

## DIRECTIVES

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**Abstract** This prospectus sketches a project in the semantics and pragmatics of action-guiding linguistic devices—imperative constructions, in particular, but also related modal constructions, and the relationships between them.

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### 1 INTRODUCTION

This prospectus sketches in broad outline a project in the formal semantics and pragmatics of action-guiding devices in formal and natural languages—imperative and permission-granting constructions, in particular, but also related modal constructions, and the relationships that obtain between them.

Certain action-guiding linguistic devices (deontic modals, in particular) are a topic of abiding interest in formal semantics and pragmatics, in both its linguistic and philosophical branches, and their study has benefited from an admirable degree of interdisciplinary awareness and exchange. The study of imperative and permission-granting constructions (hereafter “action-guiding directives”) has

been more sporadic and parochial. Perhaps not surprisingly, philosophical interest in action-guiding directives—in particular, characterizing the logic and inferential properties of imperatives—waxed and waned with interest in the metaethical work of R. M. Hare. Interest in linguistics departments has increased with interest in modeling discourse structure and the interplay between utterances and discourse structure, particularly in the last six or seven years, with a singular focus on modeling the impact of utterances with imperative content on parameters of the discourse. In both cases, the *semantics* of action-guiding directives has received scant attention (with permission-granting constructions usually treated, with a few exceptions, as afterthoughts). In the latter case, although linguists get the bulk of the credit for recent advances in our understanding of action-guiding directives, the singular focus on imperatives in discourse obscures paradigmatically “static” or “semantic” phenomena about action-guiding directives—facts about their logic, inferential properties, and model theory, in particular—that are, I will argue, worthy of investigation.

The point of this project is to explore some of the philosophical and linguistic terrain in this area, with a keen eye to clarification and resolution of problems through judicious application of formalism. This prospectus functions as a broadish survey of most of the issues, techniques, and arguments of interest. I try to give each problem a careful and relatively thorough discussion (although I aggressively footnote to indicate problems that I will take up in a longer form of this work). My goals here are two:

- To give the reader a concrete sense of the scope, structure, and content of the dissertation project—in particular, the reader who is unfamiliar with either the relevant literature or my past work.
- To provide something that is less like a dissertation-skeleton, more like a collection of preliminary drafts of chapters.

The project is pitched at anyone working in formal semantics, formal pragmatics, metaethics, or deontic logic. The timeline is ambitious, but doable: I would like to be finished with my Ph.D. by Spring/Summer 2011.

A *very* brief synopsis to orient you before beginning. Section One talks generally about the nature of directive force (the “pragmatics of imperatives”): how to model it (using techniques from formal pragmatics and update semantics), what varieties it comes in, and a collection of challenges for a simple, but venerable, view. Section Two is on foundational issues about the logic and semantics of imperatives: whether they are desirable, what the basic desiderata are, and the smorgasbord of options (and an assessment of their merits) for a formal account of imperative semantics and logic. Section Three addresses a set of problems at the intersection of formal semantics, metaethics, and deontic logic: strong and weak imperatives, conditional imperatives, disjunctive imperatives (the Ross Paradox), directed imperatives, and imperatives embedded under quantifiers. It closes with a brief application of some insights about imperatives to the project of developing the semantic program of expressivism.

## 2 DIRECTIVE FORCE

### 2.1 *Characterizing Directive Force*

Action-guiding directives (AGDs) are linguistic constructions that may be used by a speaker when her communicative intention is to alter the intentions, commitments, and/or obligations of her addressee(s). AGDs come in a number of linguistic guises. They may be syntactically imperative (cf. 1a), or not (cf. 1b-1d). They are syntactically embeddable (cf. 2a-2b), although not freely (cf. 2c), and embedding an AGD typically affects its force: felicitous utterances of (1a) tend to impose a kind of unconditional or categorical obligation; felicitous utterances of (2a) tend to impose a kind of conditional or hypothetical obligation; felicitous utterances of (2b) tend to impose a kind of disjunctive (or conjunctive) obligation.

- (1)
  - a. Fetch me some cigarettes.
  - b. You must fetch me some cigarettes.
  - c. Would you fetch me some cigarettes?
  - d. I suggest that you fetch me some cigarettes.
- (2)
  - a. If you're around a convenience store, fetch me some cigarettes.
  - b. Fetch me some cigarettes and (or) give me one of yours.
  - c. \*If fetch me some cigarettes...

AGDs can be partly characterized by the *force* of their characteristic uses, which is both *performative*, in the sense of Austin (1975), and *directive*, in the sense of Searle (1969, 1975). This characteristic force is performative in that uses of AGDs function primarily not to describe facts about the world, but rather to introduce new facts (about expectations, obligations, or, to use a relatively normatively neutral word, commitments) into a discourse. It is directive in that uses of AGDs function primarily to shape the intentions of their addressee(s) in accordance with the desires of their speaker. (To avoid confusion, I will refer to the force of characteristic uses of AGDs as directive.)

The notion of force is *dynamic* in character: having a certain kind of force is a matter of tending to update a parameter of the discourse (and perhaps corresponding parameters of a cognitive state) in a certain way. Giving a model of force in a formal linguistic pragmatics requires devising a dynamic formal system that is suited to representing discourses and the impact that utterances may have on them. This is a complicated task, and fulfilling it will be one of the primary aims of this project.

Issuing an utterance with directive force typically (with some exceptions to be detailed below) involves (i) an attempt by a speaker to shape the intentions of her addressee(s) and (ii) the imposition of new commitments on her addressee(s). There are, to divide things rather crudely, two perspectives to take on this phenomenon: the normative and the linguistic. Adopting the normative perspective, we might find ourselves interested in any of the following questions.

- How does commitment-imposition relate to speaker-intentions to shape the intentions of her addressee(s)? Is it generally a primary effect, intended side effect, or unintended side effect of the directive use of an AGD?

- What are the properties of the commitments that are imposed? What conditions are there on the successful imposition of commitments? What sorts of considerations can defeat these commitments?

These are difficult questions. Focusing on the linguistic issues lets us remain neutral on most of them. For instance, we can obtain a basic model of directive force simply by representing utterances of AGDs as reliably causing certain relevant descriptions of obligation to go from false (at the prior or original context) to true (at the updated context). We will seek to define an “update potential”—a function from a prior context to an updated, posterior context—for AGDs (or, more precisely, the speech-acts that directive uses of AGDs are used to perform) that reliably alters parameters of the context that are relevant to evaluating whether a description of obligation is true or false (cf. Lewis 1979; Kamp 1974; van Rooy 2000; Portner 2004a, 2008).<sup>1</sup>

Taking cues from recent work in linguistic pragmatics, the rest of this section gives an informal sketch of a standard model for AGD update, considers some problems, and gestures at what sort of model might be required to resolve them.

## 2.2 *Spect-Act Operators and To-Do Lists*

Directive force is a kind of *illocutionary* force. There is no clear reason for thinking that illocutionary force is syntactically encoded at the level of the clause, in contrast with, e.g., grammatical mood (for instance, imperative mood), which is so encoded (cf. Portner 2004a).<sup>2</sup> Illocutionary force, as we have seen, is not determined by an AGD’s grammatical mood (cf. 1b)—indeed, one and the same AGD may apparently be put to different illocutionary purposes (cf. 1c). Nor does grammatical mood determine illocutionary force. The following sentences each embed a clause that is grammatically imperative, but directive force is undetectable.<sup>3</sup>

- (3) Everyone drink another can of beer and we’ll set a record. (Russell 2007)  
 [≈ If everyone drinks another can of beer, we’ll set a record.]

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1. This doesn’t demand normative silence. We might, e.g., want to say something about the conditions under which the speech-act performed by a directive use of an AGD is rejected (since reliable update does not imply infallible update), and the conditions under which successful update fails to imply success of the speech-act (since successful update does not generally imply successful imposition of commitments). This is an abiding theme of Charlow (2009a: §§4–5).

2. There are various ways to encode mood at the level of the clause (see Portner 2004a). The relationship between grammatical mood and illocutionary force is fraught. Although there’s a lot to say, we sidestep most of the issues here. See Lewis (1970); Davidson (1976); Portner (2004a, 2007b); Stenius (1967) for discussion.

3. The semantics and pragmatics of so called “pseudo-imperatives”—clauses in the imperative mood, but lacking directive illocutionary force—is discussed in Russell (2007); Jayez & Dargnat (2008). Pseudo-imperatives would receive serious attention in a dissertation-length project on ADGs, but I can’t consider them in this prospectus. I note in passing that Krifka (2004) treats (4) as a disjunctive speech-act—a directive “disjoined” with a threat. He seems to be confused: (4) is just a threat—namely, to shoot if you don’t stop. Notice the intuitive equivalence with the threat *Either you stop or I shoot*. Cases where directive force is detectable (*Stop, please, or I’ll shoot*) can be handled as the “conjunction” of the directive *Stop, please* with the threat *Either you stop or I shoot*. Interestingly, Krifka (2001b) agrees with this judgment. See §2.4 for details on speech-act conjunction.

- (4) Stop or I'll shoot!  
 [≈ If you don't stop, I'll shoot.]

Upshot: interpretation functions defined on bits of the object language are not suitable for specifying update potentials for AGDs used with directive force.

We do better by introducing formal devices for distinguishing explicitly between kinds of illocutionary force. For instance, iff  $\varphi$  is a formula of the object language, let  $\lceil \text{assert}(\varphi) \rceil$ ,  $\lceil \text{query}(\varphi) \rceil$ ,  $\lceil \text{direct}(\varphi) \rceil$ , etc., be expressions in an “illocutionary metalanguage” denoting the update potentials particular to assertions, questions, and directives, respectively (cf. Isaacs & Potts 2003; Potts 2003). Following Stalnaker (1978),  $\llbracket \text{assert}(\varphi) \rrbracket$  is a function that adds the proposition expressed by  $\varphi$  (relative to the prior context) to the Common Ground. Following Roberts (1996),  $\llbracket \text{query}(\varphi) \rrbracket$  is a function adding the proposition expressed by  $\varphi$  (relative to the prior context) to the Topic List. And following Han (1998); Isaacs & Potts (2003); Potts (2003); Portner (2004a,b, 2008),  $\llbracket \text{direct}(\varphi) \rrbracket$  is a function that adds the proposition expressed by  $\varphi$  (relative to the prior context) to the *To-Do List* of the addressee(s) of the prior context.

The notion of a To-Do List (TDL) is a simple, but powerful, idea. It is plausible, as Portner (2004a) argues, that universal clause types—clause types present in all known natural languages, with declarative, interrogative, and imperative serving as standard examples—are conventionally individually associated with distinct types of illocutionary force.<sup>4</sup> It is natural to analyze a given type of illocutionary force in terms of properties of its update potential—in particular, the parameter of the discourse on which the update potential operates—and because directive force is evidently distinct from assertive and interrogative force (and because directive force, in paradigm cases, involves an attempt to introduce new facts into a discourse that are about an addressee), it is natural to think that directive update involves addition to a discourse parameter that is (i) distinct from the Common Ground and Topic List<sup>5</sup> and (ii) is indexed to individuals. The theoretical notion of a TDL thus has a central role to play in a theory of clause types and illocutionary force.

Like its sister discourse parameters, the TDL parameter is a theoretical construct whose name evokes a host of pre-theoretical preconceptions. It is an open (and interesting) question whether and to what degree the theoretical notion should be designed to mimic the pre-theoretical notion,<sup>6</sup> and, more generally, what sort of properties (in particular, once we have a truly formal pragmatics in place, what sort of *formal* properties) would be desirable to attribute to the TDL.<sup>7</sup>

How to understand the TDL's theoretical role is a separate issue. Some questions:

4. In Portner (2004a)'s account, clause types are directly assigned a force type (“sentential force”), so that well-formed sentences in the imperative mood share a common kind of force marking. Sentential force does not determine illocutionary force, although there is a conventional connection between them.

5. Natural, not obvious. Schwager (2006), for instance, proposes that directive force involves the elimination of contextual uncertainty about the desires of the speaker.

6. Pace Han (1998); Ninan (2005), the TDL for an agent shouldn't be conceived as a set of contents of the agent's actual plans / intentions. This is one respect, surely among many, in which the theoretical and pre-theoretical notion diverge.

7. For a study of the formal properties of the Common Ground, see Stalnaker (2002). Charlow (2009a) discusses the formal properties it would be desirable to attribute to a TDL.

- The Common Ground keeps track of mutual presuppositions. What is it that the TDL (for an individual) keeps track of?
- The Common Ground arguably supplies the modal base (domain of quantification) for deontic modals, epistemic modals, etc. What, if anything, does the TDL (for an individual) supply in the interpretation of such modals?

We can answer these together. TDLs keep track of the criteria that are used to rank possibilities in the modal base, according to whatever sort of standard it is that utterances with directive force are in the business of updating (Portner 2004a, 2008).<sup>8</sup> The resulting ranking is used in the interpretation of whatever modal expressions (plausibly a species of deontic modality, cf. Portner 2008) it is whose truth-values utterances of AGDs are in the business of altering. To use the jargon of Kratzer (1977, 1981), TDLs supply, and update in accordance with directive force involves addition to, the *ordering source* for a certain species of deontic modality (cf. again Portner 2004a, 2008).

Although we save a formal presentation of an ordering semantics for modals for §4.1, some of the theoretical benefits of this treatment of directive force can be appreciated now. Suppose temporarily, in lieu of a formal account, that in the paradigm class of cases,<sup>9</sup> the presence of the proposition that  $\varphi$  on an agent's TDL makes it the case that it is obligatory (for the agent) to see to it that  $\varphi$ . Then updating the individual's TDL in accordance with  $\text{direct}(\varphi)$ , thereby adding the proposition that  $\varphi$  to the TDL(s) of the addressee(s), reliably causes certain descriptions of obligation to go from false (at the prior or original context) to true (at the updated context). Supposing agents typically regulate their behavior so that they do not stand in violation of these sorts of obligations, it is clear how issuing an utterance with directive force involves an attempt, typically successful, to impose new commitments on her addressee(s) and thereby shape the intentions of her addressee(s) in accordance with her desires. So long as the formal details can be worked out, the notion of a TDL, properly understood, is a *prima facie* appealing tool for modeling the illocutionary force of AGDs, in the context of a formal pragmatics for natural language.

### 2.3 Strong vs. Weak

It is natural to distinguish, at the level of *speech-act type*, between a command or order (1a) and a suggestion or request (1c-1d). This complicates things for the basic picture of directive force sketched in the prior section.

There is a burgeoning literature on the distinction between strong and weak types of deontic necessity (see, e.g., Ninan 2005; von Stechow & Iatridou 2005, 2008; Swanson 2008b). To characterize the distinction informally, strong deontic necessity (of the sort that attaches to the modal *must*) is generally thought to bear

8. Portner (2004a, 2008) takes the standard to be a public set of criteria by which an agent's actions may be evaluated as rational. Drawing a conceptual connection between TDLs and rational assessment seems implausible, for reasons I won't go into here. A more in-depth treatment of directive force, along the lines of Hamblin (1987), would presumably allow us to say something interesting about this topic.

9. Demarcating the boundaries of this class is an interesting project. See Charlow (2009a).

with it a *requirement* entailment or presupposition, to the effect that an utterance of *must*  $\varphi$  asserts or presupposes that failing to see to it that  $\varphi$  necessarily involves a violation of the agent's basic deontic commitments ("designated goals," in the terminology of von Fintel & Iatridou 2005, 2008), whereas an utterance of *should*  $\varphi$  generally implicates that seeing to it that  $\varphi$  is the preferred way, among other acceptable ways, of discharging the agent's basic deontic commitments (cf. Sloman 1970; von Fintel & Iatridou 2005). The difference is generally thought to be semantic in character. (More on this below and in §4.2.)

Many considerations suggest that directive force comes in strong and weak varieties.<sup>10</sup> Preliminary linguistic data appears to indicate that commands and orders tend, *ceteris paribus*, to generate strong obligations (or, more precisely, true readings of the relevant strong necessity statements), while suggestions and weak requests tend, *ceteris paribus*, to generate weak obligations.<sup>11</sup> Consider the contrast between the following dialogues, in each case reading the utterance of speaker A as having directive force for her addressee B. (In cases where a weak necessity modal is used, read the AGD as a suggestion to fix on a reading with directive force.)

- (5) A: Go to mass.  
#B: Must I? (#Do I have to?)
- (6) A: You must go to mass.  
#B: Must I? (#Do I have to?)
- (7) A: Would you go to mass?  
B: Must I? (Do I have to?) (#Should I?)
- (8) A: You should (oughta) go to mass.  
B: Must I? (Do I have to?) (#Should I?)

A natural explanation for the observed contrasts is that directive force comes in strong and weak varieties, and that update in accordance with strong (weak) directive force tends to generate strong (weak) obligations.

Similarly, we notice that the felicity of "conjoining" directive uses of AGDs with assertions or expressions of expectation that the enjoined state of affairs will not obtain depends, intuitively, on the strength of the enjoiner.

- (9) a. #Go to mass, although I expect you won't.  
b. #Although I expect you won't, go to mass.
- (10) a. #You must go to mass, although I expect you won't.  
b. #Although I expect you won't, you must go to mass.
- (11) a.??Would you (please) go to mass? I expect you won't...  
b.??Although I expect you won't, would you (please) go to mass?
- (12) a. I suggest that you go to mass, although I expect you won't.  
b. Although I expect you won't, I suggest that you go to mass.
- (13) a. You should (oughta) go to mass, although I expect you won't.  
b. Although I expect you won't, you should (oughta) go to mass.

10. This isn't to claim that the sort of illocutionary force generally associated with the imperative clause-type comes in strong and weak varieties. Something like this is probably true (consider a suggestion in the imperative mood like *Have a piece of cake!*), but the issue deserves scrutiny.

11. Also *presuppositions* thereabout (cf. Charlow 2008b).

According to Ninan (2005), the infelicity of (9-10) is a reflex of the violation of a conversational maxim prohibiting a speaker from attempting to place the proposition that  $\varphi$  on the TDL(s) of her addressee(s) when she expects that her addressee(s) will not see to it that  $\varphi$ . But then, if we fail to distinguish between strong and weak directive force, and  $\llbracket \text{direct}(\varphi) \rrbracket$  is understood as a function adding the proposition that  $\varphi$  to the TDL(s) of the addressee(s), we predict (incorrectly, it would seem) the infelicity of (11-13).

A plausible response to this problem involves introducing a distinction between different types of parameters that directive utterances of AGDs might update (and using this distinction to distinguish between strong and weak directives, as speech-act types). For instance,<sup>12</sup> discussions of weak necessity modals in the vein of von Stechow & Iatridou (2005, 2008) implicate the involvement of a *secondary ordering-source*, that is used to rank acceptable (wrt the primary ordering-source) ways of discharging an agent's basic commitments. Supposing this is right, it would be natural to distinguish an agent's *Primary* TDL from her *Secondary* TDL. Strong directive force (which we might associate with a new type of speech-act operator in our illocutionary metalanguage) would then involve addition to the Primary TDL, while weak directive force would involve addition to the Secondary TDL.<sup>13</sup>

Among the advantages of this tack are its ability (i) to distinguish clearly between the typical purpose of an utterance with strong directive force and the typical purpose of an utterance with merely weak directive force, and, relatedly, (ii) to make rational sense of weakly directive utterances made under the expectation that the enjoined state of affairs will not obtain. Strong directive force might be used by a speaker only when she intended to alter the actions of her addressee(s), while weak directive force might be used when the speaker intended to introduce criteria for the purpose of *evaluative assessment* (perhaps, but not necessarily, in addition to *alteration*) of the behavior of her addressee(s).<sup>14</sup> Supposing a semantics on which the addition of the proposition that  $\varphi$  to a Secondary TDL typically secures the truth of relevant weak descriptions of deontic necessity (*should*  $\varphi$ , *ought*  $\varphi$ , etc.), this analysis would also track well with the proposed explanation of the contrasts between (5-6) and (7-8).

There are reasons (for some of these, see §4.2) for worrying about the secondary ordering-source analysis of the distinction between strong and weak deontic modality, and this makes trouble for this account of the distinction between weak and strong directive force. What is notable, for the purposes of this project-sketch, is the evidently tight connection between the correct semantic treatment of deontic modality and a pragmatic analysis of directive force. A pragmatic analysis of weak (strong) directive force plausibly *requires* a semantics of weak

12. Portner (2008: 367) suggests that distinctions in illocutionary force are explained by updates to different subsets (bouletic, teleological, deontic, etc.) of the agent's To-Do List. This is orthogonal to strength of directive force. A speaker can, for instance, issue both strong and weak recommendations about how her addressee should go about fulfilling her desires.

13. This is just a sketch of a proposal. There are many interesting complications in the area of weak necessity modals (see §4.2), to which a serious proposal would need to be sensitive. I save discussion of these for a fuller incarnation of the project.

14. The connections between the practice of evaluative assessment, weak directive force, and weak deontic modality warrant exploration. Portner (2004a, 2008) gives a preliminary stab at connecting the notion of the TDL to the practice of evaluative assessment, but it is unsatisfactory.

