

KAI FREDERICK WEHMEIER

IN THE MOOD

*Dedicated to Detlef Böer, who taught me the subtleties of the Konjunktiv,
on the occasion of his retirement*

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ABSTRACT. The purpose of the present paper is to challenge some received assumptions about the logical analysis of modal English, and to show that these assumptions are crucial to certain debates in current philosophy of language. Specifically, I will argue that the standard analysis in terms of quantified modal logic mistakenly fudges important grammatical distinctions, and that the validity of Kripke's modal argument against description theories of proper names crucially depends on ensuing equivocations.

1. INTRODUCTION

We will be concerned with English statements that are usually characterized as metaphysically modal. That is, they pertain to how things might have been (and not to how someone wishes things would be, or takes things to be). Let me give some examples¹ of such statements:

Under certain circumstances, Aristotle would not have taught Alexander.

It is possible that I would not have given these lectures today.

It is possible that France should have been a monarchy, and that the king of France should have been bald.

If we had been finished packing Monday night, then we would have departed Tuesday morning.

The items in this (admittedly somewhat biased) list not only share the semantic characteristic of pertaining to counterfactual situations, but also the grammatical characteristic of containing verbs in a non-indicative mood, signaled by the modal auxiliaries 'would' and 'should', as well as, in the last case, the backshift in tense in 'had been finished'. In the sequel, I will refer to this grammatical phenomenon as 'subjunctivity'. This choice of



terminology is surely debatable; in official English grammar, only the verb in the antecedent of the counterfactual conditional above is a subjunctive, whereas all the other predicates are said to be in the ‘conditional’ mood. Grouping these two categories together does seem to accord with the practice of logicians, however (see, for instance, Nute and Cross, 2001, 2); and some natural languages, such as German and Latin, lack a separate conditional mood, expressing all counterfactuality by means of the subjunctive.²

As said, the list of examples is slightly biased in that it is not strictly necessary for a statement to contain a subjunctive in order to pertain to counterfactual circumstances. This is certainly the case with statements of necessity, such as

It is necessary that nine is greater than seven.

It is, however, always possible to paraphrase such statements in such a way that the paraphrase does involve subjunctives, witness

No matter how things might have gone, nine *would have been* greater than seven.³

There is, on the other hand, *no* way of paraphrasing a subjunctive conditional without the use of subjunctives – even Lewis’s logician’s English

If it *were* the case that we were finished packing Monday night, then it *would* be the case that we departed Tuesday morning,

by his own admission ‘obscure in meaning and of doubtful grammaticality’ (Lewis, 1973, 3), makes use of subjunctive verbs.

Finally, some logicians seem to claim that the possibility statements considered above may be expressed with indicative predicates only, the suggestion being, for instance, to write

It is possible that I didn’t give these lectures today

instead of our second example above. I doubt that this is right. In contradistinction to the subjunctive formulation, the indicative version seems to say not that, had the world developed in some way other than it actually did, I wouldn’t have given the lectures, but rather that I cannot exclude, on the basis of what I remember, that the lectures were in fact not given today. If this is right, then ‘it is possible that’ + indicative verb forces, or at least strongly suggests, an epistemic reading, rather than a metaphysical one.

It thus seems fair to say that metaphysically modal statements are typically, if not invariably, made by using the subjunctive mood.⁴ Given the prominence of arguments appealing to possibility and necessity in analytic philosophy over the past decades, it is rather surprising that philosophical

logicians have not deemed it worthwhile to develop a theory of the logical role of the indicative–subjunctive distinction. One might think at first glance that this is due to the utter simplicity of the problem, but I hope to make it plausible in the sequel that it is by no means trivial.

I begin, in Section 2, by discussing the naïve conception of the subjunctive that I take to underlie most philosophical and logical accounts of modal discourse. According to this view, differences in verb mood only serve to disambiguate the scopes of modal operators in natural languages and therefore need not be explicitly represented in logical form (where, *qua* logical syntax, scopes are already unambiguous). In Section 3, I adduce empirical evidence against this naïve conception, namely, statements of ordinary English for which the scope theory of mood predicts incorrect truth conditions, and whose logical form cannot be represented in standard modal predicate logic at all. Section 4 discusses the standard fix for this expressiveness problem, the actuality operator. Section 5 develops a new account of mood according to which indicativity and subjunctivity are semantically significant syntactic properties of individual predicates, rather than scopal properties of entire sentences. In Section 6, I apply this new theory to Kripke’s modal argument against description theories of proper names, showing that the argument crucially depends upon equivocating indicative and subjunctive predicates. The final Section 7 presents a summary of the discussion.

2. THE SCOPE THEORY OF MOOD

One might be tempted to think that there is no deep reason behind the grammatical distinction at issue, that choice of mood is simply a matter of style (or, in more Fregean terminology, that it pertains only to coloring, not to conceptual content). And this conjecture seems to be supported by the way we standardly analyze such sentences logically. Consider the following pair of sentences:

- (1) George Bush *is* not fond of broccoli.
- (2) Under certain circumstances, George Bush *would have been* fond of broccoli.

In modal predicate logic, we render (1) as

- (3) $\neg F(g)$,

and (2) as

(4) $\Diamond F(g)$,

not discriminating between ‘is fond’ and ‘would have been fond’ at all, in representing both predicates by the letter ‘F’.

Things look a little different, however, when we consider more complicated examples. Take the following pair of sentences:

(5) Under certain circumstances, someone who wouldn’t have been fond of broccoli would’ve been fond of broccoli.

(6) Under certain circumstances, someone who isn’t fond of broccoli would’ve been fond of broccoli.⁵

There *is* a logical difference here: (6) follows from (1) and (2), but (5) does not, in fact, (5) is a logical falsehood. To see what is going on, it will help to turn to the formal idiom of modal logic again. The natural formalization of (5) is

(7) $\Diamond \exists x(\neg F(x) \ \& \ F(x))$.

The case of (6) is more difficult: if we ignore verb mood, its sequential structure is exactly like that of (5), but its logical form clearly cannot be the same as that of (5). A moment’s reflection reveals that the solution consists in shifting the possibility operator further to the right, so that only the second occurrence of ‘F(x)’ comes to lie within its scope:

(8) $\exists x(\neg F(x) \ \& \ \Diamond F(x))$.

