THE INTERACTION OF CONDITIONALS, MODALS, AND MOOD

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Abstract

The dissertation is a study of the ways in which counterfactual possibilities are contrasted with the actual world in modal and conditional linguistic environments. Many modal and conditional sentences include embedded phrases that are evaluated at the actual world rather than at the possible worlds relevant to the truth of the overall sentence. This allows us to use language not merely to describe possibilities but also to make explicit comparisons and contrasts between counterfactual possibilities and the actual world. It is argued that the linguistic phenomena observed in sentences of this kind are problematic for the theoretical framework according to which modals are sentential operators. Instead, they support a view according to which language contains variables for possible worlds which can be either bound or left free by modals. This has the consequence that sentences do not vary in truth-value across possible worlds, which in turn has implications for the theory of assertion and meaning more generally. It is also argued that actually is not a modal, and that the role generally assumed by philosophers to be played by actually is in fact played by embedded sentences with different combinations of grammatical mood. Along the way, a number of syntactic and semantic analogies between modality and tense are examined and their consequences for various theories of conditionals are explored.
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Chapter 1

Introduction

1. Basic Theme

The following are all sentences about possibilities: ways the world could be.

(1) I could have been tall.
(2) You could have bought a car.
(3) If I were seven feet tall, I would be very tall.
(4) If you had bought a car, you would drive to work.

So too are the following.

(5) I could have been much taller than I am.
(6) You could have bought the car I am driving.
(7) If I were seven feet tall, I would be much taller than I am.
(8) If you had bought the car I am driving, I wouldn’t be driving it.

The sentences in the second group all share both a syntactic phenomenon and a semantic one that are lacking in the examples in the first group. The syntactic phenomenon is that all of (5)-(8) contain an embedded phrase in the indicative mood (indicated by underline). The indicative mood is the form used in sentences that are not about alternative possibilities at all but just state claims about how things are in fact: I am tall; I am driving a car. The semantic phenomenon, meanwhile, is that all of (5)-(8) induce a kind of explicit comparison or contrast among
possibilities that is not present in (1)-(4). In each of (5)-(8), the embedded indicative phrase, unlike the rest of the sentence, is not about the possible states of the world relevant to the overall sentence; rather, it is about the actual way the world is. (5) and (7) do not state that there are possible circumstances in which a person is taller than himself; rather, they involve counterfactual circumstances in which a person is taller than he is in the actual circumstances. (6) and (8) are true only if the speaker is in fact driving a car; if he merely could have been driving one, the definite description with the indicative mood phrase is empty. Thus in each case the indicative phrase is evaluated with respect to how things actually are, even though it appears inside a modal or a conditional that makes a statement about alternative possibilities.

Contemporary formal semantics of modality in both logic and natural language is grounded in the Leibnizian idea that to be possible is to be true in at least one possible state of the world and to be necessary is to be true in all possible states of the world. The terminology of *possible worlds* for possible states of the world, or ways the world could be, is standard (as is, perhaps by analogy with *at a time*, the choice of the preposition *at* to go with it). Thus possibility is truth at at least possible world, and necessity is truth at all possible worlds. Of course, since *possible* occurs in the phrase *possible world*, these formulations should not be treated as illuminating or explanatory definitions of possibility; as such, they would be blatantly circular. Their utility lies rather in the fact that they make the quantificational relationships among modal claims explicit: possibility is truth at *at least one* possible world; necessity is truth at *all* possible worlds. This allows a number of more complex linguistic phenomena to be given a formal analysis using the tools of logic and set theory.
Thus, (1) and (2) above can be paraphrased as follows.

(1a) There is a possible world at which I am tall.
(2a) There is a possible world at which you bought a car.

In (3) and (4), meanwhile, the antecedent of the conditional specifies the possible worlds at which the consequent must be true in order for the overall conditional to be true.

(3a) At the possible worlds at which I am seven feet tall, I am very tall.
(4a) At the possible worlds at which you bought a car, you drive to work.

However, if we try to give sentences with the embedded indicative phrases the analogous type of paraphrase in terms of possible worlds, we run into trouble.

(5a) There is a possible world at which I am much taller than I am.
(6a) There is a possible world at which you bought the car I am driving.
(7a) At the possible worlds at which I am seven feet tall, I am much taller than I am.
(8a) At the possible worlds at which you bought the car I am driving, I am not driving it.

(5a)-(8a) are not synonymous with (5)-(8). (5a) is absurd: at no possible world is anyone taller than himself. (7a), therefore, is similarly absurd: no matter how tall I am, I am not in any possible state of the world taller than I am. (5) and (7), however, do not absurdly state that I could have been taller than myself — rather they contrast my height in certain counterfactual circumstances with my actual height. (6a) is similarly a mistranslation of (6), and (8a) of (8). As stated earlier, for (6) to be true, it must be the case that the speaker is in fact driving a car, not merely that he could have been driving one. (6a), by contrast, merely states that it could have been the case that there was a car bought by the addressee and driven by the speaker. And analogously in the case of (8a).
All this is to gesture at the proper diagnosis of the common problem with (5a)-(8a). In each case, the embedded indicative mood phrase is evaluated not at the possible worlds selected by the modal or conditional, but rather at the actual world. Thus the truth-conditions of (5)-(8) are instead given correctly by (5b)-(8b).

(5b)  *There is a possible world at which I am taller than I am at the actual world.*

(6b)  *There is a possible world at which you bought the car I am driving at the actual world.*

(7b)  *At the possible worlds at which I am seven feet tall, I am much taller than I am at the actual world.*

(8b)  *At the possible worlds at which you bought the car I am driving at the actual world, I am not driving it.*

These examples show that it is not the case that an entire sentence within the scope of a modal, or an entire antecedent or entire consequent of a conditional, is evaluated at a single set of possible worlds in the way that is initially suggested by the intuitive paraphrase in the language of possible worlds. Rather, only some parts of a sentence in a modal or conditional are evaluated at other possible worlds; other parts, such as the indicative embedded phrases in (5)-(8), remain evaluated at the actual world just as they would if they were not in a modal environment at all. This aspect of language allows us to go beyond merely stating that some single state of affairs is possible or necessary; we can explicitly compare or contrast one set of possible worlds to another.

This phenomenon of cross-world comparison by means of embedded mood is the central topic of the dissertation. Given the existence of this phenomenon, we should not rest content as theorists of modality with identifying and formally describing the general principles governing
the interpretation of sentences such as (1)-(4) whose meaning does not involve this kind of comparison of one world to another. Granted, sentences of the simpler kind exemplified by (1)-(4) do raise many significant questions; the sets of possible worlds at which such sentences are evaluated vary from context to context — sometimes the set of epistemically possible worlds, sometimes the set of physically possible worlds, in conditionals perhaps only at the worlds most similar to the actual world — and the linguistic mechanisms that govern these different restrictions, as well as the logical principles that result from them, are complex. Here, however, we shall mostly not be concerned with these issues. Rather, the central question is: even given a criterion in a context for assessing possible worlds for salience or similarity to the actual world, what makes it the case that only some parts of sentences are evaluated at these possible worlds and others at the actual world?

2. Outline

There are three remaining chapters. I start by explaining in more detail why sentences contrasting counterfactual worlds to the actual world pose a problem for certain received views of modality and conditionals. According to the most common view in contemporary philosophy of language, modals and conditionals take entire sentences as arguments; while this is satisfactory for simple sentences like (1)-(4), it risks assigning sentences like (5)-(8) the kind of incorrect meanings given above in (5a)-(8a), in which the entire sentences are wrongly evaluated at other possible worlds. I then consider two possible solutions to the problem that are proposed by Lewis (1973): first that the indicative mood indicates that the phrase in question takes wide
scope outside the modal or conditional, and second, that the indicative mood indicates the presence of the actuality operator $A$, whose meaning is such that for any formula $p$, $Ap$ is true at a world just in case $p$ is true at the actual world. I argue that neither solution is satisfactory. I then go on to present my own account of the phenomena of embedded mood. This account involves variables for possible worlds that can be bound in modals or conditionals. I observe that the pattern of moods that seems intractable from the point of view of the conventional approach is in fact parallel to certain other patterns observed in other linguistic phenomena that are commonly analyzed in terms of bound and free variables. I use this analogy to argue that moods also appear either bound and free in modal environments.

Chapter 2 concludes with a more theoretical discussion of some consequences of this view for content and assertion. In particular, the view will give up the idea that the truth-value of a sentence, understood from the point of view of formal semantics, varies across possible worlds. But of course, sentences can still communicate contingent information, information that is true at some possible worlds and false at others. The view therefore requires a version of two-dimensionalism according to which the semantic content of a sentence, which does not vary in truth-value from world to world, is distinguished from the information communicated by an assertion of that sentence, whose truth-value does so vary.

Chapter 3 explores another consequence of my view, which is that there is no need in natural language for a term with the meaning of the actuality operator $A$. It is frequently assumed by philosophers that the English word *actually* has at least one reading where it is synonymous with the actuality operator $A$ of Crossley & Humberstone (1977). According to this purported reading, *actually* causes sentences within its scope to be evaluated at the actual world, even when
they are in the scope of a modal operator. I argue in this chapter, however, that this is false. 

*Actually* is not a modal term, and the reasoning that has led to the thought that it is such a term suffers from inattention to the kind of combinations of mood that are our focus here.

In the second part of Chapter 3, meanwhile, I use this claim about *actually* to examine some arguments that have been made against the view that the indicative conditional is a modal construction. Although the view that subjunctive conditionals, like (9), are modal constructions is relatively widely accepted, the view that indicative conditionals, like (10), are also modal constructions is more controversial.

(9) *If it were raining, the sidewalks would be wet.*

(10) *If it is raining, the sidewalks are wet.*

Many philosophers argue that indicative conditionals have the same broad kind of possible-worlds-based truth-conditions as subjunctive conditionals. Others, though, have argued that indicative conditionals such as (10) have the truth-conditions of the material conditional of truth-functional logic: that *if p, q* is true just in case *not (p and not q)* is true. Now, my aim in Chapter 3 is not to argue positively for a modal account of indicative conditionals from scratch, but rather to examine some arguments that exist in the literature to the effect that the modal account cannot be right because it is inconsistent with the interaction of indicative conditionals with *actually*. I argue that these arguments are unsound because they rest on an incorrect understanding of *actually* and mixed moods.

Chapter 4 deals with a somewhat different topic, though still one related to the overall themes of conditionals, mood and the relationship between counterfactual worlds and the actual world. It deals with the difference in meaning between indicative and subjunctive conditionals.
Leaving aside cases such as (7) and (8) in which indicative mood occurs in a phrase embedded inside a subjunctive conditional, there is still a question what the difference in meaning is between indicative and subjunctive conditionals that do not contain such embeddings. I propose that this difference also has to do with the conditionals’ relationship to the actual world: the antecedent and consequent of a subjunctive conditional are evaluated at non-actual worlds, whereas those of an indicative conditional may be evaluated at the actual world. After giving a basic outline of this view, I outline a number of considerations in its favour. Some of these have to do with crosslinguistic similarities between modality and tense; I argue that this view makes sense of some of these crosslinguistic data. I also argue more broadly, however, that this view predicts a number of phenomena concerning the appropriate uses of indicative and subjunctive conditionals correctly.

3. Indicative Conditionals

One additional note is in order before proceeding to the more substantive chapters. Of the various linguistic constructions examined in the dissertation, indicative conditionals in particular have been the subject of research programs that operate within a quite different theoretical framework than the one I am using here. I follow a considerable amount of the contemporary literature on modals and conditionals in formal semantics and philosophy of language in assuming a modal theory of indicative conditionals in which the semantics of indicative conditionals is based on possible worlds. Leaving aside the complexities that arise in cases with
embedded combinations of mood, the modal theorist claims (10) is true just in case the sidewalks are wet at certain possible worlds at which it is raining.

(10)  *If it is raining, the sidewalks are wet.*

There are, however, robust traditions that think of indicative conditionals differently. It is therefore worth concluding the introduction with a brief note about the contrast between the modal theory within which I operate and these other accounts. It is not one of the projects of the dissertation to settle the disputes between the modal theory of indicative conditionals and these other accounts; my brief discussion here, therefore, is not intended to provide conclusive arguments against the competing frameworks.

First, I assume that indicative conditionals have truth-conditions: some are true and others are false. A number of philosophers have advocated, by contrast, that the meanings of indicative conditionals should not be explicated in terms of truth-conditions at all but rather in terms of probabilities.¹ Now, both the advantages of truth-conditional semantics in general and the relationship between conditionals and probability are large subjects that deserve a separate treatment of their own; I will limit myself here to endorsing the objections to this view of Lewis (1976) and Lycan (2001) that we should be reluctant to give up truth-conditions for linguistic constructions that have the syntactic form of declarative sentences rather than non-truth-conditional constructions such as questions or interjections. Furthermore, the conditionals that combine indicative and subjunctive mood that are of interest here pose a particular challenge to the probabilistic account. Independently of any specific proposal, these conditionals show that it is not sufficient merely to give an account of purely indicative conditionals and a separate

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¹ See Adams (1965); Edgington (1995); Gibbard (1981); Appiah (1985).
account of purely subjunctive conditionals. Instead, our goal ought to be to determine the meaning of the indicative, the meaning of the subjunctive and the meaning of the conditional in such a way as to explain how the interaction of these three meanings produces the meaning of any given conditional with a given combination of moods. Although I will argue that these conditionals pose problems for a number of existing views, it is particularly difficult to see how this compositional interaction of meanings would work on a probabilistic theory of indicative conditionals since it is unclear on many of these accounts just which component parts of the conditional are supposed to be truth-conditional and which are supposed to contribute a probabilistic meaning.

Second, I hold that the following two kinds of judgement are robust and ought not to be abandoned in the absence of strong theoretical considerations against a semantics that upholds them. First, some indicative conditionals with false antecedents are true and others are false. Suppose that Mary is, in fact, in New York, though the speakers in the context of utterance do not know this. (11) is true while (12) is false.

(11) If Mary is in Boston, she is in Massachusetts.
(12) If Mary is in Boston, she is in California.

Second, the validity or invalidity of certain arguments is as would be predicted by a view according to which indicative conditionals with false antecedents can be false. For example, the following remarkable proof of the existence of God from Edgington (1991) is invalid.² (Edgington recognizes the argument as invalid and uses it to argue against the truth-functional view.)

² Edgington credits this argument to personal communication from W. D. Hart on p. 187 of her (1991).
(13) P1. If there is no God, then it is not the case that if I pray, my prayers will be answered.

P2. I do not pray.

C. There is a God.

Both these judgements rule out the analysis according to which the indicative conditional just has the truth-conditions of the material conditional of truth-functional logic. The material conditional is always true when its antecedent is false. The view that identifies the material and indicative conditionals therefore predicts that (12) is true, just like (11). This view also predicts, counterintuitively, that the argument for the existence of God is valid. Suppose that both premises are true. P2 entails that the smaller embedded conditional in P1 has a false antecedent, and so is true. Since the larger conditional in P1 has the negation of that smaller conditional as its consequent, its consequent is false, and so C is true by modus tollens. Advocates of this theory recognize some of these difficulties and have argued that they can be explained away on pragmatic grounds; these arguments, however, are not my focus here. This truth-functionalists theory of conditionals will reappear in Chapter 3 when a certain argument in its favour is criticized.

By contrast, both judgements can be correctly predicted by a modal theory. Leaving aside exactly which possible worlds are relevant, clearly there are ways of selecting worlds such that at the selected possible worlds at which Mary is in Boston, she is in Massachusetts, not in California: thus (11) is true while (12) is false. Meanwhile, suppose that at the actual world I do not pray, and furthermore, that there is no God. and furthermore, at the possible worlds at which

\[3\] See Grice (1989) and Jackson (1987).
there is a God, it is not the case that at the possible worlds at which I pray, my prayers will be answered. It does not follow that there is, in fact, a God.

For these general reasons, I subscribe to a modal theory of indicative conditionals.
Chapter 2

Quantifying Over Possibilities

1. Introduction

The dominant view of modality and meaning in contemporary philosophy and linguistics combines two theses: first, that the content of a sentence can vary in truth-value across possible worlds; and second, that modals are sentential operators that operate on this content.

The first thesis is that the semantic value of a sentence (or alternatively, the proposition denoted by a sentence), given a context of utterance, has a truth-value that can vary across possible worlds. Thus, for example, the semantic value of (1) is true at the possible worlds at which Caesar crossed the Rubicon in 49 BC, and false at the possible worlds at which he did not do so.

(1)  *Julius Caesar crossed the river Rubicon in 49 BC.*

(On some versions of the view a proposition just is the set of possible worlds at which it is true, but our discussion here will not depend on this identification).

The second thesis is that modals are sentential operators that operate on this propositional content. A modal operator attaches to a sentence, producing a new, larger sentence. A sentence formed in this way, by attaching a modal to some subsentence, denotes a proposition that is true at a possible world just in case the proposition denoted by the embedded subsentence is true at either one or all members of a certain other set of possible worlds. Which worlds are in this other set is determined by a combination of the identity of the modal and the context of utterance. Thus
where $M$ is a modal operator and $S$ is a sentence, $M(S)$ is also a sentence, with a semantics along the lines of the following schema.

$$[[M(S)]] \text{ is true at a world } w \text{ just in case } [[S]] \text{ is true at } Q \text{ member(s) of some set } W$$

of worlds.