(strong) deontic modality. Weak (strong) directive force consists, partly, in a disposition to reliably impose weak (strong) commitments, which we are modeling as the change in truth-values of descriptions of weak (strong) obligation, from false (at the original context) to true (at the updated context). We cannot get a pragmatic analysis of weak (strong) directive force off the ground without having a sense of (i) what parameters are relevant for the semantics of weak (strong) obligation, (ii) what sort of structure these parameters have and how they respond to additions, subtractions, and (iii) what sort of effects changes in the parameters have on truth-values of the relevant obligation-descriptions. Clearly, then, the correct analysis of directive force will have to take a stand on some fundamental issues in metaethics and deontic modal logic. This is a recurrent theme of this prospectus (and indeed all of my prior work on AGDs). Its implications for the scope and interest of the project are clear.

#### 2.4 Computing and Embedding Force

This section develops some formal apparatus for the computation of update potentials and considers some reasons for and against allowing expressions denoting update potentials to embed under various kinds of operations.

The simple picture we're implicitly employing, which goes back at least to the distinctive notation of Frege's *Begriffsschrift*, presupposes a basic distinction between *illocutionary force* and *semantic content* (in the sense of linguistic meaning).<sup>15</sup> Moreover, contents (a.k.a. thoughts, phrastics, descriptors, sentence radicals) are given by object-language sentences and the propositions they express. The force of a speech-act token (e.g., an assertion that  $\varphi$ ) is computed by combining the denotation of the relevant speech-act operator (a.k.a. force operator, neustic, dicator)—in the case of assertion, `[[assert]]`—with the proposition that  $\varphi$ .<sup>16</sup> On this picture, it is natural to think any expression embedding a speech-act expression under the scope of any operator is ill-formed. In the words of Potts (2003), “force is not embeddable.”<sup>17</sup>

The truth is more complicated. To frame the relevant issues, it pays to be a bit more explicit about the syntax and semantics of the illocutionary metalanguage. As a rough first pass, imagine the vocabulary of this metalanguage as consisting of the formulas of first-order logic  $L$  and a finite set  $\mathcal{O} = \{\text{assert, query, direct, ...}\}$

15. Dynamic semantics in the tradition of Groenendijk & Stokhof (1991); Veltman (1996) denies this distinction and assimilates semantic content to illocutionary force or update potential. The controversy here is largely uninteresting. There are dynamic phenomena (force, for instance) that are perspicuously handled in a dynamic framework. There are static phenomena that are perspicuously handled in a static framework. There isn't much else to say. See §2.6 and Charlow (2009a: §§3.3, 4.13, 5.5-6, 6) for further discussion.

16. A sampling of references that endorse this basic picture: Dummett (1973); Hare (1949, 1952, 1967, 1989); Isaacs & Potts (2003); Krifka (2001a,b, 2004); Lewis (1970); Potts (2003); Searle (1969, 1975); Searle & Vanderveken (1985); Stenius (1967); Wittgenstein (1958).

17. This last assumption is plausible at first blush. We are interested in modeling the force of speech-acts. The force of a speech-act is plausibly a function of the sort of propositional attitude that speech-act generally serves to express: an assertion that  $\varphi$  expresses a belief that  $\varphi$ , a directive that  $\varphi$  generally expresses a desire that  $\varphi$ , etc. Modeling the force of a speech-act would seem to require nothing beyond fixing a content and a conversational “attitude”—an analogue of the attitude expressed by the speech-act—that a speaker can take toward that content. Schroeder (2008a) has a nice recent discussion of this basic picture.

of speech-act operators corresponding to the relevant types of illocutionary force. Expressions of this language (force-marked phrases, FPs for short) are formed, in the *base case*, by adjoining an operator  $\Delta \in \mathcal{O}$  to a formula  $\varphi \in \mathbf{L}$ .<sup>18</sup> In tree form:

$$\begin{array}{c} \Delta(\varphi) : \text{FP} \\ \swarrow \quad \searrow \\ \Delta : \mathcal{O} \quad \varphi : \mathbf{L} \end{array}$$

The semantics for this sort of case is trivial. Informally, we understand  $\llbracket \Delta \rrbracket$  to be a function from propositions to update potentials (functions from contexts into contexts), and let  $\llbracket \varphi \rrbracket$  be a proposition. The denotation of  $\Delta(\varphi)$ ,  $\llbracket \Delta(\varphi) \rrbracket$ , is computed by application of a Functional Application rule (cf. Heim & Kratzer 1998).

$$\left[ \left[ \begin{array}{c} \Delta(\varphi) : \text{FP} \\ \swarrow \quad \searrow \\ \Delta : \mathcal{O} \quad \varphi : \mathbf{L} \end{array} \right] \right] := \llbracket \Delta \rrbracket(\llbracket \varphi \rrbracket)$$

So far, so familiar. Moving beyond the base case—determining whether and how complex update potentials may be constructed out of basic update potentials and how to interpret the operations on contexts that complex update potentials perform—complicates things for the simple picture.

Notice that update potentials are typed as (deterministic) programs: updates relate an input context to a unique output context. So it's natural to ask which regular operations on programs (if any) would be sensible to represent in our illocutionary metalanguage. And one way of approaching this question is to whether and how illocutionary force can be *embedded* in complex speech-acts: are there complex speech-acts having speech-acts as constituents, and whose illocutionary force is computed from the illocutionary forces of its constituent speech-acts? Modeling such phenomena would require (i) devices for building expressions that denote complex update potentials in our illocutionary metalanguage and (ii) the specification of a syntax and semantics for these devices.

For illustration, we focus on two binary operations on update potentials (+ and ;) with a stipulated syntax and semantics, and consider some evidence for natural language constructions that embed force in these ways. (When  $\alpha$  and  $\beta$  are atomic expressions denoting update potentials,  $\lceil \alpha + \beta \rceil$  is a complex expression denoting an update potential that executes at least one of  $\llbracket \alpha \rrbracket$  or  $\llbracket \beta \rrbracket$ , while  $\lceil \alpha ; \beta \rceil$  is a complex expression denoting an update potential that executes  $\llbracket \alpha \rrbracket$  then  $\llbracket \beta \rrbracket$ .<sup>19,20</sup>)

Evidence for a kind of “conjunctive” illocutionary force is given in recent work by Krifka (2001a, 2004) on the semantics and pragmatics of questions. Questions of the form in (14) admit of so-called narrow-scope, functional, and pair-list readings (indicated semi-formally in 14a, 14b, and 14c, respectively).

18. A relevant precursor for this approach is Lewis (1970) (see also Krifka 2001b). Though Lewis conflates the syntax of object language and illocutionary metalanguage, the discussion is sophisticated.

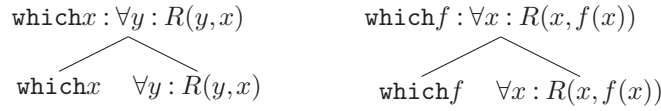
19. There would need to be further syntactic restrictions. Investigating these restrictions—how atomic directives might combine with atomic assertions or questions—seems like it would be an interesting project, possibly one with some metaethical relevance.

20. So  $\llbracket \alpha + \beta \rrbracket = \llbracket \alpha \rrbracket \cup \llbracket \beta \rrbracket$  and  $\llbracket \alpha ; \beta \rrbracket = \llbracket \alpha \rrbracket \circ \llbracket \beta \rrbracket = \{ \langle c, c' \rangle : \exists c^* : \langle c, c^* \rangle \in \llbracket \alpha \rrbracket \wedge \langle c^*, c' \rangle \in \llbracket \beta \rrbracket \}$ .

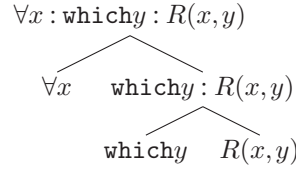
(Note: we're now assuming that some speech-act operators can bind variables in open formulae.)

- (14) Which  $x$ : all  $y$ :  $R(x, y)$ ? (E.g., Which dish did each chef prepare?)
- $\text{which } x : \forall y : R(y, x)$  (Narrow-scope)
  - $\text{which } f : \forall x : R(x, f(x))$  (Functional)
  - $\forall x : \text{which } y : R(x, y)$  (Pair-list)

The force of the narrow-scope reading is to query the identity of a dish (e.g. pasta) satisfying the property in question (being prepared by each chef).<sup>21</sup> The force of the functional reading is to query the identity of a function  $f$  (e.g.,  $x$ 's favorite dish) such that  $f(x)$  satisfies the property in question. Nothing is mysterious about either type of interrogative force. A single question is intuitively asked, and interrogative force adjoins, in either case, to an open first-order formula.



Not so, it would seem, for the pair-list reading, the force of which is to query, for each chef, the identity of the dish that chef made.



A universal first-order formula  $\ulcorner \forall x : \varphi \urcorner$  is equivalent to the conjunction of  $\varphi$ 's substitution instances (assuming a surjective map from constants to individuals and a finite domain of individuals). Similarly, the force of the pair-list reading of  $\ulcorner \forall x : \text{which } y : \varphi \urcorner$  is intuitively equivalent to the force of the ‘‘conjunction’’ of the substitution instances of  $\ulcorner \text{which } y : \varphi \urcorner$  (cf. Krifka 2004: 3-4). Formally, letting  $A$  be a finite list of constants, securing the following identity would be a desirable property of the semantics.

$$\llbracket \forall x : \text{which } y : R(x, y) \rrbracket = \llbracket \bigwedge_{a \in A} \text{SUB}^{a/x} [\text{which } y : R(x, y)] \rrbracket$$

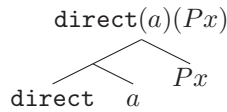
The takeaway point: pair-list readings are good evidence for embedding force under an operation which behaves a lot like conjunction. It is natural to analyze this sort of conjunction in terms of the  $;$  operation, so that  $\llbracket \alpha \wedge \beta \rrbracket = \llbracket \alpha ; \beta \rrbracket$ .<sup>22, 23</sup>

21. Technical note: for any  $\varphi$  in which  $\ulcorner x \urcorner$  occurs free, I assume  $\llbracket \varphi \rrbracket = \lambda x \varphi$ . (I'm suppressing world variables, for simplicity.)

22. An intersective operation is not appropriate, for reasons I won't broach here. It is noteworthy that in Dynamic Semantics the illocutionary force of an assertion of a conjunction  $\ulcorner \varphi \wedge \psi \urcorner$  is generally modeled with function composition, so that  $\llbracket \text{assert}(\varphi \wedge \psi) \rrbracket = \llbracket \text{assert}(\varphi) ; \text{assert}(\psi) \rrbracket = \llbracket \text{assert}(\varphi) \rrbracket \circ \llbracket \text{assert}(\psi) \rrbracket$ . Embedded illocutionary force is automatic from the standard dynamic treatment of conjunction.

23. Although the  $;$  operation is order-sensitive, it is safe to assume (so we will assume) that it commutes when we have a conjunction of substitution instances of speech-act expressions.

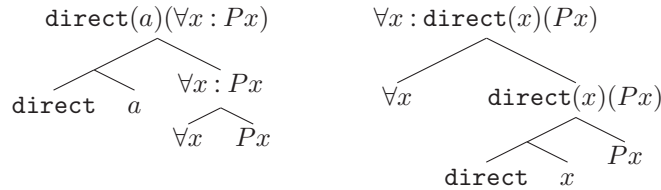
Similar considerations yield a case for embeddable directive force.<sup>24</sup> First, let's be a bit more sophisticated about the sort of function that the operator for generic directive force (*direct*) denotes. We can think of  $\llbracket \text{direct} \rrbracket$  as a two-place function, mapping an *individual* and a *property* to an update potential, so that  $\llbracket \text{direct}(a) \rrbracket$  is a function from properties to update potentials, and  $\llbracket \text{direct}(a)(Px) \rrbracket = \llbracket \text{direct} \rrbracket \llbracket a \rrbracket (\lambda x Px)$  is a function adding  $\llbracket Pa \rrbracket$  (the proposition that *a* satisfies *P*) to the TDL of *a*.<sup>25</sup> In tree form, with the right branch corresponding, as before, to the speech-act's content, the left branch to its force:



Next consider the directive utterances in (15).<sup>26</sup>

- (15) a. See to it that everyone takes shelter!  
b. Everyone take shelter!

There is an unmistakable difference in force here. Intuitively, (15a) demands of a specific addressee *a* that *a* secure the truth of a proposition of the form  $\forall x : Px$ , whereas (15b) demands of *every individual x* that *x* secure the truth of the proposition that *x* takes shelter. The differences between these directives can be represented perspicuously as a scope-difference in the metalanguage.



In the latter tree we again have quantification scoping over a speech-act operator. As before, securing the following semantic identity is desirable.

$$\llbracket \forall x : \text{direct}(x)(Px) \rrbracket = \llbracket \bigwedge_{a \in A} \text{SUB}^{a/x} [\text{direct}(x)(Px)] \rrbracket$$

The evidence for conjunctive speech-acts is pretty solid. This is not, on reflection, too surprising: the performance of a conjunctive speech-act amounts, in effect, to the performance of multiple speech-acts with a single utterance. We might well expect the existence of economizing devices allowing the performance of multiple speech-acts with a single utterance in natural language. Perhaps more surprising would be evidence for devices allowing the performance of *hedged* or *qualified* speech-acts—devices, for instance, for disjoining or conditionalizing illocutionary force.<sup>27</sup>

24. Krifka (2004)'s case for this relies on examples that all strike me as pseudo-imperative.

25. The details here are fairly consonant with the proposal of Portner (2004a,b, 2008). There are, however, some important differences, which I won't try to address here.

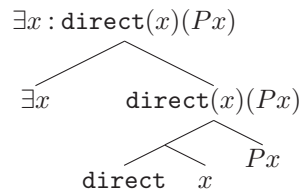
26. Portner (2004a,b) seems to blur these together.

27. An assertion that, e.g., *might*  $\varphi$ ,  $\varphi \vee \psi$ , or *if*  $\varphi$ , *then*  $\psi$  is hedged, but not in the intended

Evaluating this question requires clarity about what hedged speech-acts are—or, in lieu of that, some examples thereof. As a rough first pass, we might say that speaker performs a hedged speech-act with an utterance iff her utterance does not commit her to the unhedged speech-act. Credible examples of this sort of phenomenon are, however, hard to come by. The evidence supplied for conjunctive speech-acts, for one, does not adapt to an argument for disjunctive speech-acts. There is a pair-list reading for the question *Which dish(es) did QP prepare?* only when QP is a universal quantifier phrase (Krifka 2001a, 2004).

As for directives, consider (16), the proposed representation, and its semantics.

(16) Someone bring me a cigarette!



$$\llbracket \exists x : \text{direct}(x)(Px) \rrbracket = \llbracket \bigvee_{a \in A} \text{SUB}^{a/x}[\text{direct}(x)(Px)] \rrbracket$$

Problem one: supposing a speaker of (16) typically addresses such a directive to an audience, (16)'s force is plausibly conjunctive, not hedged—aptly represented, that's to say, with  $\lceil \forall x : \text{direct}(x)(Px) \rceil$ , with  $P$  expressing the property of seeing to it that someone brings the speaker a cigarette and the quantifier ranging over the audience. Any addressee who knows that her bringing the speaker a cigarette is the only way the speaker's request will be fulfilled is obliged to bring the speaker a cigarette. This is easy to explain, if we suppose that, for each  $x$ , the proposition that  $x$  sees to it that someone brings the speaker a cigarette is on  $x$ 's TDL. This is exactly what the update potential of  $\lceil \forall x : \text{direct}(x)(Px) \rceil$  guarantees.

Problem two: it is most natural to analyze speech-act disjunction in terms of the  $+$  operation (which executes at least one of its arguments), so that  $\llbracket \alpha \vee \beta \rrbracket = \llbracket \alpha + \beta \rrbracket = \llbracket \alpha \rrbracket \cup \llbracket \beta \rrbracket$ . But any illocutionary operator analyzable in terms of  $+$  is not the sort of operator that would be appropriate for hedging illocutionary force:  $\llbracket \alpha + \beta \rrbracket$  executes at least one of  $\alpha$  or  $\beta$ , so that the result of executing  $\llbracket \alpha + \beta \rrbracket$  on a context is the same as executing either  $\llbracket \alpha \rrbracket$  or  $\llbracket \beta \rrbracket$  on it. The  $+$  operation introduces possible uncertainty about which of its arguments is executed. *Unpredictable* and *hedged* force are distinct: an utterance whose force is to update with  $\llbracket \alpha \rrbracket$  or  $\llbracket \beta \rrbracket$  *commits* the speaker to  $\alpha$  or  $\beta$ , depending on which update is executed on the context. Disjunctive speech-acts, should they exist, would require a

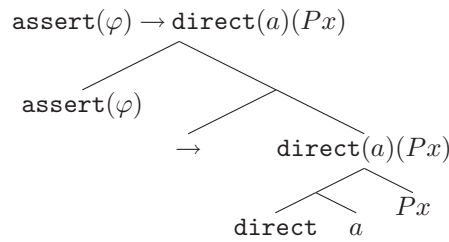
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sense. The force of asserting *might*  $\varphi$ , for instance, is plausibly that of full assertion: that  $\varphi$  is possible wrt the relevant information. For contrary views, see Swanson (2006); Yalcin (forthcoming). It is an interesting question which, if any, views about epistemic modality require speech-acts that are hedged, in the intended sense. For relevant discussion, see von Stechow & Gillies (2007: §5).

different analysis. But what?<sup>28,29</sup>

A better case for hedged speech-acts might be found in *conditional* or *hypothetical* speech-acts. If examples of such could be identified, they would clearly count as hedged speech-acts. In particular, conditional directives are often contended to yield examples of conditional speech-acts (see, e.g., Potts 2003; Asher & Lascarides 2003; Lascarides & Asher 2004; Portner 2004a). Glossing over some detail, consider a purported example, the commonly proposed representation, and its semantics. (We let  $C_{\text{assert}(\varphi)} = \{c : \llbracket \text{assert}(\varphi) \rrbracket(c) = c\}$ —the contexts where asserting  $\varphi$  is redundant.)

(19) If your boss attends the meeting, give her a seat!



$$\llbracket \text{assert}(\varphi) \rightarrow \text{direct}(a)(Px) \rrbracket = \lambda c. \begin{cases} \llbracket \text{direct}(a)(Px) \rrbracket(c), & \text{if } c \in C_{\text{assert}(\varphi)} \\ c, & \text{otherwise} \end{cases}$$

Comment:  $\lceil \alpha \rightarrow \beta \rceil$  expresses a *conditional update potential*: execute  $\beta$  if  $\alpha$  is executed; otherwise, idle. The force of  $\lceil \alpha \rightarrow \beta \rceil$  is to restrict the execution of  $\beta$  to contexts where executing  $\alpha$  is redundant. A conditional directive will typically add something to an addressee’s TDL, on the condition that the information expressed by its “antecedent” is available.

Problem one: this can’t be the right semantics for conditional directives in natural language. The directive in (19) gives an addressee guidance should the information that  $\varphi$  become available (in particular, it tells her that if her boss comes to the meeting, she must offer her a seat). But the suggested semantics returns the original context when the information expressed by the antecedent is not available. What appears to be needed is an update potential for

28. Maybe they introduce *alternatives*, so that  $\llbracket \alpha \vee \beta \rrbracket$  maps a context  $c$  into a set of alternative contexts  $\{\llbracket \alpha \rrbracket(c), \llbracket \beta \rrbracket(c)\}$  (cf. Krifka 2004; Mastop 2005; Veltman 2008). This solves the commitment problem, but at the cost of considerably complicating the semantics of update. In lieu of credible examples of disjunctively hedged speech-acts, this is to be avoided.

29. Other evidence for disjunctive speech-acts comes in the form of disjunctive imperatives / permissives.

- (17) a. ??Post or burn the letter (I haven’t decided which)  
 b. Post or burn the letter (I don’t care which)
- (18) You may post or burn the letter (I don’t care which)

If (17a) is felicitous (as Hamblin 1987; Hare 1967: 315-6 claim), it would plausibly be an example of a disjunction of directive speech-acts. I dispute its felicity (cf. Merin 1991). Krifka (2001b, 2004) contends that (17b) and (18) are examples of disjunctive speech-acts, but they seem to me to be clearly examples of conjunctive speech acts: (17b), with the indicated force, demands that the addressee either post or burn the letter *and* permits her to do both, while (18) simply permits her to do both. This result is, I contend, delivered by the correct semantic treatment of the Ross Paradox and the Paradox of Free Choice Permission. See §4.4 for discussion.

$\lceil \text{assert}(\varphi) \rightarrow \text{direct}(a)(Px) \rceil$  on which the following update potentials are identical:

$$\begin{aligned} & \llbracket \text{assert}(\varphi) \rightarrow \text{direct}(a)(Px) \rrbracket \circ \llbracket \text{assert}(\varphi) \rrbracket \\ & \llbracket \text{assert}(\varphi) \rrbracket \circ \llbracket \text{direct}(a)(Px) \rrbracket \end{aligned}$$

And this would appear to require a TDL that is sensitive, in some way, to available information.<sup>30</sup> Skeletal though it may be, the naïve formulation of the notion of the TDL of Isaacs & Potts (2003); Potts (2003); Portner (2004a,b, 2008) is unable to accommodate this very basic requirement.