Translating back into the vernacular, (8) does not yield exactly (6), but rather

(6’) Someone who is not fond of broccoli would, under certain circumstances, have been fond of broccoli.

Trivial as these little exercises in formalization may appear, there is something to be learned from them. First, (5) and (6) differ only in the grammatical mood of the first predicate occurrence. Their logical forms (7) and (8) differ only in whether the first predicate occurrence lies within or outside the scope of the possibility operator. It seems natural to conjecture that this is just what mood amounts to: a scopal element of English, indicating how far the logical scope of a modal operator extends. When a predicate is in the subjunctive mood, it falls logically within the scope of such an operator; when it is indicative, it is not logically governed by a modal operator. This scope theory of mood also explains why we do not find any

typographical distinction between ‘indicative’ and ‘subjunctive’ predicate symbols in modal logic: Its canonical notation is set up in such a way that no scope ambiguities can arise. There is no leeway in word order, as there is in ordinary English, and hence no need for additional scope indicators such as mood: Where English has both (6) and (6′) as equivalent paraphrases, modal logic has only (8).⁶

It seems to follow that, if we were willing to give up freedom of word order, we could do without the subjunctive mood altogether. We would then be speaking a language very similar to the formal idiom of modal predicate logic – not much occasion for variations of style, but an easy grammar in return.

Moreover, standard possible worlds semantics for modal logic in fact literally implements the scope theory: Since evaluation of a formula Φ in a model starts at the model’s actual world, predicates in Φ not governed by a modal operator contribute their actual extension to the truth conditions of Φ (and are hence plausibly understood as being indicative); but predicates within the scope of a modal operator will be evaluated at arbitrary possible worlds (and are therefore naturally read as subjunctive).

The scope theory of mood is a very nice theory indeed. Too bad that it is false.

3. WHY THE SCOPE THEORY IS FALSE

That the scope theory of mood cannot be correct can be seen from the following example.

(9) Under certain circumstances, everyone who is poor would have been rich.⁷

Here is what the scope theory of mood has to say about the logical make-up of (9): The predicate ‘is poor’, being indicative, is not governed by the initial possibility operator. The quantifier ‘everyone’, binding into that predicate, must therefore also lie outside the scope of ‘under certain circumstances’. The predicate ‘would have been rich’, however, falls within the scope of the modal operator, as it is in the subjunctive mood.

In other words, the scope theory predicts the following logical form for (9):

(10) $\forall x(P(x) \rightarrow \Diamond R(x))$.

That is, the scope theory implies that we should be able to paraphrase (9) as

- (11) Every poor person is such that, under certain circumstances, she would have been rich.

But this is simply not the case (at the very least, for a natural reading of (9)). For (11) to be true, it suffices that there be, for each poor person, some counterfactual situation where *that one person* would have been rich. The truth of (9), on the other hand, requires there to be *one* counterfactual situation in which all the people who are poor in the actual world would *simultaneously* have been rich.

This argument against the scope theory – depending, as it does, on linguistic intuitions concerning the meaning of (9) – is of course open to attack by bold denial that these intuitions are correct (or perhaps even that (9) is a grammatical sentence of English). One thing, however, cannot be contentious, namely that the truth conditions I have claimed (9) to possess cannot be accounted for by any sentence of standard modal predicate logic. That is to say, there is no sentence Φ in the language of first-order logic, augmented with a possibility and a necessity operator, such that Φ comes out true in an arbitrary model of S5 if and only if there exists a possible world w such that, for every individual a in the domain of the actual world $@$ of the model, if a falls under the extension of ‘P’ at $@$, then a falls under the extension of ‘R’ at w .⁸ This happens precisely because standard quantified S5 has no other way of implementing subjunctivity than by means of modal scope. But even those who are willing to discount our counterexample (9) will have to admit that a sentence like ‘everybody who won might have lost’, while certainly allowing a reading along the lines of (10), is also very naturally read as having the truth conditions just mentioned. That is to say, it can clearly be read as asserting the existence of a possible situation in which all those who, as a matter of actual fact, won, would simultaneously have lost. So, quite independently of questions of mood, the formal theory of logical form underlying the scope theory, modal predicate logic S5, must be revised if such readings are to be assigned a logical form.

4. ACTUALITY

The argument of Section 3 suggests that the simple scope theory of mood, as outlined in Section 2, is untenable. It would be too quick to conclude on this basis that the underlying idea of explaining mood in terms of operator

scope *must* be given up, for modal logicians have come up with a quick fix for the expressiveness problem.

It consists in postulating an additional sentential operator known as the ‘actuality operator’ (the *locus classicus* for which is Crossley and Humberstone (1977)). The idea is quite simple: In addition to the modal operators \Box and \Diamond , one assumes a further operator \mathbf{A} whose semantics is given by the following clause:

(12) $\mathbf{A}\Phi$ is true at a world w if and only if Φ is true at the actual world

This certainly remedies the expressive deficit manifest in sentences such as (9), which may now be formalized as

(13) $\Diamond\forall x(\mathbf{A}Px \rightarrow Rx)$.

It is straightforward to check that the truth conditions come out right (ignoring certain complications arising from the possibility of varying domains).

Now it is one thing to introduce a new operator into a logical language and stipulate a semantics for it, and quite another to claim that this operator corresponds to some feature of an actual natural language. Its name suggests that it corresponds straightforwardly to the English adverb ‘actually’. And so Hazen (1976, 40) finds that “the actuality operator is quite well attested in ordinary English”. But his example, “There could have been things other than those there actually are”, does not seem too convincing – for by deleting the alleged actuality operator, we obtain a sentence with exactly the same meaning: ‘There could have been things other than those there are’. Thus, the presence of the word ‘actually’ is apparently not necessary for the logical form of a sentence to contain an actuality operator.

But neither does it seem to be sufficient. When Kripke (1980, 124) describes his fool’s gold scenario,

Consider a counterfactual situation in which, let us say, fool’s gold or iron pyrites was actually found in various mountains in the United States, or in areas of South Africa and the Soviet Union,

he clearly does not intend ‘found’ to be evaluated with respect to the actual world.

