpliciter*; indeed, it is transformed into (ii) just in case the dog is discovered in the bog--that is, just in case the antecedent of the conditional is true. My use of (iv) indicates that I cannot form an unqualified belief about the matter at hand (i.e., the whereabouts of the cat) unless or until I already have a belief about the whereabouts of the dog. Since I do not yet possess any such belief, when I use (iv) I express the contingency of my belief; I impart that I have some unfinished epistemic business.

A non-factualist might, along these lines, propose that conditional beliefs fall short of being simple constitutive beliefs. Use of the conditional construction incurs an epistemic obligation of sorts; *it obliges me to infer the consequent should I come to accept the antecedent*. But it requires neither that I actually accept the antecedent nor even that the antecedent is possible. Moreover, when and if I do come to accept the antecedent, the conditional itself

no longer serves any purpose for me. The conditional is an epistemic instrument of deliberation, and once it has fulfilled its telos as such its capacities are neutralized: "belief" in the conditional (or conditional belief) is, upon acceptance of the antecedent, instantly converted into unconditional belief in the consequent alone.

Frank Ramsey (1931) proposed that we evaluate a conditional by subjecting it to the following test: we hypothetically add the antecedent to our set of beliefs (Ramsey says "knowledge"), make all and only the minimal revisions necessary to restore consistency to the set, and then look to see whether the resulting belief state contains the consequent. If so, the conditional is acceptable (or true). The resulting belief state is to be understood as the closure of the adjusted set of beliefs under a suitable consequent relation.

But we don't really change our beliefs. The resulting "belief state" is a *simulated* state; it is the consequence of a thought experiment into which we enter with eyes wide open. If we *actually* come to believe the antecedent, we simply add the consequent to our actual stock of beliefs and retire the conditional (since we no longer have any use for

it).⁷³ In the meantime, feigning belief in an antecedent allows us to imagine what *else we might actually* come believe if the antecedent were true. So the conditional itself does not constitute the expression of an actual belief. We are not deceived by our own simulated belief in an antecedent any more than Liz Taylor is deceived into thinking she's Cleopatra as a result of having once "made believe" she was. Conditionals, like movie sets, are *made* for supposing. So, a conditional "belief" is not a belief that any particular proposition is true.

To develop this further, let's return to an old example: IC2 (see 1.2). Imagine circumstances in which I maintain that if this is urn #1, then I am holding a black marble. There are a few possible scenarios to consider. First, suppose I am certain urn #1 contains only black marbles. Now I learn on good authority that this is in fact urn #1. With this new information, the antecedent of the conditional retires its *antecedent*-status; it has now the status of the simple belief that this is urn #1. Once I am

⁷³ I don't mean to suggest that coming to believe the antecedent *necessitates* coming to believe the consequent. We could have a change of mind, and believe the antecedent but not the consequent. However, in this case too, the conditional retires its status as a conditional.

certain of the antecedent, I have no further use for it as an antecedent. Likewise, the consequent retires its consequent-status and becomes the simple belief that I am holding a black marble. The simple statements to which these beliefs correspond may now be truth-functionally manipulated; that is, they may be conjoined, disjoined, negated and embedded in other truth-functional contexts. *Qua* components of a conditional, however, they are inert.

Now, still supposing I am certain urn #1 contains only black marbles, imagine I don't acquire any special information about whether the urn from which I have selected the relevant marble is urn #1 or not. Because I know that urn #1 contains only black marbles, I will surely affirm the conditional. But, in this case, the antecedent, *qua* antecedent, does play an active role in my deliberations. So this is a critical case. I must calculate the probabilities of what I don't know on the basis of what I do know. *Ex hypothesi*, what I do know is that urn #1 contains only black marbles, and I what I don't know is whether I have selected a marble from urn #1 or not. But, at this point, how I proceed will depend in part on what else I know. For example: How many urns are there to choose from? Do I have

access to this information? What color marbles do they contain? Do I have access to *this* information?

Here's an elementary sample case: I know there are only two urns, urn #1 and urn #2. In addition to knowing urn #1 contains only black marbles, I know urn #2 contains only non-black marbles. The only relevant thing I don't know is from which urn I have chosen. Thus, I will assign probability $\frac{1}{2}$ to the consequent of the conditional--i.e., the proposition that I am holding a black marble. From the point view of calculating odds, this description is elementary, uncontroversial and uninteresting. What is interesting is how what is occurring at the level of belief gets described. In this case, I have accepted the conditional; it seems natural even to say I believe it. Yet, on a certain understanding of what it is to have a belief, I do not believe the conditional.