Problem two: the correct treatment of conditional directives makes it clear conditional and unconditional directive force are species of the very same genus—conditional and unconditional directive force are, in a sense, types of restricted directive force, only the restriction is vacuous in the case of the latter. So neither motivates recognizing the existence of hedged speech-acts. (Although I can't go into detail, see §4.3 and Charlow 2009a: §§3.4 and 5.3 for discussion.)

To sum up: the case for conjunctive embeddings of force is strong, the case for hedged embeddings is (pending redemption of some promissory notes) weak. While that is interesting in its own right, perhaps more exciting are the prospects for a powerful and precise illocutionary logic—of the sort pursued (largely unsuccessfully) in Hare (1949, 1952, 1967, 1989)—in terms of a first-order modal logic for programs (see Harel et al. 2000), something we've only begun to examine here. Such a logic is, as we have seen, a useful tool for investigating and representing illocutionary force.<sup>31</sup> However we develop it, a large revision of the received analysis of directive force is in order.

## 2.5 Permissive Force

We assume directive uses of AGDs typically introduce obligations, either strong or weak. It seems equally clear that directive uses of AGDs introduce *permissions* (or perhaps even *rights*), which is to say that part of their performative force is, in fact, non-directive—we'll call it *permissive*—in character. Directing an addressee to see to it that  $\varphi$  involves, at a minimum, permitting her to see to it that  $\varphi$ .

- (20) #Bring me a cigarette. I forbid you to do so.  
 (21) #You must (should) bring me a cigarette. I forbid you to do so.

Although permissive force can be, in a sense, a side-effect of directive force, purely permission-granting speech-acts exist (cf. 22a-23b). Permission-granting devices (PGDs for short) are characteristically in the indicative mood (cf. 22a), but note that, like AGDs, they potentially occur in other moods, including, per-

30. On motivating and modeling information-sensitivity in ordering-sources (and, by extension, TDLs), see Charlow (2009b), Charlow (2009a: §4.10), and the discussion in §4.3.

31. As well as a nexus of other issues at the syntax-semantics-pragmatics interface, in particular the clarification and evaluation of *expressivism* (and other types of noncognitivism, e.g., about normative language, epistemically hedged language, expressive content, and so on) as a semantic and pragmatic program. The formal apparatus supplies a useful framework for presenting and evaluating recent work by Schroeder (2008a,b,c) that is critical of the semantic program of expressivism.

haps surprisingly, the imperative (cf. 22b).<sup>32</sup> Like AGDs, they embed (cf. 23a-23b), although not quite freely (cf. 23c, a felicitous reading of which obliges a permission-describing, rather than permission-granting, reading of the antecedent).

- (22) a. You may have a pear.  
b. Have a pear if you like.
- (23) a. If the apples are gone, you may take a pear.  
b. You may have a pear and (or) an apple.  
c.??If you may have a pear...

Permission is a complex topic.<sup>33</sup> Some questions we can give a first hearing:

- Is permissive force *sui generis*? Can a permission-granting illocutionary operator be defined in terms of the `direct` operator?
- Supposing permissive force is *sui generis*, what would the correct semantics for a permission-granting illocutionary operator be?

Though there are various ways of modeling permissive force, there's general agreement that permissive force is *sui generis*. Permissions are definable in terms of requirements in deontic logic, but permissive force appears irreducible to directive force.

The most common type of approach—call it the *authority-oriented* approach<sup>34</sup> (cf. Krifka 2004; Lewis 1979; van Rooy 2000)—has it that permissive force consists in some sort of one-off expansion of options for the addressee(s). The authority-oriented approach has it that  $\llbracket \text{permit}(a)(Px) \rrbracket$  expands  $a$ 's options to permit the *least reprehensible* (wrt the relevant ordering) ways for  $a$  to satisfy  $P$ ;  $\llbracket \text{permit}(a)(Px) \rrbracket$  updates the context non-vacuously only when the option-space at the prior context forbids  $a$  to satisfy  $P$ . Supposing the option-space for  $a$  is a function of  $a$ 's TDL, non-vacuous update is achieved by *weakening*, rather than strengthening,  $a$ 's TDL.<sup>35</sup> There is no reasonable way to define an appropriate weakening function in terms of the `direct` operator, so permissive force is *sui generis*.

A different approach—call it the *agent-oriented* approach (cf. Veltman 2008; Charlow 2009a)—has it that permissive force consists in the grant of a right or entitlement to the addressee(s). This approach has it that rights provide a background against which future directives are tested for acceptability. To be a bit grandiose, permissive force is understood as a grant of a kind of Berlin-ian negative right: a freedom to resist future directives that are inconsistent with her

32. Ex. (22b) is from Hamblin (1987), via Schwager (2004). Schwager notes (while registering her disagreement with the sentiment) that such examples (with pseudo-imperatives included in this class) have often “been taken as evidence that the semantics of imperatives has to be so underspecified that ultimately not much of interest can be said about it.” We discuss this point in §3.1.

33. Although we'll sidestep most of the complexity of permission-dynamics here, see Lewis (1979); Portner (2009); van Rooy (2000) for a taste.

34. So named because this approach is best-suited to modeling the commitments of an issuer of permissions and directives (i.e., an *authority*), while the latter is best-suited to modeling the commitments of an *agent*. For more on this distinction, see §3.1.

35. Although Portner (2009) endorses the view that permissions involve addition to an addressee's TDL, I have a number of objections to this view, which I won't voice here.

rights (which we can model as undefinedness of  $\llbracket \text{direct}(a)(Qx) \rrbracket$  for contexts in which an agent has a right that is inconsistent with her satisfaction of  $Q$ ). On this picture,  $\llbracket \text{permit}(a)(Px) \rrbracket$  may update the context non-vacuously when the option-space at the prior context permits  $a$  to satisfy  $P$ : it may not have been forbidden for  $a$  to satisfy  $P$  at the prior context, without there having been a right for  $a$  to do so. Absence of a prohibition on satisfying  $P$  is distinct from freedom to resist directives that are inconsistent with satisfying  $P$ .<sup>36</sup> There is no reasonable way to understand grants of rights as TDL update, so, again, permissive force is *sui generis*.

Since permissive force is *sui generis*, it would seem that we ought to treat it, in the case of directive uses of AGDs, as an *adjunct* to directive force. Directive uses of AGDs would typically involve the performance of a conjunctive speech-act: an injunction for the addressee to satisfy some property (whose force is to add the proposition that the addressee does so to her TDL), together with a grant of permission for the addressee to do so (consisting in either a weakening of the addressee's TDL, or an addition to the addressee's rights, depending on one's approach).<sup>37</sup>

So much for an overview of the issues surrounding permissive force. No matter how we choose to model permissive force, the lesson, again, is clear: the naïve approach to directive force is in for an overhaul.

## 2.6 Discourse Semantics

There is a temptation, when thinking about directives, to think there are no properly semantic (in the usual sense of that notion) generalizations to be made about AGDs (and imperatives, in particular). There are at least two kinds of motivation one could have for this sort of view. Portner (2008: 366) claims there simply *is* nothing to say about the meaning of the imperative, beyond giving an analysis of directive force. Writers in the vein of Williams (1963) argue that, since imperatives do not behave in a logically disciplined way, they do not have a logic, and

36. There is a case for having  $\llbracket \text{permit}(a)(Px) \rrbracket$  undefined for  $c$ , when a prohibition on satisfying  $P$  is in force at  $c$ . An agent's reconciling a prohibition on satisfying  $P$  with a grant of permission to satisfy  $P$  requires that she compare the authorities that are the sources of the prohibition and grant of permission, respectively. Modeling this sort of comparison is plausibly not the job of the semanticist. This approach is well-suited to handling the following asymmetry. Let A and B be authorities of equal stature (e.g., Mom and Dad), and C be their subject.

- (24) A: You may watch TV before bed. (*time passes*)  
 B: Go to bed!  
 C: Hey! A said I could watch TV!
- (25) A: Go to bed! (*time passes*)  
 B: You may watch TV before bed.  
 C: ??????

Permissions followed by matching prohibitions supply grounds for *resistance*. Prohibitions followed by matching permissions supply grounds for *confusion*.

37. We could banish representations of *sui generis* injunctive (i.e., TDL-strengthening) force from the metalanguage, by defining a new speech-act operator (one with both a TDL strengthening and option-expanding/right-granting function). As the Ross Paradox (see §4.4) makes clear, however, one and the same injunctive force can combine with grants of permission of differing content to yield different forces for one and the same AGD. So things are tidier if the pragmatics recognizes *sui generis* injunctive force.

so lack a semantics.<sup>38</sup>

The former motivation stands or falls with the latter. If there is a logic of imperatives (and it is possible to characterize this logic formally), then there will presumably be an entailment or consequence relation for imperatives (or, more precisely, for a formal imperative language). Stating necessary and sufficient conditions on that relation will presumably require defining a fundamental semantic relation for the formal imperative language—an imperative analogue of satisfaction or truth of a formula in a model. (See §3.1 for further discussion of these and related points.)

While Portner (pc) seems to acknowledge the force of this point (and agree, moreover, that there is a logic of imperatives to be characterized), he nevertheless contends that the thrust of his claim survives intact. The logic of imperatives is, he claims, simply to be read off our analysis of directive force. A *dynamic satisfaction relation* (holding between contexts and formulae of the imperative language) comes for free once update potentials are defined for the language: a context  $c$  satisfies a formula  $\varphi$  with update potential  $[[\varphi]]$ <sup>39</sup> iff  $[[\varphi]](c) = c$ . So while an analysis of directive force doesn't strictly exhaust an account of the meaning of the imperative, it will ultimately be able to explain all that needs to be explained about it.

Whatever update potentials we ultimately settle on for the language, we can usually define a *static satisfaction relation* that is rich enough to characterize them (see Charlow 2009a: §4.13 and §3.3 below).<sup>40</sup> The logics characterized by the “competing” static and dynamic relations are in large part the same (Charlow 2009a: 80).<sup>41</sup> In cases where the dynamic and static perspectives on the imperative are essentially equivalent, why should one take precedence over the other? Update potentials are useful, to be sure, for doing the pragmatics of directive force, but whether the semantics undergirding the logic is static or dynamic is neither here nor there. Nor does the use of a dynamic satisfaction relation, as such, yield a theory of imperative content that is dynamic in any special sense, so long as we are able to read update potentials off the static satisfaction conditions for formulas of the imperative language (cf. von Stechow & Gillies 2007).<sup>42</sup>

38. In support of the latter point, we might note the various guises of imperatives—as permissives and in pseudo-imperative constructions—on which directive force is undetectable. The idea here seems to be that semantic value determines “functional potential”—the kinds of speech-act that a linguistic device can be used to perform (cf. Schwager 2004). Because the functional potential of imperatives is so wide, it might be that all that can be said about the semantics of imperatives is something indistinctive, e.g., that their semantic value at a context is just a property or proposition (cf. Portner 2004a, 2008).

39. Any logic of imperatives must idealize by encoding force in the object language (cf. §3.1).

40. There are interesting update potential assignments that this is not true of. Coincidentally, they turn out to be of special use in developing expressivism qua semantic proposal (see §4.6).

41. There are cases at the margins where the resulting static and dynamic entailment relations diverge, and in a rather predictable way (Charlow 2009a: 80). As I have argued, these actually illustrate *indispensability* of a static satisfaction relation, insofar as the static entailment relation ends up characterizing a reasonable logic whose rationale fails to square with a dynamic entailment relation. There is a general lesson here: the static perspective is suited to modeling some stuff, the dynamic perspective is suited to modeling some other stuff. Insofar as each can be used to model worthwhile stuff, why be squeamish about using them to do so?

42. We might, e.g., think of the *content* of a first-order formula  $\varphi$  as  $\{P \subseteq \mathcal{P}(W) : \{w \in W : w \models \varphi\} \in P\}$ —the sets of propositions having the proposition that  $\varphi$  as an element (cf. the “constraint semantics” of Swanson 2008a). Then a context  $c$  (dynamically) satisfies  $\varphi$  iff the Common Ground

This ends our overview of the philosophical and linguistic issues surrounding directive force (although related considerations will remain in the background). We began our look at these issues with a pithy and compelling slogan: directive force involves adding something to an addressee’s To-Do List. Reality is, we’ve seen, a lot more complicated. There is a lot of work to be done (although we’ve saved the bulk of it for a more appropriate venue). The remainder of this prospectus is devoted to the logic and semantics of directives.

### 3 LOGIC AND SEMANTICS OF DIRECTIVES

“Ordinary” logic has a well-known and intuitive conceptual rationale: to characterize the set of valid arguments (for a defined formal language). The logic of directives is without such a rationale, so it’s up to us to furnish one. The issues here are complicated and fairly uncharted, so it will be hard to avoid saying a few stupid things. But we will do our best. We begin by sketching a motivation for the logic of directives (and doing some necessary bookkeeping, like defining a provisional imperative language to play around with). As we’ll see, there is a menu of options for defining the fundamental semantic relation for this language consistent with the motivation for the logic of directives.

#### 3.1 *Motivation and Rationale*

There is something compelling about these inferences.

- (26) Brush your teeth and go to bed.  
So, brush your teeth.
- (27) Pet every kitty!  
So, pet Fluffy!
- (28) See to it that: if you go, you take the train!  
Go!  
So, take the train!
- (29) Use an axe or a saw!  
Don’t use an axe!  
So, use a saw!

What *makes* them compelling—what it might even mean to describe the inference of an imperative conclusion from a set of imperative premises as compelling—is for now a mystery. The pull of these arguments is a reason for thinking there is a difference between good and bad imperative arguments. Supposing this is right, we can think of our task in much the same way as ordinary logic conceives its task: as giving a precise semantic characterization—in terms of validity or some related notion—of the set of good imperative arguments.

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of  $c$  is such a set (cf. Charlow 2009a: §4.13). This is a perfectly statically kosher notion of content (in that content is fully determined by the static satisfaction relation  $\models$ ). It’s trivial to read the value of  $\llbracket \text{assert}(\varphi) \rrbracket$  off it.

This is a modest claim, but there are objections—a *lot* of them, in fact. I'll try to lay most of them out in an orderly way here.<sup>43</sup>

**Varying Uses.** Natural language imperatives, as we've seen, can be used to perform a variety of non-directive speech-acts—assertions (or, if you like, threats; cf. 4), grants of permission (cf. 22b), and probably others. So there is reason to suspect that the semantic core underlying the imperative is too thin to support a logic of imperative validity (or, for that matter, any interesting semantic generalizations about the imperative).

I'm not sure that there is anything to this worry,<sup>44</sup> but we will sidestep it anyway. Taking the advice of Bar-Hillel (1966), we'll confine our attention to defining and interpreting a formal imperative language which *encodes directive force*,<sup>45</sup> so that the interpretation of any imperative formula is uniformly directive.<sup>46</sup>

What should this language look like? Here is a preliminary attempt at characterizing it. Let  $L$  be the formulas of first-order logic. Then the Basic Imperative Language  $L_I$  is defined as the smallest set such that:

- (30)    If  $\varphi \in L$ , then  $\varphi \in L_I$   
           If  $\varphi \in L$ , then  $!\varphi \in L_I$  (so  $L \subset L_I$ )

The *imperative operator*  $\lceil \! \rceil$  is read *see to it that*; without exception, it takes a first-order formula as complement. Some limitations of  $L_I$  that are worth noting:

- Imperative formulas do not embed.
- There is, as yet, no way of representing permissions or of distinguishing between strong and weak directive force.

These limitations will eventually need to be remedied. Embedding of imperative formulas (under certain quantifiers and perhaps certain Boolean operators) is essential for representing constructions like (15b).<sup>47</sup> Obviously, a proper logic of imperatives should represent permissions and the distinction between strong and weak directive force, just as a proper deontic logic with designs on natural language should represent deontic permissibility and the distinction between strong and weak deontic necessity. But the issues here are tricky, so we will postpone them for now. Limited though the language is, it would seem to be capable of

43. I'll skip the objection that imperative inferences are a philosopher's contrivance (cf. Wedeking 1970), which Vranas (2009) handles reasonably well.

44. Schwager (2004), for instance, gives a semantics for the imperative that aims to predict permission-granting readings, while Russell (2007) gives a semantics that aims to predict assertive readings. I doubt it's possible to merge these proposals to predict all of the relevant data, however.

45. On linguistic force-marking, see Lewis (1970); Davidson (1976); Portner (2004a, 2007b).

46. We operate under the customary expectation that insights from our understanding of the characteristic behavior and function of natural language imperatives will inform this project, and that a carefully designed and implemented formalism will enrich our understanding of imperatives in natural language.

47. You might think conditional imperatives embed imperative formulas in consequent position under some sort of conditional operator. This isn't the case, although conditional imperatives ultimately do force a revision of the language. See §4.3 for discussion.

rendering each of the above imperative inferences (supposing, for now, that an imperative of the form *do x* can be faithfully translated as *see to it that you do x*).

- (31)  $!(\varphi \wedge \psi) / !\varphi$   
 (32)  $!\forall xPx / !Pa$   
 (33)  $!(\varphi \supset \psi), !\varphi / !\psi$   
 (34)  $!(\varphi \vee \psi), !\neg\varphi / !\psi$

**Permissive Content.** Williams (1963) notes two patterns of inference we would expect to be valid for imperatives.<sup>48</sup> (Natural  $L_I$  counterparts given in brackets.)

- (35) Do *x* or *y* [ $!(\varphi \vee \psi)$ ]  
 Don't do *x* [ $!\neg\varphi$ ]  
 So, do *y* [ $!\psi$ ]  
 (36) Do *x* [ $!\varphi$ ]  
 So, do *x* or *y* [ $!(\varphi \vee \psi)$ ]

But a logic which sanctions these apparent inferences (so any logic of imperative inference) sanctions chains of reasoning whose execution typically requires a *change of mind* on the part of the reasoner. And, according to Williams, “[I]t is essential to the idea of an inference of *q* from a set of premises *P* that in reaching *q*, the [reasoner] should not go back on or change his mind about any of the members of *P*—the form of an inference is *given P, q*” (Williams 1963: 32). To put it somewhat differently: a logic is *well-behaved* only if the inferences it sanctions are such that (i) their premises stand in the required relation to the conclusion and (ii) it is possible to consistently endorse the premises together with the conclusion.<sup>49</sup> So any logic of imperative inference will not be well-behaved, insofar as it sanctions inferences that fail to obey requirement (ii).

What change of mind is involved? According to Williams, disjunctive or choice-offering commands (*do x or y*) carry “permissive presuppositions” to the effect that both doing *x* and doing *y* are permitted. But non-disjunctive commands (*do x*) expressly forbid the failure to do *x*. Supposing that doing *x* implies not doing *y* (and vice versa), the first premise of (35) presupposes permission to fail to do *x*, so that someone who endorses this premise is *committed* to permission for failing to do *x*. The second premise expressly forbids failure to do *x*, so someone who endorses this premise is committed to no permission for failing to do *x*. So it is not possible to consistently endorse both premises. Similarly, endorsing the premise of (36) commits one to no permission for failing to do *x*, while endorsing its conclusion commits one to permission for failing to do *x*. In either case, requirement (ii) is violated.

It is noteworthy that the unacceptability of inference (36) is just the Ross Paradox (Ross 1941), which, helping ourselves to some logical notation, usually

48. There is some disagreement about what Williams’ argument actually is. Vranas (2009), for instance, understands Williams claims about permissive presuppositions to be much stronger than they are. Here I only present what I consider to be the correct interpretation of and response to the argument. Åqvist (1965); Geach (1963) seem to interpret it in the same way.

49. Williams should be wary of reductio, ex falso, and suppositional reasoning. We won’t nitpick.

receives the following formulation.<sup>50</sup>

- (37)  $!\varphi \not\models !( \varphi \vee \psi )$   
 (*Post the letter!* doesn't entail *Post or burn it!*)

It is interesting (and evidently correct) that Williams explains our discomfort with argument patterns (35) and (36) as stemming from a common source—the *permissive content* (in some broad, semantically neutral sense) of imperative sentences (for consonant views, see Aloni 2007; Åqvist 1965; Charlow 2008a, 2009a). To frame Williams' argument somewhat differently (but not unrecognizably), the unacceptability of each inference stems from the fact that, apart from what they require (the satisfaction of their disjunctive complements), disjunctive commands partake in *free choice (grants of) permissions*, of the sort expressed by the indicated reading of (38a), with (38b) providing the standard contrast.

- (38) a. You can post or burn it (I don't care which)  
 $\Rightarrow$  You can burn it  
 b. You can post or burn it (I'm unsure which)  
 $\not\Rightarrow$  You can burn it

The Ross Paradox is often treated simply as a failure of some sort of closure of commanding under logical consequence (cf. Hansson 1990; Kenny 1966; Segerberg 1990). A satisfying treatment requires something more: an account of the permissive content of imperatives (which has them partaking, in some sense—whether via presupposition, entailment, implicature, or another relation of implication—in free choice permissions), and an account of free choice permissions which predicts the relevant implications.

Various replies to Williams are possible. We might deny that endorsing disjunctive commands commits one to endorsing permission to satisfy each disjunct. Although it isn't credible to deny that *do x or y* in some sense implies, on a salient reading, the permissibility of both *x* and *y*, Williams' identification of these implications as *presuppositions* is seriously mistaken. Presuppositions characteristically project under syntactic embedding and can in general be felicitously challenged with a “Hey, wait a minute!” echo. The implications of choice-offering disjunctive commands meet neither condition: they do not project out of consequent position (cf. 39), and challenging the implication with a “Hey, wait a minute!” echo tends to be infelicitous (except, perhaps, in the special case when a different source of authority has issued a conflicting injunction).

