Vocabularies of Reason 2025 Pufendorf Lectures Lund University

Lecture I

Reasoning and Representing

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I. Semantics and Pragmatics

When I say that cats are mammals, we can distinguish between what I have said something sayable, namely that cats are mammals-and my saying of it, which is something I have done, a speech act I have performed. Of course this 'ing'/'ed' structure of doing and thing done, act and (direct) object acted on, is a common linguistic construction. We distinguish breakings from what is broken, sortings from what is sorted, and drinkings from what is drunk. In the special case of discursive doings, such as sayings and thinkings, the object said or thought is of a special form or kind. What can in the central sense be said or thought is conceptual, more specifically propositional, *contents*.¹ Such contents are the subject of a special intellectual discipline: semantics. The semantic tradition that runs from Frege through the early Wittgenstein, Carnap, Tarski, and Quine, to Kripke, David Lewis, and Kit Fine among many others deploys a constellation of expressively powerful technical vocabularies for specifying, relating, and combining various kinds of meanings or conceptual contents. It addresses, to begin with, the meanings of logical and mathematical locutions, and those of other artificial languages. But the tradition extends from there, both actually and aspirationally, to encompass the contents of a wide range of kinds of linguistic expression found in natural languages. We can reasonably hope to deploy the metaconceptual resources of semantic theory to explain the difference between discursive contents, which can be said, thought, or meant, and things that can merely be broken, sorted, drunk, or the like.

¹ I am using 'discursive' in Kant's sense, as meaning "of or pertaining to concept-use."

What about the practical, 'ing' side of discursive doings? This is the 'force' side of Frege's force/content distinction, whose paradigm is the assertional force distinctive of saying something in the sense of making a statement or claim. Broadening traditional usage a bit, we can call the study of this practical dimension of discursive activity 'pragmatics'. The idea is that pragmatics studies the *use* of linguistic expressions, and semantics studies their *meanings* (to put the distinction in Wittgensteinian terms).

Rough as it is, this characterization already invites us to think about the obligations each of these theoretical enterprises, semantic and pragmatic, owes to each other. In saying things, we are *doing* something sufficiently different from nondiscursive doings such as breaking, dropping, and drinking that what is said admits of a specifically *semantic* interpretation, as having a *meaning* or conceptual, specifically propositional, *content* in a sense in which what is broken, dropped, or drunk does not. A minimal criterion of adequacy on a pragmatic theory is that it account for this difference. What is it about discursive practice that establishes the crucial connection between assertional speech acts and the propositional contents they express? There is nothing except the *use* of declarative sentences to confer propositional content on them. The semantic interpretability of sentences must be intelligible in broadly functional terms of the roles such linguistic expressions play in discursive practice. Along this dimension, pragmatics must answer to semantics. For an adequate pragmatic theory must underwrite an account of how the relation between sentential expressions and the semantic interpretants assigned to them by some semantic theory is fixed. I will call this the "conferral" condition: pragmatics owes an account of how *use*, however it construes use, confers *meaning*, as understood by some semantic theory.

Conversely, there is also a sense in which semantics answers to pragmatics. Formal semantics can be thought of as having only the restricted task of showing how to compute the semantic interpretants of complex expressions based on stipulated associations of semantic interpretants with simple expressions. But the *point* of associating sayable meanings or semantic interpretants with expressions at all is ultimately to make sense of what speakers are *doing* in using those expressions. Appeal to the meanings or contents of speech acts must help explain what practitioners are *doing* in saying something by producing those discursive performances. I

will call this the "codification" condition: semantics owes an account of how the *meanings* of expressions explain or constrain their *use*.

One model of how this condition might be satisfied understands the features of use to be explained by associating semantic interpretants with expressions as *dispositions of* and *behavioral regularities exhibited by* language users, described in a spare, naturalistic vocabulary. Meanings are then thought of as theoretical entities, postulated to explain observable patterns of discursive behavior. From this point of view, Dummett's insistence that the co-ordinate character of the concepts <u>meaning</u> and <u>understanding</u> entails that semantic properties must be analyzable without remainder into features of use shows up as a kind of semantic instrumentalism. For it in effect rejects postulating theoretical entities in explaining linguistic behavior. (That is the criticism Sellars makes of Rylean behaviorist rejection of the postulation of thoughts and sensations, in the philosophy of mind.) And Wittgenstein's wholesale rejection of the concept of *meaning* in favor of *use* shows up as a consequence of his conviction that "philosophy is not one of the natural sciences," once the postulation of unobservables to explain the antics of observables is identified as the core of natural scientific methodology.

I do not think this model will help us understand what is distinctive about the specifically discursive form of the act/content distinction: what distinguishes sayables and thinkables from breakables, sortables, and drinkables. For that we must think of meanings as codifying *norms* governing the use of expressions that have those meanings. We should understand what the semantic theorist is doing in associating a certain meaning or semantic interpretant with an expression as undertaking a commitment regarding how it would be *correct* or *proper* to use the expression in question. The immediate consequence of specifying the truth-conditions of a declarative sentence, for instance is to set a standard of appraisal or assessment of the correctness or propriety of assertions of that sentence, in a distinctively semantic sense of 'correct' or 'appropriate.' The usefulness of semantic characterizations of discursive performances in explaining dispositions or regularities of behavior of users of that sentence is indirect, mediated by the use-governing norms those semantic attributions codify.

I have gestured in the direction of an important dimension along which pragmatics answers to semantics. It is a criterion of adequacy on an account of the use of language that it show how such use serves to confer meaning on linguistic expressions-establishing the association of some sort of propositional contents (as construed by the semantics), with sentences of the language. I have also gestured in the direction of an important dimension along which semantics answers to pragmatics. It is a criterion of adequacy on an account of the *meanings* of linguistic expressions that it show how meanings codify or determine norms governing the use of those expressions—paradigmatically, the use of declarative sentences to make claims or assertions. Because we have so much better worked-out formal semantic theories of meaning than we do metasemantic, *pragmatic* theories of use, it is worth thinking of the conferral condition and the codification condition as criteria of adequacy of adequacy for pragmatics (in the very broad sense in which I am using the term). Together, they require that an adequate pragmatic theory must characterize the use of language in such a way as to show how, so specified, discursive practices are intelligible as conferring meanings or conceptual contents on linguistic expressions (paradigmatically, propositional content on declarative sentences), such that those contents or meanings are intelligible as setting normative standards for appraisal of the correctness of linguistic moves.