Another helpful suggestion due to Ramsey (1931) is that unconditional beliefs are behavioral dispositions; the litmus test of whether I really believe something is my willingness to act (or bet) on it. Conditional beliefs, on the other hand, require only my willingness to entertain what would happen (or what I would do) if the antecedent

were carried out, acted on, or otherwise made actual. This description coincides interestingly with the way in which a distinction between belief and acceptance is sometimes drawn; Stalnaker, for example, writes:

Acceptance may be the product of methodological decision rather than subjective commitment. One may accept something for the sake of argument, although one cannot believe things for this reason. (1984, p. 81)⁷⁴

The idea might be that conditional sentences are not constituents of my belief system *in the same way* that many ordinary informative sentences are. Unlike, say, my belief that *the cat is on the mat*, my conditional "belief" that *if the cat is on the mat, then the dog is in the bog* functions as a regulative principle of reasoning; in the language of AI, it is part of my procedural knowledge or control structure, rather than part of my declarative memory or data structure.⁷⁵ The distinction is between static information

⁷⁴ So, as Stalnaker points out, belief entails acceptance, but acceptance does not entail belief.

⁷⁵ In an expert system, declarative knowledge consists of explicitly represented information. Procedural knowledge, on the other hand, consists of information contained within the system, but not explicitly represented. Normally, a system's procedural knowledge is understood as a set of rules. Any given rule includes both a specification of its conditions for application and a specification of its

and methodological principles for the organization, manipulation and revision of this information.

The terminology hardly matters: we may reserve the term "beliefs" for pure information-bearing states and call our stock of regulative principles something else (say, "pre-liefs," since they circumscribe our selection of beliefs and are, thus, in some sense prior), or we may distinguish between *modes* of belief. The point is that they play different functional roles in our conceptual systems. Specifically, '*the cat is on the mat*' straightforwardly says something about the world, whereas it isn't obvious that '*If the cat is on the mat, then the dog is in the bog*' does (or does in the same way).

Insofar as my endorsement of the conditional can be described as a belief at all, it is a belief about an epistemic obligation. To accept '*if A, C*' is to grant that, in the absence of contravening reasons not to, I *ought* to infer C upon learning A; it is to declare certain *ceteris paribus*

effects. A rule gets put into effect when its conditions coincide with information stored in the declarative memory. An example of an effect (or action) is the addition of information to, or removal of information from, the content of the declarative memory.

inferential intentions.⁷⁶ In this way, conditional beliefs are instrumental in introducing new information into the declarative memory or data structure of a system. After all, if I believe C already, then there is no point in committing myself to inferring C under certain conditions.⁷⁷

Conditional beliefs, or "preliefs", might be useful to us in a couple of additional, and related, ways. First, they deliver us from having to reason anew about what to believe in response to each fresh piece of information we obtain. In situations in which the antecedent turns out to be true, this lessens our cognitive load. Since real reasoning involves real time constraints, such available epistemic commitments are beneficial in that they structure our knowledge for the purpose of more efficient

⁷⁶ D.H. Mellor (1993) claims that to accept a conditional, 'If A, C', is to be *disposed* to infer C upon learning A. *Prima facie*, this may sound much like what I'm proposing. In fact, though, I don't understand disposition talk very well. If accepting 'If A, C' is tantamount to having a disposition to infer C upon learning that A, I want to know more about the nature of this disposition. Is it a psychological habit? A neural twitch? A penchant? A desire? I understand the notions of obligation, intention, commitment, etc. much better.

⁷⁷ Perhaps something like this is what Gilbert Ryle (1950) had in mind when he suggested that conditionals are not statements, but "inference tickets."

deliberations; they supply us with ready-made responses to novel situations; they allow us to screen incoming information for potential relevance. We filter our experience through the antecedents of conditionals; they direct our attention.

But there is a rather obvious difficulty with this characterization of conditional belief.

Suppose I don't initially know where Becky lives. I make some inquiries and learn that she lives in Manhattan. In this case, the conditional 'If Becky lives in Manhattan, then she lives in New York State' (which I accepted all along) does not fall away, or become irrelevant, once I accept the antecedent. It does not seem right to say that, upon coming to believe the antecedent, my conditional belief is transformed into a belief in the consequent alone. Certainly the believing agent (me in this case) will not grant that the conditional is no longer useful, that it has served its purpose as an instrument of deliberation and may thus now be tossed into the 'moot' bin. I continue to believe 'If Becky lives in Manhattan, then she lives in New York State' every bit as much (and it seems to me in much the same way) that I believe 'Becky lives in Manhattan'.

5.6 Cheap Facts and Pleonastic Propositions

Non-factualism, though well-motivated, appears to clash with some important surface phenomena. After all, we often do assign truth-values to both simple and compound conditionals.⁷⁸ So far, we have encountered two arguments (one inspired by Lewis's triviality results and one due to Gibbard, and elaborated by Edgington) that it is a mistake to make such assignments because there can be no conditional propositions. But there is also an inventive case, advanced by Stephen Schiffer (1996), that there *must* be conditional propositions. If Schiffer's line convinces, then insofar as propositions are always either true or false (i.e., assuming bivalence) the non-factualist claim that conditionals are not truth-evaluable must be mistaken. Let's then see how

⁷⁸ Here the non-factualist can reply much as the ethical non-cognitivist would: of course we often *do* make such assignments, and they often do coincide with our attitudes of approval and disapproval towards utterances, but technically these assignations are erroneous, because the notions of truth and falsity do not properly attach to conditionals. This claim then rests on the further claims that (i) conditionals do not express propositions, and (ii) only propositions can bear truth values. And, finally, *this* pair of claims derives from the non-factualist's determination that there are no conditional facts, conjoined with the assumption that a fact is just a true proposition.

this argument in favor of conditional propositions might run.