Here $[[S]]$ denotes the semantic value of $S$, again disregarding the question of whether this is a set of worlds or some other entity, while $Q$ stands for some quantifier. The identity of $Q$ is determined by the identity of the modal $M$; if $M$ is a necessity modal such as must, $Q$ is all, whereas if $M$ is a possibility modal such as might, $Q$ is some. The identity of $W$, then, is determined by a combination of the context of utterance and the identity of $M$ in a variety of ways. $W$ might be the set of worlds which are metaphysically possible, physically possible, epistemically possible for some agents, and so on. $W$ might also be restricted to those worlds which are in some sense “closest” to the world of utterance according to some ordering of worlds. For example, we might attach a necessity modal to (1) to produce (2), which is analyzed as (2a), which in turn, when must is read in a (relatively simplistic) epistemic way, has the truth conditions depicted in (2b).

(2)  

Julius Caesar must have crossed the river Rubicon in 49 BC.

(2a)  

MUST (Julius Caesar crossed the river Rubicon in 49 BC)

(2b)  

$[[MUST (Julius Caesar crossed the river Rubicon in 49 BC)]]$ is true at a world $w$ just in case $[[Julius Caesar crossed the river Rubicon in 49 BC]]$ is true at all members of the set $W$ of worlds consistent with the speaker’s knowledge.
It is also common, meanwhile, to give conditionals a modal analysis — in some cases
only for subjunctive conditionals, but modal analyses of indicative conditionals in the general
tradition of Stalnaker (1975) are also widespread. Modal analyses of conditionals standardly also
give truth-conditions that involve the truth of the whole sentences embedded within the
conditional at various possible worlds. They hold that the conditional is true just in case the
proposition denoted by the consequent is true at some set of worlds at which the proposition
denoted by the antecedent is true:

\[
[[\text{If } S, S']] \text{ is true at a world } w \text{ just in case } [[S']] \text{ is true at } \mathcal{Q} \text{ member(s) of some set } W \text{ of worlds at which } [[S]].
\]

The preceding statement of truth-conditions is intended to be neutral with respect to the internal
syntactic structure of a conditional. Both the view according to which a conditional involves a	wo-place modal operator, advocated by Stalnaker (1968) for conditionals generally and Lewis (1973) specifically for counterfactuals, and the view of Kratzer (1981, 1986) that a conditional is formed from a restricted one-place modal operator, produce truth-conditions of this kind. I will adapt a term from Stalnaker (1975) — without adapting the exact theory in which his original term plays a role — and describe the worlds in the set \( W \) at which a sentence embedded within a modal or conditional is evaluated as the selected worlds.

I argue in this chapter, however, that this general picture is not correct. The semantic
values of sentences do not vary in truth-value across possible worlds, and modals and
conditionals do not involve sentential operators that operate on the semantic values of sentences.
Instead, modality in natural language is extensional. Sentences of natural language contain
variables that range over possible worlds. These variables have indexical meanings; given a
context of utterance, they receive individual worlds as semantic values when they are free. But they can also be bound by modals, which are quantifiers over possible worlds.

Thus for example, a sentence like (1) contains, as depicted in (1a), a free variable w that is assigned the actual world as its denotation when the context of utterance is in the actual world:

(1a)  *Julius Caesar crossed the river Rubicon in 49 BC at w.*

Given that the variable w receives the actual world as its denotation in a context of utterance at the actual world, this sentence’s truth-value does not vary from possible world to possible world. It is true at all worlds, even those at which Caesar did not cross the Rubicon, that Caesar crossed the Rubicon at 49 BC at the actual world. This variable can be bound by a modal. Thus in (2), instead of *must* being a sentential operator as depicted in (2a), it is a quantifier that can bind the variable in (1), as represented in (2c).

(2)  *Julius Caesar must have crossed the river Rubicon in 49 BC.*

(2a)  *MUST: Julius Caesar crossed the river Rubicon in 49 BC.*

(2c)  \( \forall w: \text{Julius Caesar crossed the river Rubicon in 49 BC at } w \).

The fact that (1) is true at all worlds therefore does not entail that (2) is true.

Views of this general kind have been advocated before, for instance by Stone (1997) and Schlenker (2006). The argument here, however, rests on a different phenomenon than those that they discuss. It has to do with the embeddings of phrases of different grammatical mood in modal and conditional environments.

The orthodox approach is adequate for simple sentences like (2). However, when we turn to modals and conditionals that embed additional subsentences, such as in relative clauses or comparative constructions, certain phenomena emerge which I will argue are problematic for the
orthodox framework. These phenomena show that modals and conditionals are not straightforwardly operating on the content of entire sentences to which they are attached, but rather interact distinctly with individual components of these sentences.

In certain environments, embedded indicative mood phrases are evaluated at the actual world rather than at the selected worlds, whereas similarly embedded phrases that are themselves in the subjunctive are evaluated at the selected worlds relevant to the truth of the overall modal or conditional sentence. Subjunctive conditionals are an example of such an environment; thus consider the distinction between (3) and (4) or between (5) and (6):

(3) *If I were seven feet tall, I would be much taller than I am.*
(4) *If I were seven feet tall, I would be much taller than I would be.*
(5) *If it weren’t raining, the lake we are looking at would look blue.*
(6) *If it weren’t raining, the lake we would be looking at would look blue.*

Uttered by a speaker who is five feet tall, (3) is clearly true. (4), by contrast, is false, no matter how tall the speaker is. Many people could have been taller than they are, but under no circumstances would anyone be taller than they would be. (5), meanwhile, is true only if the speakers are in fact looking at a lake, unlike (6), which can be true if the rain has not only given the lake a dismal grey appearance but also persuaded the speakers to abandon their plan to see it in favour of a day indoors. In these conditionals, it is not straightforwardly the case that the entire consequent is evaluated at the possible worlds at which the antecedent is true — rather, which parts of the conditional are evaluated at which worlds depends on the mood of the verb phrases involved. The embedded indicative phrases are evaluated at the actual world.
On the other hand, there are other modals and conditionals in which indicative mood phrases can be evaluated at other possible worlds rather than at the actual world. Thus contrast (7) and (8), on the one hand, with (9) and (10).

(7) _Bob could have been taller than he is._
(8) _If Bob were six foot five, he would be taller than he is._
(9) _As far as we know, Bob might be taller than he is._
(10) _If Bob is six foot five, he is taller than he is._

Both (7) and (8) are in the category described in the previous paragraph; they express a sensible contrast between the worlds at which Bob is six foot five and the actual world. In (7) and (8), the indicative mood phrase _he is_ describes Bob’s height at the actual world, which can be sensibly contrasted with his height at worlds at which he is six foot five. By contrast, the epistemic modal (9) and the indicative conditional (10) both seem absurd and infelicitous. They seem to claim that an obviously contradictory scenario in which Bob is taller than he is is possible. This infelicity is not explained on its own by any distinction between metaphysical and epistemic criteria for selecting worlds. If the indicative mood in (9), for example, brought us back to the actual world in the way it does in (7) and (8), then the only available reading of (9) would be true just in case there were epistemically possible worlds such that Bob was taller at those worlds than at the actual world. This would make (9) an informative and substantive utterance, roughly synonymous with _we don’t know how tall Bob is_ (leaving aside recherché cases in which his actual height is at the limit point of consistency with our knowledge). But it is not the most natural interpretation of (9). This suggests that the embedded indicative _he is_ describes his height not at the actual world but at the possible worlds relevant to the truth of the overall sentence. The
same applies to the indicative conditional (10); the consequent seems absurd, suggesting that both instances of \textit{he is} in the consequent are evaluated at the same possible worlds.

I will argue here that these phenomena are evidence that moods give rise to bound and free readings. Each embedded sentence contains a variable for possible worlds, as was the case in the simple (1). However, this variable can be either bound or free. It is bound in the cases where the embedded sentence is evaluated at the possible worlds relevant to the truth of the overall modal or conditional, where it is free in the other cases. Thus, to take one example, the difference in truth-conditions between (8) and (10) — over and above any difference in criterion by which possible worlds are assessed for nearness or salience — is explicated in terms of the fact that the indicative mood phrase in the consequent is free in (8), and is assigned the world of utterance as its denotation, whereas it is bound in (10).

\begin{align*}
(8) & \quad \text{If Bob were six foot five, he would be taller than he is.} \\
(8a) & \quad [\forall v: \text{Bob is six foot five at } v][\text{he is taller at } v \text{ than he is at } w]. \\
(10) & \quad \text{If Bob is six foot five, he is taller than he is.} \\
(10a) & \quad [\forall w: \text{Bob is six foot five at } w][\text{he is taller at } w \text{ than he is at } w].
\end{align*}

(The universal quantifier is used for convenience in (8a) and (10a), leaving aside the question of whether the worlds are restricted to those that are “nearest” in some sense; this question does not affect the basic binding mechanism).

A theory of modality of this kind requires a certain kind of two-dimensionalism. A sentence like (1), of course, communicates contingent information.

\begin{align*}
(1) & \quad \textit{Julius Caesar crossed the river Rubicon in 49 BC.}
\end{align*}
There are certain ways the world could be in which the sentence would assert a truth, and others in which it would assert a falsehood. A participant in a conversation who accepts an assertion of (1) thereby rules out certain possibilities. Specifically, to accept an assertion of (1) is to rule out all the possibilities in which Julius Caesar did not cross the Rubicon in 49 BC with his legions. All the possibilities in which he did so remain live options if they were so before the assertion. If, as is commonly thought, the semantic value of (1) is true at the possible worlds at which Caesar crossed the Rubicon at the date in question and false at other possible worlds, then the relationship between the sentence’s meaning and its ability to communicate this contingent information is straightforward. The assertion of a sentence rules out the possibilities in which it is false. On the view defended here, by contrast, the semantic value of an assertion of (1) is true at all possible worlds or false at all of them, regardless of whether Caesar crossed the Rubicon. For any world \( w \), an assertion of (1) at \( w \) is true at any possible world \( w' \) just in case Caesar crossed the Rubicon at \( w \). But whether Caesar crossed the Rubicon at some particular world does not vary from world to world. Thus the information communicated by an assertion of the sentence must be distinguished from the semantic value of the sentence, where the latter is conceived as the compositional contribution to the meanings of sentences in which it is embedded.

The remainder of the paper has five sections. In Section 2 I explain in more detail why the fact that indicative mood is evaluated at the actual world within certain modal environments is problematic for standard views of modals, focussing on the case of subjunctive conditionals. In Sections 3 and 4 I discuss two strategies that one might use to explain these data that already
exist in the literature. In Section 5 I present my positive view. In Section 6 I discuss some implications of the view for the general theory of linguistic content and assertion.

2. Mixed-Mood Conditionals

Quite independently of any other type of case, the environments in which indicative mood is evaluated at the actual world inside a modal or conditional are problematic for standard modals and conditionals. In explaining why, it will be helpful to focus on the case of subjunctive conditionals, for two reasons: first, the distinction between indicative and subjunctive mood remains clearer in conditionals than elsewhere in English, and second, there is a discussion of the kind of case that interests us here in Lewis’s classic (1973) discussion of counterfactual conditionals. Lewis notes that certain conditionals that compare non-actual worlds to the actual world pose a putative problem for his theory, puts forward a possible solution, and mentions another in a brief footnote. After summarizing the problem in more detail in this section, I will then go on to argue that neither of Lewis’s proposed solutions is successful.

Indicative mood phrases inside subjunctive conditionals are evaluated at the actual world rather than at the overall selected worlds. Recall (3) and (5).

(3)  *If I were seven feet tall, I would be much taller than I am.*

(5)  *If it weren’t raining, the lake we are looking would look blue.*

As was pointed out earlier, in each case the indicative mood embedded phrase is evaluated at the actual world for purposes of evaluating the entire conditional. (5) shows that this interpretation is not merely for reasons of charity, because the alternative reading is absurd; it would be a quite
natural state of affairs if the speakers would only be looking at the lake in the circumstances in which it was not raining, but this interpretation requires the *are* to be replaced by *would be*. Also, the phenomenon is not limited to the consequent:

(11) *If the truck were any heavier than it is, the bridge would collapse.*

Here the antecedent does not select worlds at which the truth is heavier than it is, but worlds at which the truck is heavier than it is at the actual world.

Now, the standard view of the semantics of subjunctive conditionals is that a subjunctive conditional is true just in case the proposition denoted by the consequent is true at certain selected possible worlds where the proposition denoted by the antecedent is true. This general statement applies regardless of whether the conditional is treated as a two-place sentential operator, as by Stalnaker (1968) or Lewis (1973), or involving a restricted one-place sentential operator as proposed by Kratzer (1981). It also holds independent of which worlds are selected. Following Lewis’s (1973) in particular, a variety of metaphysical accounts of similarity between worlds were developed; the more recent work of von Fintel (2001) and Gillies (2009), meanwhile, has focussed not so much on the metaphysics of similarity but rather on codifying the principles by which the linguistic environment itself affects the presence of possible worlds in the domain. But on all these accounts, there is some set of possible worlds at which the antecedent is true at which the consequent is evaluated.

The antecedent and consequent sentences of a subjunctive conditional, on all these views, denote the same propositions as the corresponding indicative sentences.

(12) *If it were raining, the streets would be wet.*

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4 See for example Bennett (1974) and Fine (1975).
The antecedent of (12) denotes the proposition that it is raining, while the consequent denotes the proposition that the streets are wet. There are no separate “subjunctive” propositions, for example, that it “were” raining, that can differ in truth-value at one and the same world from the proposition that it is raining. Rather, the reference to possible worlds is supposed to replace the distinction in mood in the object language. Thus the truth-conditions of (12) are as in (12a):

(12)  *If it were raining, the streets would be wet.*  
(13a)  *At the nearest possible worlds at which it is raining, the streets are wet.*

But now consider a subjunctive conditional that embeds an indicative clause:

(13)  *If it were raining, the streets which are dry would be wet.*

By analogy with the analysis of (12) as (12a), the semantics would seem to have the result that the truth-conditions of (13) are those of (13a):

(13a)  *At the nearest possible worlds at which it is raining, the streets which are dry are wet.*

But this cannot be right: at no possible world are the same streets both dry and wet. For similar reasons, the standard approach seems unable to explain the difference between (5) and (6).

(5)  *If it weren’t raining, the lake we are looking at would look blue.*  
(6)  *If it weren’t raining, the lake we would be looking at would look blue.*

It would seem, for instance, that (5) should be analyzed as (5a):

(5)  *If it weren’t raining, the lake we are looking at would look blue.*  
(5a)  *At the nearest possible worlds at which it did not rain, the lake we are looking at looks blue.*
But this is not the correct analysis. These are the truth-conditions of (6), where the embedded relative clause is itself in the subjunctive, just like the rest of the consequent. Thus, it seems as if this approach cannot explain the difference between (5) and (6).

3. Lewis’s Proposed Solution: Scope

Now, Lewis is aware that there is a potential problem for his theory here and therefore proffers a possible solution.\(^5\) He only discusses certain examples rather than giving an explicit theory of the role of mood, but the view can be discerned from the examples. The proposed solution can be straightforwardly adapted to the syntactic framework in which an if-clause is a restrictor, and is also adaptable to the case in which indicative mood returns us to the actual world in a bare modal outside a conditional. However, it is unsatisfactory.

Lewis’s main proposal is that the indicative mood phrases take wide scope outside the conditional and so are unaffected by its modal force. Thus, the definite description which includes an embedded indicative phrase in (6) would take wide scope:

(6) \(\text{If it weren’t raining, the lake we are looking at would look blue.}\)

(6b) \(\text{The lake we are looking at is an } x \text{ such that (if it weren’t raining, } x \text{ would look blue).}\)

Lewis uses a mixture of English and logical notation like that in (6b). It is familiar that definite descriptions and other quantifiers can vary in scope.\(^6\) And this proposal obtains the correct truth-


\(^6\) See Russell (1905); for the most prominent account in a more contemporary linguistic framework, see May (1991).
conditions for sentence (6). Since the phrase the lake we are looking at is outside the scope of any modal operator, it can only describe a lake at the world of utterance.

Lewis gives examples that do not on the surface involve a definite description or other quantifier, but instead a comparative construction (i.e. (adjective)-er than). He states that they involve wide-scope reference to a quantity. On his proposal, (14) would be analyzed as (14a).

(14) If my yacht were longer than it is, I would be happy.
(14a) The length of my yacht is an x is such that (if my yacht were longer than x, I would be happy).

Here the phrase longer than it is is translated into the length of my yacht, which denotes a quantity, and this latter phrase is outside the scope of if. And here again, we have the right truth-conditions. The phrase the length of my yacht is not in the scope of the conditional or any other modal operator and so the sentence compares the yacht’s longer lengths at certain counterfactual worlds to its length at the actual world.

The analogous view about bare modals would be that (15) should be analyzed as (15a):

(15) My yacht could have been longer than it is.
(15a) The length of my yacht is an x such that my yacht could have been longer than x.