- (39) If  $\varphi$ , then do *x* or *y*  $\not\Rightarrow$  you may *x*

- (40) A: Do *x* or *y*  
 #B: Hey, wait a minute! I'm not allowed to *x*.

So while endorsing  $\varphi$  does generally *commit* an individual to endorsing  $\varphi$ 's presuppositions, this is neither here nor there: there is no case for typing the permissive implications of disjunctive commands as presuppositions.

50. Note, *pace* Williams, that many logicians / semanticists who think there is an interesting logic of the imperative deny this inference's validity, for instance: Aloni (2007); Åqvist (1965); Geach (1966); Hansson (1990); Kenny (1966); Mastop (2005); Ross (1941); Segerberg (1990); Veltman (2008). I note in passing that this formulation of the paradox is (or, rather, is not, but ought to be) controversial (see §4.4).

Whether or not these implications count as commitments depends on the type of implication they fall under. Suppose they are grouped in with, for instance, *quantity implicatures* (Grice 1989), as Bennett (1970); Hare (1967) believe they ought to be.<sup>51</sup> Quantity implicatures (e.g. *some F's G*  $\Rightarrow$  *not all F's G*) do not generally involve speaker commitment; they are, for instance, felicitously cancellable (cf. 41), and withdrawing a statement's quantity implicature fails, as such, to sanction withdrawal of the statement itself (cf. 42).

- (41) Some, but not all, swans are white.  
 (42) A: Some whales are mammals.  
 B: Erm, actually all are.  
 A: I didn't say they weren't! (#You're right. I was wrong. It's not the case that some whales are mammals.)

Are permission implications of disjunctive commands cancellable? Well: they are (cf. 43; example taken from Rescher & Robison 1964, via Åqvist 1965; for a similar example, see Geach 1966), and they aren't (cf. 44, 45).

- (43) John, stop that or leave the room!  
 (*John starts to leave*)  
 Don't you dare leave this room!  
 (So infer: Stop that!)  
 (44) #Post or burn the letter, but don't burn it  
 (45) A: Use shears or a chainsaw to cut the branch.  
 B: I'm not allowed to use a chainsaw!  
 A: My mistake: don't use shears *or* a chainsaw. Just use shears. (#Noted, but the instruction still stands: use shears or a chainsaw.)

Ex. (43) seems to cut against Williams' entire argument. Here we have felicitous cancellation of a permission implication, an inference to an imperative conclusion, and no sense that there is anything inconsistent about endorsing the premises of the inference together with its conclusion. Ex. (44) indicates, on the other hand, that there is something fishy about conjoining an injunction to a disjunctive command, such that the former conflicts with the permission implication of the latter—unexpected, if the permission implication is a quantity implicature. In a similar vein, ex. (45) indicates that denial of a disjunctive command's permission implications sanctions (indeed, requires) the withdrawal of the disjunctive command—again unexpected, if the permission implication does not involve commitment on the part of the speaker.<sup>52</sup>

51. Typing these implications as quantity implicatures commits one to specifying a plausible, Gricean way of deriving them, involving some sort of non-informational (practical) analogue of Grice (1989)'s Maxim of Quantity. For sophisticated recent attempts to derive free-choice implications in roughly this way, see Fox (2006); Kratzer & Shimoyama (2002); Schulz (2003, 2005).

52. The data here require more scrutiny than I have space for. Synchronic cancellation constructions, as in (44) are *uniformly* bad, regardless of the disjuncts. It may be that default interpretations for disjunctive commands involve strong permission commitments, but that *retroactive* reinterpretation is possible (in particular when it is or becomes common knowledge that one of the disjuncts is strongly dispreferred by the speaker). Taking on this picture will complicate the choice-offering / alternative-presenting account presented immediately below. An examination of free-choice interpretations of indefinites is also in order. See §4.4 for further discussion.

In light of such data, it is reasonable to take on a distinction between *choice-offering* and *alternative-presenting* disjunctive commands (Åqvist 1965; see also Aloni 2007; Charlow 2009a). Endorsing a choice-offering disjunctive command involves strong commitment to permitting each disjunct, while endorsing an alternative presenting disjunctive command does not. Since the quantity implicature account of permission implications fails to account for choice-offering interpretations, it should be discarded.

How to account for the commitment, if the permissions are not presuppositions of choice-offering disjunctive commands? We do fine treating them as (in a sense we will clarify) *entailments*, by semantically encoding free choice permissions at LF. Although how exactly to do this is a matter of finesse,<sup>53</sup> there are two upshots. First, depending on how alternative-presenting disjunctive commands are analyzed (and how the relevant logical notions of consistency and validity / entailment are developed), this view should have the resources to predict that:

- On a choice-offering reading of *do x or y*, the premises of (35) are inconsistent, and the inference of (36) is invalid.
- On an alternative-presenting reading of *do x or y*, the premises of (35) are consistent, and the inference of (36) is valid.

Second, and perhaps more significant, a satisfactory logic and semantics of imperatives requires a *two-dimensional semantics*: one dimension encoding the injunctive or command content of the imperative, the other its permissive content, the objects of which do not generally coincide.

**Permitting vs. Failing to Forbid.** It is essential to contrast our picture of permissive content with the one endorsed by Castañeda (1958); Vranas (2009) (which might also be used to counter Williams). To bring it out, consider the following inference, which Castañeda (1958) says is invalid (cf. 28).

- (46) See to it that: if you read the book, you see me. [ $!(\varphi \supset \psi)$ ]  
 Read the book! [ $!\varphi$ ]  
 So, come see me! [ $!\psi$ ]

“[A] teacher who [issues the premises of 46] has not thereby ordered or told his student to come to see him, *regardless of the student’s reading of the book.*” (Castañeda 1958: 43-4)

It’s natural to extend this to Ross: if one endorses *do x*, one doesn’t thereby commit herself to endorsing *do x or y*, regardless of the doing of *x*.

Although this analysis roughly agrees with our take on disjunctive imperatives, it relies on a much stronger (and quite implausible) view about the permis-

53. See §4.4 and Charlow (2009a: §§3.5, 4.11). This solution goes naturally with a semantic resolution of the paradox of free choice permission; for some options, see Aloni (2007); Geurts (2005); Mastop (2005); Veltman (2008); Zimmermann (2000). There are a host of putatively closure-related “paradoxes” in the neighborhood of Ross that are susceptible of this sort of analysis.

sive content of imperatives in general.<sup>54</sup> The *order*  $\varphi$  *regardless of*  $\psi$  locution expresses that both  $\varphi \wedge \psi$  and  $\varphi \wedge \neg\psi$  are permitted (when possible), and at least one required. Castañeda apparently believes the conclusion of (46) to express a requirement to come see teacher and a permission to do so with or without having read the book. While inferring an order to see teacher, regardless of your reading, from the premises of (46) is indeed fallacious, glossing the conclusion of (46) as *come see me regardless of your reading of the book* misrepresents its content: the conclusion is silent about whether failing to read the book is permitted.

More generally, Castañeda's analysis seems to rely on the notion that, where  $\varphi \not\vdash \neg\psi$ ,  $\ulcorner!\varphi\urcorner$  permits that  $\psi$  (see also Vranas 2009: fn13).<sup>55</sup> But on the assumption that  $\ulcorner!\varphi\urcorner$  permits that  $\varphi$ , the analysis predicts the conclusion of (46) to express a permission that is inconsistent with the command *read the book*. This involves a basic conceptual confusion: the conflation of failure to expressly forbid with permitting.

It is logically problematic too: any logic of imperatives worth its salt will sanction inference (48).

- (48)    Read the book! [ $!\varphi$ ]  
           Come see me! [ $!\psi$ ]  
           So, read the book and come see me! [ $!(\varphi \wedge \psi)$ ]

But if *come see me* expresses permission to do so without reading the book, then (i) the premises of this inference are inconsistent (clearly they are not), and, worse, (ii) each premise expresses a permission that is inconsistent with the conclusion. This would seem to imply that endorsing the premises of this inference commits one to *rejecting* its conclusion. The opposite is true.

The upshot is familiar from our earlier examination of force: as grants of permission—the speech-act analogue of permissive content—are non-analyzable in terms of failure to prohibit, so permissive content is distinct from failure to expressly forbid.

**Eliminability.** Let a treatment of imperative logic and semantics be *reducible* if there exists a translation map  $\tau : \mathbf{L}_{IMP} \mapsto \mathbf{L}_*$  (for the relevant imperative language  $\mathbf{L}_{IMP}$  and some non-imperative language  $\mathbf{L}_*$ ) that is homomorphic wrt  $\models_{\mathbf{L}_{IMP}}$ , i.e.:

$$\varphi_1, \dots, \varphi_n \models_{\mathbf{L}_{IMP}} \psi \text{ iff } \tau(\varphi_1), \dots, \tau(\varphi_n) \models_{\mathbf{L}_*} \tau(\psi)$$

Some examples of reducible accounts, hastily presented:

- Those which state satisfaction conditions for formulas of an imperative language in terms of satisfaction conditions for formulas of an alethic

54. Crucially, for our purposes, the analysis rules out any treatment of  $\ulcorner!\urcorner$  in terms of an operator  $\ulcorner\bullet\urcorner$  that respects modal axiom **K**.

(47)     $\bullet(\varphi \supset \psi) \supset (\bullet\varphi \supset \bullet\psi)$

Supposing Castañeda is right about (46), analyzing  $\ulcorner!\urcorner$  in terms of any such  $\ulcorner\bullet\urcorner$ , leads to immediate trouble. (This is a bit sloppy, as we cannot strictly express **K** in  $\mathbf{L}_I$ . Once we have a notion of imperative satisfaction in place, we'll be able to state an analogue of **K** in the metalanguage.)

55. *Pace* Vranas, I do not see that Williams gives any indication of thinking this.

deontic language (cf. Aloni 2007; Åqvist 1964; Charlow 2009a; Schwager 2004, 2006; for objections, see Hare 1967; Portner 2008).

- Those which analyze imperatives in terms of explicit performatives ( $do\ x \approx I\ command\ you\ to\ do\ x$ ) and assign explicit performatives satisfaction conditions (cf. Lewis 1970).
- Those which analyze imperatives in terms of future-tense indicatives ( $do\ x \approx you\ will\ do\ x$ ) (cf. Geach 1958).
- Those (cf. Bennett 1970; Jørgensen 1937-8; Hare 1949, 1967) which claim that the imperative entailment relation for  $L_I$  is parasitic on the entailment relation for the base language  $L$  (e.g., that of first-order logic; cf. the discussion of fulfillment logics in §3.2), so that:

$$\tau(\varphi) = \begin{cases} \varphi, & \text{if } \varphi \in L \\ \psi, & \text{if } \varphi = !\psi \end{cases}$$

Without prejudging the prospects for such approaches, supposing that any of them are adequate, imperative logic might be regarded as being in some sense dispensable—a subject of marginal independent interest. Vranas (2009: §4) responds to something like this contention by noting that even if a reducible approach is logically adequate, imperative inferences may be useful, in virtue of being easier to perform or more transparent. This response supplies a rational justification for reliance on imperative inference, as a kind of useful heuristic for practical reasoning, but does not seem to motivate imperative logic as an object of *intrinsic* and *independent* interest for either the philosophical logician or semanticist.

The logic and semantics of imperatives is, nevertheless, worthy of such interest, for at least these reasons.

- It is hardly *obvious* that the logic of imperatives is reducible. Arguments to the effect that it is (or isn't) are of legitimate philosophical interest. Establishing either position would be genuine discovery in philosophical logic and the semantics of natural language.
- Even if it is reducible, the logic of imperatives characterizes something distinct from that which is characterized by ordinary logic, as the various ways of understanding the imperative entailment / satisfaction relation (see §3.2) make clear. (What exactly it characterizes depends on which understanding we choose to work with.)
- The translation map  $\tau$  will likely not be one-to-one (owing to imperatives' distinctive syntactic profile; Hare 1967 tacitly claims this for deontic reductions; see §3.3). How to restrict embeddings of imperatives under various operators is a topic of real, independent interest, with obvious relevance for the logic.
- Exploring (and, optimistically, coming to better understand) the logic and semantics of one fragment of apparently non-fact-stating discourse

can supply us with insights into the logic and semantics of other fragments of putatively non-fact-stating discourse (see, e.g., our discussion of expressivism in §4.6).

**Imperative Truth?** Reducible analyses of the imperative appear to give imperatives literal satisfaction-conditions. It would seem to follow that an imperative formula can be either *true* or *false*, depending on whether its translation is satisfied. Reducible logics appear to be committed to a truth-conditional semantics for the imperative (or, equivalently, a semantics on which the semantic value of an imperative formula is of the same semantic type as that of its translation).

The argument here is invalid (as discussed below). But suppose otherwise—what would the implications be? The unacceptability of the truth-conditional approach is often treated as a basic, Moorean fact. No matter the work a truth-conditional semantics did for us, there would be a strong presumption against it.

This is a dogmatic way to present a legitimate suspicion; we can do better. Suppose imperative formulae have as their semantic value the same type of object as their translations: a proposition. A formula expressing a proposition is conventionally thought to enable us to do some or all of the following with it.

- Embed them under truth-functional operators
- Embed them under intensional operators
- Assert the propositions they express
- Target the propositions they express with linguistic assent and denial

If imperatives are in the business of expressing propositions, we might wrongly expect the same of them.

(49) \*It's not the case that: come see me now

(50) \*He knows that come see me now

(51) \*I affirm that come see me now

(52) A: Come see me now!  
#B: That's true (false).

Such examples might be thought to show that canonical uses of the imperative are not interpretable as expressing propositions. The data are suggestive, I admit, but complicated nevertheless.

- It may be that parts of the asterisked constructions (in particular, those involving the overt complementizer *that*) subcategorize for complement IPs with non-null SPEC. If that were right, the badness of these constructions could be explained as a function of syntactic defect, rather than semantic type-mismatch. In support of this, note that embeddings

can often be improved by tweaking the example.<sup>56</sup>

(53) He said come see him now. (cf. 50)

(54) I say come see me now. (cf. 51)

- Linguistic denial and assent aren't typically licensed on directive interpretations of syntactically non-imperative utterances (except maybe as expressions of endorsement / rejection of speaker authority) (Crnič & Trinh 2008).

(55) A: You must (should, oughta) come here immediately.  
#B: That's true (false).

Non-embedded occurrences of imperatives typically force directive interpretations. Supposing it is directive interpretation that makes linguistic denial infelicitous, we have an appealing alternative explanation of (52).

- Pseudo-imperative constructions suggest that imperatives can syntactically coordinate with indicatives. Multiple-addressee constructions (cf. 15b, 16) suggest that imperatives can embed under quantifiers.

So while imperatives don't embed quite *as freely as* indicatives, the data's valence is ambiguous (and, in some cases, seem to point to having the semantic values of imperatives and indicatives agree on type).

The skeptic about reducible accounts may regroup: if imperatives expressed propositions, utterances thereof would be generally interpretable as *fact-stating* or *information-providing*. But this is controversial. Schwager (2006), which endorses a speaker-relative bouletic modal semantics for the imperative operator, contends that *lexical presuppositions* of the imperative operator explain why natural language imperatives generally lack fact-stating interpretations. While her proposal is unpersuasive,<sup>57</sup> it is suggestive. Whatever the right account of the performative force of imperatives, it will likely at least be *compatible* with a reducible account of the logic and semantics of imperatives (and perhaps even derivable therefrom; cf. §2.6).

The skeptic's basic argument is invalid anyway, for several reasons.

- The basic semantic relation (between a model and an imperative) need not be understood in terms of *satisfaction* or *truth*. In this vein, Lemmon (1965) suggests the notion of an imperative's *being in force*.<sup>58</sup> True: the conditions under which an imperative formula  $\varphi$  is in force are the same as the conditions under which  $\tau(\varphi)$  is satisfied, but this is not to say that

56. See Crnič & Trinh (2008) for a recent discussion of these examples, and a convincing argument that imperatives are genuinely embeddable in English. The syntactic work here is interesting and potentially fruitful, given the recent overthrow of the received wisdom about non-embeddability of imperatives in English.

57. See Charlow (2009a: §§3.3, 5.2) for a lengthy critique.

58. Segerberg (1990) suggests *requirement*. Lemmon's suggestion is superior if we elect to accommodate permissive content. It makes good sense to say that a permission is in force, considerably less sense to say that it is required.

the semantic relation of the imperative language is one of satisfaction or truth.<sup>59</sup>

- The class of models for  $L_{IMP}$  need not be the same as the class of models for  $L_*$ . In particular, they might be constructed out of *different kinds of things*. For instance: satisfaction might be relative to worlds and deontic accessibility relations, while being in force might be relative to TDLs, plans, hyperplanners (Gibbard 2003), etc. So while we could generally determine a set of worlds for a formula of  $L_*$  to express (qua proposition) from its satisfaction conditions, imperative formulas might express sets of different kinds of things altogether. (Note, however, that taking this tack is in tension with the evidence that the denotations of imperatives and indicatives agree on type.)
- Finally, even if the classes of models for  $L_{IMP}$  and  $L_*$  overlap perfectly, and formulas of  $L_{IMP}$  and  $L_*$  alike are viewed as characterizing sets of worlds, it wouldn't follow that imperative formulas express propositions. Imperative formulas characterize the set of worlds where they are in force, and there is no reason, save a fetish for identifying theoretical notions with their set-theoretic representations, for thinking this set, under this description, is a proposition.<sup>60</sup>

I take it that imperative logic and semantics is motivated. We turn now to describing the menu of options for conceptualizing the basic semantic relation for our toy imperative language,  $L_I$ .

### 3.2 The Semantic Smorgasbord

The attractiveness of a logic and semantics for a language  $L$  will in general be relative to our conception of its basic semantic relation  $\models_L$ , and this will in general be a function of what we wish to use the logic to model or characterize.<sup>61</sup> I sketch three such starting points in this section. No doubt others are possible: these are the ones best represented in the literature I am aware of. Some points worth flagging before we get moving.

- The logics we examine are all reducible.
- Let  $\mathfrak{M}_I$  be the class of models for  $L_I$ ,  $\mathfrak{M}_*$  the class of models for  $L_*$ . We assume  $\mathfrak{M}_I = \mathfrak{M}_*$ .

59. Supposing  $L_{IMP}$  contains both imperative and non-imperative formulas (and an ability to distinguish between these classes), the semantic relation of  $L_{IMP}$ ,  $\models_{L_{IMP}}$ , receives a *disjunctive* interpretation: a model satisfies or fails to satisfy  $\varphi$  in case  $\varphi$  is non-imperative, otherwise  $\varphi$  is or is not in force there. I touch on arguments that mix imperatives and indicatives in §3.2 and Charlow (2009a: §2.2).

60. We can think of programs and formulas alike as expressing relations on states, formulas expressing functions from states into  $\{0, 1\}$ . Surely we would not say that a program which counted the number of blades of grass in Washington Square Park and spit out 1 if that number was even, 0 if it was odd, expressed a proposition, was true/false, the sort of thing that could be asserted, and so on? (Thanks to Thony Gillies for suggesting this point.)

61. Though we'll generally pretend otherwise, conditions on  $\models_L$  don't determine conditions on the relevant consequence relation. See Yalcin (2007) for examples. This section largely distills Charlow (2009a: §2).

- We will actively avoid talk of imperative satisfaction or truth, assuming that imperative formulas are *in force or not* wrt a model.

**Fulfillment.** As an assertion that  $\varphi$  is true iff  $\varphi$ , so a command that  $\varphi$  is *fulfilled* iff  $\varphi$ . This parallel tempts us to consider fulfillment (and fulfillment preservation) as the imperative analogue of satisfaction (satisfaction preservation). Let  $\mathcal{M}$  be a model (or whatever sort of object is suitable for being on the left of the turnstile),  $L_I$  and  $L$  as before. Conditions on the fulfillment relation are stated thus.

$$(56) \quad \mathcal{M} \models_{L_I} \varphi \text{ iff } \begin{cases} \mathcal{M} \models_L \psi, & \text{if } \varphi = !\psi \\ \mathcal{M} \models_L \varphi, & \text{if } \varphi \in L \end{cases}$$

Since an  $L$ -sequence  $\varphi_1, \dots, \varphi_n$  entails  $\psi$  iff  $!\varphi_1, \dots, !\varphi_n$  guarantees the fulfillment of  $!\psi$ , we have the following statement of conditions on a consequence relation for unmixed imperative inferences (inferences involving no formulas of  $L$ ).

$$(57) \quad !\varphi_1, \dots, !\varphi_n \models_{L_I} !\psi \text{ iff } \varphi_1, \dots, \varphi_n \models_L \psi$$

Note that non-fulfillment logics may also endorse (57). Suppose the imperative operator is translated as the deontic necessity operator of SDL. We then have a logic conforming to (57) which is not a logic of fulfillment, in the sense of (56). Note also that this minimal picture secures the validity of (26-29), on their suggested  $L_I$  translations. It is the earliest concrete proposal for an imperative semantics and logic (see Jørgensen 1937-8) and is endorsed by Bennett (1970); Geach (1963); Hare (1949, 1952, 1967), surely among others.