So the actuality operator does not correspond to the adverb ‘actually’ in a particularly straightforward way. Another natural conjecture is that this logical operator has the indicative mood as its English counterpart. But here, too, the correspondence is not as neat as one might wish: As an example, take the sentence ‘under certain circumstances, everyone who lost

would have won'. Its logical form, in the actuality language, is $\Diamond \forall x(\mathbf{A}Lx \rightarrow Wx)$. The fact that the actuality operator precedes the predicate symbol L might be thought to reflect the fact that the predicate 'lost' is indicative. But the non-modal sentence 'everyone lost' may be represented not only as $\forall x\mathbf{A}Lx$, but also as just $\forall xLx$, as in ordinary predicate logic. So the presence of the actuality operator in the logical form of a sentence is (apparently sufficient but) not necessary for the sentence to contain an indicative verb.

It thus seems that an entirely convincing story relating the actuality operator to features of actual English has yet to be told. This is the more desirable as the actuality analysis predicts ambiguities in logical form where, intuitively, there are none. For suppose someone says: 'Jones is poor'. The actuality language gives us a choice whether to formalize this statement as Pj , or as $\mathbf{A}Pj$. While these formulae agree in their actual truth conditions, they differ in counterfactual truth conditions, for Pj is true at a world w if and only if Jones would have been poor at w , whereas $\mathbf{A}Pj$ is true at w if and only if Jones is poor in the actual world. This seems to imply that a full understanding of the non-modal indicative utterance requires knowledge as to how the statement would be evaluated with respect to arbitrary possible worlds – but intuitively, we know full well what 'Jones is poor' means without ever even thinking about its counterfactual truth conditions.

These considerations certainly do not count as knock-down arguments against the actuality operator, but I do think they raise some suspicion that it is just an *ad hoc* device introduced to solve certain primarily technical problems. Let us look for an alternative.

5. TAKING MOOD SERIOUSLY

Recall that, according to the naïve scope theory considered in Section 2, it is impossible for an indicative predicate to occur logically within the scope of a modal operator. Example (9) revealed that, quite to the contrary, indicative predicates do so occur. The crucial question is: What exactly do they do there? In which way do indicative predicates behave differently from subjunctive predicates when both occur within the scope of a modal operator?

I suggest that the answer is as simple as could be: Indicative predicates within the scope of a modal operator are used for exactly the same purpose as those outside the scopes of any such operators – namely, to describe the actual circumstances. Subjunctive predicates, on the other hand, are used to describe *counterfactual* circumstances (or at any rate, circumstances that are not *presupposed* to be actual).

Consider our example again:

- (9) Under certain circumstances, everyone who *is* poor *would have been* rich.

It is clear that the predicate ‘would have been rich’ pertains to the circumstances whose existence is posited by the initial possibility operator. By contrast, the indicative predicate ‘is poor’, although logically within the scope of that operator, continues to refer to the actual situation. In possible worlds jargon, using ‘@’ as a name for the actual world, we may express the truth conditions for (9) as

$$\exists w \in \text{WORLDS} \forall x \in \text{PEOPLE} (\text{in-@-poor}(x) \rightarrow \text{in-}w\text{-rich}(x)).$$

It is the indicative ‘is poor’ that forces ‘@’ to occur in the antecedent of the conditional, and the subjunctive ‘would have been rich’ that, by contrast, puts the quantified world variable ‘*w*’ into the consequent.

These observations suggest the following informal account of the mood distinction. The subjunctive mood activates a predicate for a governing modal operator, in that the predicate is to be evaluated with respect to the counterfactual circumstances conjured up by that operator. Indicative predicates, on the other hand, not being thus activated, remain independent of any counterfactual situations introduced by modal operators, and therefore continue to pertain to the actual circumstances even when they occur within the logical scope of a modal operator. Hence mood is a semantically significant syntactic feature of individual predicates, determining their orientation towards actual or counterfactual situations, and not just a scopal element pertaining to the logical structure of whole sentences.⁹

Let me make this notion more precise by describing a formal language and a semantics that encapsulate the informal idea presented in the preceding paragraph.¹⁰ The logical system to be introduced shall be called ‘subjunctive modal logic’, or ‘SML’.

The canonical notation of SML (in terms of which we will describe the logical forms of metaphysically modal statements of English) is based on ordinary first-order logic (FOL). As is customary, I shall assume that FOL provides the logical forms for purely indicative statements; therefore, all the predicate symbols of FOL will be interpreted as being indicative. In addition to indicative predicate symbols, SML has subjunctive ones, and so for every (indicative) predicate symbol *P* of FOL, SML has a new subjunctive predicate symbol *P*^s of the same number of argument places as *P*.¹¹ The only further additions to FOL are the possibility operator ‘◇’ (‘under certain circumstances’) and the necessity operator ‘□’ (‘no matter

how things might have gone’); both of these behave syntactically as unary sentential operators just like in ordinary modal logic.

The formulae of SML are generated inductively in much the way one would expect. Both indicative and subjunctive predicate symbols may be used to form atomic formulae by applying them to an appropriate sequence of individual variables. For instance, if P is a binary predicate symbol of FOL, and x and y are individual variables, then both $P(x, y)$ and $P^s(x, y)$ are atomic formulae of SML. Assuming that P stands for the predicate ‘loved’, $P(x, y)$ represents ‘ x loved y ’, whereas $P^s(x, y)$ represents ‘ x would have loved y ’. The Boolean connectives and the first-order quantifiers may be used to form new formulae from old as usual. Finally, a formula may be prefixed with either ‘ \diamond ’ or ‘ \square ’.

Some examples may help to illustrate the syntax of SML. ‘George Bush is not fond of broccoli’ is a purely indicative sentence; it is formalized in FOL as ‘ $\neg F(g)$ ’, and since FOL is a sublanguage of SML, this is the correct SML-translation, too. ‘Under certain circumstances, George Bush would have been fond of broccoli’, on the other hand, is symbolized as ‘ $\diamond F^s(g)$ ’. The sentence ‘Under certain circumstances, someone who is not fond of broccoli would have been fond of broccoli’ has as its representation the SML-formula ‘ $\diamond \exists x (\neg F(x) \ \& \ F^s(x))$ ’. The problematic sentence ‘Under certain circumstances, everyone who is poor would have been rich’ is easily formalized as ‘ $\diamond \forall x (P(x) \rightarrow R^s(x))$ ’, and the equally problematic (for the naïve scope theory) ‘No matter how things might have gone, someone who is a politician would have been a crook’ is assigned the logical form ‘ $\square \exists x (P(x) \ \& \ C^s(x))$ ’.