First, we need to consider the case for thinking that that-clauses in general must refer to propositions. If we accept the case for ordinary that-clauses, we will be hard-pressed to deny that it must apply equally to that-clauses containing indicative conditionals. It seems that that-clauses must be understood as referring expressions of *some sort* in order to account for the patent validity of certain inference schemata in which they occur. To wit:

- (i) Dot denies that the end is nigh.
Becky believes everything Dot denies.
So, Becky believes that the end is nigh.

It is plain that where the that-clauses in question are indicative conditionals, the same accounting for will be required. Consider:

- (ii) Dot denies that if an asteroid strikes, the end is nigh.
Becky believes everything Dot denies.
So, Becky believes that if an asteroid strikes, the end is nigh.

The sentences in (ii) appear to be routine belief-ascribing sentences, on all fours with the sentences in (i). But if the that-clauses in (i) are referential singular terms (which they must be in order to account for the validity of

certain inferences in which they may occur), then it is hard to see how we could deny that the that-clauses in (ii) are also referential singular terms.

Second, only by understanding that-clauses as referring expressions can we accommodate them within a compositional semantics.⁷⁹ Respecting compositionality requires treating 'believes' (along with 'says', 'intends', 'desires', etc.) *à la* Frege as two-place relational predicates. But treating 'believes' thus constrains us to view the grammatical complement of a statement like 'Becky believes the end is nigh' as referring to *what* Becky believes. And this brings us to the point about propositions.

Assuming it has been established that that-clauses are referring expressions, it is a short step to the conclusion that they must refer to propositions. What after all can we say about *that the end is nigh*? Clearly, it's abstract: *that the end is nigh* cannot be located in space or time. It's mind and language independent: it doesn't belong to any particular thinker(s) or language(s). It has a truth

⁷⁹ Schiffer (1987) himself regards propositions as non-compositionally-determined. This is at most ironic, since there is nothing in my present application of his account that requires this.

condition: it is true if and only if the end is nigh; and, it has its truth condition both essentially and absolutely. But the properties just enumerated simply are the defining properties of propositions. (Cf. Schiffer, 1996)

Can the non-factualist about conditionals accept this line of reasoning yet avoid its consequences for her position? While she cannot reasonably deny that *that 'if an asteroid strikes, the end is nigh'* is abstract and mind and language independent, perhaps she can continue to insist that it lacks a truth value. However, if she digs her heels in here, she will be obliged to maintain there are two distinct belief relations, one with propositions in its range, and the other with things *like* propositions, except truth-valueless, in *its* range. If this is her strategy though, the non-factualist now faces the task of providing a mechanism for generating a reference for every *that*-clause containing an indicative conditional. This represents a formidable obstacle.

So, on the one hand, it is hard to see how there could be two distinct *kinds* of references of *that*-clauses. On the other hand, however, we have seen that there are powerful arguments in favor of non-factualism. Stephen Schiffer

(1996) has suggested that the motivations underlying the non-factualist hypothesis might be made sense of from within a univocal factualist account if we "cheapen" the notion of proposition we have been presupposing. According to Schiffer, the "correct" view of propositions can be attained by imagining that they were introduced by fiat in roughly the following way. Imagine a time, t_0 , when English lacked that-clauses and all notions dependent on that-clauses. Dot (Schiffer uses "Harvey") is a paradigm English speaker.

Among the things she believes are:

(i) Bison are fine for breakfast.

and

(ii) If I can clobber a bison, I'll have
a fine breakfast.

Both (i) and (ii) have rich conceptual roles in Dot's language. Clearly, Dot stands in some functional relation to the things she believes, and Schiffer devises the metaphor of the "belief box" to make this relation vivid. The things Dot believes are said to be *in* her belief box. So (i) and (ii) are in her belief box. Whether a sentence gains admittance into Dot's belief box will depend on what's already in there, together with new experiential data, or what Schiffer terms "sensory hits". At this stage, (i) and

(ii) appear to be on equal footing. But, recall, this is a time before that-clauses, and hence a time before referents of that-clauses, and hence a time before propositions.

Now, imagine that the First Annual Convention of English Speakers (FACES) is gathered. The conclusion of FACES marks the dawn of time t_1 . At FACES, the following bipartite proposal is made and unanimously accepted. First: *Whenever we have a sentence, "S", we are allowed to interchange it with "'S' is true".* So, for example, "Bison are fine for breakfast" and "Bison are fine for breakfast is true" are to be deemed equivalent. Second: *We can always go back and forth between [That-S is true] and [The proposition that-S is true].* So, "Bison are fine for breakfast is true" and "That bison are fine for breakfast is a true proposition" are likewise to be deemed equivalent. By transitivity, then, we may now move back and forth between "S" and "That-S is a true proposition". Now, FACES determines to regard facts as nothing more than true propositions, and thus readily agrees to instate the further convention that *"It's true that S" and "It's a fact that S"* shall also be interchangeable. Schiffer's hypothesis is that the correct way to understand the notions of proposi-

tion, truth and fact is as if they had been introduced in just this way.