What about mixed imperative inferences, e.g.:

- (58) Use an axe or a chainsaw! [ $!(\varphi \vee \psi)$ ]  
 You will not use an axe. [ $\neg\varphi$ ]  
 So use a chainsaw! [ $!\psi$ ]
- (59) See to it that: if you go, you take the train! [ $!(\varphi \supset \psi)$ ]  
 You are going. [ $\varphi$ ]  
 So take the train! [ $!\psi$ ]

These are appealing, at first blush. We can sanction them by modifying (57) thus:

$$(60) \quad \{!\varphi_1, \dots, !\varphi_n\} \cup \{\psi_1, \dots, \psi_m\} \models_{L_I} !\pi \text{ iff } \{\varphi_1, \dots, \varphi_n\} \cup \{\psi_1, \dots, \psi_m\} \models_L \pi$$

Bennett (1970) designates (57) the *Weak Principle*, (60) the *Strong Principle*.<sup>62</sup> SP is a natural expression of the intuition behind a fulfillment logic:  $\varphi_1, \dots, \varphi_n$  together with  $\psi_1, \dots, \psi_m$  entail  $\pi$  iff the fulfillment of  $!\varphi_1, \dots, !\varphi_n$  and the satisfaction of  $\psi_1, \dots, \psi_m$  guarantee the fulfillment of  $!\pi$ . Insofar as we are interested in preserving fulfillment conditional on the facts, we arguably should opt for SP.

62. This formulation cannot quite be right; it has it, for instance, that  $\varphi \models_{L_I} !\varphi$ . So we must restrict its application; this turns out to be tricky. For discussion, see Geach (1958); Hare (1952); Castañeda (1958) (or, for a summary, Charlow 2009a: fn3).

**Endorsement.** Logics of fulfillment clearly come apart from logics that aim to be *normative for endorsement* of imperatives (for an authority). It is reasonable to suppose that whether or not an authority is committed to endorsing an imperative, conditional on her endorsement of others, is a function of their *practical content*—the requirements and permissions they express (what they tell someone to do, and the ways they permit them to do it), perhaps more besides. An agent who endorses a set  $\Sigma$  of imperatives isn't per se committed to endorsing an imperative requiring (permitting) anything stronger than what  $\Sigma$  requires (permits): endorsing *shut the window* doesn't commit an agent to endorsing *shut and smash the window*. An informal way of turning this intuition into a concrete semantic proposal:

- An imperative formula is in force wrt  $\mathcal{M}$  iff the permissions and requirements it expresses are in force wrt  $\mathcal{M}$ .
- An imperative is entailed by a set of imperatives  $\Sigma$  iff every model in which each imperative in  $\Sigma$  is in force is a model in which it is in force.

A full-fledged semantics requires that we be explicit about the logic and semantics of requirements and permissions. When are requirements and permissions in force wrt a model? When do the requirements and permissions expressed by an imperative follow from the requirements and permissions expressed by a set of imperatives? Deontic logics (and their model theory) provide a convenient and powerful framework. Let  $L_D$  be the language of first-order deontic logic. Then the relevant translation  $\tau$  maps an imperative formula  $\varphi$  to a formula of  $L_D$  that expresses *that what  $\varphi$  requires (permits) is required (permitted)* (non-imperative formulas are simply mapped to themselves). The reduction is completed simply by endorsing the equivalence of conditions on  $\models_{L_D}$  with those on  $\models_{L_I}$ .

- (61) a.  $\mathcal{M} \models_{L_I} \varphi$  iff  $\mathcal{M} \models_{L_D} \tau(\varphi)$   
 b.  $\varphi_1, \dots, \varphi_n \models_{L_I} \psi$  iff  $\tau(\varphi_1), \dots, \tau(\varphi_n) \models_{L_D} \tau(\psi)$

We aren't done—we still need to say how  $\tau$  works. As we see, how we do this will end up being constrained by the overarching motivation—making imperative logic normative for endorsement. We'll save the details for later. Now on to applications.

Adopting this perspective, worries about (58) and (59) (and hence SP) can be motivated in much the same way that arguments against deontic detachment of  $\Box\psi$ , given  $\Box(\varphi \supset \psi)$  and  $\varphi$ , are motivated (cf. Broome 1999). Suppose I strictly prefer your using an axe to your using a saw—although I permit both, the chainsaw consumes gas, and I prefer not to buy more gas. Suppose I also endorse the imperative *use an axe or a chainsaw*. I'm not committed to endorsing *use a chainsaw*, on the assumption that you won't use the axe. I strictly prefer, after all, that you use the axe.<sup>63</sup>

63. Hare (1967) claims a logic which “tells us what other things we are, implicitly, commanding when we give a certain command” will satisfy SP. That formulation suggests a special logic of endorsement—one that ignores the permissive side of practical content. As this argument shows, such a logic need not obey SP. (Interestingly, it does seem that you *ought* to use the axe; you just don't *have to*. If this bothers you, tweak the example so that it involves an alternative-presenting, rather than choice-offering, disjunctive imperative.)

You might think that our argument for the validity of (46) founders in a logic of endorsement. The teacher could, it seems, reasonably refrain from endorsing the imperative *come see me*, even supposing she endorses the premises of the inference—not because it explicitly permits the student to come without doing the reading (it doesn't), but rather because whether the teacher is committed to approving of telling her student to come see her depends on whether the student in fact does the reading.

Note the slip from *endorsement* to *linguistic performance*: it is supposed that if an agent is committed to endorse  $\varphi$ , she is committed to approve of some speech-act involving the utterance of  $\varphi$ . Granted, an agent who endorses the premises of (46) isn't committed to approving the utterance of *come see me* (doing so would plausibly yield the implication that Castañeda worries about). She is, nevertheless, committed to *endorsing the content of the imperative*, which comprises a requirement (and permission) for her student to come see her (although not without having done the reading).<sup>64</sup> Given that the student is required to do the reading and either not do the reading or come see her, she is required and permitted to come see her (and she is not permitted to skip her reading); supposing the natural  $L_D$  translations, this follows as a matter of logic. If the student does not come see her, the teacher should see her as violating a requirement that she imposed on her. In a nutshell: an agent endorses a formula  $\varphi$  of  $L_I$  iff she believes  $\tau(\varphi)$ , so she is committed to endorsing  $\varphi$  iff she is committed to believing  $\tau(\varphi)$ .<sup>65</sup>

Supposing it's right to treat the permissive implications of choice-offering disjunctive permissions as part of their content, a logic of endorsement will reject the Ross inference as straightforwardly invalid (so will also reject WP) (cf. Åqvist 1965; Aloni 2007; Charlow 2009a). Endorsing the imperative *post the letter* in no way commits one to endorsing a permission to burn it. The devil here is in the details (in particular, designing  $\tau$  so that it yields this prediction; see §4.4). But the outlines of the solution are clear enough.

**Satisfactoriness.** It is often thought (cf. Hare 1967; Bennett 1970) that rejection of the Ross inference stems from confusing the logic of fulfillment with a logic of *satisfactoriness*—taking satisfactoriness (and preservation thereof) as the imperative analogue of satisfaction (and preservation thereof). As expressed by Kenny (its chief proponent):

“The logic of satisfactoriness consists of the rules which ensure that *in practical reasoning* we never pass from a fiat which is satisfactory for a particular purpose to a fiat which is unsatisfactory for that purpose.” (Kenny 1966: 72)

64. Green (1997) draws a similar distinction, although to a different purpose.

65. This presupposes reducibility, and also biases us against certain reducible treatments (e.g., both Geach 1958 and Lewis 1970). The notion could be modified should we decide to develop one of these approaches. Vranas (2009) claims that “to endorse an imperative sentence which prescribes that an agent perform an action is to believe that there is a reason for the agent to perform the action.” To see why this is distinct, consider a treatment of the imperative operator in terms of the necessity operator of SDL. To endorse  $!\varphi$  is to believe  $\Box\varphi$ . But believing there is a reason for  $\varphi$  to be seen is *weaker* than believing that  $\varphi$  ought to be seen to.

On this view, imperatives of  $L_I$  express *goals for an agent* (corresponding to their first-order complements), and imperative inference is styled as reasoning about the *implementation* or *realization* of goals (rather than about the requirements and permissions to which a commanding authority is committed). A set of imperatives  $\Sigma$  supports an imperative  $\varphi$  iff the realization of the goal expressed by  $\varphi$  suffices for the realization of the goals expressed by  $\Sigma$ . So  $\Sigma$  supports  $\varphi$  iff fulfilling  $\varphi$  suffices to fulfill everything in  $\Sigma$ . Formally:

$$(62) \quad !\varphi_1, \dots, !\varphi_n \vDash_{L_I} !\psi \text{ iff } \psi \vDash_L \varphi_1 \wedge \dots \wedge \varphi_n$$

As Geach (1966) notes (in the course of endorsing Kenny's proposal), this logic is nonmonotonic:  $\Sigma \vDash_{L_I} \varphi$  will not generally imply  $\Sigma \cup \{\psi\} \vDash_{L_I} \varphi$ . That's as it should be (given the rationale): expanding the goal-set usually makes implementing it more difficult. Clearly the logic rejects (and, given its rationale, should reject) the Ross inference, but:

- It doesn't supply the only rationale for doing so (cf. logics of endorsement).
- Even if one's reason for rejecting the Ross inference is rooted in this rationale, that hardly counts in favor of the Ross inference. The satisfactoriness rationale is intelligible, and interest in formalizing it is *prima facie* legitimate.<sup>66</sup>

By no means does a focus on how imperatives structure practical reasoning require a logic of satisfactoriness. As the practical content of an imperative can be used to determine what imperatives an authority is committed to endorsing, it can be used to determine what imperatives an agent is committed to structure her practical reasoning in accordance with. As before, we can understand an imperative formula as:

- Being in force iff the permissions and requirements it expresses are in force
- Being a consequence of  $\Sigma \cup \Sigma'$  (where  $\Sigma$  is a set of imperatives,  $\Sigma'$  a set of non-imperatives) iff  $\Sigma$  being in force and  $\Sigma'$  being satisfied implies that it is in force

And, as before, first-order deontic logic seems apt for doing the logic of permission and requirement. For a logic of endorsement, it is sensible to have the deontic accessibility relation supplied by the preferences of the authority; for a logic of practical reasoning, it is sensible to have it supplied by something like

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66. There are problems: as Kenny is aware, his view, as stated, licenses the following inference.

$$(63) \quad \begin{array}{l} \text{Open the window} \\ \text{So, open the window and jump} \end{array}$$

We can get around the problem by relativizing satisfactoriness to a set of goals  $\mathcal{G}$  (cf. the notion of a TDL). Crudely, we might say that  $\varphi_1, \dots, \varphi_n$  support  $\psi$  iff fulfilling  $\psi$  implies simultaneous satisfaction of  $\mathcal{G}$  and fulfillment of  $\varphi_1, \dots, \varphi_n$ . (The possibility of conflicting goals would require something more sophisticated—something like the ordering semantics described in §4.1.)

a TDL. Assuming that sets of desires and TDLs are structures of the same *type*, this will make no difference in the model theory.<sup>67</sup> Since  $\models_{LD}$  is monotonic,  $\models_{LI}$  is as well.

### 3.3 On Deontic Reductions

I incline toward pluralism about imperative logic—each logic described in the last section is a *prima facie* reasonable logic of something or other. The only ones, however, with any particularly *interesting* features are those proposing a reduction of imperative logic to a species of deontic logic. We’ll encounter many of these issues in the next section, as well as some evidence for the superior empirical coverage of deontic reductions.

Deontic reductions of the imperative come with a pedigree (Green 1997 claims they date to Kant’s *Groundwork*). They also come with some baggage. I’ll first try to lighten the load. Then I’ll sketch a proposal for uniting the authority-focused logic of endorsement with the agent-focused logic of practical reasoning. As a bonus, we’ll give a recipe for reading (dynamic) force off (static) practical content.

**Baggage.** Hare (1967) makes hay of the fact that imperatives apparently lack negations that may serve as their “contradictories”: the negation of an imperative is either ungrammatical (cf. 64a), or expresses a “a meta-linguistic statement; it reports the second-order fact that somebody has” failed to issue the relevant command (cf. 64b). This contrasts with deontic logic, which allows formulas to embed freely under Boolean negation.<sup>68</sup>

- (64) a. \*Not: do  $x$   
b. You aren’t to do  $x$

Hare leans hard on his intuition about (64b). Even if it is right, the most this could establish is that  $\tau^{-1}$  is not homomorphic wrt  $\models_{LD}$  (so imperative and deontic logic are not isomorphic), since it not generally true that:

$$\varphi_1, \dots, \varphi_n \models_{LD} \psi \Rightarrow \tau^{-1}(\varphi_1), \dots, \tau^{-1}(\varphi_n) \models_{LI} \tau^{-1}(\psi)$$

How does this relate to embedding under negation? Let  $\varphi$  be imperative. If Hare is right, although  $\tau(\varphi), \neg\tau(\varphi) \models_{LD} \perp$ , it won’t generally hold that  $\tau^{-1}(\tau(\varphi)), \tau^{-1}(\neg\tau(\varphi)) \models_{LI} \perp$ . Though there are many candidate imperative formulas that intuitively contradict *do x* (*don’t do x*, for instance), none seems a viable candidate for the value of  $\tau^{-1}(\neg\tau(\varphi))$ : this value should express a permission (to contravene  $\varphi$ ), nothing more. There is no way of expressing this in the imperative language, as we have designed it.

In reply:

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67. It will, however, make some difference in how it makes sense (i) to define the consequence relation and (ii) to think about what the logic is in the business of tracking. The latter difference can be finessed away (cf. the comments on constraints and force below). The former cannot (cf. Charlow 2009a: §5.5-6).

68. Hare presupposes, wrongly, that the imperative operator would have to be translated as an operator of deontic necessity. This is my attempt to recast the argument, in a plausible light and without the presupposition.

- The conclusions applies only to translation maps *defined on*  $L_I$ . Because of the permissive dimension of imperative content (and the fact that grants of permission cannot be treated in terms of failure to forbid), it was already clear that we would need to define a permission operator for the imperative language. All Hare’s argument shows, if it succeeds, is that this operator is not  $L_I$ -definable.<sup>69</sup> In an adequately expressive imperative language, it is open to us to make imperatives and contrary permissions “contradictories”.
- Why should a treatment of imperative logic in terms of deontic logic require an isomorphism? Given the distinctive syntactic profile of imperatives, it is hard to see why we would want one (although *not* for the reasons Hare adduces). For instance: if  $\varphi$  and  $\psi$  are imperative, then  $\tau(\varphi) \vee \tau(\psi)$  is a formula of  $L_D$ . It is far from clear what a reasonable value for  $\tau^{-1}(\tau(\varphi) \vee \tau(\psi))$  would be. Supposing we are right about the non-existence of genuinely hedged directives (recall §2.4),  $\tau^{-1}(\tau(\varphi) \vee \tau(\psi))$  should probably be undefined. Likewise for any formula of  $L_D$  that iterates deontic operators.

Green (1997) voices a different worry: the directive force of an imperative is generally *directed at* a specific individual or group of individuals.

“In contrast to imperatives, the truth of a deontic proposition does not, as such, lay obligations upon any one person rather than another. ‘It is obligatory that A’ does not discriminate among the various people who might be obligated to make it the case that A.”

But note that neither  $L_I$  nor  $L_D$  has resources for expressing this sort of directedness.  $L_I$ , for instance, lacks the resources to distinguish between (15a) and (15b), repeated here;  $L_D$  lacks the resources to distinguish between their deontic cognates.

- (65) a. See to it that everyone takes shelter!  
 b. Everyone take shelter!
- (66) a. It must be that: everyone takes shelter  
 b. Everyone must take shelter

This is, as various people have argued, a deficiency *in both* languages (cf. Belnap, Jr. 1991a,b; Belnap, Jr. & Perloff 1988, 1992; Geach 1982; Horty 1996; Horty & Belnap, Jr. 1995; Wedgwood 2003; Williams 1981). We sketch a remedy in §4.5.

**Constraints and Force.** Logics of endorsement and logics of practical reasoning, as I’ve described them, agree that the content of an imperative is given by the requirements and permissions it expresses.<sup>70</sup> But finer-grained distinctions could be made. Requirements and permissions in an endorsement logic seem to

69. This followed anyway from our argument in §2.5 that permissive force is *sui generis*.

70. What does this *expression* relation amount to? For our purposes, speech-acts with purely directive force correspond to formulas that express requirements (those with permissive force correspond

track what is required and permitted, in view of the preferences of the relevant authority; the logic yields constraints on the endorsements of the authority. But in a logic of practical reasoning, they track what is required and permitted, in view of the things which an agent is antecedently committed to or allowed, in view of, say, her TDL; the logic yields constraints on the agent's intentions.

In each case, the ultimate target of the relevant requirements and permissions is, however, the same: *the regulation of the actions of an agent*. We can provisionally (and, needless to say, impressionistically) think of an imperative as a proposal for regulating the actions of an agent in a specific way, and a TDL as the relevant mechanism for this sort of regulation. Then an imperative is a proposal for regulating the actions of an agent through her TDL. An imperative, on this understanding, supplies conditions on a TDL (just as an indicative supplies conditions on a world): the TDL for an agent meets these conditions insofar as it enforces the requirements and permissions expressed by the imperative.

These sorts of intuitions are readily incorporated into the semantics: a TDL enforces a requirement (permission) just in case a description of the requirement (permission) is satisfied by the TDL (what satisfaction wrt the TDL amounts to will be clarified in §4.1). Semi-formally: an imperative  $\varphi$  is in force wrt a TDL  $T$  iff  $\tau(\varphi)$  is satisfied wrt  $T$ . This semantics has two important properties.

- Its consequence relation can be couched as normative for *both* endorsement and practical reasoning. Whether an authority is committed to endorse an imperative  $\varphi$  or an agent is committed to structure her practical reasoning in accordance with  $\varphi$ , conditional on  $\Sigma$ , depends on whether enforcing the requirements and permissions embodied by  $\Sigma$  enforces the requirements and permissions expressed by  $\varphi$ .
- Directive force can plausibly be read off content. The conditions on TDLs specified by the content of an imperative will characterize a set of TDLs that meet the conditions (*admissibles*) and a set of TDLs that do not (*inadmissibles*) (cf. Swanson 2008a). The update potential associated with an imperative formula is definable as a function mapping the admissibles to themselves and the inadmissibles to the maximally similar admissible. (See Charlow 2009a: §4.13 for a more developed proposal.)

The upshot is twofold. One, logics of endorsement and logics of practical reasoning, as I've described them, are different ways of conceptualizing the same underlying notion of imperative content. Two, imperative content is an extremely flexible notion, capable of characterizing entailment and force relations, depending on what sorts of phenomena we're interested in theorizing about.

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to formulas that express permissions); the latter is a static representation of the former. The data type of a requirement might be conceived as an ordered-pair of a force and a proposition (corresponding respectively to the semantic values of the imperative operator and its complement). Note that this notion of force is distinct from the notion of illocutionary force developed above. Illocutionary force is modeled with an update potential; static force is not. Requirements correspond to conditions on relevant semantic parameters; update potentials correspond to operations on them. (The point of this subsection is to argue that the latter may be read off the former.)

## 4 ISSUES IN METAETHICS AND DEONTIC LOGIC

I wrap up by surveying a collection of concrete logical, semantic, and metaethical issues in the neighborhood—ordering semantics for imperatives, weak and strong imperative force, conditional imperatives (and conditional obligation), the Ross Paradox, and problems stemming from various complexities of natural language imperative constructions. Each of these issues demands a new understanding of the LFs of imperatives and, usually, an attendant complication of the semantics; the flexibility of the model theory for deontic logic is, we’ll see, an essential ingredient in the proposals we sketch. We close with some speculative remarks about how our investigation might shed light on the prospects for a formal expressivist semantics of normative language.

## 4.1 Kripke and Ordering Semantics

We start with the simplifying assumption that  $\ulcorner \square \urcorner$  is translated as the deontic necessity operator  $\ulcorner \square \urcorner$  of  $L_D$ , and proceed to give a semantics for  $L_I$  indirectly: by stating satisfaction conditions for arbitrary formulas of the form  $\ulcorner \square \varphi \urcorner$ . We move quickly, focusing on essential points, leaving exposition for another occasion.<sup>71</sup>

**The Standard Approach.** Models for  $L_D$  are defined standardly, except for the explicit addition of the TDL in place of the ordinary deontic accessibility relation. (We idealize for the moment by presupposing a single authority and a single subject.)

$$(67) \quad \begin{aligned} \mathcal{M} &= \langle W, T, V \rangle \\ W &\text{ is the universe} \\ T \subseteq 2^W &\text{ is the To-Do List for the agent} \\ V &\text{ is the valuation} \end{aligned}$$

It’s standard to assume, as we’ve done here, that TDLs are just sets of requirements for the agent (Han 1998; Isaacs & Potts 2003; Potts 2003; Portner 2004a,b, 2008).