In order to turn SML into a proper logical analysis we have yet to supply a formal semantics that matches the intuitive semantics of ordinary English. Such a semantics can be given in terms of the familiar Kripke models for the standard modal predicate logic S5. For the sake of simplicity, I shall restrict attention to models with constant individual domains. Nothing of importance – with regard to our present concerns – depends on this restriction; and it can easily be removed (if the formal language is supplemented in a natural way).¹²

A Kripke model thus consists of a set K of possible worlds, a designated element $@$ of K called the actual world, a non-empty domain D of individuals, and for each n -ary predicate symbol P of FOL and each world w in K , an n -ary relation P_w over D .¹³

Before turning to the notion of truth-in-a-model *simpliciter*, I shall have to define an auxiliary notion of truth relative to certain parameters. As SML contains ordinary quantification theory, it is to be expected that one such parameter will be an assignment σ of elements of the domain D to

individual variables. There will be a further parameter which I shall explain when it becomes relevant. Let us first consider *indicative* atomic formulae. The formula $P(x, y)$, for instance, will be true in the model (with respect to assignment σ and a parameter w), if and only if the pair $(\sigma(x), \sigma(y))$ satisfies the relation $P_{@}$. This stipulation implements the intuition that indicative predicates invariably pertain to the actual world, no matter where they occur. The Boolean connectives and the quantifiers work exactly as in FOL. For instance, a formula $A \& B$ will be true (with respect to σ and w) if and only if both A and B are true with respect to the same parameters, and a formula $\forall xA$ will be true with respect to σ (and w) if and only if A is true with respect to every variable assignment τ that differs from σ at most in what it assigns to the variable x (and with respect to w). So far, the semantics is set up in such a way that FOL, as a sublanguage of SML, is simply interpreted in the Tarskian structure associated with the actual world, the unexplained parameter w being irrelevant to the semantic evaluation of FOL-formulae.

It remains to accommodate the properly modal ingredients of SML. Let us begin with the modal operators. I shall follow common practice in interpreting them as quantifiers over possible worlds – the possibility operator ‘ \diamond ’ as existential, and the necessity operator ‘ \square ’ as universal. Given this quantificational apparatus, we shall need, in the auxiliary notion of truth, an argument place into which these quantifiers can bind, and this will be the hitherto unexplained parameter. I shall thus say that a formula $\diamond A$ is true with respect to σ and a world w if and only if there is a world v in K such that A is true with respect to σ and v , and similarly for the necessity operator. The modal operators are thus responsible for changes in world parameter.

In all the clauses for truth with respect to σ and w considered so far, the world parameter is completely idle, so that the modal operators are, until now, semantically vacuous. But I have yet to lay down truth conditions for subjunctive atomic formulae, and it is here that the world parameter plays a crucial role. Let a formula $P^s(x, y)$, say, be true with respect to assignment σ and world w if and only if the pair $(\sigma(x), \sigma(y))$ satisfies the relation P_w , that is, the extension of P at w . This stipulation implements the intuition that subjunctive predicates pertain to the salient counterfactual situation (invariably introduced, in SML, by modal operators, i.e. world quantifiers). This completes the definition of the auxiliary notion of truth in a model (with respect to variable assignments and salient worlds).

We are now in a position to define truth *simpliciter* (relative only to a model). Not all formulae of SML are eligible for truth, just as not every

phrase of the fragment of English that SML formalizes can be said to be true or false. This is a familiar phenomenon in FOL: ‘If it is a man, it is human’ has a truth value only relative to an assignment of a value to the pronoun ‘it’, unlike its generalization ‘Everything is such that, if it is a man, it is human’. In the case of SML, this phenomenon is not restricted to individual variables, but also occurs with subjunctive predicates. Consider the phrase ‘George Bush would have been fond of broccoli’. Is it true or false? We cannot say. This phrase depends, for its truth or falsity, on the specification of a salient counterfactual situation. Not so with ‘George Bush is fond of broccoli’ (false), or with ‘Under certain circumstances, George Bush would have been fond of broccoli’ (true). On the formal side, this is reflected in the fact that the result of the semantic evaluation of ‘ $F^s(x)$ ’ with respect to a variable assignment σ and a world w crucially depends upon the choice of w . However, in evaluating ‘ $F(x)$ ’ or ‘ $\diamond F^s(x)$ ’ with respect to σ and w , the choice of w is immaterial: In the case of ‘ $F(x)$ ’, it never enters the truth conditions in the first place, and in the case of ‘ $\diamond F^s(x)$ ’, the parameter w is immediately overwritten by an existentially quantified world variable induced by the possibility operator. Clearly, choice of world parameter is immaterial precisely when every occurrence of a subjunctive predicate symbol lies within the scope of some modal operator. Let us call formulae satisfying this condition ‘subjunctively closed’. We can then say that a subjunctively closed sentence of SML is true (in a model) if and only if it is true with respect to some variable assignment and some world; equivalently, if it is true with respect to all variable assignments and worlds.

To illustrate and test this semantics, let us consider the SML-sentence formalizing the recalcitrant statement (9). We saw earlier that the logical form of (9) is given by the sentence ‘ $\diamond \forall x(P(x) \rightarrow R^s(x))$ ’. This sentence is true in a model if and only if for some world w , ‘ $\forall x(P(x) \rightarrow R^s(x))$ ’ is true with respect to w . This in turn is the case precisely if there is a world w such that for all individuals a and assignments σ assigning a to the variable ‘ x ’, ‘ $P(x) \rightarrow R^s(x)$ ’ is true with respect to σ and w . Finally, this amounts to the requirement that there be a world w such that every individual falling under $P_{@}$ also falls under R_w , which is exactly the truth condition for (9) we identified earlier.