In the abstract, it is difficult to say what a pragmatics that met those conditions might look like. In the next section, I will sketch a minimal discursive practice, specified in a simple, regimented pragmatic metavocabulary. Then I will introduce Kit Fine's truthmaker semantic theory and show how it can be understood to be so related to the pragmatic theory that the twin requirements are satisfied. What practitioners do in talking, according to the pragmatic theory, both suffices to connect the expressions used to Finean semantic interpretants, and explains how those interpretants set normative standards for assessment of the correctness of speech acts that use those expressions. This is the first large move in a narrative arc will lead, in my third lecture, to a novel account of the rational functional role that confers propositional conceptual content on declarative sentences.

II. Reasons and Practices

Discursive practices, in the sense I am focusing on, are those that enable practitioners to claim that things are thus-and-so. These are acts of *claiming*, both asserting and denying, which address specifically *propositional* contents. I began by considering a distinctive kind of contrast between act and content ('ing'/'ed'): the distinction between a *saying*, a speech act or discursive performance, and what is *said*, a content or meaning. Specifying that the sense of 'saying' that is in play here is *claiming*, *stating*, *saying or denying that* things are thus-and-so, is our first step in outlining a pragmatic theory. Linguistic expressions that can be uttered with that kind of *force* (asserting or denying, expressing accepting or rejecting) and that kind of *content* (propositional) are thereby functioning as *declarative sentences*. That is why it is declarative sentences that are both uttered in speech acts of asserting or denying, and used to form the 'that'-clauses specifying the propositional contents asserted or denied.

So, we can functionally define declarative sentences as linguistic expressions whose freestanding utterance has the basic, default pragmatic force or significance of claimings, paradigmatically assertions. Is there a corresponding functional definition of that assertional force or pragmatic significance? The orienting idea I will pursue is that there is an internal conceptual relationship between *claiming* and *reasoning*. Asserting and denying are activities that takes place in what Wilfrid Sellars calls "the space of reasons: of justifying and being able to justify what one says."² Discursive practices, in the sense of practices that accord some performances the practical significance of assertions or denials, are essentially (and not just accidentally) practices of giving and asking for reasons.³ Making claims is part of a package of activities that includes rationally *challenging* claims by making further claims that contest them

² Empiricism and the Philosophy of Mind §36.

³ "What is it that we are *doing* when we assert, claim, or declare something? The general answer is that we are undertaking a certain kind of commitment... The idea is that assertings (performances that are overt undertakings of assertional commitments) are in the fundamental case what reasons are asked for, and what giving a reason always consists in. The kind of commitment that a claim of the assertional sort is an expression of is something that can stand in need of (and so be liable to the demand for) a reason; and it is something that can be offered as a reason... The idea exploited here, then, is that assertions are fundamentally fodder for inferences." (Brandom, *MIE* 1994: 167-168)

by offering reasons *against* them, and rationally *defending* claims by making further claims that justify them by offering reasons *for* them. Of course not every claiming need be challenged or defended, but that claims are liable to challenges that bring with them justificatory obligations is a core feature of the genus.

Sellars offers the following historical metaconceptual context for this line of thought:

Kant was on the right track when he insisted that just as concepts are essentially (and not accidentally) items which can occur in judgments, so judgments (and, therefore, indirectly concepts) are essentially (and not accidentally) items which can occur in reasonings or arguments.⁴

It is essential to assertings (including covert acts of judging) that they can both serve as and stand in need of reasons, can play the role both of premise and of conclusion in inferences. In fact Sellars draws (and attributes to Kant) semantic consequences from this holist, functionalist pragmatic order of explication. Thinking of saying that things are thus-and-so as 'descriptive' uses of expressions, he says:

It is only because the expressions in terms of which we describe objects...locate these objects in a space of implications, that they describe at all, rather than merely label.⁵ [CDCM §108]

What is disparaged as 'mere labeling' is a matter of an expression having determinate circumstances of appropriate application, so its proper production reliably differentially classifies what is being responded to. The surplus needed for genuine *conceptual* contentfulness, whose paradigm is *propositional* contentfulness, Sellars is claiming, is situation in a space of implications that determine also the appropriate *consequences* of application of the expression: what follows from the applicability of the concept. The suggestion is that propositions must be individuated at least as finely as the roles they play in a 'space of implications.'⁶

⁴ "Inference and Meaning" [I-4], in Kevin Scharp and Robert Brandom (eds.) *In the Space of Reasons: Selected Essays of Wilfrid Sellars* [Harvard University Press, 2007].

⁵ "Counterfactuals, Dispositions, and the Causal Modalities" §108.

⁶ In fact, he thinks that semantically we must pay particular attention not only to which implications hold, but also to the *ranges of subjunctive robustness* of those implications. This is an important point, which I'll come back to in the third lecture, on the way to formalizing the Dummetian metaconcepts of circumstances and consequences of application.

I take these functionalist, specifically inferentialist, ideas to be right-headed and helpful. But in thinking about the relations between pragmatic claims about assertional *force* (what one is *doing* in saying that things are—describing things as—thus-and-so) and semantic claims about propositional conceptual *content*, it behooves us to be clear and careful about both the distinction and the relations between *inferential* moves or doings (justifying, challenging), on the pragmatic side of understanding assertional force in terms of practices of *reasoning*, on the one hand, and *implication* relations, on the semantic side of understanding propositional contents in terms of such relations. Harman provocatively claims that there is no such thing as deductive inference. If there were, he argues, surely a paradigmatic instance would be inferring from *p* and the conditional *if p then q* to the consequent *q*. But, he points out, thought of as a rule for *doing* something, in the sense of a general policy for belief-revision, that would be a bad one. For one might well have far better reasons or evidence *against q* than one had *for* either *p* or the conditional. And in that case one should surely *not* inferentially draw the conclusion *q* from one's commitment to *p* and *if p then q*. One should rather revise or reject one of those premises.

Harman's conclusion is that deductive logic determines implication relations, but that those *implication relations* do not determine, but only constrain proper *inferential practices*. We can put the point by saying that the fact that p and *if* p *then* q imply q means that it is inappropriate or incorrect to assert p and *if* p *then* q and to deny q. But if we find ourselves with good reasons for all those attitudes, the implication relations do not tell us what to doinferentially to repair that discordant constellation of doxastic commitments. The implicational relations among them don't settle what conclusion should be drawn, what assertional stance should be the outcome of an inferential move.