A handy notion for bringing out the differences between various semantic treatments of deontic modal logic is the notion of a *deontic selection function*  $D$ , defined on sets of worlds. Let’s begin by assuming, as is standard in basic treatments of the semantics of  $L_D$ , that the role of  $D$  is to select the set of  $T$ -ideal worlds from a given set.

$$(68) \quad D(P) := \{v \in P : v \in \bigcap T\}$$

Satisfaction conditions for deontic formulas interpret  $\ulcorner \square \urcorner$  as a universal quantifier over ideal worlds.

$$(69) \quad \mathcal{M}, w \models_{L_D} \square \varphi \text{ iff } \forall v \in D(W) : \mathcal{M}, v \models_{L_D} \varphi$$

When there is no risk of confusion, we use  $\llbracket \varphi \rrbracket^w = 1$  to abbreviate that  $w$  satisfies  $\varphi$  wrt the model. Then:

$$(70) \quad \llbracket \square \varphi \rrbracket^w = 1 \text{ iff } D(W) \subseteq \llbracket \varphi \rrbracket$$

71. I explore the model theory in a more technically rigorous way in Charlow (2009a: §4).

**Ordering Semantics.** The basic treatment is inadequate along multiple dimensions. Most clearly, by presupposing a single authority (and, implicitly, the consistency of that authority’s will), it avoids confronting the phenomenon of *conflicting imperatives*—imperatives enjoining logically incompatible states of affairs.<sup>72</sup> When incompatible items occur on a TDL,  $D(W) = \emptyset$ , and  $\lceil \Box \varphi \rceil$  is satisfied vacuously (and  $\lceil !\varphi \rceil$  is in force), *for any*  $\varphi$ .

The standard solution to this problem is due largely to Kratzer (1977, 1981) (for equivalent presentations, see Lewis 1973, 1981). We avoid the presupposition of a consistent TDL by reconceiving the domain of quantification—the value of  $D(W)$ —as the set of *best* worlds, rather than the set of ideal worlds. The TDL  $T$  is treated as inducing a *non-strict partial order*  $\preceq_T$  on  $W$ .<sup>73</sup> Best worlds in a given domain  $P$  are defined as the  $\preceq_T$ -minimal elements in  $P$ —worlds such that no world is strictly better than them.

$$(71) \quad v \preceq_T u \text{ iff } \{P \in T \mid u \in P\} \subseteq \{P \in T \mid v \in P\}$$

$$(72) \quad D(P) := \{v \in P \mid \forall u \in P : u \preceq_T v \Rightarrow v \preceq_T u\}$$

Some formal presuppositions of the semantics we will want to make explicit.

$$(73) \quad \forall P : \exists Q \subseteq P : D(P) = Q \wedge Q \neq \emptyset \text{ [Definedness]}$$

$$(74) \quad \text{If } P' \subseteq P, w \in P', \text{ and } w \in D(P), \text{ then } w \in D(P') \text{ [Stability]}$$

Definedness—intuitively, just the idea that there are always worlds as close to the ideal as any other—is just the Limit Assumption of Lewis (1973).<sup>74</sup> Stability has it that if a possibility  $w \in P$  is best, it remains best in any contraction of  $P$ . Stability follows from the definitions of  $\preceq_T$  and  $D$  above. It is also independently plausible: if a possibility has enough (wrt other possibilities in a set  $P$ ) good-making features, then it does not cease having enough good-making features wrt a contraction of  $P$ . Contracting  $P$  *reduces its competition*.<sup>75</sup>

Satisfaction conditions for deontic formulas remain the same. The solution to the problem of vacuous satisfaction lies in allowing non-ideal worlds into the domain.

72. The case against relational semantics does not require conflicting imperatives. See Kratzer (1977, 1981); von Stechow & Iatridou (2005); and Charlow (2009a: §3.4.4) for discussion. I’ve argued elsewhere (Charlow 2009a: §4) that items on a TDL cannot conflict. The standard formulation of ordering semantics for cases of conflict in the TDL implicitly presupposes that items on a TDL are on *equal footing* (so, the authorities from which they originate are on equal footing). This is unwarranted, even as an idealization. One way to avoid it is to suppose that conflicts must be resolved prior to TDL update. Another is to *prioritize* or *weight* items (or collections of items) in the TDL. The latter route now strikes me as superior, although there is an array of difficulties with implementation; for two different approaches, see von Stechow & Iatridou (2008: §8) and Charlow (2009b).

73. On the significance of using a partial order, see Swanson (2009) and discussion in §4.2.

74. Note that the Limit Assumption is a weakening of the no-conflicting-imperatives assumption. It amounts to the requirement that there are always worlds  $v$  such that for some  $T' \subseteq T$ :  $v \in \cap T'$  and for no  $T'' \supset T'$  and no  $u \neq v$ :  $u \in \cap T''$ . The Limit Assumption is unwarranted (see Swanson 2008b, 2009 for a great discussion of cases where it fails), but only in cases where the relevant ordering-source is such that for any world, there is always another world strictly better than it (so Limit Assumption violations require an infinite universe). We’ll bracket these for the prospectus.

75. See §4.3 for discussion. Charlow (2009b) is an extended critique of the Stability constraint.

4.2 *Strong vs. Weak*

We saw evidence (cf. 5, 6, 8, repeated here) for thinking imperatives—canonical uses, anyway—pattern with strong, rather than weak, deontic modals. We can add some more (constructions borrowed freely from von Fintel & Iatridou 2008).

- (75) a. A: Go to mass.  
#B: Must I? (#Do I have to?)  
b. A: You must go to mass.  
#B: Must I? (#Do I have to?)  
c. A: You should (oughta) go to mass.  
B: Must I? (Do I have to?)
- (76) a. #Go to mass ...but you don't have to  
b. #You must go to mass, but don't have to  
c. You should go to mass, but don't have to
- (77) a. #Go to mass ...in fact, you should  
b. #You must go to mass, in fact you should  
c. You should go to mass, in fact you have to  
d. You should go to mass. In fact, I'm telling you: go to mass!

We also saw (cf. §2.3) there was reason for distinguishing between the kind of force associated with canonical uses of imperatives (of the sort associated with what we might colloquially refer to as *commands*) and a weaker sort of directive force (of the sort associated with what we might colloquially refer to as *suggestions*). Inasmuch as suggestions are felicitously expressed with weak modals like *should*, it is no surprise that they pattern with weak, rather than strong, deontic modals. A natural explanation for the contrasts, we conjectured, is that update in accordance with strong (weak) directive force tends to generate strong (weak) obligations.

A semantics that obscures the distinction between weak and strong interpretations of imperatives is ipso facto incomplete. A natural way of avoiding this fate (consonant with our commitment to deontic reduction) involves the following tasks:

- Revising the basic imperative and deontic languages, so that they are capable of representing the distinction between strong and weak directives and strong and weak descriptions of obligation. (Since the revision is trivial—involving just the addition of a new operator,<sup>76</sup> with the same syntactic profile as the old one—we will, for simplicity, leave it implicit.)
- Defining  $\tau$  on the new bits of the imperative language. (For now we suppose that the weak imperative operator is translated in terms of the weak deontic necessity operator.)
- Finally, stating a semantics for the weak deontic necessity operator.

76. The semantics stated in von Fintel & Iatridou (2005, 2008) is actually more consonant with defining a weak necessity operator in terms of *iterated strong necessity operators*, each appealing to a different ordering source. This doesn't matter for our purposes.

**Secondary Orderings.** On the last task: the received wisdom about the semantic contrast between strong and weak deontic necessity (due originally to Sloman 1970, developed formally in von Fintel & Iatridou 2005, 2008) has it that:

- *must*  $\varphi$  asymmetrically entails *should*  $\varphi$
- *must*  $\varphi$  is true iff seeing to it that  $\varphi$  is the *only* way to fulfill some designated goal (or maximize fulfillment of a designated goal-set)
- *should*  $\varphi$  is true iff seeing to it that  $\varphi$  is the best way (relative to secondary considerations, e.g., expedience) to realize some designated goal (or maximize the fulfillment of a designated set of goals), perhaps among other ways on equal footing vis-à-vis the designated goal

This is implemented in an ordering semantics by distinguishing the *primary* ordering source (corresponding to the set of designated goals—i.e., the To-Do List) from the *secondary* ordering source (corresponding to the set of relevant secondary considerations). For notational consistency, we let  $g_1$  and  $g_2$  designate the primary and secondary ordering sources, respectively, and relativize deontic selection functions to ordering-sources (defining the partial order in the same way as before).

$$(78) \quad D_{g_k}(P) := \{v \in P \mid \forall u \in P : u \preceq_{g_k} v \Rightarrow v \preceq_{g_k} u\}$$

Strong and weak necessity modals are each interpreted as universal quantifiers, but the latter quantify over a restricted domain: the best-according-to- $g_2$  worlds *of the worlds* that maximize the fulfillment of the set of designated goals,  $g_1$ . Formally, letting  $\Box$  express weak deontic necessity and  $\Box$  express strong deontic necessity, we have:

$$(79) \quad \llbracket \Box \varphi \rrbracket^w = 1 \text{ iff } D_{g_1}(W) \subseteq \llbracket \varphi \rrbracket$$

$$(80) \quad \llbracket \Box \varphi \rrbracket^w = 1 \text{ iff } D_{g_2}(D_{g_1}(W)) \subseteq \llbracket \varphi \rrbracket$$

As mentioned in §2.3, if the semantics is right, the account of weak directive force is immediate: since weak directive force typically involves the generation of weak obligations (toggling the truth-value of formulas of the form  $\Box \varphi$ ), weak directive force simply involves addition to a salient secondary ordering source. Intuitively, this hits on a real truth: suggestions typically do not alter the designated goals of their addressees; a suggestion that  $\varphi$  does not typically suffice to make it the case that the addressee must see to it that  $\varphi$ .

**Dilemmas.** There are problems. The existence of *practical dilemmas*—cases where an agent both ought to see to it that  $\varphi$  and ought to see to it that  $\neg\varphi$  (i.e., cases where a formula of the form  $\Box \varphi \wedge \Box \neg\varphi$  is true at a point of evaluation<sup>77</sup>)—while controversial, is plausible (and I will take it for granted; cf. van Fraassen 1972, 1973; Lemmon 1962; Marcus 1980; Slote 1993; Williams

<sup>77</sup>. The literature on moral dilemmas is immense (and my understanding of it impressionistic). To be clear: I assume (pace Swanson 2008b) that there are no moral dilemmas in the case of strong deontic necessity, i.e., nothing of the form  $\Box \varphi \wedge \Box \neg\varphi$  is ever true at a single point of evaluation. For one, I think it is right that *must*'s entail that their complements are the *only* way to satisfactorily

1965). Assuming it is never the case that an agent ought to make a contradiction true (assuming, that is, that  $\models \neg \Box(\varphi \wedge \neg\varphi)$ ), the existence of moral dilemmas rules out any semantics for weak deontic necessity on which the following *agglomeration* principle is valid.

$$(81) \quad \Box\varphi \wedge \Box\psi \rightarrow \Box(\varphi \wedge \psi)$$

But any semantics for weak deontic necessity modals which interprets them as expressing universal quantification over a domain—whether pared down by one, two, or, for that matter, arbitrarily many deontic selection functions—will ipso facto validate agglomeration.<sup>78</sup> I take this as evidence against the von Fintel and Iatridou semantics for weak deontic necessity modals.

A natural response is that such dilemmas are merely apparent, and dissolve once we are explicit about the secondary ordering-sources in play. Consider the following dialogue.

- (82) A: Do you think I should get that tattoo?  
B: Well, you should, and you shouldn't.

It's natural to interpret B as claiming something like *you shouldn't, in view of the risk of infection, but you should, in view of that gangsta dragon*. That is to say: B invokes a prudential ordering-source with the first *should* and a non-prudential ordering-source with the second. It's doubtful that this strategy will generalize. There are, for instance, strong arguments for *purely moral* practical dilemmas (van Fraassen 1973; Marcus 1980; Williams 1965) as well as, if we admit violations of the Limit Assumption, *purely rational* practical dilemmas (Slote 1993).<sup>79</sup>

What sort of semantics should we be on the lookout for?<sup>80</sup> Eric Swanson, in recent work, develops a compelling formal approach to this question. Following Swanson, pure practical dilemmas should intuitively be modeled as originating from some sort of *incompatibility in the relevant ordering source*—a conflict in what the relevant ordering source demands. In the simplest case (or close enough), suppose that:<sup>81</sup>

- $P \cap Q = \emptyset$
- The relevant ordering source  $g = \{P, Q\}$

---

fulfill some designated goal or goals. For two, I think *must's agglomerate* (while *ought's* do not), so that  $\Box\varphi \wedge \Box\psi \models \Box(\varphi \wedge \psi)$ . I take it that endorsing agglomeration for a certain kind of deontic necessity commits one to rejecting moral dilemmas; agents are never obligated, independent of type of deontic necessity, to make contradictions true. (Other authors—e.g., van Fraassen 1973—take it that this is not *obvious*, but so far as I know, no one actually *endorses* its negation.) Other references that reject agglomeration for *ought* include van Fraassen (1973); Marcus (1980); Williams (1965).

78. We also, of course, need to avoid the validating  $\lceil \Box\varphi \rightarrow \neg\Box\neg\varphi \rceil$ , which universal quantifier treatments of weak necessity modals will also have trouble with (supposing that  $\forall$  presupposes  $\exists$ ).

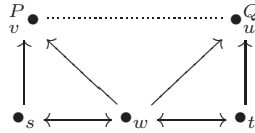
79. Almeida (1990) voices the view (since, I take it, retracted) that examples of violations of agglomeration do not involve “interesting” practical conflicts. Violations do not, however, have to be interesting to impinge on our theorizing.

80. It's natural to look to a neighborhood (Montague-Scott) semantics when trying to avoid closure of some quasi-modal operator under logical consequence (cf. Charlow 2009a: §3.5.1). But such approaches invariably leave important explananda unexplained. I will ignore them here.

81. Swanson (2009) gives a concrete version of this case, involving incomparability of human suffering, although he presents it as an objection to Kratzer 1981's account of strong necessity.

- The universe  $W = \{w, v, u, s, t\}$
- $v \in P, u \in Q, w, s, t \notin P \cup Q$

The ordering  $g$  on  $W$  is as diagrammed below (with  $x \supset x'$  representing that  $x$  is worse than  $x'$ ,  $x \leftrightarrow x'$  that  $x$  and  $x'$  are equally good, and a dotted line representing incomparability wrt  $g$ ).



Assuming  $P$  and  $Q$  are considerations of equal standing (equally basic, important, valuable, etc., which is what I take presence in an ordering source to represent), we have a simple version of a genuine practical dilemma. Consider an agent deliberating at  $w$  about what to do: she must realize  $P \cup Q$ , although neither  $P$  nor  $Q$  is such that she *has* to realize it. Since  $P$  and  $Q$  are equally basic, she should realize  $P$  and she should realize  $Q$  (although she should not realize  $P \cap Q$ , this being impossible). If she fails to realize  $P$ , she violates a basic consideration of value (similarly for  $Q$ ). No matter what she does, guilt (or, if the ordering source is non-moral, some kind of regret) is fitting.<sup>82</sup> In cases like this, we invariably do what we shouldn't in doing what we should. So this schematic sort of case plausibly involves a pure practical dilemma.

I conjecture that pure practical dilemmas all instantiate the structure exemplified by this simple case.<sup>83</sup> That's to say, we have two (or more) equally good—indeed at least as good as any alternative—options that are incompatible and incomparable.

More formally, still following Swanson, we will think of a *practical option* as a set of worlds such that, by the lights of the relevant ordering: (i) all of its members are comparable wrt each other, (ii) none of its members can be strictly improved upon, and (iii) it is *complete*, in the sense that it does not ignore deontically relevant worlds (worlds at least as good as any of its members). Formally:<sup>84</sup>

(83)  $P$  is a *practical option* wrt  $g$  iff

- $\preceq_g$  totally orders  $P$
- $P \subseteq D_g(W)$
- $(\exists w : \exists v : w \in P \wedge v \preceq_g w) \Rightarrow v \in P$

In the above case, the practical options are:  $\{v\}, \{u\}$ .

82. The aptness of *post hoc* guilt or regret, even in cases where one does what one should, is often taken to motivate the existence of moral dilemmas (cf. Marcus 1980; Williams 1965).

83. It will be an interesting project—more than I can tackle here—to demonstrate how the best examples of pure practical dilemmas in the ethics literature fit into this paradigm.

84. The formalization here and in the rest of this section originates in the work of Swanson (2009).

A plausible conjecture is that practical dilemmas involve (at least) two practical options  $P$  and  $P'$  that are *jointly incomparable*, in the following sense.

$$(84) \quad P \succ P' \text{ iff } \forall w \in P : \forall w' \in P' : w \not\prec_g w' \wedge w' \not\prec_g w$$

In all (and only) such cases, we have incomparable options that are indistinguishable wrt the ordering (and which do not ignore any other options that can be extracted from the set of best worlds).

How is the practical dilemma actually generated in such cases? The operative satisfaction conditions on the weak necessity modals seem to be these:<sup>85</sup>

$$(85) \quad \llbracket \Box \varphi \rrbracket^w = 1 \text{ iff } \exists P : P \text{ is a practical option wrt } g \text{ and } P \subseteq \llbracket \varphi \rrbracket$$

This is not the proper venue for a sustained defense of Swanson's semantics. But the reader can verify that this (i) yields the correct result for the simple case, and (ii) allows agglomeration only in the special case where we do not have jointly incomparable practical options.

**Secondary Orderings, Redux.** This all could be admitted without relinquishing the idea that secondary ordering sources play a central role in the semantics of weak deontic necessity. In principle, we could simply ditch the interpretation of weak deontic necessity modals as universal quantifiers, in favor of a version of the practical option semantics.

$$(86) \quad P \text{ is a practical option wrt } \langle g_1, g_2 \rangle \text{ iff}$$

- $\preceq_{g_2}$  totally orders  $P$
- $P \subseteq D_{g_2}(D_{g_1}(W))$
- $(\exists w : \exists v : w \in P \wedge v \preceq_{g_2} w) \Rightarrow v \in P$

$$(87) \quad \llbracket \Box \varphi \rrbracket^w = 1 \text{ iff } \exists P : P \text{ is a practical option wrt } \langle g_1, g_2 \rangle \text{ and } P \subseteq \llbracket \varphi \rrbracket$$

The idea is that practical options must first be good enough wrt the designated goal set  $g_1$ . Weak necessity modals still essentially invoke secondary considerations to discriminate among options that are admissible wrt  $g_1$ : an agent should see to it that  $\varphi$  just in case  $\varphi$  respects her designated goals *and* is a practical option wrt her secondary goals. This allows us to hang onto the picture of weak directive force sketched above: weak directive force is just addition to a secondary ordering source.

We should be wary of this picture. For this semantics admits dilemmas only when they originate from competing secondary considerations. But we can have dilemmas that originate from conflicts within the primary ordering source. If the primary ordering source is a TDL, this can be because the agent has been issued conflicting demands. If the primary ordering source is moral in nature, this can be because the agent is under incompatible moral obligations. And so on. There is

85. The natural way to state the satisfaction conditions without the Limit Assumption is just the second pass semantics of Kratzer (1981) (which corresponds to the semantics for *ought* of van Fraassen 1973). In essence, these proposals just involve redefining a practical option  $P$  as a set of worlds closed under the *at-least-as-good-as* relation (i.e.,  $\neg \exists w \in P : \exists v \notin P : v \preceq w$ ).

no reason to think the standard arguments for practical dilemmas cease to apply when we focus on “primary” considerations (in fact, every reason to think the opposite).<sup>86</sup>

The standard semantics for weak necessity modals does, as noted above, hit on something important: a suggestion that  $\varphi$  doesn’t typically suffice to make it the case that the addressee must see to it that  $\varphi$ . If adding  $\llbracket\varphi\rrbracket$  to a TDL typically suffices to make it the case that  $\Box\varphi$  (as the analysis of paradigmatic—i.e., strong—imperative force in terms of TDL update supposes), suggestions must be doing something besides adding what they suggest to a TDL.

I do, to be clear, endorse the following claims:

- It’s right to admit a multiplicity of independent ordering sources, and to suppose that these ordering sources are themselves *ranked by higher-order considerations* (e.g., prioritizing orders to suggestions).
- In some cases (when, for instance, the favored ordering source at a context fails to yield a determinate verdict; cf. [Kratzer 1981](#) as quoted in [von Fintel & Iatridou 2005: fn11](#)), secondary considerations *can* be invoked to systematically discriminate among admissible options.<sup>87</sup>

These are, however, independent of whether weak necessity modals are *invariably* relative to a primary and secondary ordering source, with the latter playing some sort of filtering role on worlds that are admissible by the lights of the former. I will omit the details here, but the essence of the proposal is this:

- Unembedded weak and strong necessity modals *both* are generally interpreted relative to a single ordering source. The semantics for the latter is as stated in (85); the semantics for the former is as stated in (79). (Note: once an ordering source is fixed, we have  $\Box\varphi \models \Box\varphi$  and  $\Box\varphi \not\models \Box\varphi$ .)
- Certain constructions (e.g., anankastic conditionals embedding weak necessity modals in their consequents; see fn87) may require invoking secondary considerations qua filters. *This is peculiar to these constructions*; it has no import for unembedded weak necessity modals. (We

86. The semantics also sanctions odd entailments. Suppose primary considerations demand you be a vegetarian, but some secondary considerations demand you be a hunter. Assuming the canonical interpretation of *to* restriction clauses, this entails that to be a good hunter, you ought to be a vegetarian. [von Fintel & Iatridou \(2005\)](#) attribute this problem to the fact that *to P, ought Q* strongly implies that *Q* is an “essential part of a way of achieving” *P*. But their attempt to formalize this notion fails. A more plausible diagnosis is this: ordering sources track different, often independent, types of modality. The fact that considerations relevant to one kind of modality are, in some sense, subordinate or secondary to those relevant to another kind of modality does not mean that the former kind of modality *depends* on the latter.