Lewis does not give a general formula for obtaining the wide scope referential phrase from a given comparative construction, which might make the proposal appear slightly ad hoc at first glance. However, contemporary semantic theorizing about the comparative commonly postulates quantificational expressions at some level of analysis for degrees of this kind, like the length of my yacht.7

7 See for example Kennedy (1999) and Schwarzschild (2008).
The problem with this view lies elsewhere. The fact that an indicative mood phrase is evaluated at the actual world cannot, in general, be due to its taking wide scope. In the examples we have considered thus far, the indicative phrase is located within a definite description — either one which appears on the surface or one which is assumed in an analysis of comparative adjectives. When the indicative phrase is embedded inside certain other quantifiers, however, incorrect truth-conditions result from the scopal proposal. This observation was made about an example with an existential quantifier in the development of deontic logic by Castañeda (1967).

(16)  *It is obligatory that someone who chaired a meeting last year preside over the entire committee next year.*

Castañeda observes that any formalization in which the phrase *someone who chaired a meeting last year* takes wide scope over the deontic necessity operator *it is obligatory that* will have different truth-conditions from (16). Lewis’s scopal proposal would give (16) an analysis like (16a).

(16a)  *Someone who chaired a meeting last year is an x such that it is obligatory that x preside over the entire committee next year.*

But (16) does not state that there is a person such that it is obligatory for him or her to preside over the committee next year; if more than one person chaired a meeting last year, there may be no single person with such an obligation. For example, suppose that both Ann and Bob chaired a meeting last year. Prior to the decision of which of the two will preside over all meetings next year, it is not the case that either of them is such that it is obligatory that that person preside over every meeting next year. Humberstone (1982, 2004) and Wehmeier (2004) note that similar examples extend to non-deontic cases.
The problem extends to subjunctive conditionals as well.

(17) If every person who lives in Paris lived in London instead, Britain would be more populous than France.

(18) If most of the days on which it rained had been sunny, the crops would have succeeded.

(19) If exactly one team that plays in the National League were to transfer to the American League, baseball’s two major leagues would be equinumerous.

In (17), the constituent containing the indicative mood phrase lives in Paris that can take wide scope is every person who lives in Paris. The proposed analysis of (17) would therefore be (17a):

(17a) Every person who lives in Paris is an x such that if x lived in London instead, Britain would be more populous than France.

But this analysis gives incorrect truth-conditions. (17a) requires, for its truth, that every resident of Paris be such that if that person lived in London, Britain would be more populous than France. For this to be the case, the population of France could not exceed that of Britain by more than one. But these are not the truth-conditions of (17). In (17), the condition being introduced by the antecedent is for every person who lives in Paris to live in London. The universally quantified phrase must be within the scope of the conditional. But the indicative mood still describes the actual world; the conditional does not involve possible worlds at which everyone who at that world lives in Paris somehow also lives in London. For similar reasons, (18) cannot be read with the indicative phrase taking wide scope. If the crops in fact suffered from a severe excess of rain, (18) might be true without it being true that most of the rainy days are such that if that day had been sunny, the crops would have succeeded. (19), meanwhile, is true, since the National League has two more teams than the American League, but the proposed wide-scope analysis is false:
(19a)  *Exactly one team that plays in the National League is an x such that (if x were to transfer to the American League, baseball’s two major leagues would be equinumerous).*

Rather, every team that plays in the National League satisfies (19a)’s embedded conditional.

Thus, the proposal that the return to the actual world is due to the indicative mood phrases’ taking wide scope is not correct.

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4. An Alternative Solution: Adding Additional Operators

The issues raised by sentences of the kind just discussed, in which a component of the sentence within the scope of a modal operator is nevertheless evaluated at the actual world, have been discussed more extensively in connection with the expressive power of the formal languages of modal logic than in the study of the semantics of modality in natural language. The reason for this is that they pose a logical problem independent of those formal languages’ relation to natural language. The kind of sentences we have been discussing, in which other possible worlds are contrasted with the actual world, not only pose a problem for the semantics of modality in natural language but are outright inexpressible in the basic formal language of modal logic consisting of the terms of classical quantificational logic supplemented only with □ and ◊. I do not reproduce the formal proof here; the issue is discussed again in further detail in Chapter 3. The problem is exemplified, though, by the fact that (20) is not expressed by either of the possible scope combinations of ◊ and ∀, represented by (20a) and (20b):

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8 See Wehmeier (2003) and additional citations discussed on p. 57 of the dissertation.
(20)  *It could have been the case that everyone who is happy was instead unhappy.*

(20a)  \[ \forall x(\text{Hx} \supset \Diamond \text{Ux}) \]

(20b)  \[ \Diamond (\forall x(\text{Hx} \supset \text{Ux})) \]

Neither scope combination has the truth-conditions of (20). (20a) has the same problem as was just discussed in the case of mixed-mood conditionals; because the quantifier takes wide scope over the modal, (20) is true if every happy person is such that that person could have been unhappy, regardless of whether they could all have been unhappy together, unlike (20). (20b), meanwhile, where the quantifier takes narrow scope, states that it could have been the case that every happy person was unhappy, and thus presumably in a state of bittersweet ambivalence. In order to express claims like (20), richer formal languages have been developed with additional operators or other terms that enable such cross-world comparison.

The broad approach behind such logical languages is to divide the formulas into those next to which the modal operators have their usual effect and those next to which the modal operators are vacuous. A formula in the former category has a truth-value that varies across worlds in the conventional way, whereas one in the latter category has a truth-value that is fixed from world to world based on its truth-value at the actual world.

By far the best-known version of this approach among philosophers is to add to the basic modal operators the additional operator \( A \) (pronounced “actually”) of Crossley & Humberstone (1977). Crossley and Humberstone supplement the language of modal logic with an additional operator \( A \), such that \( Ap \) is true at all indices \( w \) iff \( p \) is true at the designated actual index \( w^* \). Since the normal interpretation given to the model theory for modal logics is that the indices are possible worlds and the designated index \( w^* \) is the actual world, this amounts to the claim that
$Ap$ is true at any world $w$ just in case $p$ is true at the actual world. Thus, for any formula $p$, $p$ and $Ap$ share the same truth-value at the actual world. But while $p$ can vary in truth-value at other possible worlds, the addition of $A$ puts the resulting formula into the second category described above: $Ap$ has the same truth-value at all worlds, and so the modal operators are vacuous when affixed to it: $Ap$ is equivalent to both $\Box p$ and $\Diamond p$. In a brief and suggestive footnote in his (1973), Lewis suggests that one might analyze the countercomparative cases discussed earlier without any transformation of scope using an operator of this kind.\[9\]

In this language with the $A$ operator, sentences without any modal operators at all are in the category that are evaluated at other possible worlds, just as those same sentences are in the simpler modal language without $A$. When a formula $p$, containing no modal operators, is embedded in a modal operator such as $\Box$, $\Box p$ is true just in case $p$ is true at all possible worlds: one needs $p$ to be attached to a further modal operator, $A$, in order for the truth of $p$ at the actual world to determine the truth of the overall modal claim $\Box Ap$. In this respect, Crossley and Humberstone’s language is dissimilar to the English examples discussed here. In these examples, the indicative, the form used in non-modal environments, return us to the actual world in subjunctive conditionals and certain other modal environments, without the addition of other linguistic material. This disanalogy has motivated the development of alternative modal logics in which formulas without any modal operators are evaluated at the actual world in the scope of modal operators, just formulas with $A$ in them are in the logic with the $A$ operator.

Humberstone (1982), for example, points out that instead of adding an actuality operator, one can achieve a similar increase in expressive power by adding a “subjunctive”

operator $S$ such that $\Box S p$ is true just in case $p$ is true at all accessible worlds, while adapting the semantics so that $\Box p$ is true just in case $p$ is true at the actual world. Intuitively, $S$ is, as Humberstone puts it, the “mirror image” of $A$: whereas in the system with $A$ a formula is presumed to be carried along to other possible worlds by a modal operator unless the modal operator’s effect is cancelled by $A$, in this system a formula is presumed to remain fixed at the actual world unless it is released by $S$ to be carried along by a modal operator. At the models in which $\Box p$ is true in the logic with $A$, $\Box S p$ is true in the logic with $S$, whereas at the models in which $\Box A p$ is true in the logic with $A$, $\Box p$ is true in the logic with $S$. Wehmeier (2004, 2005), meanwhile, motivated by similar phenomena as the ones we are considering here, develops a logic in which rather than additional operators, there are two sets of predicate symbols, the indicative ones and the subjunctive ones. For each $n$-place predicate $P$ there is an additional subjunctive version of the predicate $P^s$; the modal operators are vacuous next to the indicative versions of the predicate, but have their more familiar effect next to the subjunctive versions of the predicate.

Each of these three logics can express the formerly inexpressible (20):

(20)  \textit{It could have been the case that everyone who is happy was instead unhappy.}

(20c)  $\Diamond (\forall x (A(Hx) \supset Ux))$ (Crossley & Humberstone 1977)

(20d)  $\Diamond (\forall x (Hx \supset S(Ux)))$ (Humberstone 1982)

(20e)  $\Diamond (\forall x (Hx \supset U^s x))$ (Wehmeier 2004)

In each of these three cases, the basic, non-modal formulas can be divided into those next to which modal operators are vacuous and those next to which they are not. One might propose, therefore, that the difference in meaning between indicative and subjunctive sentences in natural
language corresponds to the difference in meaning between these two kinds of formulas in these formal languages. Indicative mood formulas are those next to which the modal operators are vacuous, whereas subjunctive mood formulas are those next to which the modal operators have their usual effect. There are different ways of making the proposal more precise, corresponding to each of the logics discussed. One could postulate that indicative mood has the meaning of the $A$ operator while retaining the standard meanings for the modal operators; alternately, one could postulate that the subjunctive mood has the meaning either of Humberstone’s or of Wehmeier’s subjunctive forms while giving the modals the kind of meanings they have in these logics.

Syntactically, the latter style of approach is more plausible, since it is the unmarked indicative that remains evaluated at the actual world in the modals or conditionals in the environments we are considering. However, all three versions of this approach face their principal difficulties in common.

The first thing to note about this approach is that in an important sense, it is not a version of the orthodoxy, even though it does retain the view that modals are sentential operators. It gives up the idea that an ordinary indicative sentence has a truth-value that varies across possible worlds. In the model theory for the logic of Crossley & Humberstone (1977), a sentence of the form $A(p)$ does not have a truth-value that varies across possible worlds, and in the modal logics that have either a subjunctive operator or designated subjunctive predicates, a formula $p$ with no modal operators does not vary in truth-value across possible worlds. Thus, if indicative mood sentences have the truth-conditions of these types of formulas, they do not vary in truth-value across possible worlds. On the orthodox view, the semantic value of (1) is true at the possible worlds at which Caesar crossed the Rubicon in 49 BC and false at the worlds at which he did not.
Julius Caesar crossed the river Rubicon in 49 BC.

On the view now under consideration, however, (1) is true at all possible worlds, since it is true at the actual world. Now, the view I will defend in the subsequent section also has this consequence, so of course I do not take this as a sufficient reason to reject the view. It is worth noting, however, since some advocates of the view that modals are sentential operators, such as King (2003), take it to be an advantage of the view that modals are sentential operators, as opposed to quantifiers over possible worlds, that it has the consequence that sentences’ semantic values have truth-values that vary across possible worlds.

The real problem for this approach, though, is that it is false that indicative mood sentences are evaluated only at the actual world. As discussed in the introduction, there are certain modal environments in which indicative mood is evaluated at the actual world and others in which it is evaluated at other selected possible worlds. Up to now in this section, we have been attempting to explain just the first phenomenon. The scopal proposal was unsuccessful as an explanation of this phenomenon on its own terms; the proposal now under consideration can account for this phenomenon, but it is inconsistent with the existence of the other phenomenon. The proposal predicts that indicative mood should always be evaluated at the actual world in the scope of a modal or conditional, and so the modal operators are vacuous when affixed to indicative mood sentences. However, this is not correct.

First, an ordinary indicative sentence like (21) does not entail (22), even though (21) is in the indicative.

(21) The cat is on the mat.

(22) Necessarily, the cat is on the mat.
More natural examples reinforce the point that the idiom in which the modal adverbs *necessarily* and *possibly* are used instead of modal verbs such as *must* or *could* is not a philosophical artifice; an utterance of (23) is not automatically false just because it will in fact turn out to rain:

(23) *It won’t necessarily rain.*

Second, as mentioned at the opening, indicative mood does not necessarily bring us back to the actual world in certain other modals, as well, such as many epistemic modals. If it did, then the only interpretation of (9) would be that which is true if there are possible worlds consistent with our knowledge at which Bob is taller than he is at the actual world.

(9) *Bob might be taller than he is.*

Lastly, any view according to which the indicative mood always keeps us at the actual world obtains a view very much like the truth-functional account of the indicative conditional even if the semantics for indicative conditionals is strictly speaking modal. For suppose that two indicative sentences $S$ and $S'$ are true at all worlds if and only if they are true at the actual world, and that the indicative conditional *if S, S’* requires that $S'$ be true at certain selected possible worlds at which $S$ is true. Either $S$ is false at the actual world, in which case it is false at all worlds, and so the conditional is vacuously true since no worlds are selected, or $S$ is true at the actual world (and at all worlds), in which case, if $S'$ is false at the actual world (and at all worlds), the conditional is false, whereas if $S'$ is true at the actual world (and at all worlds), the conditional is true. In other words, the conditional is false if $S$ is true and $S'$ is false and true otherwise. So an indicative conditional will have the same truth-value, if not the same modal profile, as the corresponding material conditional. All indicative conditionals with false antecedents will be true.
5. The View: Mood as a Variable

The problem here is that the distinction between indicative and subjunctive does not so neatly correspond to the difference between sentences which are evaluated with respect to the actual world and those which are evaluated with respect to the selected worlds. While the approaches described in the previous section predict successfully that indicative and subjunctive mood should behave differently with respect to modal operators in which they are embedded, they still predict that the moods should behave constantly with respect to modals: a mood either is always evaluated locally at the worlds selected by a modal operating on it, or it is always evaluated at the actual world. We need a way of explaining the fact that indicative mood is evaluated at the actual world in certain counterfactual modal environments while evaluated locally at selected worlds in other modal environments. In the present section I propose that we achieve this result by postulating that a mood has the semantic value of a variable ranging over possible worlds which can be quantified over in a modal or conditional. I start by observing that the behaviour of moods which has been so challenging is in fact an example of a linguistically general pattern also displayed by pronouns and tenses. I then move on to propose that they should therefore be given a parallel analysis in terms of variables and quantification.10

10 In addition to the work of Partee’s which is mentioned below, certain linguists should be mentioned here upon whose work the general approach draws. The notion of feature as a presupposition upon the value of a variable is from Cooper (1982), while its extension to mood is adapted loosely from Portner (1995). The general parallel among pronouns, tenses and moods has been urged by Schlenker (2004b, 2006) regarding a number of other linguistic phenomena.
5.1 Determining Denotations

Consider how the denotation of pronouns is determined. First, in the basic case, a
singular pronoun denotes an individual:

(24) Bob spoke to her.

*Her* in (24) denotes a female individual; which one is denoted is made clear by the context (if the
utterance is felicitous at all). Usually this will be the person the speakers have just been
discussing, but it may also be someone physically present.

Second, a pronoun in the scope of a quantifier does not necessarily refer just to one
individual, but rather can apply to everyone picked out by the quantifier, even if
the pronoun is singular:

(25) Every woman listened to Bob speak to her.

Now, *her* here can be read as referring to a single woman as it does in the unquantified case, but
it can also be read as bound by the quantified *every woman*.

Third, this latter reading, where the pronoun has a bound quantificational reading, is
unavailable when the pronoun and the quantified noun phrase lack a relevant feature in common.
In the case of English pronouns, gender is such a feature.

(26) Every man listened to Bob speak to her.

Here the referential reading of *her* is forced by the gender mismatch of *man* and *her*.

Now consider how the present tense works. First, on its own, present tense
describes the present time:

(27) It is raining.
By contrast, when the present tense is embedded within a *when*-clause, it can pick out times in the past and the future:

(28)  *When it is raining, the streets are wet.*

This sentence can be true even if it is not raining and the streets are not wet at the time of utterance. If we imagine the *when*-clause as a quantifier over times (or as restricting such a quantifier), we see a parallel between this sentence and the quantified sentence above: it states that all times such that it is raining are such that the streets are wet at that time. And, like pronouns, the tense of the quantified phrase must match a certain feature — not male or female in this case but past or present — in order for binding to occur:

(29)  *When it was raining, the streets which are dry were wet.*

In the previous sentence, (28), the present-tense *are* could describe some past times at which it was raining, but *are* in (29) can only pick out the present. For the definite description in (29) to be felicitous, some streets must be dry at the time of utterance. *Are* cannot be bound by *when it was raining*, because a quantifier over times can only bind a tense with the same feature.