Taking on Harman's distinction between reason *relations* of implication or consequence between propositional contents and reasoning *practices* of justifying and challenging assertions and responding assertionally to such justifications and challenges puts us in a position to indicate the contours of a minimal model of discursive practice that can meet the dual basic criteria of adequacy of an account of the relations between pragmatic theory and semantic theory. These requirements are that it explain both how engaging in practices of making claims and reasoning

about them by inferentially justifying and challenging them can confer conceptual (paradigmatically propositional) content on assertible linguistic expressions, and how such contents can provide normative standards for assessments of the correctness of assertional and inferential performances. (These are what I earlier called the 'conferral' condition and the 'codification' condition on the relations between pragmatics and semantics.) The model is *minimal* in that all it aims to do is to characterize minimal conditions on a practice for it to be a discursive practice-conditions, that is, that are necessary and sufficient for some performances to be accorded the practical significance of *claimings*. That requires understanding what is asserted by those acts of asserting or denied by those acts of denying (utterings of what thereby count as declarative sentences) to be propositional contents, which are the claimables claimed in claimings of the two kinds. Propositional contents are what can both serve as and stand in need of reasons. Two principal criteria of adequacy are then that the minimal model of discursive practice make intelligible how engaging in that practice confers propositional contents, and how those propositional contents serve to normatively constrain the practice, in the sense of setting standards for assessment of the correctness of claimings, including those that play the role of justifying or challenging other claimings.

The idea for understanding the connections between implication relations and norms governing reasoning practices that I will pursue comes from the *bilateral* normative pragmatics of the consequence relations expressed by sequent-calculus turnstiles developed by Greg Restall and David Ripley. Put in my terms, they start with the idea of the *bipolarity* of doxastic attitudes. This is taking them to come in two essentially contrasting flavors: acceptance and rejection. We can think of them as co-ordinate with two flavors of the speech acts that express them: assertion and denial. Implication relations between a set of premises and a conclusion can then be understood in normative terms of assessments of the correctness or propriety of constellations of doxastic attitudes of the two kinds. In particular, for the premise-set of sentences Γ to imply conclusion sentence A (endorsing ' Γ |~A') is for the overall position any speaker would be in if they *accepted* all of Γ and *rejected* A to be normatively "out of bounds," in Restall and Ripley's idiom. The two sides implicitly invoked in calling this definition 'bi*lateral*' are the two sides of the turnstile, which it proposes to treat differently with respect to the fundamental doxastic bipolarity of acceptance and rejection. For bilateralism understands the

significance for reason relations of what appears on the left-hand, *premise* side, in terms of doxastic *acceptance* and the significance for reason relations of what appears on the right-hand, *conclusion* side, in terms of doxastic *rejection*.

Restall and Ripley offer a definition of the central reason relation of implication that is couched in an avowedly *normative* pragmatic metalanguage. They are explicit about the normative character of the crucial concept of being 'out of bounds', which entails incorrectness: a negative 'ought-to-be.' Our purposes will be served by offering a friendly amendment. For I take it that the notion of a 'position,' which is what is subject to normative assessment as in or out of bounds, is itself a normative notion. What is assessed is attitudes of acceptance or rejection (ultimately, of propositions), and those can usefully be thought of as the two basic kinds of doxastic commitment. A 'position' is then itself a constellation of normative statuses or attitudes, divided into commitments to accept and commitments to reject. For a set of premises Γ to *imply* a conclusion A is then for the set of *commitments* to accept everything in Γ and to reject A to be one to which one cannot be jointly *entitled*. 'Out-of-boundness' is a matter of preclusion of entitlement to all of a set of commitments.⁷ Here it is worth noticing that the notion of doxastic commitment, whether to accept or reject, is an *atomistic* one. A speech act of assertion or denial can add a commitment to a position independently of what that position already contains. But entitlement is a *holistic* matter, assessed for whole positions, where entitlement to any one commitment depends on what else one is committed to.

In these terms, we can offer a rough characterization of the relation between rational implication *relations* and reasoning *practices*, that respects Harman's insight. Speech acts of claiming, like the doxastic commitments they express, must come in two flavors: assertions, expressing doxastic acceptance commitments, and denials, expressing doxastic rejection commitments. Basic reasoning practices govern two kinds of pragmatic significance some claimings can have relative to others: *challenging* a claim by offering reasons *against* it, and *justifying* a claim by offering reasons *for* it. The idea is that successfully challenging a claim

⁷ In Chapter Five of *Articulating Reasons* I argue that any practice of giving and asking for reasons must distinguish something corresponding to the two normative statuses of commitment and entitlement, and that doing so provides a demonstrably more expressively powerful normative metalanguage than any single-sorted deontic metavocabulary, which work with one notion of appropriate/inappropriate or correct/incorrect.

voids the default entitlement doxastic commitments can be thought of as coming with, and successfully justifying a claim reinstates its status as a commitment entitlement to which is not precluded. How do reason relations, paradigmatically implication, figure in the doxastic practices of this model? The idea is that the pragmatic notion of the set of claimables Γ *being a reason for* the claim A appeals to the *implication* of A by Γ : the relation that holds when commitment to accept all of Γ precludes entitlement to deny A. Of course, as Harman would point out, whether offering Γ as a reason for A succeeds depends on entitlement to the premises in Γ .

What about reasons *against*? The *critical* dimension of rational practice—as opposed to the justificatory dimension—is articulated by another kind of reason relation: *incompatibility*. In the spirit of Restall's bilateral definition of the reason relation of implication, we can say that to give a reason *against* A is to make claims, Γ , acceptance of which precludes entitlement to *accept* A. There must be two basic kinds of reason relation because practices of reasoning require claims standing to one another both in the relation of being a reason *for* and in the relation of being a reason *against*.⁸ In the most basic case, these are reasons to *accept* and reasons to *reject* (though there are also reasons for rejections, as well as against acceptances). We can take it that if Γ implies A, in the sense that commitment to *accept* all of Γ precludes entitlement to *reject* A, then Γ thereby *implicitly* provides reasons to *accept* A, since one has been precluded from being *entitled* to the only alternative commitment. Similarly, if Γ is incompatible with A, in the sense that commitment to accept all of Γ precludes entitled to the only alternative commitment.⁹

Inferring is explicitly acknowledging commitments that are implicit, in this specific sense of 'implicit'. Our explicit notion of implication as reason for is of his type Wo-.

Our notion of implicit implication is of his type Wr+.

⁸ Huw Price cogently assembles considerations showing that relations of doxastic incompatibility are essential to discursive practice, in "Why 'Not'?" [*Mind* V. 99, No. 394 (April 1990), pp. 221-238].