A brief comparison of SML with actuality-enriched standard modal logic (to which I shall henceforth refer to as ‘AML’) is perhaps in order. For the sake of simplicity, I shall continue to consider only possible worlds models with constant individual domains. Let us note first that, in AML, it suffices to consider formulae in which the actuality operator occurs only

in front of atomic subformulae. This is because, at every world in any such model, the following are equivalent:

- $\mathbf{A}\neg F$ and $\neg\mathbf{A}F$;
- $\mathbf{A}(F \ \& \ G)$ and $\mathbf{A}F \ \& \ \mathbf{A}G$;
- $\mathbf{A}\diamond F$ and $\diamond F$;¹⁴
- $\mathbf{A}\mathbf{A}F$ and $\mathbf{A}F$;
- $\mathbf{A}\forall xF(x)$ and $\forall x\mathbf{A}F(x)$ ¹⁵

Hence the actuality operator may be pulled inwards until it governs only atomic formulae. It is now easy to see that every sentence Φ of AML can be translated into a subjunctively closed sentence Φ^s of SML such that, in any given model, Φ is true (in the received sense of AML, i.e. true at the actual world) if and only if Φ^s is true in the same model (in the SML sense). To obtain Φ^s from Φ , (a) apply the above equivalences to Φ until the actuality operator occurs only in front of atomic formulae, (b) then add a superscript 's' to every predicate symbol in the resulting sentence that lies within the scope of a diamond or a box, but is not preceded by \mathbf{A} , and then (c) erase all occurrences of the actuality operator.

Similarly, there exists a translation from subjunctively closed SML-sentences Ψ into sentences Ψ^A of AML: Prefix every indicative predicate symbol in Ψ with \mathbf{A} , and then erase all subjunctive markers (this translation procedure always produces sentences in which the actuality operator precedes at most atomic formulae).

So, from a purely logical point of view, the languages are expressively equivalent. It is important to realize, however, that they are not simply notational variants of each other – one might think that the sole difference consists in that AML marks indicative predicates and has unmarked subjunctive predicates, whereas SML has unmarked indicatives and marked subjunctives. But this is not quite so. For instance, the translation procedure maps the two formulae $\exists xPx$ and $\exists x\mathbf{A}Px$ of AML to the one SML-formula $\exists xPx$; and so the marked-unmarked dichotomies are not the same in the two languages.¹⁶

6. KRIPKE'S MODAL ARGUMENT¹⁷

In this section, I shall analyze Kripke's modal argument in terms of SML, and attempt to show that it fallaciously fails to take the indicative-subjunctive distinction into account.

The modal argument is designed to show that proper names are generally not synonymous with definite descriptions. Consider, for instance, the proper name 'Lyndon Johnson' and the description 'the President in 1965'.

If they are synonymous, they must be intersubstitutable in modal contexts *salva veritate*. But apparently they are not, for

- (14) Under certain circumstances, Johnson would not have been President in 1965

is arguably true (suppose, for instance, that Kennedy had not been assassinated and had continued to be President), whereas

- (15) Under certain circumstances, the President in 1965 would not have been President in 1965

appears to be contradictory – there seem to be no circumstances under which a person would both be President and fail to be President.

According to Kripke, the substitutivity failure is due to the fact that the name ‘Johnson’ refers to the same individual no matter which actual or counterfactual situation we speak about. The description ‘the President in 1965’, on the other hand, shifts its denotation from possible world to possible world – when speaking about the actual circumstances, it refers to Johnson, but when speaking about a counterfactual course of history in which, say, Kennedy had not been assassinated, it refers to Kennedy. In Kripke’s terminology, the proper name is a rigid designator, the definite description a non-rigid one.

As Pardey (1994: 141–148, especially 142–145) has observed, Kripke’s modal argument as presented above seems to depend on an unjustified assimilation of indicative and subjunctive mood:¹⁸ It only applies to subjunctive descriptions. Let me explain this point by means of the following fictitious news magazine passage.

Suppose Kennedy had not been assassinated. Arguably, then, Johnson would never have become President. Of course, the person who would have been President in 1965 would have faced the same political challenges that plagued Johnson. All in all, the world would have been pretty much the same as it is – not for the person who *was* President in 1965, to be sure: Johnson would have had a lot more leisure time.

The passage discusses a certain counterfactual course of history, namely one in which Kennedy would not have been killed. With respect to these counterfactual circumstances, *two* definite descriptions are being used: ‘the person who *would have been* President in 1965’, where the descriptive predicate is in the subjunctive mood, and ‘the person who *was* President in 1965’, differing from the first only in the mood of the description predicate. The crucial observation here is that these descriptions refer, in the context of the passage above, to distinct individuals: the indicative one, to Lyndon B. Johnson, the subjunctive one, to whomever would have been

President in 1965, had the circumstances in question obtained. It should be clear by now why this happens: The subjunctive predicate is evaluated with respect to the salient counterfactual circumstances, and so the subjunctive description denotes the unique individual who *would have been* President under those circumstances; whereas the indicative predicate pertains to the actual world, so that the indicative description picks out the unique individual who *was* President (under the actual circumstances).

The difference in modal profile between the two descriptions can be brought out more compactly in the following pair of sentences:

(15i) Under certain circumstances, the person who was President in 1965 would not have been President in 1965.

(15s) Under certain circumstances, the person who would have been President in 1965 would not have been President in 1965.

(15i) is most naturally read as a statement about Lyndon Johnson, saying that he, the man who was president in 1965, might not have been President in 1965. (15s), on the other hand, is contradictory, claiming that there are circumstances *C* in which the unique individual who would have been President in *C* would not have been President in *C*. In fact, it is so obviously contradictory that one is inclined to consider it ungrammatical, but I do not think that it is.¹⁹

The hesitant reader may wish to consider necessity contexts instead:

(15i') No matter how things might have gone, the man who was President in 1965 would have been President in 1965.

This sentence falsely claims that Johnson would have been President no matter what. If we change the first description from indicative to subjunctive, however, we obtain an obvious truism:

(15s') No matter how things might have gone, the man who would have been President in 1965 would have been President in 1965.

These observations show that Kripke's original argument depends on reading 'the President in 1965' subjunctively as 'the person who would have been President in 1965'; for only on this reading does (15) come out false (namely, as (15s)). On the other hand, the modal argument must, *at the same time*, read the description indicatively – otherwise, it is not even a synonymy candidate for 'Johnson' (it seems absurd from the start to claim that 'the person who *would have been* President in 1965' should

be synonymous, or even co-designative, with ‘Johnson’). Thus, from our present point of view, the argument illegitimately exploits an ambiguity in the description ‘the President in 1965’.