Mood and conditionals display the same pattern. Indicative mood, unembedded, tells us what is the case at the actual world:

(30)  *It is raining.*

By contrast, when embedded within a conditional of the right mood, the indicative mood can describe non-actual worlds:

(31)  *If it is raining, the streets are wet.*

But when embedded in a conditional antecedent of the wrong feature (indicative or subjunctive, in this case), the indicative reverts to denoting the actual world, as it does unembedded:
If we stipulate a technical sense of “salience” in which the present is always the most salient time and the actual is the most salient world, we can make the following generalization. Alone, a pronoun, tense or mood denotes the most salient entity of the relevant kind. Embedded within a certain kind of quantificational antecedent, it can distribute in some way over all the entities picked out by that antecedent. But if the antecedent does not match the pronoun, tense or mood in certain features (e.g. male/female, past/present or indicative/subjunctive), then this distributed reading is unavailable and only reference to a single individual is possible, just as in the unembedded case.

5.2 Explaining this Pattern Using Quantification

In each case, this pattern is reminiscent of the distinction between bound and free variables in quantificational logic. Quantificational structures in natural language are standardly analyzed using a version of classical logic in which a sentence receives a truth-value not just at a model but at a model and an assignment that assigns values to the free variables. A variable is assigned an individual of the relevant kind allowed by its feature. Where a variable attaches to a quantifier, the domain of the quantifier is restricted to objects that satisfy the feature of the variable. Pronouns are the basic case here; their analysis as variables is standard in natural language semantics. When a quantifier phrase and a pronoun do not match features (like gender), they cannot involve the same variable and so, just like different variables in predicate logic, the one cannot bind the other.

(24) *Bob spoke to her.*
(24a) Bob spoke to x.

(25) Every woman listened to Bob speak to her.

(25a) Every woman x listened to Bob speak to x.

(26) Every man listened to Bob speak to her.

(27a) Every man y listened to Bob speak to x.

This analysis predicts the readings of the natural language sentences in question.

Following a tradition that originates with Partee’s (1973) work on temporal anaphora and that has been used in much subsequent research into tense\(^\text{11}\), we can analogously treat tense here as a variable that denotes times. In this tradition, a tense acts as a variable which can be bound by a quantifier over times. And just like male and female pronouns, past and present tenses cannot receive the same variable. I use \(t\) to represent present-tense variables and \(s\) to represent past-tense variables. Let past tense variables have the feature past (i.e. before the time of utterance)\(^\text{12}\), while the denotations of present tense variables are restricted by no such feature; they can therefore denote any times but when free automatically denote the present.

(27) It is raining.

(27a) It is raining at \(t\).\(^\text{13}\)

(28) When it is raining, the streets are wet.

(28a) Every time \(t\) such that it is raining at \(t\) is such that the streets are wet at \(t\).

(29) When it was raining, the streets which are dry were wet.

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\(^\text{12}\) Though this will suffice for our purposes, it may be a simplification, due to the phenomenon known as sequence-of-tense where past tense is used for non-past times; see Ogihara (1996) and Abusch (1997).

\(^\text{13}\) Strictly speaking, what I have in mind here is that “It is raining” is a predicate of the variable \(t\), and there is no separate “at” in the logical form. But for the sake of readability, I use \textit{it is raining at \(t\)} rather than \textit{(it is raining)(\(t\))}. The analogous claim holds for all world and time variables.
(29a) *Every time s such that it is raining at s is such that the streets which are dry at t are wet at s.*

The analogous claim for mood is that the mood of a sentence has the semantic value of a variable. This means that when it is free, it denotes a single entity allowed by its feature. But it may also be bound by a quantifier. We obtain the right results if we let indicative mood variables be bound in conditionals with indicative antecedents, and subjunctive mood variables be bound in conditionals with subjunctive antecedents. Just as the present tense is assigned the present time as its denotation when free, so too is the indicative mood assigned the actual world. But again analogously to the present tense, it may be bound by a quantifier over worlds, and this quantifier may range over non-actual worlds as well as the actual one. Here I use $w$ to represent indicative variables and $u$ to represent subjunctive variables. Now, whereas the past tense restricts the times to those before the time of utterance, it is a little less clear just what modification to the selection of worlds is imposed by the addition of subjunctive morphology. The view of Stalnaker (1975), for example, would be adapted into the present framework as the view that subjunctive world variables have a feature something like “unconstrained by speakers’ presuppositions”. But the quantificational framework is independent of a specific view about this question, and other theories of the subjunctive could be incorporated into the view as theories of the content of the subjunctive feature. (I will make a different proposal of my own about this question in Chapter 4).

(30) *It’s raining.*

(30a) *It’s raining at $w$.*
If it is raining, the streets are wet.

Every\textsuperscript{14} world \( w \) such that it is raining at \( w \) is such that the streets are wet at \( w \).

If it were raining, the streets would be wet.

Every world \( u \) such that it is raining at \( u \) is such that the streets are wet at \( u \).

If it were raining, the streets which are dry would be wet.

Every world \( u \) such that it is raining at \( u \) is such that the streets which are dry at \( w \) are wet at \( u \).

In (30a), the indicative world variable in the consequent is bound by the antecedent and so receives a bound reading. In (32a), by contrast, the indicative world variable is not bound by the antecedent and so can only receives a referential reading; it picks out the world assigned to it by the assignment, which by default is the actual one.

(I am assuming here that the subjunctive form a sentence takes in the antecedent of a conditional is semantically equivalent to the form it takes in the consequent, even though in English, subjunctive consequents are formed with \textit{would} whereas subjunctive antecedents undergo a direct transformation. \textit{Would} is the traditional subjunctive (and past) form of \textit{will}, so this phenomenon is related to the fact that for historical reasons whose semantic import is somewhat obscure, English often requires \textit{will} in the consequent while forbidding it in the

\textsuperscript{14} As explained later, I use “every” here for convenience’s sake; I do not mean to commit to the view that if \( p, q \) requires \( q \) to be true at all worlds where \( p \). One could replace “every world” with “the nearest worlds” in this section without affecting the basic point about quantification and variables.
antecedent, even where there is no temporal difference between the two, and where many other languages would represent them with the same grammatical form.)^{15 \ 16}

The point of the view is that an indicative world variable denotes the actual world when it is not bound, but when bound it can take us to all the worlds selected by the quantifier that is binding it. A subjunctive antecedent cannot bind an indicative consequent. Therefore, the indicative mood denotes the actual world when it is not in a conditional at all, and it denotes the actual world when it is embedded within a conditional of another mood. But it can describe other possible worlds when it is in the scope of an indicative conditional antecedent. This is just the pattern that initially seemed so unusual. We can therefore explain this pattern without postulating that indicative mood has a different semantic value depending on where it is embedded. The pattern can be explained with a standard adaptation of quantificational logic to quantificational structures in natural language.

Now, I want to remain neutral on questions about where exactly in the syntax these variables are located. They manifest themselves phonologically as modifications to the verb phrase, but so too does tense, which is often thought to have its own node separate from the verb phrase at some level of syntax. Furthermore, there are differing accounts of the relationship between mood and tense in recent linguistic literature. There is a certain trend, sparked especially by Iatridou (2000), towards thinking that the salient transformation between the conditionals

\[ \text{If the boss is a shareholder in the company, then refusal of its offer would have angered the mob. If refusal of its offer would have angered the mob, then acceptance of the offer was the prudent choice.} \]

The relationship between this \textit{would} and that that appears more traditionally in the consequent of subjunctive conditionals raises a number of complex issues; Burgess suggests that it may be here that the \textit{would} can be bound by a noun phrase like \textit{refusal of its offer}. 

^{16} \text{See Dale and Tanesini (1999).}

^{15} \text{John Burgess (p.c.) points out that there is a use of} \textit{would} \text{that can appear in both the antecedent and the consequent of what would otherwise seem to be indicative conditionals. If the boss is a shareholder in the company, then refusal of its offer would have angered the mob. If refusal of its offer would have angered the mob, then acceptance of the offer was the prudent choice. The relationship between this \textit{would} and that that appears more traditionally in the consequent of subjunctive conditionals raises a number of complex issues; Burgess suggests that it may be here that the \textit{would} can be bound by a noun phrase like \textit{refusal of its offer}.}
traditionally labelled by philosophers “indicative” and those called “subjunctive” is in fact one of tense rather than one of mood. Iatridou proposes that what I have been calling “subjunctive” mood is strictly speaking an alternative form of past tense that receives a modal rather than a temporal interpretation. Some other recent research, by contrast, continues to use the traditional categories of indicative and subjunctive mood\(^\text{17}\). My use of the traditional vocabulary of subjunctive and indicative should not be read as taking a stand on this syntactic question. By “subjunctive” I just mean, stipulatively: the form that verbs take in the conditionals traditionally called “subjunctive”. If this is in fact a version of the past tense that receives a modal rather than a temporal interpretation, the claims I make about subjunctive mood should be read as claims about this past tense when it receives this modal interpretation. The exact place in the syntax where the mood is located depends on these details of the syntactic relationship between tense and mood.

5.3 Bare modals

In the case of modals that do not involve conditionals, the view postulates an analogous distinction of modals into those which bind the indicative mood and those that do not. Thus, the analysis of (9) would be (9a) while that of (7) would be (7a):

(9) \( Bob \) might be taller than he is.
(9a) Some world \( w \) is such that Bob is taller at \( w \) than he is at \( w \).
(7) \( Bob \) could have been taller than he is.
(7a) Some world \( v \) is such that Bob is taller at \( v \) than he is at \( w \).

\(^{17}\) See for example Schlenker (2004b).
The nature of the difference between the modal in (7) and that in (9) is less clear on the surface here than it was in the case of conditionals. In the case of conditionals, it was relatively clear that the difference in feature which prevented the indicative from being bound corresponded to a difference in mood between the embedded indicative clause and the main verb of the antecedent. It does not seem so clear that the could in (7) is subjunctive while the might in (9) is indicative.

Now, I want to refrain here from making a detailed suggestion as to how exactly the mood and tense features on a modal affect the combinations of moods and tenses that it binds. It is at this point that the current research mentioned earlier about the relationship between counterfactuality and past tense becomes most relevant, and the specifics of which modals have which features will depend on the outcome of some of that research in a way that requires a separate treatment. Condoravdi (2002), for example, points out that auxiliary verb have which is present in (7) but not in (9) is frequently present in modals that receive a counterfactual reading. This have + past participle (been in (7)) construction, she postulates, is an imperfective form which is receiving some kind of modalized reading. It does seem that this modal + have + past participle blocks the indicative mood from receiving a bound reading and causes us to return to the actual world. Iatridou also observes imperfective morphology being used to denote counterfactuality crosslinguistically. Without staking claim to an exact theory of why, we can tentatively hypothesize at this point that this modalized imperfect is a feature with some kind of non-indicative meaning that blocks binding of the indicative. There is, to be sure, more research to be done on the syntactic details of the process, but it is clear, at least, that the indicative mood has the readings within modals that show the pattern of bound and free variables.
5.4 Ordering

One other detail is worth mentioning. The presentation thus far has used the universal quantifier to represent the quantifier in a conditional. A conditional does not, however, require that its consequent be true at literally all possible worlds, no matter how remote or bizarre, at which its antecedent is true. But this fact is consistent with the analysis just given, because in natural language, the domain of a quantifier can be restricted to a set of contextually salient objects. We can speak truly of *every book* where we do not mean to speak of every book in the universe. Similarly, a conditional might mean *at every world where p, q* with the domain of *every world* restricted to those salient in the context of utterance. The view that a conditional requires the consequent to be true at all contextually salient possible worlds where the antecedent is true has been the subject of renewed interest, at least in the case of subjunctive conditionals, since it was defended by von Fintel (2001). The more familiar view of Lewis, though, is that even within a single restricted context, the antecedent does not select all possible worlds where it is true. In Lewis’s theory, the context does not only restrict the domain of worlds, but also induces an ordering on the worlds and that the antecedent selects the worlds which are closest to the actual world on that ordering. Intuitively, the worlds are ordered by how close they are to the actual world; Lewis discusses various ways of capturing this notion more formally in his (1973). Kratzer (1981) also argues that certain bare modals are sensitive to orderings on worlds as well.

It is therefore worth noting that we can just translate Lewis’s view about ordering into a version of the present view by specifying a quantifier that is sensitive to orderings. We can define such a quantifier $\forall^*$, meaning intuitively “all the closest”, such that $\forall^*xFx$ is true
at an ordered domain iff all objects in the domain which are nearest in the ordering satisfy Fx, and postulate that a conditional involves this quantifier.\textsuperscript{18} This quantifier is unfamiliar, but philosophically there is little new about it. It adapts the universal quantifier in roughly the same way as Lewis adapts the strict conditional operator, and as Kratzer adapts the necessity operator.\textsuperscript{19}

6. Content and Assertion

According to the view I have advocated, indicative mood admits of bound and free readings: in modal and conditional environments in which an embedded indicative phrase is evaluated locally at the selected worlds, the indicative mood is bound, whereas in those environments in which it is evaluated at the actual world, it is free. An ordinary indicative mood sentence contains a variable for a possible world that may be bound by certain modal terms.

This means that an unembedded plain indicative sentence, when asserted at a particular world and context, does not have a truth-value that varies across possible worlds. Consider an ordinary sentence in the indicative mood, without a modal, asserted in a particular context:

\textsuperscript{18} More formally, in order to deal with certain issues arising from infinitely descending orderings, the definition of such a quantifier requires a somewhat unwieldy formulation adapted from Lewis’ counterfactual operator: given a domain X and an ordering ≤ on X, \( \forall'x(Fx) \) is true iff for all \( x \in X \), there is a \( y \in X \) such that \( y \leq x \) and for all \( z \in X \), if \( z \leq y \), then \( z \) satisfies \( Fx \).

\textsuperscript{19} There is a third possibility. Although there have been many controversies about the semantics of definite descriptions, orderings on objects like that proposed by Lewis for counterfactuals do not appear in most positions. According to most views, there must be a unique contextually salient F for the F to denote something. However, Schlenker (2004a), drawing on suggestions from Lewis (1973, 1979), argues that definite descriptions are sensitive to ordering. On this view the F or the F’s do not denote the unique F or all the F’s in the context of utterance, but only those which are nearest according to some ordering on objects. This is the view that leads Schlenker to the conclusion that conditionals are definite descriptions: if both conditionals and definite descriptions are sensitive to ordering and conditionals involve object-language quantification, then conditionals can be treated as definite descriptions of worlds.
(1)  *Julius Caesar crossed the river Rubicon in 49 BC.*

This sentence has the truth-conditions of (1a), where the free variable *w* is assigned the actual world.

(1a)  *Julius Caesar crossed the river Rubicon in 49 BC at w.*

But given an assertion of (1) in a context, in which the indicative variable receives the actual world as its denotation, this sentence’s content does not vary across possible worlds at all: it is either true at all possible worlds or false at all of them that Caesar crossed the Rubicon in 49 BC at the actual world. This does not entail that Caesar necessarily crossed the Rubicon in 49 BC, since (1a) does not, of course, entail (1b):

(1b)  *∀w (Julius Caesar crossed the river Rubicon in 49 BC at w).*

It does, however, require that the semantic value of (1) as asserted in a context be distinguished from any notion of content which is required to vary across possible worlds.

There is still, however, a sense in which the assertion of a sentence like (1) communicates contingent information and rules out certain possibilities. In any context in which (1) is asserted and is not already known by all speakers, there will be possible worlds consistent with the speakers’ knowledge at which an assertion of (1) would assert a truth and those at which it would assert a falsehood. Specifically, at any world *w* at which (1) is asserted, the semantic value of that utterance of (1) is true if and only if Julius Caesar crossed the river Rubicon in 49 BC at *w* and false if and only if he did not do so at *w*. Thus, (1) asserts a truth in a context of utterance if and only if the world of utterance is one in which Caesar crossed the Rubicon in 49 BC.
The view requires that all sentences be assimilated to Stalnaker’s (1978) account of necessarily true sentences that communicate contingent information. Since Stalnaker’s work, it has been common to model the information contributed by the assertion of a sentence by postulating that assertions eliminate the worlds at which they are false from the set of worlds which are live options in the context. The basic idea is that at any moment in a conversation there exists a set of worlds, which Stalnaker calls the context set, which are being treated as live options for the purposes of a conversation. An assertion (or at least a successful assertion that goes unchallenged) eliminates the worlds at which the content of the asserted sentence is false from the context set. For example, on the traditional assumption that the content of (1) is true at the worlds at which Caesar crossed the Rubicon in 49 BC and false at worlds at which he did not do so, the assertion of (1) will eliminate the worlds at which Caesar did not cross the Rubicon in 49 BC from the context set.

Now, Stalnaker recognizes in his original paper that for certain sentences with indexicals whose content in a given context of utterance is fixed from world to world, the content which reduces the context set cannot be the semantic value of the sentence uttered in context. His example is:

(34) That is either Zsa Zsa Gabor or Elizabeth Anscombe.

Stalnaker points out that an assertion of (34) can clearly be informative despite the fact that given the theses of Kaplan (1989) and Kripke (1980) that demonstratives and names respectively are rigid designators, its semantic value when uttered in a context is either true at all worlds or false at all worlds. Yet clearly the sentence is informative. Stalnaker proposes that in such cases the context is reduced not by the proposition denoted by the sentence, but rather by the proposition
that is true at all worlds at which (34) asserts a truth. In the case of (34), this will be the set of worlds at which the person pointed to by the speaker is either Zsa Zsa Gabor or Elizabeth Anscombe. This is sometimes known as the “two-dimensional” model of assertion. The view about modality defended here has the consequence that all ordinary indicative assertions need to be assimilated to this two-dimensional model. Since all ordinary indicative mood assertions contain an indexical variable that denotes the actual world, their semantic value also does not vary from world to world. However, the proposition which is true at all worlds where a true utterance is made by (1) is just the set of worlds at which Caesar crossed the Rubicon in 49 BC, since the variable \( w \) will receive the world of utterance as its denotation in each case.