⁹ MacFarlane ["In What Sense (If Any) Is Logic Normative for Thought" 2004] sharpens Harman's argument and question. MacFarlane's conclusion is:

[&]quot;My own temptation is to go for a combination of Wo- and Wr+."

Wo- $=_{df}$ you ought to see to it that if you believe A and you believe B, you do not disbelieve C.

 $Wr + =_{df.}$ you have reason to see to it that if you believe A and you believe B, you believe C.

Being precluded from entitlement to deny is implicit commitment to accept.

The paired reason relations of implication/ incompatibility accordingly articulate the pragmatic significance of being a reason for/against, which is an essential aspect of the fundamental bipolarity of acceptance/rejection. This is the same bipolarity that is expressed in a semantic metalanguage by the opposition true/false. These expressions of the basic bipolarity in the two idioms, pragmatic and semantic, are connected by the principle that acceptance is practically taking-true and rejection is practically taking-false. One of my principal aims in this lecture is to show that and how this platitude can be deepened substantially by focusing on the manifestation of the fundamental bipolarity at the level of reason relations among claimables, rather than of properties of those claimables—whether the *semantic* property of being true/false or the *pragmatic* property of being accepted/rejected by some interlocutor.

Reason relations of implication and incompatibility show up in this normative pragmatic model as systematic preclusions of entitlement to some constellations of doxastic commitments. So understood, reason relations give us a grip on the claimable propositional contents that stand in such relations. We can understand those semantic contents as the roles sentences expressing them play in structures of reason relations: both what they imply and what implies them, and what they are incompatible with. For these determine what is a reason for and against what, and so what challenges and defenses count as successful in altering which doxastic commitments various interlocutors are entitled to. In my third lecture, I'll present a formal conceptual role semantics based on this idea of propositional contents as roles with respect to reason relations. For now it is enough to observe that the idea of propositional contents as standing in relations of implication and incompatibility as defined in the bilateral normative pragmatic vocabulary points to how the paired criteria of adequacy I called the *conferral* condition and the *codification* condition can be satisfied.

This minimal model of discursive practice shows how the use of declarative sentences by discursive practitioners can determine the reason relations that the claimables expressed by those sentences stand in to one another. The key question is which constellations of acceptances and rejections preclude entitlement to which others, according to the way practitioners keep track of entitlements in response to various claimings that they take or treat as reasons for or against

which others. Following the lead of Restall and Ripley's bilateral normative pragmatic definition of the reason relation of implication, we specify claiming and reason-giving practices in a richly normative metalanguage of commitments and preclusions to entitlement. Their example shows how we can explain what reason relations are, in those normative terms. By treating some claims as reasons for and against others, in the sense of what assertions and denials they count as challenges to and justifications or defenses of what others, practitioners institute reason relations among claimables, and so confer the kind of conceptual, propositional content articulated by the role claimables play in those reason relations.

The model of the role reason relations of implication and incompatibility play in practices of making claims and rationally challenging and defending them with reasons also explains how the reason relations we are thinking of as articulating propositional contents can be understood as providing normative standards for assessment of the correctness of linguistic performances. The pragmatic idea of rational challenges to claims as consisting in undertaking commitments that provide reasons against those claims, in the sense of being incompatible with them, and of rational defenses or justifications of claims as consisting in undertaking commitments that provide reasons for those claims, together show how what actually implies and is incompatible with what determines which challenges to or defenses of claims are successful in altering their entitlement status. The reason relations accordingly codify norms governing the making, challenging, and justifying of the propositionally contentful claims undertaken by assertions and denials.

Harman offered convincing reasons to distinguish rational *relations* of implication (and, by extension, incompatibility) and *practices* of giving and asking for reasons. I have suggested that a lightly tweaked version of Restall and Ripley's bilateral normative pragmatic definition of implication can be used to explain the relations between the two dimensions that Harman distinguishes. By explaining in normative pragmatic terms what reason relations of implication and incompatibility *are*, the bilateral account opens the way to an understanding of how *sayables* (in the sense of claimables) are related to *sayings* (in the sense of claimings). For we can appeal to the prospect of understanding those propositional claimables in terms of their role in reason relations.

The concept of reason relations, which the bilateral normative pragmatic account of implication has clarified, brings into view another concept, which in one way or another will be the topic of the rest of these lectures. That is the concept of a *vocabulary*. I will use that term in a technical sense, to refer to a certain kind of algebraic relational structure. By 'vocabulary' I mean an ordered pair $\langle L, I \rangle$, whose first element is a domain of sentences, which we can call a lexicon, and whose second element is a specification of the reason relations holding between elements of the lexicon. More specifically, the reason relations are represented by a set of ordered pairs of sets of sentences from the lexicon. For a pair of sets of sentences to be included in the reason relations of a vocabulary means that the implication whose premises are the sentences included in the first element of the ordered pair and whose conclusions are the sentences included in the second element of the ordered pair is a good implication. (We can encode incompatibilities as well as implications in this format, by using Gentzen's convention that endorsing the goodness of an implication with an *empty* set of conclusions is to be read as taking the premise-set to be incoherent, in the sense that any element of it is incompatible with the rest.¹⁰) I take it that the (amended) bilateral definitions of implication and incompatibility tell us, in a deontically two-sorted (commitment/entitlement) normative pragmatic metalanguage, what it is, in broad outlines, for a linguistic community to use a vocabulary. It is for their practices of making, challenging, and defending claims expressed by sentences of the lexicon of the vocabulary to be normatively governed by the reason relations of that vocabulary. The vocabulary articulates the claimablessentences playing roles with respect to reason relations—whose use in claimings the minimal model of discursive practice explicates.

What we have seen so far is how vocabularies look from the point of view of pragmatics: both how the vocabulary can be elaborated from what discursive practitioners do (according to the minimal model), as expressed in a relatively rich normative pragmatic metalanguage, and how the vocabulary can be understood as providing a normative standard for assessments of the correctness of discursive performances of claiming and challenging and defending claims. I

¹⁰ In fact I am thinking of the presence of an ordered pair of sets of sentences $<\Gamma,\Delta>$ in the second element of the relational structure that is a vocabulary as indicating that the multisuccedent sequent $\Gamma|\sim\Delta$ is good in the bilateral sense that commitment to accept all of Γ precludes entitlement to deny all of Δ . But this detail does not matter for my story at this point.

want to turn next to consider how vocabularies, in this regimented sense of a lexicon plus a set of reason relations defined on that lexicon, look from a more orthodox *semantic* point of view.