But what bearing does this have on the truth conditions of indicative conditionals?

With our semantic notions thus cheapened, or "pleonasticized" (cf. Schiffer), the non-factualist line loses status; in particular, it no longer represents the sole alternative to the factualist accounts discussed in Chapters One and Two. Inasmuch as propositions are correctly understood as, *pace* Schiffer, "shadows" of sentences--mere epiphenomena--the claim that some indicative sentence or class of sentence fails to be proposition-expressing is unintelligible. If Schiffer is right, then, trivially anyway, every sentence that goes grammatically into a that-clause expresses a proposition. So, again trivially, indicative conditional sentences must express propositions.

To the extent that a pleonastic characterization of propositions is correct (as I suspect it is), the factualist and non-factualist alike have apparently misframed their cases. Indeed, this misframing is most conspicuously reflected by the misnomic appellations, *factualist* and *non-factualist*. Why misnomic? Because if facts are just true

propositions, and our semantic notions (e.g., of propositions and of truth) are gotten on the cheap in the way just outlined, then it is clear that facts may be obtained cheaply too. Any sentence that goes grammatically into a that-clause will, if pleonastically true, be pleonastically fact-stating.

Interestingly, while Schiffer's strategy can be adopted to show how a univocal factualist account is possible, the resulting program may be in spirit closer to the non-factualist's than to the traditional factualist's. With the cheapening of *facts*, the traditional factualist will surely take umbrage. Even if all parties agree that a fact is just a true proposition, the factualist traditionally understands this claim in the context of the assumptions of classical compositional semantics (CCS).⁸⁰ To be sure, the non-factualist equally buys into the assumptions of CCS, and

⁸⁰ One of the central such assumptions is that propositions are (at least) structured, compositionally determined entities. We may leave open the question of what, on the supposition that propositions are structured entities, the best account of the logical form of propositional attitude sentences is. The two dominant candidates within this supposition are (i) that propositions are mode-of-presentation containing entities (a la Frege) and (ii) that they are singular, object-containing entities (a la direct reference theory). Schiffer's pleonastic conception of propositions avoids commitment to either of these interpretations.

thus (if Schiffer's alternative picture is roughly correct) perpetuates a misframing of the issues. Given cheap facts, pleonastic propositions and minimal truth, denying the existence of conditional facts and propositions, and their concomitant truth conditions, now seems an unnecessarily extreme, and indeed wrongheaded, measure.

ENVOY

There are many ingenious, but no wholly satisfactory, theories of the semantics of the English indicative conditional. All formal attempts to model the behavior of indicative conditionals truth conditionally have, as yet, foundered somewhere on the onerous obstacle course of objections. Yet, the alternative hypothesis that indicative conditionals simply lack truth conditions fares no better, and in some important respects it fares much worse. I have not sought to rejuvenate any of the existing accounts, but rather to reshape, and to some extent defuse, this apparently insuperable opposition. In so doing, I have identified several fresh points of departure for further investigation.

APPENDIX

A.1 Preliminary Remarks

A potentially instructive parallel can be drawn between non-cognitivism and no-truth theories of indicative conditionals; in particular, there are relevant similarities between certain considerations that prompt the non-cognitivist picture and considerations that prompt non-factualism with regard to conditionals. Despite endorsements from various factions, a carefully developed no-truth-conditions theory of indicative conditionals has yet to be advanced. On the other hand, non-cognitivism in ethics has been extensively, if not altogether successfully, championed in one form or another at least since Hume. What, if anything, do ethical sentences have in common with indicative conditional sentences such that it is tempting to deny them truth conditions? An instructive way to approach such a question might be to formulate a set of necessary and sufficient conditions for truth-aptness in general, and then to note the extent to which (and attempt to diagnose the reasons why) ethical sentences and indicative conditional sentences respectively either satisfy, or fail to satisfy, these conditions. I have suggested such an

account of truth-aptitude in the body of the dissertation, and entertained what the no-truth theorist would, in accordance with it, be constrained to say about indicative conditionals. I have left the parallel task for the ethical case to the ethicist.

A.2 An Analogy with Ethical Non-Cognitivism

The non-cognitivist in ethics maintains there is something special about evaluative discourse that renders it uniquely resistant to straightforward logical analysis. In her attempt to emphasize a logical disparity between normative subjects and informative subjects, the ethical non-cognitivist will typically advert to the suggestion that sentences involving evaluative language lack truth conditions. The idea is that it is not possible to identify the conditions under which any particular evaluative sentence is true or false because evaluative sentences are not truth-apt in the first place; that is, the notions of truth and falsity simply aren't applicable to them. This is because there is no realm of ethical facts or properties, and hence nothing for such sentences to be true *in virtue of*. Although some such sentences may be regarded as

hybrids, they will be truth-evaluable only to the extent that it is feasible to abstract away from their evaluative content and consider the remainder independently.