The general conclusion to be drawn is that the set of possibilities which are consistent with a sentence’s asserting a truth are not the set of possibilities at which the sentence’s semantic contribution to sentences containing it are true. The evaluation of indicative mood sentences at the actual world even when embedded in modals or subjunctive conditionals shows that the indicative mood sentence is true at any world just in case it is true at the actual world. But the assertion of the same sentence communicates information that is true at some worlds and false at others. This difference between two kinds of content corresponds to Dummett’s distinction between the **assertoric content** and the **ingredient sense** of a sentence.\(^{20}\) The assertoric content of an assertion, according to Dummett, is the content that divides the possibilities into those which in which the assertion is correct and those in which it is incorrect. This is the content that can vary in truth-value across possible worlds. By contrast, a sentence’s ingredient sense is its compositional semantic contribution to the content of larger sentences containing it. Ingredient

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senses are the subject matter of formal semantics, and it is the ingredient senses of modals and conditionals that we have been examining here.

Whether these two kinds of content are different has been the subject of a longstanding debate in the philosophy of language. Lewis (1980) argues for a certain distinction along these lines from a quite different starting point. Lewis argues essentially for the opposite thesis about tense (and certain other linguistic phenomena) to the one I am making here about modality. Lewis argues that sentences’ semantic value vary across times, since there are temporal sentential operators. But according to Lewis, the entities that play the role of the object of assertion and the propositional attitudes do not vary in truth-value across times. Lewis concludes therefore that the semantic values of sentences are distinct from the sort of traditional propositions whose truth-values vary only across worlds. Subsequent research by linguists on tense, however, has tended to reject the idea that there are temporal and locational operators that require the semantic values of sentences to be variable in this way. This research is summarized and endorsed by King (2003), who uses it to defend the identity of the semantic values of sentences with their assertoric content. King therefore rejects the distinction that Dummett, Lewis and I make (for separate reasons) and argues that the semantic value of a sentence denotes a proposition that varies in truth-value only across possible worlds.

The details of this dialogue about tense need not concern us here, since I am not in disagreement with King’s view that the semantics of tense in natural language is consistent with the lack of temporal sentential operators. The problem for the identification of the semantic value of a sentence with something that varies only across worlds lies instead with the semantics of modality. Essentially I have proposed that theorizing about modality should undergo an
analogous transformation to that documented by King in the study of tense. This upsets King’s balance on the opposite side as Lewis’s proposal. If moods admit of bound and free readings and modals are quantifiers rather than sentential operators, we have the opposite problem: not that the semantic values of sentences in context do vary across times and locations, but that they do not vary across worlds, unlike the propositions which they intuitively express. Dummett’s distinction between two kinds of content is thus vindicated. The semantic value of a sentence (what Dummett calls ingredient sense) is not the same as its assertoric content.21

21 One final technical qualification can be made about the thesis of the chapter and its relation to the distinctions between two kinds of content. One could, in principle, save the view that modals are sentential operators, but at the cost of giving up the idea that a sentence has a unified compositional semantic value at all. One could instead postulate two pairs of modal operators, an indicative pair of modal operators must and might on the one hand and a subjunctive pair musts and musts on the other, such that the indicative modals carried the indicative mood to be evaluated locally at the selected worlds while the subjunctive modals carried only the subjunctive mood to be evaluated at the selected worlds while leaving the indicative mood to be evaluated at the actual world. The subjunctive modals, on this view, would correspond to those that bind subjunctive world variables on my view and the indicative modals would correspond to those that bind indicative world variables. But the semantics would then require a sentence to be true at a different set of possible worlds for evaluating each pair of modals. An indicative sentence, for example, would be true at all possible worlds if true at all for the purposes of subjunctive modals, but would have a truth-value that could vary across possible worlds for the purposes of evaluating indicative modals. Now, we could model the semantic value of a sentence, for example, as a pair of sets of worlds, the first of which the indicative modals operated on and the second of which the subjunctive modals operated on. For any sentence S, Musti(S) would be true if all selected worlds were in the first member of S’s semantic value, while Musts(S) would be true if all selected worlds were in the second member of S’s semantic value. Here the two-dimensionalism would be clearly incorporated into the semantics in a quite direct way. Clearly we have abandoned the notion that the semantic value of a sentence is anything like a proposition in the traditional sense that also functions as the assertoric contribution to contexts in which it is asserted. I am unsure to what degree the differences between such a semantics and the approach developed here involving variables and quantification are substantive rather than notational. This dual-operator approach, just like mine, gives up the main philosophically interesting aspect of the orthodoxy, that a sentence denotes a single proposition that varies in truth-value at different possible worlds, at the cost of introducing a considerable degree of relatively unfamiliar technical apparatus.
Chapter 3

Against the actually of the philosophers

1. Introduction

Up to this point, the word actually has not appeared in any of the object-language example sentences we have considered. By contrast, the word will be our focus in this chapter.

It must be emphasized that the English actually is not the same entity as the actuality operator $A$ of Crossley & Humberstone (1977), despite the fact that that operator is often pronounced by philosophers as “actually”. The former is a term of natural language, whereas the latter is a term of a formal language with a meaning stipulatively introduced by logicians. Of course, the two might, as a matter of fact, have the same meaning. But this is a contingent thesis about the relationship between a term of natural language and a certain formal language. In principle, the formal operator $A$ could share its meaning with a different term in natural language, or with none. In Chapter 2, for example, we considered, but did not adopt, the proposal that the indicative mood feature itself shares its meaning with the actuality operator. It is a widespread assumption among contemporary philosophers, however, that the word actually has at least one reading on which it is synonymous with the modal logicians’ $A$. According to this assumption, actually has a substantive modal meaning and cause sentences to which it attaches to be evaluated at the actual world. I will argue here, however, that this claim is false. Instead, given a sentence $s$ of a given mood, actually $s$ has just the same semantic value as $s$. The role traditionally thought to have been played by actually is in fact played by mood, and inattention
to the details of mixed mood is the source of the idea that *actually* has the philosophically robust meaning it has been though to have.

This claim is related to the issues concerning mood and conditionals from the previous chapter in two ways. First, as was briefly gestured at in that chapter, the $A$ operator was introduced into modal logic to remedy a certain expressive deficiencies in logical languages that lack that operator. The standard language of modal logic without $A$ cannot express certain claims of the kind that are our focus here, those which compare one world to another. By contrast, formal languages that include variables for possible worlds do not have this expressive deficit; they may express all the propositions in question without the addition of any special terms. It follows that if English, for example, is a language with variables for possible worlds, it can express the claims in question without an actuality operator.

Second, the assumption that actually has a substantive modal meaning along the lines of the operator $A$ has been used as a premise in certain arguments in favour of a truth-functional, rather than a modal, account of indicative conditionals. In the second part of this chapter, I will argue that these arguments are unsound because the premise that the English *actually* has the modal meaning like that of the modal logicians’ $A$ is false.

The chapter has five remaining sections. The first is just a brief clarification about just what thesis about *actually* is being propounded. Second, I summarize the formal considerations about expressive power that led to the introduction of $A$. Third, I present the evidence that unlike the formal operator $A$, the English *actually* does not change the truth-conditions of sentences in which it appears. Fourth, I present the arguments against modal theories of indicative
conditionals that use conditionals’ interaction with actually as their key premise. Fifth, I explain why these arguments are unsuccessful in light of the mixed mood phenomena articulated thus far.

2. A Clarification

First, one technical clarification is in order about just what claim is being defended about actually. In Chapter 2 it was advocated that natural language contains extensional quantification over possible worlds. In languages with such quantification over possible worlds, modals are quantifiers rather than sentential operators. The reason for this is that since sentences’ semantic values do not vary in truth-value across possible worlds, modal sentential operators would be vacuous. Thus take the simple sentence (1). Given that the indicative feature on is a free variable that denotes the actual world, as depicted in (1a), it is true at all possible worlds, given that grass is green at the actual world.

(1) Grass is green.
(1a) Grass is green at w.

Now consider the English sentence (2), and contrast (2a) with (2b).

(2) Necessarily, grass is green.
(2a) ∀w (Grass is green at w)
(2b) □ (Grass is green at w)

The truth-conditions of (2) are correctly captured by (2a): all worlds are such that at that world, grass is green. By contrast, (2b), a sentence of a strange hybrid formal language that includes both sentential modal operators and variables of this kind, is not a correct translation of (2).
Given that the free variable \( w \) denotes the actual world, (2b) is true just in case at all worlds it is true that grass is green at the actual world. But this is not the meaning of (2). Suppose that grass is in fact green but could have been blue. Then (2a), like (2), is false, but (2b) is true.

Because modals are not sentential operators in languages with quantification over worlds — including natural languages, on my view — the claim that \textit{actually} is not a sentential operator would be consistent with the view that \textit{actually} is a substantive modal term on a par with \textit{necessarily} and \textit{possibly}, and would not constitute an interesting new thesis over and above the arguments advanced in Chapter 2 for extensional modal quantification. Rather, the thesis here is that \textit{actually} is not a modal at all, neither a sentential operator nor a modal of the quantificational kind that exists in my framework. Now, no-one, as far as I know, has developed a substantive modal meaning for \textit{actually} in a language with explicit quantification, in the way that \textit{necessarily} is defined as \( \forall w \) and \textit{possibly} is defined as \( \exists w \). It would, however, be reasonably straightforward to do so. In translating a modal operator into a language with extensional quantification over worlds, the translation of a modal operator is the quantifier used in the semantical clause in the metalanguage for that operator. Thus, since \( \Box p \) is true iff \( p \) is true at all possible worlds, \( \Box \) is translated as \( \forall w \), and since \( \Diamond p \) is true iff \( p \) is true at some possible world, \( \Diamond \) is translated as \( \exists w \). Just as \( \Box p \) is true just in case \( p \) is true at all worlds, \( \Diamond p \) is true just in case \( p \) is true at some world, \( Ap \) is true just in case \( p \) is true at the actual world. The natural extension then would be to treat \textit{actually} as a definite description of the actual world —as \[ \text{[The } w: w \text{ is actual]}[\text{grass is green at } w]. \]

Thus on the candidate proposal a sentence like (3) would have the meaning of (3a).

(3) \hspace{1em} \textit{Actually, grass is green.}

(3a) \hspace{1em} \text{[The } w: w \text{ is actual]}[\text{grass is green at } w].
The view of this chapter, however, is that actually is not a modal at all — neither the modal logicians’ operator $A$ nor a corresponding definite description such as [The $w$: $w$ is actual]. *Actually* $s$ has the same semantic value as $s$. Its contribution to the meaning of sentence is solely pragmatic, by drawing attention through increased wordiness to sentences whose truth is particularly surprising or noteworthy.

3. Expressive Power and Actuality Operators
This clarification aside, let us turn, then, to the question why languages with sentential modal operators require $\Box$ and $\Diamond$ to be supplemented with an actuality operator $A$ in order to express certain claims even though languages with variables for possible worlds do not need any additional modals beyond $\forall w$ and $\exists w$. This is a formal result already established in the logical literature that I do not reproduce in full here. Rather, I want to summarize the the basic point before moving on to the philosophical and linguistic applications of the result that are my interest here.

    The formal language of standard modal logic consists of the language of classical logic supplemented with the necessity operator $\Box$, and thus with the possibility operator $\Diamond$ which can be defined as $\neg \Box \neg$. In this language, certain intuitively comprehensible claims are inexpressible. Some of these claims, however, are expressible in a language which consists of the language of modal logic supplemented with the operator $A$, such that $Ap$ is true at an index for any formula $p$ just in case $p$ is true at the index that represents the actual world. By contrast, the claims which are inexpressible in the modal language unsupplemented with $A$ are expressible in a language
with variables for possible worlds. A language with variables for worlds and quantification over worlds does not need the addition of a term with a meaning like that of A in order to express these claims. It follows that if, as has been argued, English is a language with quantification over worlds, there is no need for a term with the meaning of the A operator in order to express all the propositions in question. The discussion of English actually will follow in the next section. In the present section I summarize the comparison of expressive power between the formal languages, giving examples of claims that are inexpressible in modal logic without A but expressible in a formal language with quantification over possible worlds.

The expressive deficit for the language of modal logic was first shown in the corresponding case in tense logic by Kamp (1971) and is examined at a greater level of generality in the comprehensive examination of expressive power in tense logic of van Benthem (1977); the modal analogue is discussed by Cresswell (1990) and a more accessible version of the proof is given by Wehmeier (2003). The reader is referred to these texts for a general proof of the inexpressibility claim; here I merely give the simplest example of the type of inexpressible sentence and the basic reason why it is inexpressible.

Consider the following sentence:

(4) *It could have been that everyone who lives in Britain lived in Spain.*

(4) is true just in case there is a possible world w such that everyone who lives in Britain at the actual world lives instead in Spain at w. None of the plausible scope combinations of the possibility operator and the universal quantifier produce an accurate translation of this sentence into the formal language of modal logic.
Since *lives in Britain* is evaluated at the actual world whereas *lived in Spain* is evaluated at other possible worlds, one might think as a first attempt that the possibility operator takes narrowest scope next to the open sentence *lived in Spain*. In all the formalizations, $Bx$ stands for $x$ lives in Britain and $Sx$ for $x$ lives in Spain.

\[(4a) \quad \forall x(Bx \supset \diamond Sx)\]

(4a), however, is not synonymous with (4). (4a) is true just in case everyone who lives in Britain is such that he or she could have lived in Spain, even if they could not all have lived in Spain together, which is required by (4).

The formalization in which the modal takes wide scope, however, is also unsuccessful.

\[(4b) \quad \diamond (\forall x(Bx \supset Sx))\]

(4b) however, does not have the truth conditions of (4); (4b) is true if there is a world at which everyone who lives in Britain at that world lives in Spain at that very same world.

The intermediate position for the modal, outside the scope of the conditional but inside the scope of the universal quantifier, produces an even wilder mistranslation. (4c) is true if at least one thing is a possible non-resident of England.

\[(4c) \quad \forall x(\diamond(Bx \supset Sx))\]

The sentence is expressible, however, if we add an actuality operator $A$ to the formal language, such that $Ap$ is true at a world just in case $p$ is true at the actual world.

\[(4d) \quad \diamond (\forall x(A(Bx) \supset Sx))\]

A language with explicit quantification over worlds, however, has no trouble expressing a claim like (4) without the addition of any special terms. In (4e), the variable $w_o$ is still distinguished from the variable $w_1$ and is thus not bound by the quantifier.
(4e) $\exists w_1(\forall x (\text{Ex at } w_0) \rightarrow \text{Sx at } w_1))$

A formal language with quantification over worlds does not, therefore, require an addition modal that returns the evaluation to the actual world. Because modals take entire sentences as arguments whereas quantifiers can bind certain variables in a sentence but not others, leaving the variable $w_0$ in (4e) free, and thus unaffected by the quantifier $\exists w_1$.

In Chapter 2 it was advocated that natural language contains variables that range over possible worlds. These variables are realized morphologically as modifications in the mood of verbs. In conjunction with the formal results just summarized, this thesis has the consequence that natural language does not require a separate term with a meaning like that of $A$ for reasons of expressive power.

Of course, the mere fact that a term is not needed in a language for expressive power does not itself show that the language does not contain that term. Languages can be expressively redundant. The preceding considerations, therefore, do not themselves show that the English $actually$ does not have a meaning like that traditionally assumed by philosophers. Nevertheless, as will be observed in the next section, attention to the behaviour of $actually$ confirms that it does not have this meaning.

4. Actually in English

The mainstream assumption is that $actually$ has the robust modal meaning of $A$; the addition of $actually$ to a sentence causes the sentence to be evaluated based on the local truth-value of the embedded sentence at the actual world. This claim about the meaning of $actually$ is frequently
assumed in discussions in diverse areas of philosophy; the only dissent I know of is Wehmeier (2004), who rejects it in the course of the development of the project of subjunctive modal logic mentioned in the previous chapter. The assumption, however, is not correct.

Now, there are sentences in which actually is attached to a phrase and in which the phrase with actually is evaluated at the actual world even though it is within the scope of a modal. This is the environment where it would be most plausible that actually has a philosophically robust meaning. For example, (4) above could have been rephrased as (5):

(5) *It could have been the case that everyone who actually lives in England lived in Spain.*

Here, however, the phrase being modified by actually — *lives in England* — is itself in the indicative mood and would in this environment be evaluated at the actual world even if actually were absent. The existence of sentences with actually attached to a phrase that is evaluated at the actual world even though it is within a modal does not show that actually itself changes the world of evaluation to the actual world. If some other feature of the sentences in question would cause them to be evaluated at the actual world irrespective of the presence of actually, then the fact that they are evaluated at the actual world even with actually does not show that actually is causing the sentences to which it attaches to be evaluated at the actual world. In order to show that actually did have this effect, we would need to provide a sentence where the combinations of moods are such that if actually were absent, a sentence would not be evaluated at the actual world, but when actually is added with no change in mood, the sentence is evaluated at the actual world. A survey of the relevant combinations of mood, however, shows that this does not happen in any combination of mood.
First, the indicative mood is evaluated at the actual world when it is embedded in a
subjunctive or counterfactual environment with or without actually:

(6) \textit{If I were seven feet tall, I would be much taller than I am.}

(7) \textit{If I were seven feet tall, I would be much taller than I actually am.}

Both (6) and (7) are true just in case, the nearest possible worlds at which I am seven feet tall are
such that I am much taller at those worlds than I am at the actual world. The fact that I actually am
allows a comparison to the speaker’s actual height in (6) is not evidence that actually is
affecting the world of evaluation, since I am in (7) allows the same comparison.