III. Truthmaker Semantics

The most sophisticated and expressively powerful contemporary representational formal semantic framework is Kit Fine's truthmaker semantics. It begins with a metaphysical picture of what there is to be represented semantically. That universe consists of a structured collection of what he calls 'states.' The formal apparatus is as noncommittal as possible about what these consist in, but states are meant to include such ways things could be as Pittsburgh's being to the West of New York City and snow being white. The universe of states is thought of as having two sorts of structure: mereological and modal. On the mereological side, some states are to be understood as being *parts* of others. More formally, there is a *fusion* operation that maps any set of states into a whole comprising them. This defines the part-whole relation: state A is part of state B just in case B is the result of fusing A with some other states. On the modal side, the universe of states is partitioned into *possible* and *impossible* states.

Mereologically and modally structured state spaces generalize the metaphysics of possible worlds in a number of important ways. Possible worlds show up in this framework as maximal possible states: possible states such that every other state is either a part of that state or incompatible with it, in the sense that fusing it with the world-state yields an *im*possible state. Situation semantics had already shown the expressive advantages of building such wholes out of smaller parts, rather than getting the partial ones by analyzing whole worlds. On the modal side, state spaces in general include multiple *im*possible states, where the possible worlds setting in effect has only one. On the mereological side, various structural conditions can be put on the fusion operation, for instance, requiring that all the states that contain any impossible state are themselves impossible—that is, that the result of fusing any state with an impossible state is always an impossible state. Like the existence of multiple impossible states, the capacity to consider different kinds of mereological structures is a major degree of freedom in the apparatus, enhancing the expressive power of the truth-maker framework.

This metaphysical specification of what is there to be represented is then married to a flexible and powerful semantics. An interpretation function assigns each declarative sentence to a pair of sets of states, thought of as the (exact) *truth*-makers and *falsity*-makers of that sentence. Rather than simply defining one of these sets in terms of the other, one can put various explicit structural constraints on the sets of verifiers and falsifiers that are assigned to declarative sentences as their semantic interpretants. One might be tempted to require that they be disjoint: no possible state is both a truth-maker and a falsity-maker of any sentence. Fine requires rather that the fusion of any truth-maker with any false-maker of the same sentence must be an impossible state. He calls this condition *Exclusivity*. It entails the cognate, but usefully different, requirement that any states that are both truth-makers and false-makers of the same sentence be impossible states. Some statements, say "All cows are made of glass," and "This photon has a mass of 500 kilograms," might have only impossible truth-makers—but they are not required to have the *same* impossible states as truth-makers. The combination of the mereological and modal fineness of grain of the underlying metaphysics and keeping separate books on the truth-makers and falsity-makers that semantically interpret sentences results in a hyperintensional theory of meaning, which makes many more distinctions than its possible-worlds predecessor.

Together, Fine's modal-mereological metaphysics and truthmaker semantics underwrite a striking realism about the propositional contents expressed by declarative sentences. Such contents are just pairs of sets of states that meet whatever structural conditions we impose on such pairs to make them eligible to serve as truth-makers and false-makers of sentences— paradigmatically, Exclusivity, which requires that all fusions of elements of the first set with elements of the second set be impossible states. A proposition, for Fine, is any pair of sets of states meeting that condition, since it is eligible to serve as the interpretant of a sentence. Even in the metaphysically implausible case where there is only a countably infinite number of states, there will be uncountably many pairs of sets of them meeting the minimal structural condition for propositionality—so, far more than any natural or formal language in the ordinary sense can have sentences to express.

Further, those worldly propositions, understood as set-theoretic and mereological constellations of possible and impossible states, stand to one another in relations of consequence and incompatibility. Fine offers two principal ways one might define consequence and counts it a virtue of the system that there are such alternatives. He says that a set of sentences Γ *entails* a

conclusion A in case every verifier of all the premises in Γ is also a verifier of A. He says that A is a consequence of Γ in the sense of *containment* if and only if every verifier of A includes as a part a verifier of all of Γ and every verifier of all of Γ is a part of a verifier of A. Corresponding definitions of incompatibility are not far to seek. Here I want to offer a friendly amendment. We might notice, to begin with, that Fine's definitions of consequence relations do not make anything like full use of the mereological and modal innovations that principally distinguish his framework from the possible worlds semantics it develops from and improves upon. Taking it that premise-set Γ entails conclusion A just in case all the verifiers of all of Γ are verifiers of A just translates the set-theoretic inclusion criterion of consequence from the possible-worlds setting, without adding anything of substance to it. His notion of containment exploits the mereological structure of his metaphysics, but not its modal structure.

My collaborator and coauthor, Ulf Hlobil shows us how to do better.¹¹ We can take our cue from Fine's Exclusivity condition relating verifiers and falsifiers of the same sentence (so of the same proposition). It requires that every fusion of any verifiers and any falsifiers be an impossible state. Hlobil suggests that we take Γ to *imply* A just in case every fusion of any verifiers of all of Γ with any falsifier of A is an impossible state. Exclusivity of verifiers and falsifiers is then manifested as the Reflexivity of the consequence relation: the principle that every premise implies itself. Like Exclusivity, this definition of a notion of consequence appeals both to the mereological and to the modal structure of the universe of states from which the semantic interpretants of sentences are drawn. (The corresponding notion of incompatibility requires that the fusion of any verifiers of all of Γ with any verifiers of all of Γ with any verifiers of all of Γ with any zerifiers of all of Γ with any the modal structure of the universe of states from which the semantic interpretants of sentences are drawn. (The corresponding notion of incompatibility requires that the fusion of any verifiers of all of Γ with any *verifier* of A be an impossible state.)

The key point is that this semantic definition of implication lines up perfectly with the bilateral *pragmatic* definition of implication.

Hlobil's version of consequence (implication) in truth-maker semantics is:

1. Γ implies A iff any fusion of a state that verifies all the members of Γ with a state that falsifies A is an impossible state.

¹¹ Hlobil, U. (2022a). The laws of thought and the laws of truth as two sides of one coin. *Journal of Philosophical Logic*, 52:313–343.

The Restall-Ripley normative pragmatic reading of implication is:

 Γ implies A iff any position that includes accepting all of Γ and rejecting A is normatively incoherent or "out of bounds"—as we have read it: one cannot be entitled to such a constellation of commitments.

And similarly for incompatibility:

- 3. Γ is incompatible with A \Leftrightarrow the state resulting from *fusion* of any *verifiers* of all the members of Γ with any *verifier* of A is an *impossible* state,
- 4. Γ is incompatible with A ⇔ the position resulting from concomitant commitment to *accept* all of Γ and to *accept* A is normatively *incoherent* ("out of bounds")—a constellation of commitments to which one *cannot* be entitled (entitlement to which is precluded).