Although some extremists may, the non-cognitivist need not deny the intelligibility of evaluative sentences; rather, she need only deny the assumption that all sentences a competent speaker can understand are either true or false. Given that such sentences have no truth-conditions, however, it is not clear what we comprehend when we comprehend them. The hypothesis that the meaning of a compound sentence is determined, at least in part, by the role that the compounding element plays in inference is far from revolutionary. Nor, as we saw most vividly in our discussion of the truth-functional program, is it unusual to give the explanation of the role played in inference by any given compounding element (e.g., 'or', 'and', 'if') in terms of conditions for truth. But, if truth conditions are not essentially involved in our apprehension of evaluative language, we need a different account of meaning for compound sentences that involve such language.

One potentially unattractive consequence of hard non-cognitivism is that it cannot, consistent with the view that

evaluatives lack truth values, concede the formal validity of an inference from, say, 'Abortion is wrong and the death penalty is just what this country needs' to (via simplification) 'The death penalty is just what this country needs.' The idea is that, since validity is ordinarily understood in terms of truth preservation, simple sentences must themselves be truth evaluable before they can serve as components of validity evaluable inference.⁸¹

For the classical non-cognitivist, an evaluative utterance such as "Eating animal flesh is wrong" is, despite its straightforwardly declarative grammatical form, reducible to a non-truth-evaluable display of feeling; accordingly, a suitable non-cognitivist translation of such a locution would be something like "Down with the eating of animal flesh!"⁸² But the non-cognitivist does not require a translation in order cogently to represent her position; her

⁸¹ Of course, a non-cognitivist might overcome this objection rather easily by supplying a notion of inferential legitimacy that, unlike the formal notion of validity (which technically attaches to arguments rather than inferences anyway) doesn't depend on components of inference having truth values.

⁸² The *locus classicus* of this suggestion is A.J. Ayer's Language, Truth and Logic (1946). Ayer described evaluative claims as partly expressions of feeling and partly commands (either prescriptions or proscriptions).

contention is simply that, by virtue of their content and regardless of their form, evaluative sentences fail to make claims about reality. A full-fledged non-cognitivist counts nothing as evidence against her position: the bottom line is simply that ethical statements are not truth-apt (at least not in any non-minimalist sense of truth-aptitude) because, again, there are no moral properties, no moral facts, nothing (whether Platonic or naturalistic) for such statements to be true of.

A.3 Moral Disagreement

The singular recalcitrance of moral and aesthetic disagreements is often invoked to ratify the conclusion that there is a significant distinction between fact-stating and non-fact-stating language, and that sentences with evaluative content fall into the latter class. In ordinary exchanges about ethics and aesthetics it often happens that, no matter how precisely we specify our vocabulary, our disputes defy resolution. If non-cognitivism is correct, then it will be possible for opposing parties in a dispute to agree on the facts of a given matter, and yet persist in a disagreement over how those facts are to be valued. Of

course, the non-cognitivist's explanation of this chronic intractability is that, in the domain of ethics, there are simply no facts in play, no moral reality to consult by way of adjudicating our conflicts.

Despite their peremptory bottom line, there has been some attempt from within the non-cognitivist camp to acknowledge and explain the widespread appearance of factual disagreement.⁸³ The now classic explanation derives from Charles L. Stevenson's book, Ethics and Language (1944, pp. 2-19). Here, Stevenson introduces a distinction between disagreement in belief and disagreement in attitude, and argues that, in accordance with this distinction, only non-evaluative indicative sentences will be fit to express propositions (and hence belief contents). He urges that while moral disagreements are genuine, they are to be understood as chiefly disagreements in attitude, or feeling.⁸⁴ And, attitudes, or feelings, are not, on this

⁸³ Similarly, the non-factualist about indicative conditionals will want to reconcile the appearance of factual disagreements involving conditionals with her contention that there are no conditional facts.

⁸⁴ Stevenson acknowledges that, in real cases, facts inform feelings and feelings inform facts to a high degree. The task of uncoupling facts and feelings for the sake of analysis is thus generally too intricate to be feasible.

theory, truth-apt. Indeed, with respect to their truth-aptitude, ethical sentences are to be regarded as on a par with linguistic items such as "Bring me the dog!" and "Yip-pee!" A consequence of this view is that now, insofar as reason is operative at all, what we will regard as *good* reason to accept or reject ("yay" or "nay") an evaluative sentence will not, as we might naively have supposed, be connected to the truth or falsity of that sentence. Despite possessing all the cvert (i.e., grammatical) trappings of statement-making, an evaluative sentence cannot be used to state a fact or express a representational thought because there is no realm of moral facts, no moral reality to be represented.

A.4 Can Indicative Evaluatives Be Believed?