Let us pretend for the time being that we still believe in the scope theory of mood. We would then naturally diagnose this ambiguity as one of scope: (15i), we would be inclined to say, is the reading of (15) in which the description receives wide scope over the modal operator, so that the description predicate lies outside the scope of ‘under certain circumstances’. On the other hand, (15s) is the narrow scope reading of (15), under which the description predicate comes to lie within the scope of the modal operator and is hence subjunctive. This observation, of course, is the origin of the so-called wide scope objection to Kripke’s argument.²⁰ Importantly, however, we would think of the indicative and the subjunctive description as sharing the same logical form, ‘the $x: P(x)$ ’, the difference in mood arising only from different ways of scoping the description within the whole sentence.²¹ Now we saw in Section 2 that the scope theory, which arguably underlies Kripke’s exposition in *Naming and Necessity*, is incorrect as a theory about the moods of English: The indicative predicate ‘was President’ and the subjunctive predicate ‘would have been President’ do *not* share the same logical form. The ambiguity present in (15) is thus *not* one of scope. In fact, scope is irrelevant for non-empty indicative descriptions; in other words, the following is a logical truth of SML (where logical truth is, of course, truth in all models, and ‘P’ is an *indicative* predicate symbol):

$$(16) [\text{the } x: P(x)](x = y) \rightarrow \Box [\text{the } x: P(x)](x = y).$$

In terms of SML, the logical form of (15i) is ‘ $\Diamond [\text{the } x: P(x)] \neg P^s(x)$ ’ (or, equivalently, ‘ $[\text{the } x: P(x)] \Diamond \neg P^s(x)$ ’), whereas the logical form of (15s) is ‘ $\Diamond [\text{the } x: P^s(x)] \neg P^s(x)$ ’. We thus find, in Kripke’s argument, an equivocation in the proper sense of the word.

What remains of the *semantic* dichotomy of rigid versus non-rigid designators is a *syntactic* dichotomy: singular terms containing an inflectible verb, such as indicative descriptions, are subject to subjunctivization, and once subjunctivized, shift their extensions from possible world to possible world; on the other hand, singular terms that do not contain a verb, like proper names, are simply not amenable to subjunctivization. This hardly entails, though, that indicative descriptions differ from proper names *semantically*.

It is interesting that Kripke himself (1977, 389–390) discusses an analysis that, with regard to definite descriptions, is very much like the one proposed here (although he does not consider the logical role of moods generally). He writes:

If definite descriptions, $\iota x\phi(x)$, are taken as primitive and assigned reference, then the conventional non-rigid assignment assigns to such a description, with respect to each possible world, the unique object, if any, which would have ϕ 'd in that world. (...) For example, "the number of planets" denotes eight, speaking of a counterfactual situation where there would have been eight planets (...). Another type of definite description, $\iota x\phi x$, a "rigid" definite description, could be introduced semantically by the following stipulation: let $\iota x\phi x$ denote, with respect to all possible worlds, the unique object that (actually) ϕ 's (...). Both kinds of definite descriptions can obviously be introduced, theoretically, into a single formal language, perhaps by the notations just given. Some have suggested that definite descriptions, in English, are *ambiguous* between the two readings. (...) Although I have an open mind on the subject, I am not yet convinced that there is any clear evidence for such an ambiguity.

Note how Kripke himself uses, in the metalanguage, precisely the indicative-subjunctive distinction in order to explain how the two kinds of descriptions differ in their semantic behavior: $\iota x\phi(x)$ denotes, with respect to a world w , the object (if any) that *would have* ϕ 'd in w ; $\iota x\phi x$ denotes, with respect to a world w , the object (if any) that ϕ 's. It is hard to see how he could deny that the distinction of moods is evidence for an ambiguity in descriptions, such as 'the number of planets', which contain no inflectible verb.

It might be thought that a certain strategy that has become standard in arguing against the wide scope objection also has force against the objection from mood that I have just described. This 'formal mode' strategy consists in circumventing object-linguistic ambiguities by means of semantic ascent.²² Let me first explain how this strategy is supposed to neutralize the wide scope objection (so for the purposes of exposition, we need to temporarily adopt the scope theory of mood again).

Wide scopers claim that, in contexts of metaphysical modality, definite descriptions typically take wide scope over modal operators. If that is so, then no failures of substitutivity can arise, and the modal argument is blocked, because '[the $x: P(x)$] $x = a$ ' and ' $\diamond\neg P(a)$ ' jointly entail '[the $x: P(x)$] $\diamond\neg P(x)$ '. But, so the formal mode strategy goes, we can force the narrow scope reading by focusing on formal mode contexts of the form 'X is a necessary truth' or 'X might have been the case', where the subject place 'X' is occupied by a noun phrase referring to the non-modal statement '[the $x: P(x)$] $\neg P(x)$ '. For to say in formal mode that

(17) '[the $x: P(x)$] $\neg P(x)$ ' might have been the case

surely means the same as saying that

(18) \diamond [the $x: P(x)$] $\neg P(x)$,

in material mode, and (18) is false even by wide scopers' standards. However, "‘ $\neg Pa$ ' might have been the case" was assumed to be true, so 'the $x: P(x)$ ' and 'a' cannot be synonymous after all – the modal argument is reinstated.²³

Now discard the scope theory again. Let us see whether the formal mode strategy has any bearing upon the objection from mood. As always, it will help to consider a specific example.

(19) 'Johnson was not President in 1965.' – 'That's not the case, though it might have been.'

(20) 'The person who was President in 1965 was not President in 1965.' – 'That's not the case, though it might have been.'

We feel that the reply in (19) is perfectly adequate. In particular, we have strong intuitions to the effect that "‘Johnson was not President in 1965' might have been the case" is true. Not so with (20): Here we strongly feel that it is not the case that the initial statement might have been true. Again, this seems to show that the name 'Johnson' and the description 'the person who was President in 1965' differ in modal profile. And it is hard to see how one could object to this version of the argument that it rests on an equivocation of indicative and subjunctive predicates – all predicates occurring are indicative, and all constructions accord perfectly well with English grammar.