Second, where the indicative mood is evaluated at non-actual worlds since it is bound, it
does so even where actually is present.

(8) \textit{As far as we know, Bob may be taller than he is.}

(9) \textit{As far as we know, Bob may be taller than he actually is.}

(10) \textit{If Bob is seven feet tall, he is taller than he is.}

(11) \textit{If Bob is seven feet tall, he is taller than he actually is.}

In (8), the is is most naturally read as evaluated at the worlds selected by the modal may rather
than at the actual world. If the is had to be evaluated at the actual world as it does in (6), then (8)
would be true just in case there are worlds consistent with the speakers’ knowledge at which Bob
is taller than he is at the actual world. But on that reading, (8) would be a natural and potentially
informative sentence, roughly synonymous with “We don’t know how tall Bob is”, rather than an
admission of ignorance of the law of non-contradiction. If (8), however, expresses something
that cannot be true, the is is being evaluated at the same possible worlds selected by the modal
may; no person is taller than he is at one and the same world. But when we insert actually in (8),
the sentence remains bizarre. This suggests that \textit{actually} does not force the \textit{is} to be evaluated at the actual world. Similarly in the indicative conditional (10). One would not use (10) to make a cross-world comparison as in (6). According to a modal theory of indicative conditionals such as the one defended in the previous chapter, the \textit{is} is evaluated at the worlds selected by the antecedent. (10) therefore seems absurd, because it states that there are worlds at which Bob is taller than he is. But (11) similarly is absurd, and does not enable a cross-world comparison of the kind that can be made when the indicative is embedded in a subjunctive conditional. Thus \textit{actually} does not cause the \textit{is} to be evaluated at the actual world. Furthermore, this claim does not depend on a modal theory of indicative conditionals. Advocates of the truth-functional theory would claim that the \textit{is} modified by \textit{actually} in (11) is evaluated at the actual world, but they would also claim that the \textit{is} unmodified by \textit{actually} in (10) is also evaluated at the actual world, since other possible worlds do not enter into the evaluation of indicative conditionals at all. Thus the example still does not provide a case where \textit{actually} causes a phrase to be evaluated at the actual world that would not otherwise be so evaluated.

Third, \textit{actually} does not cause the subjunctive \textit{would} to be evaluated at the actual world where it would not otherwise be.

(12) \textit{If it were raining, it would be raining.}

(13) \textit{If it were raining, it would actually be raining.}

(13) is just as trivial as (12); it is true regardless of whether it is, in fact, raining. Both conditionals are true just in case at the selected possible worlds at which it is raining, it is raining. We can also make the point in a non-trivial, informative example:
If you had written some books but people said that you hadn’t written the books that you had written, you would be sad.22

If you had written some books but people said that you hadn’t written the books that you actually had written, you would be sad.

Neither (14) nor (15) requires the addressee to have in fact written books in the world of utterance; thus the had written following even more than is not evaluated at the actual world in either case.

5. Arguments Against the Modal Theory Using Actually.

Frank Jackson (1987) uses the interaction between conditionals and actually to argue against Stalnaker’s (1968/1975) modal theory of indicative conditionals. According to a modal theory of indicative conditionals, an indicative conditional is true just in case the consequent is true at the selected worlds at which the antecedent is true. (On Stalnaker’s exact view only one world is ever selected in a context, but this issue does not affect the argument here). Jackson points out that a sentence stating explicitly that things are other than as they actually are may appear as the antecedent or consequent of a subjunctive conditional, but not as the antecedent or consequent of a subjunctive conditional. For example, (16) might coherently be true, if Bob is six feet tall, while (17) is absurd, regardless of how tall Bob is.

(16) If Bob were seven feet tall, he would be taller than he actually is.

(17) If Bob is seven feet tall, he is taller than he actually is.

22 This is a variant of an example from Cresswell (1990) for which he cites Angelika Kratzer, p.c.
However, a modal theory predicts that both (16) and (17) are true just in case, at the nearest possible worlds at which Bob is seven feet tall, he is a foot taller than he actually is. There might be some difference in what worlds these are, because of a difference in how worlds are assessed for nearness for the purpose of evaluating the two conditionals, but this does not affect the present issue: if Bob is six feet tall, then all worlds at which he is seven feet tall are worlds at which he is taller than he actually is. The modal theory, according to the objection, therefore seems to predict that both (16) and (17) should be naturally assertible, and true if Bob is six feet tall; the fact that the indicative (17) is obviously false regardless of Bob’s height is therefore taken as evidence against this theory.

However, my view has a ready explanation of why (16) is felicitous and (17) is not which is consistent with an overall modal account of indicative conditionals. In (16), the indicative mood variable is free and therefore denotes the actual world:

(16a) \( (\forall v: Bob \text{ is seven feet tall at } v)(Bob \text{ is taller at } v \text{ than he actually is at } w) \)

By contrast, when the indicative variable is bound in an indicative conditional, it receives a bound reading, and so does not denote the actual world:

(17a) \( (\forall w: Bob \text{ is seven feet tall at } w)(Bob \text{ is taller at } w \text{ than he actually is at } w). \)

This version of the modal theory of indicatives predicts that (16) unlike (17) should be used for cross-world comparison and is not vulnerable to Jackson’s objection.

An alternative solution to Jackson’s objection is offered by Brian Weatherston (2001). Weatherston’s solution is not correct, in my view, but it illustrates a number of issues that arise from a certain sort of two-dimensional semantics different from the kind I advocated in Chapter 2.
Weatherson operates with the traditional framework in which there are no variables for possibilities in the language; indeed, like Lewis and Stalnaker and unlike Kratzer, his semantics is given in terms of a conditional operator that takes two sentences as arguments. Furthermore, he interprets the word *actually* as an actuality operator of the traditional kind. However, he uses the two-dimensional model theory of Segerberg (1973), in which a sentence is evaluated not at a single world but at a pair of worlds, interpreted in the manner of Davies and Humberstone (1981), in which the first world is thought of as the world of evaluation for the sentence in the conventional sense while the second is thought of as the world considered as actual. In a semantics of this kind, it is not simply the case that *actually s* is true at a world if *s* is true at the actual world. Rather, *actually s* is true at a world *w* considering a world *w’* as actual just in case *s* is true at *w’*. The truth-value of many sentences depends only on the world of evaluation; but the truth value of sentences containing the actuality operator depends also on the world considered as actual.

Weatherson then proposes a modal theory for both indicative and subjunctive conditionals like that of Stalnaker, but with an additional element designed to address Jackson’s objection. As in Stalnaker’s view, each type of conditional is true just in case the consequent is true at the nearest possible world where the antecedent is true, but the moods impose different constraints on which world is selected as the nearest by the antecedent. Weatherson, however, proposes an additional difference between indicative and subjunctive conditionals. In subjunctive conditionals, he claims, the antecedent and consequent are evaluated with the actual world considered as actual, whereas in indicative conditionals, the antecedent and consequent are evaluated with the selected nearest antecedent-world considered as actual. Thus in indicative
conditionals, actually $s$ is evaluated as true if $s$ is true at the world selected as the nearest where the antecedent is true, while in subjunctive conditionals, actually $s$ is evaluated as true if $s$ is true at the actual world.

Weatherson’s view, unlike the simple version of the modal theory considered by Jackson, correctly predicts that subjunctives like (16) make a coherent comparison across possible worlds while indicatives like (17) do not:

(16) *If Bob were seven feet tall, he would be taller than he actually is.*

(17) *If Bob is seven feet tall, he is taller than he actually is.*

According to Weatherson, since actually is evaluated with respect to the actual world (i.e. considering the actual world as actual) in (16), (16) is true just in case at the nearest possible world at which Bob is seven feet tall, he is taller than he is at the actual world. By contrast, in (17), since the selected world is considered as actual, (17) is true if and only if: at the nearest possible world at which Bob is seven feet tall, he is taller than he is at that world. But obviously, at no world is anyone taller than he is at that same world. This correctly predicts the difference in assertability between (16) and (17).

However, by locating the source of the difference in the interpretation of actually rather than in the mixtures of moods, this proposal makes mistaken predictions in two types of case: first, where actually attaches to a sentence in the subjunctive mood, and second, where indicative mood appears embedded in a subjunctive conditional without actually.

(13) and (15) from above are examples of the first type of case:
(13) *If it were raining, it would actually be raining.*

(15) *If you had written some books but people said that you hadn’t written the books that you actually had written, you would be sad.*

Since (13) is a subjunctive conditional, it should be evaluated with the actual world considered as actual, so the consequent is true at a world just in case it is raining at the actual world. This has the consequence that (13) should be true if and only if it is raining at the actual world. But this is incorrect; (13) is trivial. Similarly, (15), if actually is a rigidifying operator evaluated with respect to the actual world as Weatherson proposes, should require that the speaker in fact wrote some books. But this is incorrect. This again shows that even though the conditionals in question are subjunctive rather than indicative, actually is not behaving like an actuality operator considering the actual world as actual.

Second, Weatherson’s semantics has no way of distinguishing (18), where the indicative appears embedded in a subjunctive conditional, from (19), which is entirely in the subjunctive.

(18) *If Bob were seven feet tall, he would be taller than he is.*

(19) *If Bob were seven feet tall, he would be taller than he would be.*

Since neither conditional contains a term such as actually whose denotation at a world depends on which world is being treated as actual, there is no explanation of why (18) should contrast Bob’s height at the actual world to his counterfactual seven-foot height while (19) should be absurd. Indeed, as was articulated in Chapter 2 before the presentation of my own view, it is not very clear how sentences like (18) and (19) could differ in truth-value at all on the traditional Lewisian view that indicative and subjunctive conditionals involve the same propositions conjoined with a different conditional operator. Weatherson could advocate the proposed
solutions from Lewis’s (1973) that I criticized in that chapter, but he does not discuss this issue in his paper. As far as Weatherston’s semantics in his paper is concerned, (18) involves the same antecedent and consequent as (19) and should therefore have the same truth-conditions. This is a second incorrect prediction.

6. Williamson on Congruential Contexts

Williamson (2006, 2009) argues against the view that the indicative conditional is a modal constriction along similar general lines but at a much more abstract logical level. The basic general form of his argument, described at a very informal level, is that in languages with an actuality operator, sentences that have a certain combination of properties must have an extensional, non-modal meaning. He claims that indicative conditionals but not subjunctive conditionals have this combination of properties, and therefore concludes that only subjunctive conditionals can have a modal meaning. However, like Jackson’s original argument, this argument suffers from inattention to issues of mixed mood.

Williamson defines a sentential context, following the logician’s traditional usage where a “context” is a linguistic environment rather than an extralinguistic context of utterance, as an ordered pair of sentences <a, b>, where b, intuitively, is a subsentence contained in a. Then, where C is a sentential context <a, b> and s is a sentence, C(s) is the result of replacing every instance of b in a with s. A couple of examples will help illustrate the idea.
Where $C$ is $<p \& q, q>$, $C(r)$ is $p \& r$. (Each instance of $q$ in $p \& q$ has been replaced with $r$).

Where $C$ is $<p \lor (p \& q), p>$, $C(r)$ is $r \lor (r \& q)$. (Here each instance of $p$ has been replaced with $r$; since $p$ is the second member of the ordered pair $C$, and thus it is the part to be replaced.)

Williamson then defines three properties of contexts $C$ which he calls extensionality, nonhyperintensionality and congruentiality. They are defined as follows. In each definition the symbol $\mathbb{F}$ stands for logical truth, understood as truth in all models, while $\equiv$ represents the material biconditional.

First, a context $C$ is extensional iff for all sentences $a$ and $b$:

$$\mathbb{F}(a \equiv b) \supset (C(a) \equiv C(b))$$

Second, a context $C$ is nonhyperintensional iff for all sentences $a$ and $b$:

$$\mathbb{F} \vdash (a \equiv b) \supset (C(a) \equiv C(b))$$

Third, a context $C$ is congruential iff for all sentences $a$ and $b$:

If $\mathbb{F} a \equiv b$ then $\mathbb{F} C(a) \equiv C(b)$

Intuitively, a context is extensional if the substitution of a sentence with the same truth-value preserves truth-value; a context is nonhyperintensional if the substitution of a sentence with the same modal profile preserves necessary truth; a context is congruential if the substitution of a logically equivalent sentence preserves logical truth.

Williamson then proves that in a formal language with an actuality operator, every nonhyperintensional, congruential context is extensional. The reader is referred to Williamson’s
paper for the proof itself. The role of the proof for our purposes is that Williamson then argues that indicative conditionals are nonhyperintensional and congruential, and therefore extensional — i.e. equivalent to the material conditional.

Amidst all the technical details, the relevant ostensible difference between indicative and subjunctive conditionals is that indicative conditionals, but not subjunctive conditionals, are congruential — they always permit substitution of logical equivalents. Williamson’s premise in favour of this claim is that \( S \) and \( Actually \ S \) are intersubstitutable in indicative conditionals but not in subjunctive conditionals.

For any sentence \( S \), \( S \) is logically equivalent to \( Actually \ S \): this is common ground between me and Williamson, since on my view they have the same content, while Williamson is using an extensional notion of logical equivalence whereby two sentences are logically equivalent if it is a logical truth that they have the same truth-value at the actual world, even if they may differ in truth-value at other possible worlds. Williamson argues that when we replace some sentence \( S \) with the logically equivalent \( Actually \ S \) inside an indicative conditional, the sentence does not change truth-conditions. As we saw earlier with (10)-(11), this claim is correct.

(10) \( If \ Bob \ is \ seven \ feet \ tall, \ he \ is \ taller \ than \ he \ is. \)
(11) \( If \ Bob \ is \ seven \ feet \ tall, \ he \ is \ taller \ than \ he \ actually \ is. \)

Williamson also, however, claims that inside a subjunctive conditional, the addition of \( actually \) does change the truth-conditions of the conditional. His evidence for this, however, comes only from conditionals in which \( actually \) appears attached to a sentence in the indicative mood. He gives examples of subjunctive conditionals that contain an embedded indicative mood phrase with \( actually \), observes correctly that the embedded phrase is evaluated at the actual world, and
concludes that actually causes the embedded phrase to be evaluated at the actual world. He does not discuss the role of the embedded indicative mood in the interpretation of these conditionals. In fact, however, as was shown above, actually does not change the truth-conditions of subjunctive conditionals in which it is inserted without a change in mood. In particular, a subjunctive conditional that is a logical truth, like (12), remains just as trivial when actually is added.

(12) If it were raining, it would be raining.
(13) If it were raining, it would actually be raining.

Thus, in fact subjunctive conditionals are congruential by Williamson’s definition.

The formal claim Williamson proves, recall, is that in languages with an actuality operator with the property that \( p \equiv \text{Actually } p \) is a logical truth even though \( p \) and \( \text{Actually } p \) may differ in truth-value at a world, all contexts that are both non-hyperintensional and congruential are extensional. Amidst all the formalities, the key point regarding conditionals in Williamson’s discussion is that if actually \( p \) is always intersubstitutable with \( p \) in some context, that context is congruential. Williamson argues that while all conditionals are non-hyperintensional, only indicatives are congruential, and thus extensional. What we have shown is that in fact subjunctive conditionals are also congruential. This does not, however, entail that subjunctive conditionals are extensional, since Williamson’s proof is in conditional form. In languages without the actuality operator, a context may be nonhyperintensional and congruential without being extensional. In fact, English is such a language and both indicative and subjunctive conditionals are such environments.
7. Conclusion

In the previous chapter it was argued that natural language contains variables for worlds which can be bound in a modal or conditional sentence. One consequence of that view is that it does not make sense for an ordinary unembedded indicative sentence $S$ to differ in truth-conditions from $Actually S$, since the ordinary sentence $S$ contains a variable that receives the actual world as its denotation and so it is already, like $Actually S$, true at all possible worlds or false at all possible worlds. Indeed, in languages with explicit full quantification over worlds there is no need for an actuality operator at all, since the sentences that are inexpressible in modal logics that lack such an operator are expressible with full quantification over worlds. Given this background, we investigated whether there were in fact combinations of mood in which the insertion of the word actually changed the truth-conditions of a sentence without a corresponding change in mood. The answer was that there are not.