Prima facie there is substantial dissimilarity between a sentence such as "Snow is white", that appears to serve a predominately descriptive function, and a sentence such as "Bring me the dog!" that appears to serve a predominately

Still, the idea is that the factual strands and attitudinal strands of any given disagreement are in principle separable, and it is only the factual elements that are properly evaluated in terms of truth and falsity.

directive function, or an expression such as "Yippee" that appears to serve a predominately expressive function. At the very least, it is clear that, in ordinary discourse, "that's true" or "that's false" would be appropriate responses to an utterance of the first sentence and positively *non sequitur* responses to utterances of the latter two. Likewise, we do not speak of *believing* (or doubting, intending, desiring, etc.) that 'Bring me the dog,' or 'Yippee'; moreover, such expressions do not (*sans* fancy reconfiguration anyway) go grammatically into propositional attitude position; and nor do they make much sense as components of structured arguments.⁸⁵

But what is the argument that indicative evaluatives cannot serve as belief contents? Unlike commands and exclamations, such sentences slip easily into propositional attitude position, and we often speak (most adamantly) about *believing* that some evaluative sentence or other (say, "Eating animal flesh is wrong") is *true* or *false*.⁸⁶ I

⁸⁵ Consider the following absurd substitution instance of *modus ponens*: (i) If bring me the dog, then yippee!
(ii) Bring me the dog / Therefore, Yippee!

⁸⁶ (i) *Becky believes that murder is wrong* and (ii) *Becky believes that murder is illegal* are clearly on a par

suspect the Humean contention that descriptions (facts) are not conceptually or motivationally linked to prescriptions (values), that "ought cannot be deduced from is", is behind this claim.

If the mental state that corresponds to, underlies, or causes the production of a descriptive sentence is belief, what is the mental state that corresponds to, underlies or causes the production of an evaluative sentence? Whatever else is true of the state that causes us to use an evaluative sentence, whatever the circumstances of use, it will be connected with motivation. For example, the sentence 'Eating animal flesh is wrong' will be connected to motivation (perhaps just a 'yuck' reaction) against the consumption of animals. But insofar as we concede the Humean point (shared and developed by Ayer, Hare, Stevenson, Blackburn and Mackie among others) that no belief can enjoy a conceptual connection to motivation, then we must concede also that the state underlying the production of an ethical

in all relevant syntactic respects, and also with regard to their intelligibility. Thus we would expect that if one has clear truth conditions, then the other does too, but this is just what the non-cognitivist denies.

sentence cannot be belief.⁸⁷ But since only sentences that express belief contents will be evaluable in terms of truth or falsity, we are led to the conclusion that evaluative sentences must lack truth conditions.

A.5 Theory Relativization and "Correctness" for Evaluatives

Suppose we grant the implausible thesis that this approaches an accurate characterization. The non-cognitivist must nevertheless allow that, relative to any particular moral or aesthetic norm, evaluative claims can be assessed, if not for truth in some absolute sense, at least for some brand of "correctness". While she will at the outset deny that any moral or aesthetic norm can reflect a moral or aesthetic reality, she cannot, once some norm is in play, deny that *in relation to it* some judgments will be correct

⁸⁷ Why think that no belief can enjoy a conceptual connection to motivation? Here is one familiar line: suppose Becky commits a crime, the factual description of events is not in question, and, though she readily admits it was wrong, she manifests no shame or regret. In this case, it seems we will want to influence her attitudes, rather than her beliefs. After all, she and her prosecutors share all relevant beliefs. What we want is to affect her motivational structure; we want her to actively disapprove of herself so that we may be assured she won't commit such crimes in the future.

and some incorrect. That is, by plugging in a value, n , for a norm the factual elements will get fixed.

Take the aesthetic case. Suppose prevailing norms distinguish a "good painting" as a painting that $X\%$ of the recognized art critics of the world affirm as "good"; now whenever the definiens is satisfied with regard to some particular painting, the goodness of that painting, relative to the appropriate norm, must be conceded. It may then be that whenever evaluative claims are made, there is an elliptical reference to a norm. If this is the case, then to the extent the relevant norm can be identified, it will be possible to distinguish "correct" evaluative judgements from "incorrect" ones. I think this is the most plausible way to reconcile the application of truth conditions (granted they will be *ad hoc*) with the non-cognitivist conclusion.

One desideratum of any account of truth-aptness that endeavors to respect and give some sense to the intuitions that motivate non-cognitivism is that it should also respect and give some sense to a distinction *within* the evaluative (and conditional) realms between those utterances that are intuitively "correct" and those that are not. For the hard-

core ethical non-cognitivist, such a distinction within the class of non-fact-stating discourse will only be acceptable to the extent that evaluative discourse can be considered relative to norms.

To the extent we find the proposed solution to the ethical case helpful, it is natural to seek an analogous solution to the conditional case. But, firstly, and unlike the ethical case, it's far from obvious what sort of frame of reference we implicitly relativize to when we distinguish "true" from "false" conditionals. And, secondly, the relativization strategy can only have restricted application in any case. Even given a frame of reference (say, the material account or Blamey's partial material account) relative to which clear truth conditions can be formulated, we will still want to know whether indicative conditionals are truth-apt.