The key question here is how we semantically evaluate formal mode statements of the type 'X might have been the case', where the place marked by 'X' is occupied by a noun phrase referring to an indicative statement S. It is clear how Kripke thinks this works: We simply take the very statement S itself and evaluate it at all possible worlds w , to see whether it is true at some of them. I have argued on independent grounds in Section 3 that this is not the right picture. In terms of the SML-analysis, what happens is rather this: We take the statement S, subjunctivize all predicates occurring in S, thus obtaining a related subjunctive phrase S^s , and evaluate S^s at all possible worlds to see whether *it* comes out true with respect to some of them. In the cases at hand, we find the reply in (19) adequate because there is a world w such that the subjunctive phrase 'Johnson *would not have been* President in 1965' is true with respect to w ; the reply in (20) seems incorrect because there is no world with respect to which the subjunctive phrase 'the person who *would have been* President in 1965 *would not have been* President in 1965' is true. What appear to be intuitions about the initial statements in (19) and (20) are therefore, at bottom, intuitions about these subjunctive phrases. If that is so, then all

that follows from the difference between (19) and (20) is that ‘Johnson’ and *the subjunctivization of* ‘the person who was President in 1965’, that is, ‘the person who would have been President in 1965’, differ in modal profile. This we already knew. As before, it also follows that the proper name and the indicative description differ in their syntactic properties – the description is amenable to subjunctivization, while the name, not containing an inflectible verb, is not. Again, this is hardly evidence for the non-synonymy of the proper name with the indicative description itself.

7. CONCLUSION

Let me try to summarize the preceding discussion in somewhat informal terms. Ordinary modal predicate logic (without the actuality operator) treats predicates as essentially moodless. Their orientation towards actual or counterfactual circumstances is determined exclusively by context: when a predicate occurs within the scope of a modal operator, it will be evaluated semantically at arbitrary possible worlds (and is thus, according to the scope theory, to be read subjunctively); but when a predicate does not lie within the scope of any modal operator, it will be evaluated with respect to the actual circumstances (and is hence to be read indicatively). By adding the actuality operator, AML has both moodless and explicitly indicativized predicates; for the moodless predicates, context continues to determine whether they are evaluated with respect to actual or counterfactual circumstances, but the explicitly indicativized (‘rigidified’) predicates always pertain to the actual world, independent of context. It is, of course, the presence of moodless predicates that is responsible for the existence of definite descriptions that are, at the same time, complete singular terms and non-rigid: if the description predicate can vary its extension according to context, then the description itself can vary its referent according to context. The proposal to analyze modal discourse by means of SML does not countenance moodless descriptions. According to it, every English predicate (in the fragment of English under discussion) is either indicative (and hence always evaluated at the actual world), or subjunctive (and hence only evaluable when salient counterfactual circumstances have been introduced).²⁴ Subjunctive descriptive phrases, like ‘the man who would have taught Alexander the Great’, are therefore incomplete expressions – it makes no sense to ask whether Aristotle is the man who would have taught Alexander in a non-modal context. In other words, a subjunctive definite description is not even a synonymy candidate for a proper name, for surely, if the singular term D has any credibility as a synonym for the name N, then the sentence ‘N is D’ must make sense even in non-modal contexts. Denot-

ing indicative definite descriptions, on the other hand, denote their referent rigidly, because indicative predicates are never evaluated anywhere but at the actual world. It is for this reason that Kripke's modal argument fails when one takes SML to provide the correct analysis of modal English: for a description to be non-rigid, it must be subjunctive, but for it to denote, in the proper sense of the word, it must be indicative.

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NOTES

¹ The first three are taken more or less verbatim from Kripke's writings on the subject. The first two are from Kripke (1980, 62n and 39–40n), the third from Kripke (1977, 388); the last example is Lewis's (1973, 3).

² Indeed, centuries ago, the subjunctive mood was more common in English than it is now. Some examples: 'If it were done when 'tis done, then 'twere well it were done quickly' (Shakespeare, *Macbeth*, early 17th century); 'Had we but world enough and time, this coyness, lady, were no crime' (Andrew Marvell, *To His Coy Mistress*, middle 17th century); 'it were better for him that a millstone were hanged about his neck, and he cast into the sea' (English bible, early 17th century). I am grateful to John Burgess for bringing these examples to my attention.

³ In fact, such paraphrase is often appealed to when the specifically metaphysical meaning of 'necessary' needs to be emphasized. For instance, one might naturally take the statement 'Oswald necessarily killed Kennedy' to mean that criminal evidence is sufficient to establish with certainty that Oswald was indeed the killer, thus interpreting the statement epistemically. To exclude such an understanding, one typically resorts to subjunctive talk.

⁴ David Chalmers, in an unpublished draft, even speaks of the 'tyranny of the subjunctive'. See his webpage <http://www.u.arizona.edu/~chalmers/papers/tyranny.html>. The significance of the subjunctive mood for the semantics of modal discourse has also recently

been noted by Yablo (2002). John Burgess discusses many of the points at issue here in some detail in Section II.B of Burgess and Rosen (1997); see especially p. 142. As Burgess (and independently, Helge Rückert) has pointed out to me, the phenomenon of cross-world predication (“you could have done a lot better than you did”) is highly germane to the proper formalization of modal discourse. Unfortunately, I do not have the space to go into this topic here.

⁵ Those who find double subjunctives hard to take in may wish to consider the following pair of sentences instead: ‘Suppose that someone who didn’t like broccoli liked broccoli.’ ‘Suppose that someone who doesn’t like broccoli liked broccoli.’

⁶ The scope theory is rarely made explicit. See Nute and Cross (2001, 2–3) for an exception.

⁷ A similar example can be found in Kripke (1980, 124; emphasis added): “Consider a counterfactual situation in which, let us say, fool’s gold or iron pyrites was actually found in various mountains in the United States, or in areas of South Africa and the Soviet Union. *Suppose that all the areas which actually contain gold now, contained pyrites instead (...)*”.

⁸ This was first conjectured by Hazen (1976). The inexpressibility result follows from work by Harold Hodes (1984). For a direct proof along the lines suggested by Hazen, see Wehmeier (2003).