Indeed, Hlobil proves that with these definitions, the reason relations defined semantically in Fine's truth-maker setting are *isomorphic* with those defined pragmatically in the bilateral normative setting.

IV. Representation, Reason Relations, and Bimodal Conceptual Realism

This isomorphism is the result I have been building up to in this lecture so far. It points to a structure that is common to or amphibious between a pragmatic account of what one is doing in saying or claiming that things are thus-and-so, on the one hand, and a semantic account of the sayable or claimable propositions that are said or claimed. For both on the pragmatic side of speech acts and on the semantic side of conceptual contents the isomorphism reveals reason relations, bivalently distinguished into relations of implication and incompatibility. The isomorphism shows that the *very same* reason relations can be understood as both defining reasons for and reasons against suitable for underwriting practical defenses of and challenges to doxastic commitments, and also as defining relations among worldly propositions. From the pragmatic point of view, both kinds of reason relation appear as the incompatibility of a set of doxastic commitments. From the semantic point of view, both kinds of reason relation appear as the incompatibility of a set of propositions, in the sense of the modal noncompossibility of the worldly states those propositions comprise.

The common topic revealed earns the right to be called "reason" relations in virtue of its role in a pragmatic account of reasoning practices. These include not only rationally challenging and defending commitments by giving reasons for and against them by making further claims that stand to them in relations of incompatibility and implication, but also inferring in the sense of explicitly acknowledging an implicit commitment by accepting what one is precluded from entitlement to deny, or denying what one is precluded from entitlement to accept. Hlobil's isomorphism articulates a precise sense in which those very same abstract reason relations can be discerned in the relations among worldly propositions, understood according to Fine's semantics and the modal-mereological metaphysics of objective reality on which the truthmaker semantics is based. The reason relations so discerned are 'abstract' in the technical sense: they are the result of treating an equivalence relation as an identity. (Frege's model in the *Grundlagen* is abstracting directions of lines from the equivalence relation of being parallel.)

The pragmatic and semantic theories I have sketched offer substantive specifications and accounts of relations of implication and incompatibility. But they are very different. Our version

of the bilateral pragmatic account of the use of sentences is in terms of normative statuses of *commitment* and *entitlement*, and practical doxastic attitudes of *acceptance* and *rejection*. It tells us what it is for a discursive community practically to take or treat various implication and incompatibility relations as holding, by implicitly acknowledging them as norms governing their practices of making claims and challenging and defending them with reasons. This pragmatic account of the subjective appearance of reason relations is mirrored by a semantic account of the objective metaphysical realities, couched in terms of the alethic impossibility of certain mereologically fused states, that determine what propositions in fact follow from and are incompatible with which others. The isomorphism proves that the two metalinguistic accounts can offer perspectives on a single common more abstract structure of implication and incompatibility.

So the isomorphism between these two ways of specifying reason relations precisely determines their common topic: the relations of implication and incompatibility that were informally introduced by Harman's argument. Astonishingly, it allows us to see that and how those reason relations articulate a structure common to assertional force and propositional content. I introduced the term 'vocabulary' to refer to relational structures consisting of a domain of sentences, the lexicon, and a set of reason relations on that domain. The formal representation of reason relations I will use in specifying vocabularies is a set of pairs of sets of sentences, interpreted as the good implications relating premise-sets of sentences to conclusion-sets of sentences.¹² Then we can see both the bilateral normative pragmatic theory and the truthmaker modal-mereological semantic theory as offering explanatory accounts of reason relations, and hence of vocabularies in this sense—even as we are pointed to a broader model in which the things that stand in reason relations are thought of not as sentences, but as propositions in Fine's sense of pairs of sets of objective states satisfying Exclusivity. The next two lectures explore and exploit these newly precise concepts of <u>reason relations</u> and <u>vocabulary</u>. In

¹² In order to facilitate later revealing illuminating connections (both logical and semantic) between vocabularies and sequent calculi, we read the premise sets conjunctively and the conclusion sets disjunctively—that is, Gentzenwise rather than Tarski-wise. But that difference does not make a difference at this point in my story. As previously noted, incompatibility relations are encoded by empty conclusion-sets (which, in the presence of structural rule of weakening on the right, on the disjunctive multisuccedent reading becomes equivalent to having the whole lexicon as a conclusion).

particular, I will investigate the notion of conceptual content as consisting in the functional role some bearer (sentential or otherwise) plays with respect to the reason relations in a vocabulary.

Already we can see how focusing on reason relations illuminates what pragmatic and semantic theories owe each other, the criteria of adequacy they set for each other. The Hlobil isomorphism between (suitably tweaked versions of) Fine's truth-maker representational semantics and (our deontically two-sorted version of) Restall and Ripley's bilateral normative pragmatics supplies an answer to a question Fine's framework by itself does not. For it begins to tell us what practitioners must do, how they must use expressions, in order to confer on them the conceptual contents Fine assigns them in terms of truth-makers and falsity-makers, up to isomorphism of reason relations. To associate verifiers and falsifiers with expressions as their semantic interpretants, practitioners must use those expressions according to the bilateral pragmatics, distinguishing in practice between constellations of commitments to accept and reject claimables that are normatively "in bounds" and those that are normatively "out of bounds." That includes expecting anyone who is precluded from being jointly entitled to the doxastic commitments they have undertaken practically to acknowledge the obligation to alter those commitments so as to repair the situation and find their way back in bounds. This account does not explain what it is to use a sentence so as to confer on it a relation to one pair of sets of states rather than another, if those pairs of verifiers and falsifiers are incompatible with, or imply and are implied by, the same propositions. The isomorphism is only up to reason relations. Fine would still owe an account of how the more fine-grained semantic relations to states that his semantic interpretation functions appeal to can be established by the use of linguistic expressions. Still, being able to say exactly how assertional uses of sentences implicitly acknowledge the normative significance of reason relations, which we can also understand in his semantic-cum-metaphysical terms, represents real progress on this front. For it at least shows how using sentences assertionally is intelligible as treating those sentences as expressing propositional meanings, insofar as conceptual contents are identified with roles in implication and incompatibility relations.