BIBLIOGRAPHY

- Adams, Ernest (1975). The Logic of Conditionals. Dordrecht: Reidel.
- Adams, Ernest (1992). "Grice on Indicative Conditionals", Pacific Philosophical Quarterly, 73, pp. 1-15.
- Anderson, Alan Ross (1951). "A Note on Subjunctive and Counterfactual Conditionals". Analysis, 12, pp. 35-8.
- Appiah, Anthony (1985). Assertion and Conditionals. Cambridge: Cambridge University Press.
- Ayer, A.J. (1946). Language, Truth and Logic. New York: Dover.
- Bennett, Jonathan (1976). Linguistic Behavior. Cambridge: Cambridge University Press.
- Bennett, Jonathan (1988). "Farewell to the Phlogiston Theory of Conditionals", Mind, 97, pp. 509-527.
- Blamey, Stephen (1983). "Partial Logic", Handbook of Philosophical Logic. Dordrecht: D. Reidel Publishing Company, pp. 1-70.
- Boghossian, Paul (1990). "The Status of Content", The Philosophical Review, 99, pp. 157-84.
- Braine, Martin (1991). "A Theory of If: A Lexical Entry, Reasoning Program and Pragmatic Principle", Psychological Review, 98, pp. 182-203.
- Byrne, Ruth (1989). "Suppressing Valid Inferences with Conditionals." Cognition, 31, pp. 60-83.
- Byrnes, James P. and Willis Overton (1988). "Reasoning About Logical Connectives: A Developmental Analysis", Journal of Experimental Child Psychology, 46, pp. 194-218.
- Carlstrom, I.F. and Hill (1978). "Review: Adams, E.W. The Logic of Conditionals", Philosophy of Science, 45.

- Chisholm, R.M. (1946). "The Contrary-to-fact Conditional", Mind, 55, pp. 289-307.
- Copi, Irving (1979). Symbolic Logic, 5th edition. New York: Macmillan.
- Cosmides, Leda (1989). "The Logic of Social Exchange: Has Natural Selection Shaped How Humans Reason? Studies With the Wason Selection Task." Cognition, 31, pp. 187-276.
- Cummins, Denise (1991). "Conditional Reasoning and Causation", Memory and Cognition, 19, pp. 274-282.
- Dale, A.J. "The Transitivity of 'if, then'", Logique et Analyse, 15.
- Doring, Frank Erich (1993). An Epistemic Theory of Conditionals. Ann Arbor: U.M.I.
- Dudman, V.H. (1991). "Interpretations of 'If'-Sentences". In Conditionals, Frank Jackson, ed. Oxford: Oxford University Press, pp. 202-232.
- Dudman, V.H. (1992). "A Popular Presumption Refuted", The Journal of Philosophy, 89, pp. 431-432.
- Edgington, Dorothy (1995). "Conditionals", Mind, 104, pp. 235-329.
- Edgington, Dorothy (1986). "Do Conditionals Have Truth-Conditions?", first published in Critica XVIII, 52, pp. 3-30. Reprinted in Conditionals (1991), Frank Jackson, ed. Oxford: Oxford University Press, pp. 176-201.
- Edwards, J.S. (1974). "A Confusion About 'if...then'". Analysis, 34.
- Eells, Ellery and Skyrms, Brian, eds. Probability and Conditionals: Belief Revision and Rational Decision. Cambridge: Cambridge University Press.
- Ellis, Brian (1978). "A Unified Theory of Conditionals", Journal of Philosophical Logic, 7, pp. 107-124.

- Evans, Jonathan (1982). The Psychology of Deductive Reasoning. London, Boston and Henley: Routledge & Kegan Paul.
- Field, Hartry (1994). "Disquotational Truth and Factually Defective Discourse". Philosophical Review, Vol. 103, No. 3.
- Gärdenfors, Peter (1986). "Belief Revision and the Ramsey Test for Conditionals", The Philosophical Review, 95, pp. 81-93.
- Gibbard, Allan (1990). Wise Choices, Apt Feelings. Cambridge, Mass: Harvard University Press.
- Goodman, Nelson (1973). Fact, Fiction and Forecast. Indianapolis: University of Indiana Press.
- Grandy, R.E. and Warner, R. eds. (1986). Philosophical Grounds of Rationality. Oxford: Clarendon Press.
- Grice, H.P. "Logic and Conversation" (1975). First published in Syntax and Semantics, Vol. 3. ed. Peter Cole and Jerry L. Morgan (Academic Press, 1975). Reprinted in Conditionals (1991), Frank Jackson, ed. Oxford: Oxford University Press, pp. 155-175.
- Hanson, W.H. (1991). "Indicative Conditionals are Truth-Functional", Mind, 100. pp. 53-72.
- Hansson, Sven (1992). "In Defense of the Ramsey Test", The Journal of Philosophy, 89, pp. 522-540.
- Howson, Colin (1994). "Bayesian Conditionalization and Probability Kinematics", The British Journal for the Philosophy of Science, 45, pp. 451-466.
- Hunter, Geoffrey (1993). "The Meaning of 'if' in Conditional Propositions", The Philosophical Quarterly, 43, pp. 279-297.
- Jackson, Frank (1979). "On Assertion and Conditionals", Philosophical Review, 88, pp. 565-589.