⁹ I am not claiming to provide anything close to a complete linguistic, or even logical, account of the English mood system. This would obviously be a daunting task, as subjunctives (in the broad sense I haven’t given the term) play all sorts of roles in natural languages. An obvious desideratum for a theory of mood is an explanation of its interplay with tense, about which I have nothing to say in this paper (see, e.g., Condoravdi (2001) for a discussion of such matters). I do claim that, for the very narrow class of modal English statements considered here, my proposed analysis is more plausible than, or at least as plausible as, the received approach (using modal predicate logic with or without an actuality operator).

¹⁰ After I had devised the logical system introduced below, I became aware of related technical work by Humberstone (1982). He compares, mainly in the context of propositional modal logic, an ‘actuality’ and a ‘subjunctivity’ language. The subjunctivity approach is motivated through deontic logic, where expressivity problems such as those mentioned here for modal logic had earlier been noticed by Castañeda. Humberstone goes on to discuss certain problems related to propositional attitudes with the help of his apparatus, but neither metaphysical modality nor Kripke’s modal argument are investigated. The reader is advised that this highly insightful paper requires some guess work in its formal parts, due to an unusual amount of typographical errors and the fact that the typesetter apparently had only one capital Greek letter available. A corrected and updated version of the paper can be found in chapter 1 of Humberstone (2000). See also Humberstone (2004).

¹¹ The superscript ‘s’ is to be thought of as a subjunctivity marker and may be regarded as a (non-iterable) predicate modifier or, alternatively, as an operator that is applicable only to atomic formulae. In order to facilitate comparison with ‘actually’ languages, Humberstone (1982) treats subjunctivity as an ordinary sentential operator that may have arbitrarily complex formulae in its scope, instead of a subjunctive marker on atomic predicates only. This seems neither necessary (as no expressive power is gained) nor, in our context, desirable, as mood is a morphological feature of individual predicates in natural languages. In addition, Humberstone’s approach necessitates otherwise inexplicable syntactic restrictions in that

neither the subjunctivity operator nor the modal operators are allowed to occur within the scope of a subjunctivity operator.

¹² In the more general setting with varying domains of individuals, we would have to introduce an additional subjunctive quantifier, ‘there would have been an x such that’, say, written ‘ $\exists^s x$ ’, ranging over the domain of the salient possible world. See Wehmeier (forthcoming), Humberstone (2000), and Humberstone (2004: 46–48).

¹³ I assume that equality is among the predicate symbols of FOL, and require that for any world w in K , $=_w$ be the true identity relation over D . This is a standard assumption in ordinary modal logic, too, reflecting the intuition that for any objects a and b , if they are identical (distinct), then they could not possibly have been distinct (identical). As ‘=’ therefore (‘rigidly’, one might say) denotes true identity with respect to every world, I shall refrain from using ‘=^s’ in the object language at all, it being interchangeable with ‘=’ everywhere.

¹⁴ In models with non-universal accessibility relations, this equivalence holds only at worlds from which the same worlds can be reached as from the actual world.

¹⁵ If the individual domains are allowed to vary, we need to introduce an additional actuality quantifier \forall^A (as in Hazen, 1990) with the following semantics: $\forall^A x F(x)$ is true at w iff for every a existing at the actual world, $F(a)$ is true at w . We then also have the equivalence of $\forall x F(x)$ and $\forall^A x F(x)$.

¹⁶ The matter is actually quite subtle. One might object to my analysis that it is quite possible to translate the two actuality sentences as different SML-sentences, namely $\exists x P^s x$ and $\exists x P x$, respectively, *if the subjunctive world parameter is required to be set to the actual world*. But this would be to misconstrue the role of the subjunctive world parameter in SML: It provides the salient possible world with respect to which subjunctives are to be evaluated; and while it may so happen that the actual world becomes the salient possible world, it would be counterintuitive to require that, in the absence of an otherwise specified world, the actual world serves by default as the salient possible world. Note also that, for subjunctively closed sentences, no default subjunctive world needs to be specified in SML, whereas AML always begins evaluations with respect to the actual world. For more discussion, see Wehmeier (forthcoming).

¹⁷ Although by now more than thirty years old, and arguably one of the most widely discussed philosophical arguments of the last century, the validity of Kripke’s argument continues to be contentious. In the most recent past, the argument has been criticized by Stanley (1997), Sosa (2001), and Chalmers (2002). On the other hand, it has been defended against the most popular objections by Soames (1998).

¹⁸ Pardey’s objections to Kripke rest not only on the observation that indicative and subjunctive mood are not properly distinguished. He also argues that identity statements of natural languages fall into a number of logically distinct categories (Pardey, 1994: 134–136) and shows that Kripke’s argument depends on inadmissible identifications of these categories. My argument in this section develops only the first, mood-related point. I follow Kripke in taking all identity statements to be of essentially the same logical form. Thus, for instance, I agree with Kripke – if only for the sake of argument – that identity statements involving only proper names are necessary; whereas Pardey (1994, 148) argues that the question of contingency simply does not arise in such cases.

¹⁹ Another possible reaction to (15s) is to read an additional possibility operator into it, thus taking it to mean that there are circumstances C such that the man who would have been President in C would not have been President under certain *other* circumstances C' .

It seems to me, however, that the attractiveness of this reading rests on a pragmatic desire to avoid ascribing obvious inconsistency to the sentence.

²⁰ The wide scope objection is due to Dummett (1973, 110–151) and has most recently been defended by Sosa (2001). See also Soames (1998).

²¹ That is, we would analyze (15i) as $[\text{the } x: P(x)] \diamond \neg P(x)$ and (15s) as $\diamond [\text{the } x: P(x)] \neg P(x)$.

²² The strategy is outlined by Kripke (1980, 13–14) and refined and extended by Soames (1998, 5–13).

²³ While I share Sosa's (2001) worries whether the removal of scope ambiguity through semantic ascent is legitimate, I shall put these aside here.

²⁴ One might argue against this claim that noun phrases like 'the teacher of Alexander' are moodless, simply because they do not contain an inflectible verb. My view is that such phrases are syntactically ambiguous between 'the man who taught Alexander' and 'the man who would have taught Alexander'.

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Logic and Philosophy of Science
University of California, Irvine
e-mail: wehmeier@uci.edu