87. An example (cf. [von Fintel & Iatridou 2008: 137](#)): both the A and C train go to Harlem, but the A is generally quicker. So: if you want to go to Harlem, you ought to take the A (but you don’t have to). Here, the relevant primary consideration (getting to Harlem) plausibly induces an order on worlds ranking A and C worlds equally, while the relevant secondary consideration (minimizing travel time) refines the admissible worlds so that only A worlds remain.

This is, incidentally, a fairly standard view in formal decision theory. Secondary considerations (e.g., risk aversion) may be invoked to “break ties” when expected utility verdicts are indeterminate. See the classic discussion in [Levi \(1986\)](#) of the Ellsberg Paradox.

can, in fact, simply appropriate the treatment of anankastic conditionals of von Fintel & Iatridou 2005, although I won't show this here.)

- Unembedded strong necessity modals (and utterances with strong directive force) will tend, by default, to invoke (update) higher-ranked ordering sources. Unembedded weak necessity modals (and utterances with weak directive force) will tend, by default, to invoke (update) lower-ranked ordering sources. There are linguistic and pragmatic devices for modulating both of these defaults.

Pending details, this sort of proposal is an all-around better fit with the data. It explains everything that the canonical semantics for weak necessity modals is able to explain, while respecting the frequently dilemmatic character of weak necessity. (Note: the rest of this prospectus will be fairly sloppy about the distinction between strong and weak necessity.)

### 4.3 Conditional Imperatives and Conditional Obligation

We now sketch an extension of our apparatus to conditional imperatives (and their deontic analogues), attempting to motivate a particular understanding of the relevant LFs (and their interpretations) and a definite analysis of the force of conditional imperatives. The latter is not straightforward, and turns out to require a basic revision in the model theory and our conception of the parameter that utterances with varieties of imperative force might update (the erstwhile TDL). The analysis we endorse has a surprising upshot: all species of directive force are best modeled as special cases of conditional directive force. We close by considering another way that conditional imperatives and obligations demand a fundamental revision in the model theory. In this case, as was the case with weak deontic necessity, the pressure comes from normative considerations. Handling it means rethinking the *epistemic conditions* under which a consideration of value can count as a reason.<sup>88</sup>

**Logical Form.** Lewis (1975) and Kratzer (1981, 1991) present evidence that “*If*-clauses are devices for restricting the domains of various [quantificational] operators. Whenever there is no explicit operator, we have to posit one” (Kratzer 1991: 656). Lewis focuses his attention on adverbs of quantification (*mostly*, *always*, *sometimes*, etc.), arguing that they are to be interpreted as two-place generalized quantifiers  $Q(\cdot)(\cdot)$ , the left argument being filled by a subordinate restriction clause (functioning to narrow the domain of  $Q$ ), the right argument filled by the matrix clause (functioning to specify the condition that holds for  $Q$ -many individuals in the restricted domain). Kratzer (1981, 1991) extends the idea to conditionals with modalized consequents. Quantificational modals occurring in consequent position of a conditional are interpreted as two-place generalized quantifiers, with a restriction (filled by the subordinate *if*-clause) and scope (filled by the matrix clause);  $\ulcorner (if \ \psi)(probably \ \varphi) \urcorner$ , for instance, expresses that most of

88. This section is a very quick overview. Conditional imperatives and obligations are an abiding theme of my research, and I discuss them extensively in Charlow (2008b,a, 2009a,b).

the relevant  $\varphi$  possibilities are  $\psi$  possibilities. When no restriction is syntactically explicit, the restriction is vacuous (filled by a tautology, if we like), and the scope is filled by the matrix clause.

We profit by treating the operators of alethic deontic modal logic in line with this idea: as two-place, restrictable generalized quantifiers, representing unconditional statements of deontic necessity as vacuously restricted.<sup>89</sup> We implement this by banishing monadic deontic operators from the deontic language: descriptions of strong conditional obligation of the form  $\ulcorner (if\ \psi)(must\ \varphi) \urcorner$  are assigned LFs of the form  $\ulcorner \Box(\varphi/\psi) \urcorner$ , while descriptions of strong unconditional obligation of the form  $must\ \varphi$  are assigned LFs of the form  $\ulcorner \Box(\varphi/\top) \urcorner$ . Satisfaction conditions for arbitrary deontic formulas of the form  $\ulcorner \Box(\varphi/\psi) \urcorner$  are as follows. (I omit the obvious extension to weak obligation.)

$$(88) \quad \llbracket \Box(\varphi/\psi) \rrbracket^w = 1 \text{ iff } D(W \cap \llbracket \psi \rrbracket) \subseteq \llbracket \varphi \rrbracket$$

Continuing, for simplicity, to ignore permissive content, the semantics of conditional imperatives is automatic: informally, a conditional imperative of the form  $\ulcorner (if\ \psi)(see\ to\ it\ that\ \varphi) \urcorner$  is in force iff  $\ulcorner (if\ \psi)(must\ \varphi) \urcorner$  is satisfied.<sup>90</sup> Formally, we'll modify the formal imperative language by introducing dyadic imperative operators (with strong and weak flavors), and stipulating that  $\tau(!(\varphi/\psi)) := \Box(\varphi/\psi)$ , while  $\tau(!(\varphi/\psi)) := \Box(\varphi/\psi)$ .

**Conditional Imperative Force.** Utterances of conditional imperatives typically generate (strong or weak) *conditional obligations*. This is all we can presently say toward characterizing their force. Recalling how the semantics of weak deontic necessity helped with a characterization of weak directive force, we might try looking to the semantics of conditional obligation for help. Perhaps surprisingly, none is forthcoming. Introducing a conditional obligation of the form  $\ulcorner \Box(\varphi/\psi) \urcorner$  is not a simple matter of addition of some proposition to an ordering-source. It is, rather, a matter of modifying the ordering-source so that  $\psi \wedge \varphi$  possibilities are ranked more highly (*ceteris paribus*) than  $\psi \wedge \neg\varphi$  possibilities. There is no good candidate proposition to perform this function.<sup>91</sup>

The diagnosis? In §2.4, I claimed a proper treatment of conditional imperative force requires a TDL sensitive, somehow, to available information. Issuing something of the form  $\ulcorner (if\ \psi)(see\ to\ it\ that\ \varphi) \urcorner$ , followed by an assertion

89. In particular, we gain a powerful tool for better representing normatively laden discourse, in natural and philosophical language. I won't recapitulate the case for "dyadic" over "monadic" deontic operators here—see Åqvist (1986); van Fraassen (1972); Lewis (1974); Loewer & Belzer (1983) for discussion. As others have noticed (e.g. Finlay forthcoming), the Kratzer/Lewis analysis of conditional obligation is a useful tool for representing "normative requirements" (in the sense of Broome 1999; Kolodny 2005) that avoids the bootstrapping problems noted by Bratman (1987), as well as for avoiding related problems stemming from the assumption that conditional obligations allow detachment of unconditional obligations, on the assumption that their antecedents are satisfied (on this last point, see Charlow 2009b; Kolodny & MacFarlane 2009).

90. Most of the adverted advantages of a dyadic analysis of conditional obligation extend to a dyadic analysis of conditional imperatives. For an illustration, see Charlow (2009a: §3.4). For a similar analysis of conditional imperatives, see Schwager (2006) (but for a skeptical look at her reasons for adopting it, see Charlow 2008b: 7-8).

91. The natural inclination here is to say that an utterance of  $\ulcorner !(\varphi/\psi) \urcorner$  adds  $\llbracket \psi \supset \varphi \rrbracket$  to the TDL. In other words, a "wide scope" treatment of conditional imperative force: the force of  $\ulcorner !(\varphi/\psi) \urcorner$  and  $\ulcorner !(\psi \supset \varphi) \urcorner$  are identified. Wide scope treatments are defective; see Charlow (2009a: §3.4).

of its antecedent, ought to have the same effect on the addressee’s planning as simply ordering her to see to it that  $\varphi$ —in typical cases, the imposition of an obligation for the addressee to see to it that  $\varphi$ . The structure of the TDL parameter—an information-invariant set of propositions, indexed to an individual (and a context)—is too coarse to accommodate this.<sup>92</sup>

A natural idea is to index TDLs to worlds, in addition to agents (and, implicitly, contexts). For every world  $w$ , we suppose there is a TDL for the agent at  $w$ ,  $T_w$ . Conditional imperative antecedents function as *update restrictors* (cf. Charlow 2008b,a, 2009a; for related ideas, see Mastop 2005; Veltman 2008). Informally, the force of an utterance of  $\ulcorner!(\varphi/\psi)\urcorner$  is to add  $\llbracket\varphi\rrbracket$  to the addressee’s TDL at (a subset of) the  $\psi$  worlds. A minimal revision of the definition of the deontic selection function (and satisfaction conditions for dyadic deontic formulas) will be required: since the ordering source is indexed to a world, the domain is as well (and we allow the index of evaluation to supply the relevant index for  $T$ ).

$$(89) \quad D_w(P) := \{v \in P \mid \forall u \in P : u \preceq_{T_w} v \Rightarrow v \preceq_{T_w} u\}$$

$$(90) \quad \llbracket\Box(\varphi/\psi)\rrbracket^w = 1 \text{ iff } D_w(W \cap \llbracket\psi\rrbracket) \subseteq \llbracket\varphi\rrbracket$$

This strategy has these things going for it (and more besides).

- It is a natural extension of the Lewis-Kratzer idea that conditional antecedents function to restrict the domain of some operator. We can think of the “domain” of the imperative operator as the set of worlds whose associated TDLs are modified. Supplying explicit restrictor arguments for the imperative operator narrows the scope of its force. Lack of explicit restrictor arguments corresponds to vacuous restriction, so that unconditional imperative force may be treated as a special case of conditional imperative force: modification of the addressee’s TDL at the worlds satisfying a tautology.
- It is plausible! Imperatives of the form  $\ulcorner!(\varphi/\psi)\urcorner$  aim to provide guidance in  $\psi$  situations: namely, to realize  $\varphi$ . Suppose  $w$  is a  $\psi$  situation, and the agent’s TDL is updated in accordance with  $\ulcorner!(\varphi/\psi)\urcorner$ . Then  $\llbracket\varphi\rrbracket \in T_w$  and, typically,  $\llbracket!(\varphi/\top)\rrbracket^w = \llbracket\Box(\varphi/\top)\rrbracket^w = 1$ . The semantics thus accommodates a prima facie plausible *quasi-detachment* property. Informally stated: when a conditional imperative is issued and its antecedent is satisfied, an unconditional obligation (to fulfill the consequent) is typically generated.

But there are problems. The envisioned update potential for conditional imperatives fails to reliably introduce *object-language conditional obligations*. Instead, it introduces an unconditional obligation (to realize  $\varphi$ ) in  $\psi$  situations, and does nothing whatever for  $\neg\psi$  situations. To illustrate: if  $w$  fails to satisfy  $\psi$ , then  $T_w$ ’s

92. A related point, developed in Charlow (2008a: §4.3): since TDLs are *index-invariant*, the deontic selection function is as well, and the truth of something of the form  $\ulcorner\Box(\varphi/\psi)\urcorner$  anywhere implies its truth everywhere. This is problematic: obligations are (i) plausibly contingent (our obligations depend, to some extent, on the world), (ii) the sorts of things we can be uncertain about (but assuming epistemic *might* is an existential quantifier over possibilities, we predict, incorrectly, that anything of the form  $\ulcorner\text{might}\Box(\varphi/\psi) \wedge \text{might}\neg\Box(\varphi/\psi)\urcorner$  is unsatisfiable).

“attitude” toward  $\varphi$  is unchanged. This gets conditional imperative force wrong: an utterance of  $\ulcorner!(\varphi/\psi)\urcorner$  reliably introduces an obligation of the form  $\ulcorner\Box(\varphi/\psi)\urcorner$  (so that  $\llbracket\Box(\varphi/\psi)\rrbracket^w = 1$ ). As it stands, we have only a metalinguistic analogue of this prediction (the quasi-detachment property): when  $\ulcorner!(\varphi/\psi)\urcorner$  is issued and  $w \in \llbracket\psi\rrbracket$ , then typically  $\llbracket\Box(\varphi/\top)\rrbracket^w = 1$ . Informally, supposing  $\ulcorner!(\varphi/\psi)\urcorner$  is issued: if  $\psi$  is true, the agent ought to realize  $\varphi$ . A metalinguistic prediction is not good enough.

We might lay blame for this at the feet of the semantics of conditional obligation stated in (90) (and, more broadly, the impulse to reduce unconditional obligation to a special case of conditional obligation). Suppose we think that a conditional obligation of the form  $\ulcorner\Box(\varphi/\psi)\urcorner$  is in force just in case an unconditional obligation of the form  $\Box\varphi$  is in force at each  $\psi$  world (or, perhaps, each good enough  $\psi$  world).<sup>93</sup> Since satisfaction conditions for conditional obligations are stated in terms of those for unconditional obligations, we are straightaway prevented from reducing unconditional obligation to a special case of conditional obligation. We must instead go for something like this:

$$(91) \quad \llbracket\Box(\varphi/\psi)\rrbracket^w = 1 \text{ iff } W \cap \llbracket\psi\rrbracket \subseteq \llbracket\Box\varphi\rrbracket$$

$$(92) \quad \llbracket\Box\varphi\rrbracket^w = 1 \text{ iff } D_w(W) \subseteq \llbracket\varphi\rrbracket$$

This semantics is tailor-made to accommodate the truism that conditional imperatives reliably introduce (object-language) conditional obligations. It also validates genuine (rather than merely quasi) detachment properties (on the assumption that  $\tau(!) = \Box$ ):

$$(93) \quad \Box(\varphi/\psi), \psi \models \Box\varphi$$

$$(94) \quad !(\varphi/\psi), \psi \models !\varphi$$

There is a problem: plausible though they may be, no version of detachment (full or quasi) is a desirable property in a semantics of conditional imperatives / obligation. A simple case from [Kolodny & MacFarlane \(2009\)](#) suffices to make the point: ten miners are trapped in a shaft—A or B, we don’t know which—and threatened by rising waters. We can block one shaft or neither, but not both. The decision matrix:<sup>94</sup>

	<i>in_A</i>	<i>in_B</i>
<i>block_A</i>	All live	All die
<i>block_B</i>	All die	All live
$\neg(\textit{block}_A \vee \textit{block}_B)$	Nine live	Nine live

93. In other words, we treat conditional obligations as fairly run-of-the-mill strict conditionals.

94. This little case is of considerable interest for ethicists and decision theorists. We sidestep many of the ethical issues (for these, see [Kolodny & MacFarlane 2009](#), although we do touch on some ground-level issues of practical reasoning and action theory). Nearly all of the points we make in this section can be recast in the decision theorist’s vocabulary. The case is, for instance, a prima facie counterexample to the Sure Thing Principle ([Savage 1954](#)). Stability (discussed below) is simply Principle  $\alpha$  ([Sen 1984](#)) (cf. Arrow’s Independence of Irrelevant Alternatives), extended to a particular kind of choice function: a deontic selection function. Our own proposal about the information-relativity of orderings bears similarities to the work on conditional desire in [Weirich \(1980, 1982\)](#). I hope to more fully explore these connections in future work.

The sentences in (95) are all arguably true (so, a fortiori, consistent).

- (95)
- a.  $in\_A \vee in\_B$
  - b.  $\Box(block\_A/in\_A)$  (If they're in A, we oughta block A)
  - c.  $\Box(block\_B/in\_B)$  (If they're in B, we oughta block B)
  - d.  $\neg(\Box block\_A \vee \Box block\_B)$  (Neither is such that *it* oughta be blocked)

But, supposing the validity of (full) detachment, we have a proof this can't be right.

1	$in\_A \vee in\_B$	hyp
2	$\Box(block\_A/in\_A)$	hyp
3	$\Box(block\_B/in\_B)$	hyp
4	$in\_A$	hyp
5	$\Box block\_A$	2, 4: detachment
6	$\Box block\_A \vee \Box block\_B$	5: disj int
7	$in\_B$	hyp
8	$\Box block\_B$	3, 7: detachment
9	$\Box block\_A \vee \Box block\_B$	8: disj int
10	$\Box block\_A \vee \Box block\_B$	1, 4-6, 7-9: disj elim

What might have gone wrong? Not much, as I assume:

- Disjunction introduction and elimination are valid.
- The deontic operators do not take wide-scope over conditional operators. The LF of *If they're in B, we oughta block B* isn't  $\Box(in\_B \supset block\_B)$ , but rather  $\Box(block\_B/in\_B)$ . So our intuitions about the natural language *ought's* are a reliable guide to what ought to hold for conditional *ought's* in our regimented deontic language.<sup>95</sup>
- The sentences in (95) are consistent—possibly true at a context and point of evaluation—on a univocal interpretation of  $\Box$ .

On these assumptions, any semantics for conditional obligation validating full detachment renders the sentences in (95) inconsistent.

Quasi-detachment fares little better: suppose the sentences in (95) are true at  $w$  (and, further, the command *if they're in A, you must block A* is issued and in force). Either they're in A at  $w$  or they're in B at  $w$ . Suppose the former. Then, on the above proposal for analyzing conditional imperative force, the proposition that I block A is on my TDL at  $w$ . So (typically) I ought to block A, so at least one oughta be blocked. Likewise for the other disjunct. So infer: at least one oughta be blocked. Contradiction.

95. As K&M show, rejecting these first two assumptions doesn't avoid the trouble. The best gambit is to reject the last, which they argue convincingly against.

**Information-Sensitive Orderings.** Supposing this is on track, the intuitively attractive proposal for analyzing conditional imperative force is seriously flawed (and the suggestion for revising the semantics of conditional obligation to track with that proposal is a non-starter). We might simply scratch our heads and decide to put conditional imperatives back onto our To-Do List. But a deeper, more general problem is afoot. Solving it resolves a fundamental issue in the semantics for normative language and, as a bonus, points the way to a plausible account of conditional imperative force.

As before, we begin with a set of sentences that are all arguably true (so, a fortiori, consistent):

- (96)    a.  $in\_A \vee in\_B$   
           b.  $\Box(block\_A/in\_A)$  (If they're in A, we oughta block A)  
           c.  $\Box(block\_B/in\_B)$  (If they're in B, we oughta block B)  
           d.  $\neg\Box(block\_A \vee block\_B)$  (We may leave both shafts open)

But this is *impossible*, on the Kratzer-Lewis ordering semantics for conditional obligation (see 88), on the minimal supposition that it is common knowledge that the miners are in A or B (which we model by assuming that  $W \subseteq \llbracket in\_A \vee in\_B \rrbracket$ ).

- **Proof.** Suppose (96) are jointly consistent. Choose  $w \in D(W)$ .  
 Since  $W \subseteq \llbracket in\_A \vee in\_B \rrbracket$ ,  $w \in W \cap \llbracket in\_A \rrbracket$  or  $w \in W \cap \llbracket in\_B \rrbracket$ .  
 By (97) (Stability),  $w \in D(W \cap \llbracket in\_A \rrbracket)$  or  $w \in D(W \cap \llbracket in\_B \rrbracket)$ .  
 By (88),  $D(W \cap \llbracket in\_A \rrbracket) \subseteq \llbracket block\_A \rrbracket$  and  $D(W \cap \llbracket in\_B \rrbracket) \subseteq \llbracket block\_B \rrbracket$ .  
 So  $D(W) \subseteq \llbracket block\_A \rrbracket \cup \llbracket block\_B \rrbracket$ .  
 So  $\llbracket \Box(block\_A \vee block\_B) \rrbracket^w = 1$ . Contradiction.

Assuming something like the Kratzer-Lewis ordering semantics is right, the proof makes it fairly clear that the culprit is Stability (repeated here).

- (97)    If  $P' \subseteq P$ ,  $w \in P'$ , and  $w \in D(P)$ , then  $w \in D(P')$  [**Stability**]

In §4.1, we suggested that Stability was a reasonable constraint on selection functions: it says, simply, that shrinking a world's competition cannot reduce that world's rank, wrt a fixed ordering. We can now see that this gloss obscures the fact that the domains on which selection functions are defined *encode relevant information*—they supply the possibility space relevant for practical reasoning and deliberation (implicitly wrt a contextually supplied model). (For instance, the possibility space relevant in the miners context is one according to which it's known that they are in either A or B.) There is good reason to model ordering-sources (hence, selection functions) as information-dependent: whether and how you are willing to weigh a consideration of value in deliberating about what to do depends, in part, whether (and perhaps to what degree) that value is *actionable wrt the relevant information*.<sup>96</sup>

96. K&M reject Stability too, but only in passing, and without supplying a rationale for doing so. The argument here (and the formalism of my own proposal) is developed much more precisely in Charlow (2009b). Considerations of the sort used to motivate the Knowledge-Action Principle of Hawthorne & Stanley (2008) turn out to be extremely relevant in motivating this view.