- Jackson, Frank (1987). Conditionals. Oxford; New York: Basil Blackwell.
- Jackson, Frank, Oppy, Graham and Smith, Micheal (1994). "Minimalism and Truth Aptness", Mind, Vol. 103, No. 411, pp. 287-302.
- Jeffrey, Richard (1981). Formal Logic: Its Scope and Limits, 2nd edition. New York: McGraw-Hill.
- Jespersion, Otto (1924). The Philosophy of Grammar. London: Allen and Unwin.
- Kneale, W. and Kneale, M. (1962). The Development of Logic. Oxford: Oxford University Press.
- Lance, Mark (1991). "Probabilistic Dependence Among Conditionals", The Philosophical Review, 100, pp. 269-276.
- Lewis, David (1973). Counterfactuals. Cambridge: Harvard University Press.
- Lewis, David (1976). "Probabilities of Conditionals and Conditional Probabilities", Philosophical Review, 85, pp. 297-315.
- Lyons, J. (1977). Semantics (2 Volumes). Cambridge: Cambridge University Press.
- Martin, C.B. (1994). "Dispositions and Conditionals", The Philosophical Quarterly, 44, pp. 1-8.
- McGee, Vann (1985). "A Counterexample to Modus Ponens", The Journal of Philosophy, 82, pp. 462-471.
- McGee, Vann (1989). "Conditional Probabilities and Compounds of Conditionals", The Philosophical Review, Vol. XCVIII, No. 4.
- McLaughlin, Robert (1991). "On the Logic of Ordinary Conditionals", Mind, 100, pp. 403-406.
- Mellor, D.H. (1993). "How To Believe A Conditional", The Journal of Philosophy, 90, pp. 233-248.

- Nute, Donald (1980). Topics in Conditional Logic. Dordrecht, Holland: D. Reidel Publishing Company.
- Oaksford, Mike (1992). "Reasoning with Conditionals Containing Negated Constituents", Journal of Experimental Psychology, 18, pp. 835-854.
- Odegard, Douglas (1993). "Truth Conditions and Contradiction", American Philosophical Quarterly, 30, pp. 363-372.
- Papineau, David (1989). "Conditionals", The Philosophical Quarterly, 39, pp. 493-498.
- Pendlebury, Michael (1989). "The Projection Strategy and the Truth Conditions of Conditional Statements", Mind, 98, pp. 179-205.
- Pollock, John L. (1976). Subjunctive Reasoning. Dordrecht, Holland: D. Reidel Publishing Company.
- Price, Huw (1988). Facts and the Function of Truth. Oxford: Basil Blackwell.
- Quine, W.V.O. (1952). Methods of Logic. London: Routledge and Kegan Paul.
- Ramsey, F.P. (1978). Foundations, ed. D.H. Mellor. London: Routledge & Kegan Paul.
- Ryle, Gilbert (1951). Essays on Logic and Language. New York: Philosophical Library.
- Shapiro, Stewart and Taschek, William (1996). "Intuitionism, Pluralism and Cognitive Command", The Journal of Philosophy, 93, pp. 74-88.
- Skyrms, Brian (1975). Choice and Chance. Belmont, California: Wadsworth Publishing Company.
- Skyrms, Brian (1984). Pragmatics and Empiricism. New Haven: Yale University Press.

- Sobel, Jordan Howard (1989). "Partition Theorems for Causal Decision Theories", Philosophy of Science, 56, pp. 70-93.
- Sorensen, Roy (1988). "Pragmatism, Junk Knowledge, and Conditionals", The Philosophical Quarterly, 38, pp. 433-454.
- Schiffer, Stephen (1987). Remnants of Meaning. Cambridge: MIT Press.
- Schiffer, Stephen (1996). Graduate seminar on Conditionals, The Graduate Center of the City University of New York.
- Stalnaker, Robert (1968). "A Theory of Conditionals", first published in Studies in Logical Theory, American Philosophical Quarterly, Monograph 2 (Blackwell, 1968), 98-112. Reprinted in Conditionals (1991), Frank Jackson, ed. Oxford: Oxford University Press, pp. 28-45.
- Stalnaker, Robert (1984). Inquiry. Cambridge: The MIT Press.
- Stevenson, Charles (1944). Ethics and Language. New Haven: Yale University Press.
- Teller, P. (1973). "Conditionalization and Observation". Synthese, 26.
- Strawson, P.F. (1986). "'If' and '→'", in Grandy, R.E. and Warner, R. (1986), pp. 229-42.
- Tichy, P. (1975). "A Counterexample to the Lewis-Stalnaker Conditional Analysis of Counterfactuals". Philosophical Studies, 29.
- Thomson, James (1990). "In Defense of >", The Journal of Philosophy, 87, pp. 57-70.
- van Frassen, Bas (1976). "Probabilities of Conditionals" in Foundations of Probability Theory, Statistical Inference and Statistical Theories of Science. Volume I. ed. W.L. Harper and C.A. Hooker. Dordrecht: Reidel.
- Ward, Shawn (1990). "Semantic Familiarity, Relevance, and the Development of Deductive Reasoning", 26, pp. 488-493.

Weinrich, Paul (1984). "Probabilities of Conditionals in Decision Theory", Pacific Philosophical Quarterly, 65, pp. 59-73.

Wright, Crispin (1992). Truth and Objectivity. Cambridge: Harvard University Press.

Wunderlich, D. (1977). "Assertions, Conditional Speech Acts and Practical Inferences". Journal of Pragmatics I.