It is important that the isomorphism, and so the correspondence between representings and representeds, is specified to begin with not at the level of sentences and facts, but at the higher

level of reason relations. This is the very top of the hierarchy Sellars describes Kant as having arrived at by inverting the traditional bottom-up order of explication. That is, on the linguistic side it is at the level of *meaning*, not of *truth*. The common structure we have discerned does not depend on what anyone is actually doxastically committed to, on the pragmatic side of representings, nor on what states are actual, on the semantic side of represented reality. It is not a correspondence theory of truth. Rather, the sort of conceptual realism it underwrites is a transcendental presupposition of the possibility of correspondence theories of truth.¹³ One reason the possibility of understanding representation at the level of reason relations has not been sufficiently explored is that people have not been working with a sufficiently developed pragmatics. Another is insufficient appreciation of the lessons taught by the history of the concept of <u>representation</u>.

¹³ The idea of "coherence theories of truth" was always the result of misunderstandings of holistic theories of *meaning*. Truth of sentences as correspondence to reality is a local property, appropriate to atomistic categories of resemblance rather than the holistic categories of representation presupposed at the level of meaning, on which it turns out to depend. At the level of reason relations, we see new possibilities emerge for combining elements of coherence and correspondence in a semantic theory.

V. From Atomistic Resemblance to Holistic Representation

For this reason, it is worth standing back a bit and looking at how the isomorphism between pragmatics and semantics at the level of reason relations illuminates the specifically representational semantic dimension of discursive practice. The concept of representation is a distinctively modern one, essentially due to Descartes. The classical philosophical tradition understood the relation between appearance and reality (in that sense, mind and world) on the model of *resemblance*, whose paradigm is the relation between a picture and what is pictured. The idea is that a picture (or idea) resembles its object, and so is veridical, insofar as it shares visual properties of shape or color with it, and is a misleading appearance insofar as does not in this sense resemble what it pictures. Descartes saw that this model begins to break down when it is applied to the theories of the new science of his time. Copernicus claimed that the reality behind the appearance of a stationary Earth and Sun revolving around it is a rotating Earth and stationary Sun. Any resemblances there run the wrong way. And it gets worse. The appearances Galileo found most veridical and (so) useful for reasoning about physical reality have periods of time appearing as the lengths of lines, and accelerations as the areas of triangles. What properties are shared there to underwrite a resemblance? And in the case of Descartes's own analytic geometry, the relation between the equations $x^2+y^2=1$ and x+y=1 on the one hand, and the circle and line they determine, on the other, is certainly not one of resemblance in the traditional sense.

Descartes sees that a more abstract concept of <u>representation</u> is required to handle these cases, since the more intuitive notion of <u>resemblance</u> ceases to be useful just when it is most urgently needed: in explaining the sense in which the new science offers *better*, more veridical appearances of physical reality than common sense. He did not go on to offer a useful *account* of this more general and abstract relation of representation, however. He took it to be essentially a brute fact that the world contains two kinds of things, representings, which are by nature *tanquam rem*, of or about things, and extended things, which are merely represented or representable.

Spinoza (whose first book was on Descartes) figured out the most basic features of the concept of <u>representation</u> that was implicit in the motivating paradigm of analytic geometry. The key is that, as he puts it, "the order and connection of ideas is the same as the order and connection of things."¹⁴ Equations can represent geometrical figures because the whole *system* of equations is isomorphic to the whole *system* of figures—with, for instance, simultaneous solutions of equations corresponding to intersections of lines. That is why algebraically manipulating equations is intelligible as reasoning about geometrical figures. Given the global isomorphism—the "order and connection" of linear strings of symbols that is the same as the "order and connection" of linear strings of symbols that is the same functional role in the world of equations that the circle it thereby counts as representing plays in the world of geometrical figures, with simultaneous solutions of equations algebraically playing the role of geometrical intersection of lines.

According to this story, the resemblance model was not wrong to take the sharing of properties to be essential to the *of*-ness invoked by talk of appearances *of* material reality. Its mistake, the source of its expressive limitations, was to restrict attention to *local* properties, conceived *atomistically*: properties elements of picturings and of what is pictured could have regardless of what properties *other*, systematically related elements had. Spinoza saw that the wider scope of the new representational model is due to the *holistic* character of its appeal to *global* isomorphisms, which make visible *functional* correlations between items in the two systems that might have quite different atomistic material properties. The new, more abstract and expressively powerful representational model of the intentional nexus between appearance and reality develops the older, more concrete resemblance model by shifting attention to the larger relational structures whose individual elements can be understood to play the functional roles of representing and represented in virtue of the global isomorphism of those structures. Representings and representeds are still understood to share properties—but properties of a new, functional kind, intelligible only globally, in terms of relations to other representings (or representeds, respectively).

¹⁴ *Ethics* II, Prop 7.

Spinoza elaborated this functionalist, holist conception of the representational relations between mind and world in a rationalist spirit. For him the abstract, systematic "order and connection" that is common to the two poles of the intentional nexus consists of rational relations—just as our isomorphism is at the level of reason relations. With the recollective wisdom of hindsight, we can see that Spinoza was hobbled in developing his rationalist, holist insight by two connected mistakes, both of which Kant would rectify. First, he still thought of the items that most proximally stand in representational relations to one another as *particulars*, thoughts and things (finite modes of substances), rather than subjective judgings and objective judgeables, that is, *propositions*. Second, he failed to appreciate the distinctive *normative* character of the "order and connection of ideas." This is the Kantian thought that applying concepts or ideas in judging is undertaking a kind of *commitment*, something the judger is responsible for, something that can stand in entitlement relations of licensing and prohibition to other such commitments. Spinoza thought of the relations making up the "order and connection" common to thoughts and things in terms of 'necessity.' He understood necessity in alethic modal terms, and found its paradigm in the lawful regularities natural science was beginning to codify. By contrast, Kant used the term 'necessary' ('notwendig') to mean "governed by a rule." In addition to government by rules in the sense of laws of nature, he acknowledged practical necessities where rules become *normatively* binding only when endorsed by autonomous agents.

I mention these mighty dead philosophers both to provide context for and to emphasize some radical features of the conception I have been articulating. The fundamental structural identity between features of the use of linguistic expressions and their objective correlates is at the level of reason relations, of implications and incompatibilities, not of sentences and facts or terms/predicates and particulars/relations. Declarative sentences and worldly propositions are correlated, just insofar as they play the same role with respect to reason relations. The roles with respect to reason relations shared by the sentences used to make assertions and the worldly propositions they express are conceptually articulated by the reason relations they stand in to others of their kind. This is a kind of *conceptual realism*, in that conceptual contents are to be found on both sides of the intentional nexus, in the world as well as in the practices of linguistic communities. This distinctive sort of realism is made possible by a *non-psychological* conceptual as consisting in role with respect to reason relations. According to

that conception, worldly propositions, as pairs of sets of states that meet the modal Exclusivity condition, can themselves be bearers of conceptual content, by standing to one another in relations of implication and incompatibility. In this sense, the objective world would have been conceptually structured by relations of consequence and incompatibility even if there never had been talkers-and-thinkers to reason according to those relations.