In the second part of the chapter this result was used to evaluate various arguments against the modal theory of indicative conditionals that rely on the existence of a distinct actuality operator in the language for their soundness. These arguments started from the observation that subjunctive conditionals with actually and an embedded indicative verb phrase allow a coherent contrast between the selected non-actual worlds and the actual world, whereas indicative conditionals with actually modifying an indicative verb phrase do not. They then proceeded to assume that indicative and subjunctive conditionals interacted differently with actually in a way that was inconsistent with the modal theory of indicative conditionals. In fact, however, they neglect to note that it is the embedded indicative mood rather than actually that allows the comparison between worlds. As a result, the three discussions of this issue are
mistaken, though in different specific ways in the case of Williamson’s general logical argument, Jackson’s simpler semantic argument and Weatherson’s response to it. The modal theory of indicative conditionals is consistent with the interaction of conditionals with actually.
Chapter 4

Counterfactuality and non-actuality

1. Introduction

This chapter, unlike Chapter 3, does not examine a specific consequence or aspect of the view developed in Chapter 2, nor does it concern the kind of mixed-mood cases that have been our focus up to now. It does, however, concern a question intimately linked to the overall theme of the differing role played by counterfactual worlds and the actual world in the conditionals of different moods.

The dissertation thus far has operated with a modal theory of conditionals, in which the semantics of both indicative and subjunctive conditionals is based on possible worlds. The traditional formulation of this view is that a conditional is true just in case its consequent is true at certain possible worlds at which the antecedent is true. Now, one of the main claims has been that this traditional version of the view, on which entire propositions have truth-values at individual possible worlds and modal claims are made by affixing sentential operators to entire sentences that denote those propositions, is inadequate to describe certain sentences in which situations in one possible world are contrasted with situations in another. An alternative account was proposed in which the language contains variables that denote possible worlds and which may be bound by a modal. But the basic semantics for ordinary conditionals without such embeddings, that do not compare different sets of possible worlds, was still modal. Thus, each of (1) and (2) is true if, at certain possible worlds at which it is below zero degrees celsius, the water will freeze.
If it is below zero degrees Celsius, the water will freeze.

If it were below zero degrees Celsius, the water would freeze.

Modal theorists of conditionals typically locate the difference in meaning between indicative and subjunctive conditionals in different criteria by which possible worlds are selected. Since (1) and (2) are not identical in meaning, (1) is postulated to select different possible worlds than (2). The nature of this difference is the subject of this chapter.

This is a separate question from the difference between bound and free readings of mood discussed in Chapter 2. Neither (1) nor (2) contains an embedded phrase with free mood. The indicative mood is bound in (1) and the subjunctive is bound in (2). Thus in both cases the consequent is evaluated at the selected possible worlds. But the fact that the sentences are not synonymous shows that there is a difference in which worlds at which indicative and subjunctive are evaluated even when bound and thus can both in principle be evaluated at non-actual worlds.

The view I propose is that subjunctive conditionals select only non-actual worlds, whereas if the antecedent of an indicative conditional is true at the actual world, the actual world is among those selected. A subjunctive conditional is true just in case its consequent is true at the nearest or most salient non-actual possible worlds at which its antecedent is true. An indicative conditional, by contrast, is true just in case its consequent is true at the nearest or most salient possible worlds simpliciter at which its antecedent is true, including the actual world if the antecedent is true there. What counts as nearby or salient varies widely from context to context: in some contexts, objective metaphysical criteria are in force, while in other contexts worlds are selected based on the knowledge of the speakers. But I will argue, contrary to the general tenor
of a good deal of the literature, that both indicative and subjunctive conditionals can select worlds based on either metaphysical or epistemic criteria.

Now, this issue is largely independent of the specific syntactic mechanism by which conditionals like (1) and (2) have their meanings. Some given way of selecting worlds for closeness or salience, for example, could be applied to (2) regardless of whether it is treated with a two-place sentential operator as in Stalnaker (1968) or Lewis (1973); a restricted one-place operator as in Kratzer (1981, 1986); or an object-language quantifier as in my Chapter 2. The specific version of the question within the framework of Chapter 2 is what restriction on worlds is imposed by the indicative and subjunctive features on world variables, in the way that masculine and feminine features on pronouns, for instance, restrict the interpretation of pronouns. But since this question is independent of the specific linguistic mechanisms proposed in Chapter 2, I shall largely speak here just in terms of the selection of worlds in conditionals of a single mood.

In examining which worlds are selected by a conditional, we face two particular challenges. First, the selection of worlds by conditionals is highly contextually variable, even with conditionals of just one mood. Thus Lewis’s (1973) pair:23

(3) If Caesar had been in command in Korea, he would have used catapults.
(4) If Caesar had been in command in Korea, he would have used the atom bom.

In certain contexts, it might seem like (3) is true; in others, it might seem like (4) is true. But surely they are not true in the same context. Rather, in some contexts this slightly strange antecedent selects worlds at which Caesar made it to Korea in ancient times, whereas in others it

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23 See Lewis (1973), p. 66.
selects worlds at which Caesar was alive during the Korean War of the 1950’s. Many other conditionals are similarly dependent on context. My interest here is certainly not in the details of all the contextually possible ways of selecting worlds. Rather it is merely in the general difference between what ways of selecting worlds are allowed for the evaluation of subjunctive conditionals and what such ways are allowed are allowed for indicative conditionals.

The second challenge is that even in a particular context, our intuitive judgements about conditionals are not so fine-grained as to deliver exact results about where the line is drawn between the worlds that are selected and those that are not. This is the very reason that there are so many competing accounts of the truth-conditions of indicative conditionals. Suppose that (1) is asserted in a context where winter is approaching and someone is explaining the basic mechanics of temperature to a child.

(1) \textit{If it is below zero degrees Celsius, the water will freeze.}

It may be clear enough that worlds where the physical interaction of temperature and water are so different from the actual state of affairs that water freezes at, say, 100° Celsius are excluded. But does the antecedent select all possible worlds at which the laws of nature are basically as they are at the actual world? All possible worlds at which the speaker’s knowledge is true? All possible worlds at which the speaker’s presuppositions are true? Consideration of this particular case on its own does not deliver any obvious answer to this question; any of these ways of selecting worlds delivers the result that the all the intuitively nearby worlds relevant in the context where it is below zero degrees Celsius, the water will freeze, and so the conditional is true. It is doubtful that the speaker’s intentions are explicit enough to rule out all but one precise way of selecting possible worlds. Since each conditional on its own does not deliver an exact
judgement about where the line is drawn between the selected worlds and those not selected, views on this question should be assessed on their ability to synthesize various cases and theoretical considerations.

2. Basic Outline of the View

To the reader to whom this view is unfamiliar, its intuitive point is unlikely to be immediately apparent. However, the sense in which subjunctive conditionals exclude the actual world according to this view is the same sense in which non-present tenses exclude the present time. The analogy between tense and modality will therefore be helpful in getting a basic feel for the view.

Consider the following two sentences:

(5) *When it is sunny, it is hot.*
(6) *When it was sunny, it was hot.*

(5) and (6) both state, roughly, that at the times at which it is sunny, it is hot. In (5), those times may include the time of utterance, though they need not: (5) may be true even if it is not hot and not sunny at the time of utterance. Because (6) is in the past tense, the times which the sentence is about must be earlier than the time of utterance. Whether it is sunny or hot at the time of utterance is simply irrelevant to the truth of (6).

Now consider (7) and (8):

(7) *If it is sunny, it is hot.*
(8) *If it were sunny, it would be hot.*
Both (7) and (8) state that at the worlds at which it is sunny, it is hot. The view I propose is that the difference between (7) and (8) is a modal analogue of that between (5) and (6). In particular, the relationship of the past tense in (6) to the time of utterance is the relationship of the subjunctive mood in (8) to the world of utterance. Both (7) and (8) state that at the worlds at which it is sunny, it is hot. In an indicative conditional like (7), those worlds may include the actual world, though they need not. In a subjunctive conditional like (8), those worlds do not include the actual world. Just as sentences with past-tense when-clauses describe only past times, so too do subjunctive conditionals describe only non-actual worlds.

A comparison with past tense shows that some of the basic patterns of assertability that are widely accepted about indicative and subjunctive conditionals are closely parallel to the patterns of assertability of sentences in present and past tense. This speaks in favour of these pragmatic patterns having a common semantic origin.

A past-tense sentence of the form when it was that p, it was that q does not require that either p or q be false at the time of utterance.24 If it is clear from the context that I am describing the events of some past day, I can state what happened when it was raining even if it is also raining at the time of utterance. Analogously, a subjunctive conditional need not have an antecedent that is false at the world of utterance. This is shown by Anderson (1951), who points out that a doctor examining a patient may utter (9):

24 I do not intend by this formulation to commit to the view that propositions change truth-value over times. The eternalist and the temporalist about the content of sentences agree that there is some abstract entity that can be associated with a sentence S that is true at certain times and false at others, though they disagree over whether this entity is the semantic value of S. P and q here should be thought of as ranging over these entities, whatever they may be. For example, in the framework discussed for tense in Chapter 2 by analogy with modality, these entities correspond to open sentences with their t variables not assigned a value in the context of utterance, but my hope is that the more informal presentation will facilitate communication of the issues that are of interest here.
If Jones had taken arsenic, he would have shown just exactly those symptoms which he does in fact show.

Neither the truth nor the assertability of this claim requires either that the antecedent be false or that the doctor believe it is false. Indeed, as Anderson writes, “in this context the doctor’s statement would probably be taken as support for the hypothesis that the patient took arsenic”. But the claim that the antecedent selects non-actual worlds in the way that the past tense denotes past times is perfectly consistent with this. Compare, for instance, (9) to (10): the latter clearly excludes the present time from the times described by the *when*-clause, but the hypothesis that the patient is currently suffering from arsenic poisoning at the time of utterance is consistent with the statement’s being both true and, like (9), explanatorily helpful to the doctor’s inquiry.

Whenever patients have suffered arsenic poisoning in the past, they have shown just the exact symptoms this patient shows.

By contrast, when it is presupposed that all members of a set of times are in the past, a *when*-clause that selects those times is appropriately stated only in the past tense. (11) is a natural utterance. (12), by contrast, is odd, and someone who asserts it might be suspected of not realizing that Aristotle is dead:

*When Aristotle lectured, he paced along a path.*

*When Aristotle lectures, he paces along a path.*

If the analogous relationship holds between subjunctive and indicative conditionals, antecedents which are presupposed to be true only at non-actual worlds — i.e., which are presupposed to be false — should be expressed in subjunctive form. This is the correct prediction.
(13)  *If Aristotle had been Egyptian, he would have written in hieroglyphics.*

(14)  *If Aristotle was Egyptian, he wrote in hieroglyphics.*

Just as it is very odd to assert (12) when it is taken for granted that Aristotle died centuries ago and thus no longer lectures, it is odd to assert an indicative conditional like (14) in a context in which it is taken for granted that Aristotle was Greek. Speakers who presuppose that Aristotle was actually Greek, however, can assert (13) naturally, just as those who presuppose that he no longer lectures can assert (11).

The main points here are that this view correctly predicts that counterfactual conditionals — those with false antecedents — should be expressed in the subjunctive but that subjunctive conditionals need not be counterfactual. The analogous claims with a tense that excludes the present make this clear. Of course, the view is not unique in making these predictions. What distinguishes the view from others is its ability to combine these basic phenomena involving presupposition and counterfactuality with two other more distinct aspects of the view. The first is the structural analogy between the subjunctive and past tense just discussed, and the second is that it does not postulate that the difference in the selection of worlds by indicative and subjunctive conditionals is directly based on the knowledge or presuppositions of speakers. Let us discuss each of these in turn.
3. Crosslinguistic Considerations

In making this proposal, I am inspired in part by some linguistic research on the use of past tense in counterfactual environments that are not about past times. As was briefly discussed in Chapter 2, Iatridou (2000) claims that the distinguishing linguistic element of so-called “subjunctive” conditionals is in fact not really the subjunctive mood but a past tense form that receives a modal rather than a temporal interpretation. Iatridou observes that many different languages use the past tense in the counterfactual environments that philosophers have traditionally called “subjunctive”, such as subjunctive conditionals. Indeed, although it may not be completely obvious at first glance, English is such a language. Even among speakers who still use the traditional subjunctive in English, the form in conditionals is always the past subjunctive \textit{if it were}, rather than the obsolete present subjunctive \textit{if it be}, and many speakers nowadays simply omit the subjunctive and use the traditional indicative past tense for these counterfactual conditionals.

(15) \textit{If it were sunny now, it would be hot.}

(16) \textit{If it was sunny now, it would be hot.}

(16) is a grammatical sentence of many English speakers’ idiolects which is synonymous with (15). The worlds selected by the antecedent of (16) are clearly not restricted to those at which it was sunny in the past, relative to the time of utterance. This fact is made explicit in (16) by the inclusion of \textit{now}.

This use of the past tense is not a quirk of English, caused for example merely by phonological similarities between the past and the subjunctive in English. Iatridou notes a number of examples from a variety of languages, drawing on other empirical linguists, in which
the past tense (or an imperfect form used for the past) appears in this environment. The phenomenon exists not only in many other Indo-European languages — she concentrates on Modern Greek — but also in languages as historically unrelated as Papago, Proto-Uto-Aztecan, Japanese, Korean, Hebrew, Turkish and Basque.\(^{25}\)

We do not generally expect an ambiguity that is a mere accident of phonology without semantic significance to reappear independently in geographically disparate languages that do not share a historical lexicon. It would therefore be surprising if the normal meaning of past tense were unrelated to the meaning it adopts in these subjunctive environments. It would be doubly surprising if the normal past tense and this “subjunctive” past not only had different meanings but fundamentally different kinds of meaning — say, if the difference between present tense and past tense were a straightforward semantic difference in truth-conditions while the difference between indicative and subjunctive conditionals merely represented a difference in presuppositions or other pragmatic factors. Of course, past tense and subjunctive do not have the same exact meaning and are represented differently in some other languages. But the data do favour the hypothesis that the meaning of the past tense can be naturally extended to subjunctive environments.

I do not take this crosslinguistic syntactic evidence to be sufficient evidence for any semantic proposal in the absence of evidence of a more traditional semantic kind. Nor, certainly, do I seek to offer a full and exact explanation of the evolution of this syntactic pattern in these various languages that do not share a common ancestry. I do want to point out, however, that the view I am advancing here postulates a certain common structure between the past in its

conventional temporal interpretation and the past in this “subjunctive” use, and even allows us to state a single meaning for the past tense at a certain level of generality that could be applied to both meanings: essentially, with respect to some domain of entities one of which is the location of the speaker, it excludes of the location of utterance, whether it be a world or a time. Conventionally, this meaning is applied to the set of times consisting of all past times and the present time, but it can also be applied to the set of worlds consisting of non-actual worlds and the actual world. Of course, past tense does not just denote simply exclusion of the time of utterance; future times are also excluded. But there is a sense in which the structure of possible worlds resembles that of the set of just one half of a temporal frame — including the present — rather than the whole set of times. There are not in any coherent sense two directions from the actual in the way that there are two directions from the present. This is why modal logic has just the one set of sentential operators □ and ◇ whereas tense logic has two sets of operators, one for the future and one for the past, each with one with a meaning more like □ (the “always” operators $H$ and $G$) and one with a meaning more like ◇ ($P$ for the past and $F$ for the future). The structure of the past and present alone is therefore better adaptable to the modal domain than the structure of all of time.

To be sure, this is fairly speculative and elides over a number of details in the semantics of past tense. My goal in this section, just to be clear, is not to argue that this is the only explanation of the linguistic connection between past tense and subjunctive conditionals, nor is it to argue that it is an overriding constraint on a semantic account of subjunctive conditionals that it postulate a univocal, unambiguous meaning for the past tense that can be applied both to the modal and the temporal domain. The goal is more modest: merely to point out that the
semantics for subjunctive conditionals at least renders the use of past tense intelligible and not an accident whose crosslinguistic reoccurrence would be very surprising, which provides some support for the view in conjunction with evidence of a more traditional semantic kind. By contrast, if the subjunctive feature involved in conditionals had nothing to do with exclusion of the index of utterance at all, but some unrelated metaphysical or epistemological criterion, then the use of past tense to express them would be more mysterious.

This position is an adaptation of the one that Iatridou herself proposes based on her data. Iatridou proposes that past tense denotes exclusion of not just the $x$ of utterance, where $x$ can range over times or worlds, but exclusion of what she calls “$C(x)$”, which she defines as “the $x$ that for all we know is the $x$ of the speaker”.$^{26}$ Here ($x$) can range over either times (excluding future times) or worlds.

Iatridou’s more complex formulation, however, is slightly puzzling on two grounds. First, since there is frequently more than one world such that for all the speakers know it is the world of the speaker, what I assume she means is that $C(x)$ is the set of $x$ such that for all $x$ in the set, we do not know that $x$ is the world or time of the speaker. Thus past tense in its temporal interpretation signifies that the times being described exclude the times $t$ such that for all the speakers know $t$ is the time of utterance. In its modal interpretation, meanwhile, it signifies that the worlds being described exclude the worlds $w$ such that for all the speakers know $w$ is the world of utterance.

Second, it is unclear what is motivating this introduction of epistemic relativity into the semantics of tense. On most theories of tense the truth-values of tensed sentences is determined

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simply by what is the time of utterance, and Iatridou’s paper, which is mostly devoted to the morphological data, does not discuss either her motivations for inserting this epistemic relativity into the semantics of tense or the implications of that view for the truth-conditions or assertability of past-tensed sentences or subjunctive conditionals. As will be discussed in the subsequent sections, there are views of conditionals in the literature that posit some connection between indicative conditionals and speakers’ knowledge, but Iatridou’s view is not identical to these. *Pace* Iatridou, the connection between modality and tense here is more straightforward here if we just adapt the standard position that past tense excludes the present time. And as I will argue subsequently, we can predict the right connections between knowledge and indicative conditionals even without including this explicit reference to knowledge in the semantics.