The roles with respect to reason relations that are shareable between items caught up in discursive practices of claiming and defending and challenging claims, on the one hand, and constellations of worldly states, on the other hand, can be thought of as *rational forms*, in a recognizably neo-Aristotelian sense. They are *rational* forms precisely in being roles things play in structures of reason relations. They are essentially *modal* forms. For both essentially appeal to a notion of preclusion: the im*propriety* ("out of boundness") of a collection of concomitant commitments, or the im*possibility* of a state resulting from the fusion of other states. In both cases, consequence is a matter of a kind of necessitation, and incompatibility of a kind of exclusion. The isomorphism shows that the modal relations can correspond exactly.¹⁵ But the kinds of modality involved in the pragmatics of representing and in the metaphysics of the representeds in the semantics are systematically different.

The modality that articulates the reason relations implicit in the use of declarative sentences is a *deontic* modality, while that articulating the reason relations implicit in the modalized mereological universe of states is an *alethic* modality. On the pragmatic side of claimings, the claim that the coin is made of copper is materially incompatible with the claim that the coin is an electrical insulator. The modal ruling-out involved in this kind of incompatibility is *normative*: one cannot be *entitled* to commitments to accept both these claimables. It is *possible* to do so,

¹⁵ Hilary Putnam argues (beginning in "Models and Reality" *Journal of Symbolic Logic* vol. 45, No. 3 (Sep. 1980), pp. 464-482) that isomorphisms come cheap. For instance, given any two physical systems, there is some vocabulary in which they will have a common structural description. This objection does not show that the isomorphism between reason relations as specified in a bilateral deontic normative pragmatic metavocabulary and reason relations as specified in a truthmaker alethic modal semantic metavocabulary is trivial. First, we start with two vocabularies for specifying reason relations that are fixed in advance and independently motivatable as characterizing the use and meaning of linguistic expressions, respectively. Second, our isomorphism is *modally robust*—modulo the difference between deontic and alethic modalities. As will be discussed in my third lecture, our isomorphism extends to the *ranges of subjunctive robustness* of the implications and incompatibilities specified. The resulting isomorphism is not vulnerable to the sort of extensional, model-theoretic trivializing counterexamples Putnam appeals to.

but not *appropriate* or *correct*. The state consisting of the coin's being made of copper and the state consisting of the coin's being an electrical insulator are incompatible in the different, alethic modal sense that the combination of them that is their metaphysical fusion is *impossible*. Both the order and connection of ideas and the order and connection of things consist of *modally robust* reason relations: in the one case deontic normative, and in the other case alethic modal. The view I am recommending is accordingly a *bimodal* conceptual realism.

Although the early Modern philosophical tradition I have sketched culminates in a top-down order of explication, it never fully came to terms with the *holism* about conceptual contents implicit in it. It did not because of the impoverished conception of *relations* bequeathed it by Aristotelian and Scholastic logic. Substances and their individual modes are foundational for Descartes and Spinoza. Leibniz denies the reality of relations entirely, treating them as "wellfounded phenomena" emergent from the co-ordination of monadic perspectives. Even Kant treats relations as transcendentally ideal, understanding all relations as the products of synthetic activities of the transcendental subject operating on the diverse manifold of particular representings delivered by the senses. Hegel was the first to pursue the radical top-down, holistic program of understanding both the ideas and things that stand in the relations that articulate the "order and connection of ideas" and the "order and connection of things" as *constituted by* those reason relations. (He took his Romantic predecessors' dominant metaphor of organic unity as anticipating this insight, while misunderstanding its essentially conceptual character.) The question of whether such a holistic ontological conception is ultimately so much as intelligible has been with us ever since. In my third lecture, I will discuss how such a topdown, relations-first order of understanding of propositional conceptual contents in terms of reason relations can be worked out in detail.

VI. Conclusion

My principal concern in this lecture has been to introduce the concept of <u>reason relations</u> of implication and incompatibility, along with the closely related concept of a <u>vocabulary</u>, which is a lexicon of sentences together with a set of reason relations among them. To do that, I pursued a stereoscopic triangulation strategy: comparing and contrating how implication and incompatibility can be characterized in a bilateral pragmatic metavocabulary expressing what interlocutors are *doing* in using declarative sentences to make claims and challenge and defend them, with how they show up in a truthmaker semantic metavocabulary expressing what interlocutors are *saying*, the propositions they are expressing by engaging in discursive practice. Appealing to a result due to Ulf Hlobil, I showed how to define reason relations *isomorphically* in the bilateral pragmatics and the truthmaker semantics. The isomorphism both secures a common (abstract) topic and underwrites a recognizably *representational* relation at the level of reason relations, connecting the norms governing challenging and defending doxastic commitments to modally robust relations of consequence and incompatibility among worldly propositions.

My next lecture addresses two related topics: the structure of reason relations in general and the relation of distinctively *logical* relations of consequence and inconsistency to reason relations in general. The first question is: What are the minimal structural conditions on reason relations that are compatible with the concordance between use and meaning given definite content by the fundamental isomorphism of pragmatically and semantically specified reason relations? We can approach the issue of the ultimate structure of reasons by investigating how robust the isomorphism we are using to pick out reason relations is under variations in their structure. The second question is: What are the relations between *reasons* and *logic*? Here I will offer an account of logical vocabulary as distinguished by its characteristic *expressive* role of making reason relations explicit. This expressivist account sets criteria of adequacy for an ideal logical vocabulary: that it have the expressive power to make explicit any and all reason relations, whatever their structure. Again reporting results from our book, I will present a logic that can be shown to maximally satisfy this expressive ideal. The third lecture completes the investigation of reason relations by presenting a pure model-theoretic semantics of the propositional

conceptual roles expressed by sentences as defined solely by reason relations, independently of whether they are specified in pragmatic deontic normative or objective alethic modal terms. I will then survey the virtues of that implication-space semantics for arbitrary vocabularies including massively substructural ones—beginning with a sound and complete semantics for the logic introduced in the previous lecture. My overall aim is to use the very spare and simple representation of reason relations in vocabularies to illuminate discursiveness from a number of perspectives: to begin with, pragmatics and representational semantics, and then from the points of view of logic and an implication-space semantics of pure conceptual roles.

End of Lecture 1