4. Non-Epistemic Readings

According to the established views in the literature which, like my view here, give a modal analysis to indicatives as well as subjunctives, the difference between the two is generally that indicatives are constrained in some way by the speakers’ knowledge or presuppositions. The most controversial consequence of my view is likely, therefore, to be that indicative conditionals may select worlds based on criteria other than the epistemic state or presuppositions of the speakers. However, there are many such contexts, and we can develop examples that make the point vivid.

Kratzer (1986) argues in her that an indicative conditional in many cases receives an epistemic interpretation. It is, however, not completely clear how universal this generalization is
supposed to be. She does not state outright that all indicative conditionals receive epistemic interpretations. There do seem to be occasional attempts in her work to assimilate apparently non-epistemic readings of indicative conditionals to epistemic readings; in her (1991), for instance, she states that mathematicians and logicians “behave like omniscient gods” in using the material conditional, since an epistemic conditional reduces to the material conditional if all facts are known, but this suggestion is omitted from more recent work. In providing explicit examples of non-epistemic indicative conditionals, therefore, it is not completely clear that we are refuting Kratzer’s 1986/1991 view, but the point is significant in its own right, showing that this tentativeness is not needed.

Some speakers, let us suppose, are in a state of serious geographical confusion. They are under the misapprehension that Vostok Station, the Russian Antarctic research station, is in fact near the equator. Furthermore, they have heard something about the seasons being the opposite way in different hemispheres, and from that they reached the false conclusion that the equator is wintry during the northern summer. They are discussing their friend, a scientist (who presumably would be under no such misapprehensions, though this does not affect the case).

(17) A. *I hear Professor X is at Vostok Station.*

B. *Well, Vostok Station is near the equator, and the equator is wintry at this time of year. So Vostok Station is very cold now. If he’s at Vostok Station, he’s surrounded by snow and ice.*

Speaker B is in a state of doxastic luck: his beliefs about the worlds are wildly false, but they are false in such a way that he can infer from them a conclusion that happens to be true. And both conclusions — that Vostok Station is very cold, and that if Professor X is there, he’s surrounded
by snow and ice — are true. There is no intuitive pull to the idea that of the two conclusions the speaker draws from the geographically confused premises, the first, that Vostok Station is very cold, is a truth stumbled upon by luck, while the second — the conditional — is false. Both conclusions follow equally from the premises. But it is false that the professor will see snow and ice everywhere in all the worlds consistent with the speakers’ knowledge in which he goes to Vostok Station. For all the speakers genuinely know, Vostok Station could be sunny and warm. Surely the right diagnosis is that the contextually salient criterion for selecting possible worlds is constrained by the actual facts about geography and weather. The speakers’ intentions to this effect are sufficient for their conditionals to be constrained by this criterion for selecting worlds even though their beliefs about those facts are false and thus not knowledge.

We do not need speakers with such wildly false beliefs to make the point. In another type of case, we do not know the truth of a conditional, even though we have not made any mistakes about what follows from our knowledge.

(18)  
A: Is it true that if I stop eating vegetables, I will get scurvy?  
B: I don’t know. I don’t know what causes scurvy.

But if indicative conditionals are purely epistemic, the conditional uttered by A should be clearly false, and recognized as such by B. After all, it is false that at all possible worlds consistent with the speakers’ knowledge where the speaker stops eating vegetables, he will get scurvy. Otherwise the question would not need to be asked. But this is also incorrect. Speaker A is inquiring not about what possibilities have been ruled out by their knowledge but about a scientific question about human health and nutrition.
What both cases suggest is that the selections of worlds by indicative conditionals can be constrained by facts about the world even if those facts are not known. In the first case, the worlds are constrained by the world’s geography; in the second, by the nutritional facts about human beings. Now, it has been advocated that epistemic modals themselves can select worlds based on objective features of the world unknown to the speakers when these facts could come to be known by a practicable investigation. With indicative conditionals, however, there does not seem to be any requirement that the facts be reasonably easy to discover for those facts to constrain the selection of worlds. Suppose that the conversation in (18) occurs centuries before the development of modern nutritional science, and the speakers have no feasible way of knowing the relevant facts. Still there is no inclination to say that the conditional is false just because it is not the case that at all worlds consistent with what is known to the speakers or could reasonably come to be known in the circumstances where the speaker stops eating vegetables, he will get scurvy.

Indicative conditionals are also unconstrained in many contexts by speakers’ presuppositions. There is no general requirement that the worlds selected by indicative conditionals be consistent with the presuppositions in force in the context of utterance.

Suppose that our same geographically misguided speakers, who believe that the equator is wintry, have heard instead that Professor X is in Singapore. And they presuppose — reasonably enough, given their beliefs about the equator! — that Singapore has a wintry climate. And so they believe they have reason to assert the following conditional:

(19) If Professor X is in Singapore, he is surrounded by snow and ice.

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Here the consequent is true in all antecedent-worlds where the presuppositions of the speakers are true: in the vocabulary of Stalnaker (1975), the consequent is true at all antecedent-worlds in the context set. But nevertheless (assuming that Singapore is its usual tropical self at the time of utterance) the asserted conditional is false.

Examples of this kind are easy enough to construct. Speakers who mistakenly presuppose the truth of Lamarckian evolution or the phlogiston theory of combustion do not assert truths when they utter (20) or (21) respectively:

(20) *If this giraffe stretches its neck, its offspring will have longer necks.*

(21) *If we burn a piece of wood, it will decrease in mass.*

Indicative conditionals are not generally about just what follows from our presuppositions. Generally, if one’s categorical beliefs about some subject is mistaken, one will have correspondingly mistaken conditional beliefs about that same subject. Mistaken beliefs about laws — either natural or juridical — produce mistaken beliefs about what will happen if one behaves in a certain way. Mistaken beliefs about ordinary matters of fact produce mistaken beliefs about what will turn out to be the case if some uncertain proposition is true.

Although the falsity of the speakers’ presuppositions is crucial to these cases, the assertions of the conditionals themselves do not suffer from presupposition failure. An assertion suffers from presupposition failure not merely when it is asserted in a context in which some of the presuppositions are false, but when the assertion’s *felicity* would require the truth of one of the presuppositions. But in these cases, the conditional is perfectly felicitous; it is merely false. Thus so long as we are using a notion of presupposition whereby an assertion is defective or
inappropriate if its presuppositions are not satisfied, there is no general rule that an assertion of
an indicative conditional presupposes that the worlds selected are within the context set.

These cases are problematic for the view of von Fintel (1997) and Schlenker (2004a), who both propose, broadly inspired by Stalnaker (1975) propose that indicative conditionals involve a presupposition that the domain of worlds is within the context set, a term coined by Stalnaker for the set of worlds consistent with the presuppositions of the speaker. In fact the domain from which the antecedent selects worlds may be outside the context set, and the conditionals do not suffer from presupposition failure in these cases.

Von Fintel describes his position as an adaptation of Stalnaker (1975). However, his position is crucially different from Stalnaker’s, and Stalnaker’s original view is in fact not susceptible to this type of counterexample. Stalnaker’s original constraint is as follows (emphasis mine):

“if the conditional is being evaluated at a world in the context set, then the world selected must, if possible, be within the context set as well (where C is the context set, if i∈C, then f(A,i)∈C). In other words, all worlds inside the context set are closer to each other than any worlds outside it”.

Whereas Von Fintel claims outright that there is a presupposition that the worlds selected are within the context set, Stalnaker holds only that this constraint applies if the conditional is being evaluated at a world in the context set. This is not merely a difference in generality. It is not the case, for example, that Stalnaker is giving conditions for evaluating the truth-value of a sentence at any world in principle while his later advocates are merely giving the truth-

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conditions of sentences at the actual world, where they are asserted. Instead, the views make different predictions for many cases in which the speakers are not themselves in the context set.

Presuppositions can be false. Stalnaker is explicit about this in his original work on presupposition, and rightly so: much of the explanatory work presuppositions are supposed to do requires this possibility, most obviously in accounting for the phenomenon of presupposition failure. Because presuppositions can be false at the world inhabited by their presupposers, speakers are often not in the context set. In the case of speakers in the actual world, the actual world is often outside those speakers’ context set. In such cases, a version of the theory in which the presuppositional constraint always holds, regardless of whether the evaluation is at a world in the context set, predicts that the worlds selected by the antecedent will be within the misguided context set. Stalnaker’s original view makes no such prediction.

In his (2005), meanwhile, Stalnaker admits that privately held beliefs may play a role similar to that played by presuppositions in his original theory, even if they are not admitted by all others present. It is therefore not worth putting too much emphasis on the public aspect of presupposition in examining Stalnaker’s theory. But of course, private beliefs may also be false.

The example above of the speakers who presuppose that Singapore has a wintry climate is problematic for the view of von Fintel and Schlenker. In this case it seems clear that when speakers have false presuppositions — i.e. when the actual world is not in the context set — that the worlds selected by the antecedent are not in the context set, even though the conditionals are indicative. And the subsequent examples showed that in general, when one has false presuppositions, a conditional will select worlds that are outside the context set. Von Fintel and Schlenker do not state that an indicative conditional always selects worlds within the context set,
merely that there is a presupposition to this effect. But as we saw in those cases, the fact that the conditional antecedent selects worlds outside the context set does not produce infelicity or presupposition failure.

None of these cases is a counterexample to Stalnaker’s own account. In each case, because the speakers have false presuppositions, the actual world is not in the context set and so the pragmatic constraint has no consequences at all for the selection function on worlds. This feature of Stalnaker’s view reveals that in a certain way it is closer to the spirit of this paper than von Fintel or Schlenker’s; it leaves significant room for the selection of worlds by criteria that have nothing to do with speakers’ presuppositions or knowledge, even when the conditional is indicative.

However, this same point reveals that Stalnaker’s constraint is incomplete in a certain way. It does not postulate a difference between the selection functions of conditionals in which the world of utterance is not in the context set. But the world of utterance is frequently not in the context set: all it takes is for one presupposition to be false in order for the world of utterance not to be in the context set. Stalnaker’s constraint no longer imposes any constraints at all on the selection of worlds once the speakers in the context have one false presupposition, and thus allows, like my view here, that conditionals can be evaluated at worlds at which speakers’ presuppositions are false.
5. Epistemic Readings

Thus, indicative conditionals can select worlds based on objective metaphysical criteria. The view also predicts that subjunctive conditionals should be able to select worlds based on epistemic criteria, when the speaker is in a position to assert that all the worlds selected are non-actual. But if we intend to select all worlds consistent with our own knowledge, we are not in a position to assert that all the selected worlds are non-actual. For a world to be consistent with one’s knowledge just is for one to be open to the possibility that the world is the actual one. To state that a possible world is both consistent with one’s own knowledge and non-actual is surely a pragmatic violation of the same general kind as Moore’s paradox: if a world is consistent with someone’s knowledge, how could they be in a position to state that the world is non-actual? The only way one can coherently state that a world consistent with some body of knowledge is non-actual is for the body of knowledge to be either someone else’s knowledge, or one’s own knowledge at some previous time. A speaker can know at the time of utterance that a world is non-actual even though it was consistent with his own knowledge at an earlier time, or with someone else’s knowledge. Thus, the view predicts that subjunctive conditionals can select worlds based on epistemic criteria, but only when the speaker is in a position to assert that all the worlds selected are non-actual.

Some cases from Edgington (2008) show that this is the correct prediction. The police are examining a crime, and the evidence rules out all but two possible suspects: Jones and Smith. The police detain the two suspects and interview them at length. This process leads to the discovery that in fact the guilty party is Jones. Afterwards, one of Smith’s friends confronts a
police officer, asking why Smith was subjected to such inconvenience when he was innocent of the crime. The police officer responds:

(22)  Because we knew that the crime was committed by either Smith or Jones; if it hadn’t been Smith, it would have been Jones.

In this scenario the police officer does not assert in any metaphysical sense that if Smith has not decided to commit his murder, then Jones, who in fact has never killed anyone, would have killed the very same victim. The worlds in which Smith does not commit murder and Jones does involve a greater rupture to the causal history of the actual world than those in which Smith does not commit his murder and Jones went on living his life just as he actually did. Rather, the assertion is that in the worlds consistent with the police officers’ knowledge at a previous time where Smith was not the murderer, Jones committed the crime in question. In this case the speaker is now in a position to know certain worlds consistent with his own earlier body knowledge are non-actual, and so can use the subjunctive form. Edgington uses cases of this kind to argue that subjunctives can be just as subjective and variegated as indicatives. But in fact they are part of a more systematic pattern: whether a conditional appears in the indicative or the subjunctive depends not on whether it receives an epistemic reading but whether the speakers can assert that the worlds consistent with the knowledge in question are non-actual. This would be problematic for a view which held that subjunctive conditionals always receive metaphysical interpretations.

Conditionals that select all the antecedent worlds where the knowledge of the speakers is true appear only in the indicative. It is this type of conditional that has most commonly been thought to justify a semantic link between knowledge and indicative conditionals. Suppose that
Allan has stolen my wallet but that all I know is that either Allan or Bob or Carol stole it. Suppose further that I subsequently come to know that Bob is not guilty; the remaining live options are Allan and Carol. In such a context I could assert something true by (23):

(23)  *If Allan didn’t take the wallet, Carol did.*

By contrast, suppose instead that after the initial state in which all three hypotheses about the culprit are consistent with my knowledge, I come to know that Carol is innocent of the crime. Now it seems I would assert something true by (24):

(24)  *If Allan didn’t take the wallet, Bob did.*

Considering each case on its own, the conditionals seem quite natural, but it is very odd that both should be simultaneously true. Indeed, Gibbard (1981) uses a case like this to argue that indicative conditionals do not have truth-conditions at all; but as Kratzer (1986) points out, we can save truth-conditions if we postulate instead that each conditional selects worlds based on the knowledge of the speaker. But of course, the mere existence of contexts of this kind is insufficient to show that indicative conditionals always select worlds based on consistency with the knowledge of the speakers.

The underlying theme of all the cases discussed is that the choice of whether to voice a conditional in the indicative or the subjunctive is not based on the criterion for selecting worlds, but has to do in most cases with whether speakers are open to the truth of the antecedent. In many cases, a speaker is open to the truth of the antecedent, but nevertheless intends that the possible worlds be selected on the basis of some objective scientific facts about the world. In most such cases, we use the indicative. Conversely, we can use subjunctive conditionals where

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29 I am assuming here that there is no particular reason to think that two people co-operated on the theft.
we intend the worlds to be selected on the basis of someone’s knowledge, so long as we are in a context in which it is coherent to assert that worlds consistent with that person’s knowledge are non-actual.

But crucially, because the view does not require that subjunctive conditionals be counterfactual, it leaves room for other reasons, besides disbelief in the antecedent, to use the subjunctive. Sometimes, for example, even though we are open to the truth of the antecedent, we do not want to draw attention to this fact, simply because it is upsetting. Compare:

(25) If you get hit by a car on your way to work tomorrow, I will be devastated.
(26) If you were to get hit by a car on your way to work tomorrow, I would be devastated.

On the view presented here, the choice of whether to assert (25) or (26) does not involve a different way of selecting possible worlds. Indeed, in most contexts, assuming the addressee does not actually get hit by a car, the most natural assessment (25) and (26) would select the same possible worlds. Rather, the subjunctive (26) is just slightly more delicate, because it is somewhat upsetting to confront the fact that the worlds where one’s loved one gets hit by a car could include the actual one.

6. Conclusion

The study of conditionals in the philosophy of language is noteworthy for the degree to which a number of competing views can explain difficult cases despite their radically distinct foundations. It is unlikely therefore that a new view will immediately dispel all alternatives. But I hope to have shown at least that the present theory has a number of advantages.
First, it captures the fact that there are readings of indicative conditionals in which the selection of possible worlds is based on objective features of the world rather than the knowledge or beliefs of the speaker. Using knowledge as a general constraint on indicatives is unsatisfactory because we can assert an indicative conditional truly even when it is not entailed by our knowledge. Using presupposition or belief as the criterion makes indicatives too subjective; it predicts that conditionals that seem wildly false are true just because their speakers’ false beliefs entail them.

Second, it explains how despite the ability of indicatives to be assertable in non-epistemic contexts, it also explains why normal epistemic contexts seem to require the indicative. It is infelicitous to state that worlds consistent with one’s knowledge are non-actual.

Third, it explains why conditionals that are believed to have false antecedents are voiced in the subjunctive, but does not require that subjunctives have false antecedents. If a speaker believes that an antecedent is false, of course he should also believe that all worlds where that antecedent is true are non-actual. But a speaker may have other reasons for only discussing non-actual worlds — for example, if the antecedent is painful to contemplate and so the speaker does not want to draw attention to the fact that it is a live possibility.

And lastly, it provides us at least with some headway in explaining why past tense should be used for subjunctive conditionals in so many unrelated languages.
Bibliography