The formal gist is just this: we let ordering sources be sensitive to the information borne by the relevant possibility space. We introduce *ordering-sources* (OSSs, informally, sets of “basic” or “information-invariant” values), and define an ordering source  $ch(\mathcal{Y}, P) \subseteq \mathcal{Y}$  relative to an OSS  $\mathcal{Y}$  and a body of information  $P$  (see Charlow 2009b for details). The worlds selected by a selection function from a possibility space  $P$  are the worlds that rank best according to the ordering source *determined by*  $P$ .

$$(98) \quad D(P) = \{w \in P \mid \forall v \in P : v \leq_{ch(\mathcal{Y}, P)} w \Rightarrow w \leq_{ch(\mathcal{Y}, P)} v\}$$

This suffices to block the proof. Since conditional antecedents are domain restrictors, a world that is best in an unrestricted domain may lose that status when evaluating a statement of conditional obligation. This is, it is important to note, quite intuitive. The Ramsey test for the truth of a conditional, for instance, has us check whether the consequent holds wrt a relevant body of information *from whose standpoint the antecedent is known*. Supposing the antecedent hypothetically affects which considerations of value we take to matter. While saving all ten miners may not count for or against a course of action in a state of uncertainty about their location, it may count for blocking B on the supposition that they are in B.

With this picture in place, conditional imperative force is more or less automatic. We index TDLs, not to worlds, but to bodies of relevant information (in addition to agents and contexts), so that  $T_P$  is the TDL for the agent wrt the body of information  $P$ . The antecedent of a conditional imperative  $\lceil \Box(\varphi/\psi) \rceil$  functions to select  $T_{\llbracket \psi \rrbracket}$  for update. Once a TDL is selected, update is trivial:  $\llbracket \varphi \rrbracket$  is added to  $T_{\llbracket \psi \rrbracket}$ .<sup>97</sup> I leave it to the reader to verify that this account succeeds where others had trouble.

#### 4.4 The Ross Paradox

A satisfactory resolution of the Ross Paradox (Ross 1941) is generally thought to require an explanation of the invalidity of the following inference:

$$(100) \quad \begin{array}{l} \neg\varphi \not\models \neg(\varphi \vee \psi) \\ \text{(Post the letter! doesn't entail Post or burn it!)} \end{array}$$

In §3.1, we argued that the paradox is to be explained in terms of the permissive content of different types of disjunctive imperative. A rough summary: choice-offering readings partake in free choice permissions (cf. 101a), while alternative-presenting readings, though they involve permissions, do not involve free choice permissions (cf. 101b).

- $$(101) \quad \begin{array}{ll} \text{a. You can post or burn it (I don't care which)} & \\ \quad \Rightarrow \text{You can burn it} & \\ \text{b. You can post or burn it (I'm unsure which)} & \\ \quad \not\Rightarrow \text{You can burn it} & \end{array}$$

---

97. It would be natural to require that for all  $P \subseteq \llbracket \psi \rrbracket$ ,  $\llbracket \varphi \rrbracket$  is added to  $T_P$ . We need to finesse this, on account of the possibility of consistent imperative Sobel sequences (cf. Gillies 2007).

- $$(99) \quad \begin{array}{ll} \text{a. If you go to the concert, take pictures.} & \\ \text{b. If you go to the concert but can't see the stage, don't take any pictures.} & \end{array}$$

We're led to the following desideratum on an adequate resolution of the paradox:

- A semantic distinction between choice-offering and alternative-presenting disjunctive imperatives (probably to be represented as a difference *at LF* between free choice and ordinary types of permissions). (Hence, we also presumably require a way of explicitly representing permission in our formal imperative language, and an account of free choice permissions which predicts the relevant distinctions.)

Thin though this requirement might seem, it rules out a host of semantic treatments of imperative languages which analyze the Ross Paradox (or a close deontic relative) as a species of (non-permission-related) closure failure (cf. [Hansson 1990](#); [Kenny 1966](#); [Segerberg 1990](#)). While such treatments do predict the invalidity of the Ross inference, insofar as they ignore permissive content, they fail to *explain* it ([Charlow 2009a](#): §3.5.1).

There is the further matter of *how to account for the posited ambiguity*. Suppose we let  $\lceil \ddagger \rceil$  and  $\lceil \dagger \rceil$  be permission and requirement operators, respectively, for a more regimented imperative language (allowing embedding of permission and requirement formulas under conjunction), the former expressing a permission to realize its complement (so that  $\tau(\ddagger) = \neg\Box\neg$ <sup>98</sup>), the latter expressing pure requirement to (so that  $\tau(\dagger) = \Box$ ). A disjunctive imperative of the form  $\lceil!(\varphi \vee \psi)\rceil$  would, we're supposing, be *ambiguous* between the following LFs of this more regimented language.

$$!(\varphi \vee \psi) \left\{ \begin{array}{l} \dagger(\varphi \vee \psi) \wedge (\ddagger(\varphi) \wedge \ddagger(\psi)) \text{ (Choice offering)} \\ \dagger(\varphi \vee \psi) \wedge \ddagger(\varphi \vee \psi) \text{ (Alternative presenting)} \end{array} \right.$$

It would be natural to assume that well-formed imperatives, in general, are analyzed as “conjunctions” of pure requirements with (either free choice or not) permissions in the more regimented language, so that:

$$\tau(!\varphi) \left\{ \begin{array}{l} \Box\varphi \wedge \Diamond^+\varphi, \text{ if } \text{---} \\ \Box\varphi \wedge \Diamond\varphi \text{ otherwise} \end{array} \right.$$

With the ‘---’ filled in by a statement of conditions on when the choice-offering LF in the disambiguated imperative language is used in the analysis of a disjunctive imperative in the ambiguous language. On this point, [Åqvist \(1965\)](#); [Charlow \(2009a\)](#); [Aloni \(2007\)](#) are roughly in agreement. Differences emerge in how to fill in the ‘---’. [Åqvist \(1965\)](#) offers nothing concrete. [Aloni \(2007\)](#) gives an account, but it turns out to be no more explanatory than a stipulation that the free choice LF be used when the choice offering reading is salient (see [Charlow 2009a](#): §3.5.2).

A first stab (details to be worked out in another venue). Notice that selectively focusing natural language *or* makes the free choice effect robust—so robust that alternative-presenting readings are unavailable (cf. 103). Notice also that focused *or* patterns with free-choice *any* (cf. 104), while unfocused *or* (cf. 105, or

98. As with conditional imperative force, *permissive force* is not straightforward to read off from the semantics of deontic permission. Reference the earlier discussion.

with focus displaced to the disjuncts, cf. 106) seems to pattern with indefinite *a* (cf. 107).<sup>99</sup>

- (103) a. Take (EITHER) an apple OR a pear (I don't care which)  
 b. #Take (EITHER) an apple OR a pear (Just not the pear)
- (104) a. Take any piece of fruit (I don't care which)  
 b. #Take any piece of fruit (Just not the pear)
- (105) a. Take AN APPLE OR A PEAR (I don't care which)  
 b. ?Take AN APPLE OR A PEAR (Just not the pear)
- (106) a. Take an APPLE or a PEAR (I don't care which)  
 b. ?Take an APPLE or a PEAR (Just not the pear)
- (107) a. Take a piece of fruit (I don't care which)  
 b. Take a piece of fruit (Just not the pear)

In view of this data, an account which fills in the '\_\_\_' along the following lines would seem promising.

- Ties LF (choice-offering / alternative-presenting) to focal structure (for relevant discussion, see Fox 2006).
- Ties conditions for felicitous use of focused *or* in disjunctive commands to conditions felicitous use of the negative polarity item *any*. [Although it is a bit unclear how to extend the canonical account of NPI-licensing for *any* (Kadmon & Landman 1993) to the imperative case (cf. Aloni 2007: 90), the prospects for a unified treatment seem good to me.]

Surprisingly, if this is right, there is reason to suspect that the Ross Paradox is actually ill-formed. We have intuitions about the semantic impact of focus- and polarity-sensitive environments in natural language *masquerading* as intuitions about the semantics of a formal imperative language (which lacks such environments). Faithfully modeling imperative discourse in natural language does require grappling with a Ross-like Paradox—just not as traditionally formulated

99. This is not to claim that alternative-presenting readings with unfocused *or* are easily accessible, only that focus makes a felt difference in their accessibility. Free choice interpretations of disjunctive imperatives are strongly preferred (so much so that synchronic cancellation constructions are, as noted above, nearly always marked), and cases need to be constructed with care in order to access them.

Is the uniform oddness of synchronic cancellation constructions reason to think that free choice entailments cannot be modulated by focus marking? I'm inclined to think not. For one, this sort of oddness does not always track entailment.

- (102) a. ?Bond is in Zurich or in London (although he can't be in London)  
 b. ?Bond is (EITHER) in Zurich OR in London (although he can't be in London)  
 c. ?Bond is IN ZURICH or IN LONDON (although he can't be in London)

Few (with Zimmermann 2000 an important exception) take *P or Q*, on any possible assignment of focal structure, to entail *might P*. Certain sorts of implicatures are, then, very resistant to synchronic cancellation. While this complicates the case for free choice implications as entailments (part of which rests on the oddness of synchronic cancellation constructions), it does not, I think, ultimately undermine it, in view of supporting evidence from *diachronic* cancellation constructions (§3.1). The rough picture is this: contextual parameters (some of which can be modulated, others of which cannot) favor free choice LFs by default, perhaps for broadly Gricean reasons. There is more to say here, but I leave matters here for now.

(since we are not forced to locate the relevant ambiguity in a formal imperative language). That is to say: it does not require predicting that  $!\varphi \not\equiv !(\varphi \vee \psi)$ .<sup>100</sup> Instead, it requires:

- Supplying appropriate imperative LFs for choice-offering and alternative-presenting readings of disjunctive imperatives in some fragment of natural language (something achieved as early as Åqvist 1965).
- Stating conditions on when the choice-offering imperative LF is used in the analysis of a disjunctive imperative in that natural language fragment—something roughly along the lines of the schematic account sketched above.

#### 4.5 Agents, Quantifiers, and Times

The imperative and deontic languages we have been working with rely on two salient idealizations.

- Imperative and deontic operators are *sentential operators*, taking formulas of first-order logic as complements.
- Imperative operators are unembeddable under connectives or quantifiers.

A quick, but compelling, case against these idealizations: there is, we've seen, a distinction between what everyone ought to do (is commanded to do)—a constellation of personal obligations (commands), addressed to every relevant agent—and what ought to be the case (is commanded) concerning everyone—an impersonal obligation (command), addressed to no agent in particular. The deontic and imperative languages are, as they stand, unable to represent this very basic distinction.<sup>101</sup>

- (108) a. See to it that everyone takes shelter! [ $!\forall xPx$ ]  
 b. Everyone take shelter! [??????]
- (109) a. It must be that: everyone takes shelter [ $\Box\forall xPx$ ]  
 b. Everyone must take shelter [??????]

Resolving these issues raises further interesting issues / technical complications:

100. Even if we ignore focus and polarity, the historical focus on this simple inference is misleading. Close relatives of the Ross Paradox manifest in conditional imperatives, imperatives that involve reference to temporally sequenced (and arbitrarily long) courses of action, and so on. I discuss such complicated versions of the Ross Paradox in Charlow (2009a: §4.11).

101. We simplify, but see Geach (1982); Wedgwood (2003); Williams (1981) for relevant discussion (and Belnap, Jr. 1991a,b; Belnap, Jr. & Perloff 1988, 1992; Horty 1996; Horty & Belnap, Jr. 1995 for relevant further arguments, relating to expressive limitations, against the standard deontic and imperative languages). Quantified deontic logic allows quantifying in, so that (109b) might be represented with a formula of the form  $\Box\forall xPx$ . Two problems: (i) the strategy, even if it worked, can't explain distinction between what ought to be the case concerning Fred and what Fred ought to do (since  $\Box f\Box Px$  is not a wff of QDL, and it is hard to imagine a principled way of deriving the LF  $\Box\exists x : x = f \wedge \Box Px$  from the surface grammar of a sentence like *Fred ought to take out the trash*); (ii) In view of the validity of  $\Box\forall x\Box Px \equiv \Box\forall xPx$ , this still misses the distinction between what ought to be the case concerning every individual and what every individual is obligated to do.

- Characterizing the expressive demands of imperative and deontic languages that aim to represent normative and imperative speech. Specifically, we will want to characterize different kinds of commands and obligations (e.g., the so-called “political,” personal, and impersonal varieties), while being clear about what is required of an adequate formal representation of them. Is a calculus of actions required (cf. [Segerberg 1990, 1992](#))? Devices for expressing agentives (cf. the vast STIT literature) or relations between agents and actions or states of affairs (cf. [Geach 1982](#))?
- Devising formal languages (and model theories for these languages) that are up to these expressive demands.

This is a large project. I’ll mostly gloss over it here, although I will try to sketch, in broad outline, two interesting pieces of it.

**The Agent Argument.** The examples above show that the simple propositional operator treatment we’ve been presupposing *ignores agency*, in a crucial sense: obligations and commands are *directed at agents*. Imperative and deontic languages require some way of expressing this sort of agent-directedness.

The fix is not difficult, but powerful nevertheless. We construe deontic and imperative operators as binary operators, one argument place filled by a formula of first-order logic, another filled by an *agent-constant*. If  $a$  is an agent-constant, then all well-formed deontic and imperative formulas are respectively of the form  $\ulcorner \Box(a)(\varphi) \urcorner$  and  $\ulcorner ! (a)(\varphi) \urcorner$  (pronounced, respectively, *a is obligated to see to it that  $\varphi$*  and *a: see to it that  $\varphi$* ). The semantics for directed formulas proceeds by exploiting the insight of [Portner \(2004a, 2008\)](#) that ordering-sources for deontic modals (TDLs) should be indexed to agents. We incorporate this into our own analysis by indexing OSSs to agents, so that  $\Upsilon_a$  is the OSS for  $a$ .

$$(110) \quad D_a(P) = \{w \in P \mid \forall v \in P : v \leq_{ch(\Upsilon_a, P)} w \Rightarrow w \leq_{ch(\Upsilon_a, P)} v\}$$

$$(111) \quad \llbracket \Box(a)(\varphi/\psi) \rrbracket^w = 1 \text{ iff } D_a(W \cap \llbracket \psi \rrbracket) \subseteq \llbracket \varphi \rrbracket$$

One very nice side effect of specifying agent-directedness in the argument structure of deontic and imperative operators is the ability to *bind variables occurring in the agent argument-place*. Adding the obvious quantifier clauses to our implicit characterization of our languages,<sup>102</sup> we can fill out the missing LFs for universally directed commands and obligations as follows:

$$(112) \quad \text{Everyone take shelter!} \\ \forall x ! (x)(Px)$$

$$(113) \quad \text{Everyone must take shelter} \\ \forall x \Box (x)(Px)$$

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102. The syntactic issues here are actually quite sensitive. What sorts of embeddings of imperative formulas should we be willing to sanction? Can existential quantifiers bind variables in the agent argument-place of an imperative formula? Can imperative formulas be embedded under negation? Is there any explanation for these syntactic restrictions (which are, from the perspective of the logician used to unrestricted recursive characterizations of formal languages, quite unusual)? We saw direct pragmatic analogues of each of these questions in §2.4.

The semantics for deontic formulas of the form  $\lceil \forall x \Box \varphi \rceil$  is just what you would expect, and we will not fuss with it here.

**Temporality.** Here are some more things we would like to be able to represent, but, as things stand, cannot.<sup>103</sup> For sake of concreteness, focus on the example of someone attempting to follow a recipe for a soufflé.

- The distinction between obligations and commands that are binding *now* (e.g., *whip the egg whites*) and those binding at some later point in time (e.g., *put the soufflé into the oven*).
- Obligations (commands) to perform a series of actions in some sequence (e.g., *fold the egg whites into the custard, after whipping them*).
- Obligations (commands) to perform an action or series of actions *conditional on the performance* of an action or sequence of actions. A bit less formally: how particular courses of action will impact an agent's later obligations (e.g., *fold the egg whites into the custard, if you've whipped them to stiff peaks; make a pudding, if you've failed*).
- The distinction between obligations and commands that lapse upon fulfillment, and those that do not: *dischargeable* and *non-dischargeable* obligations and commands, respectively (e.g., *whip the egg whites* versus *never set fire to your kitchen*).

Some of these things (e.g., the first) can be achieved rather easily with the addition of tense operators to our language. Others (e.g., the third) plausibly depend on the ability to form claims about the *performance* of an action by an agent.<sup>104</sup> Others still (e.g., the second, third, and fourth items) plausibly depend on the ability to *reference actions*—both simple (e.g., whipping the egg whites) and complex (e.g., folding the egg whites into the custard after whipping them, which is crucially distinct, as anyone who made a soufflé knows, from whipping and folding the egg whites into the custard).<sup>105</sup>

I think (although I won't argue here) that a comprehensive analysis of these issues requires a hybrid of STIT and PDL languages (and their model theories). The terrain here gets very technical, very fast—a rigorous discussion requires reference to branching-time models and the logic and interpretation of programs (and, moreover, some sort of integration of these tools with the possible-worlds ordering semantics we've been developing), discussion of which we will save for

103. Relevant work on the connection between time (and tense) and deontic notions can be found in: Belnap, Jr. (1991a,b); Belnap, Jr. & Perloff (1988, 1992); Horty (1996); Horty & Belnap, Jr. (1995); Thomason (1981b,a).

104. For one approach to this, see the cited STIT literature. For a different approach, rooted in the logic of programs (PDL), see Segerberg (1992). The STIT approaches seem to have it right that any semantics for a performance predicate or relation will rely on branching-time models. This is something which PDL treatments, as usually presented, tend to neglect; see, e.g., Segerberg 1992: 375. (Indeed, I know of no way to sensibly formalize the claim that an agent has performed a particular action at  $w$ —crucially different from the claim that an agent is able to perform a particular action at  $w$ —without branching-time models.)

105. This is comfortable terrain for PDL approaches—see, e.g., Segerberg (1990, 1992, 1994).

another venue (although see [Charlow 2009a](#): §4.12; [Charlow 2009b](#): §4.3 for some discussion). But it is terrain that is well-worth exploring.

#### 4.6 Expressivism

And now for something different. I close this prospectus by sketching, in brief, an application of update semantics (and the reduction technique for the imperative language developed in §3.1) to an area of abiding philosophical interest: clarifying metaethical expressivism, as a proposal about the semantics and pragmatics of normative discourse.

Let  $\varphi$  be a *normative sentence* (one containing normative auxiliaries, predicates, etc.). Metaethical expressivism (exemplary references include [Blackburn 1998](#); [Hare 1952](#); [Gibbard 1990, 2003](#)) is generally associated with some or all of the following.

- **Nonfactualism.**  $\varphi$  is not truth-apt (not evaluable for truth, does not have a proposition as its semantic value, etc.).
- **Noncognitivism.** The state of mind involved in a normative judgment—a judgment that  $\varphi$  is true or correct—is not a cognitive state (e.g., belief), but a non-cognitive state (something like intention, desire, approval, disapproval, being for, or being against).
- **Normative speech-acts.** A sincere utterance of  $\varphi$  does not constitute an assertion—it is neither a proposal for addition to the Common Ground, nor for revision of addressees’ beliefs (see esp. [Geach 1965](#); [Searle 1962](#)). [Hare \(1952\)](#), e.g., argues that normative speech-acts are relevantly similar to commands. Modern expressivists, inspired by the notion that assertions express beliefs, suggest something along the lines of *expressions of (dis)approval*.<sup>106</sup> (So understood, there is a tight link between noncognitivism and the recognition of a type of speech-act peculiar to normative discourse.)
- **Meaning as use.** The state of mind implicated in a judgment that  $\varphi$  is true (or the type of speech-act a sincere utterance of  $\varphi$  is typically used to perform) is of semantic import. According to [Gibbard](#), we “explain the meaning of a term” by explaining “what states of mind the term is used to express” ([Gibbard 2003](#): 6-7).

“Expressivism,” as I use the term, is characterized by each of these theses.<sup>107</sup>  
Some traditional problems for expressivism, so understood.

- **Expression.** What is it for an utterance to express or voice an attitude?  
(For discussion of this problem, see [Schroeder 2008b](#))

106. For discussion and clarification, see [Schroeder \(2008b\)](#).

107. Although expressivists typically go in for all of these views, the logical interrelationships are subtle. It is, for instance, unclear whether the semantic type of a semantic value of a sentence  $\varphi$  should determine the sort of mental state typically implicated in a sincere endorsement of  $\varphi$  or the type of speech-act that is typically performed with a sincere utterance of  $\varphi$ .

- **Semantic commitments.** How is expressivism to be cashed out as a formal proposal about the semantics of natural language, within the paradigm of generative linguistics? Note that truth-conditional approaches to normative language can simply treat normative predicates on the model of descriptive predicates (functions from individuals to propositions), normative auxiliaries on the model of modal auxiliaries (functions from propositions to propositions), and so on. Expressivism cannot.<sup>108</sup>

According to [Schroeder \(2008a,b,c\)](#), expressivists haven't given satisfactory answers to these problems. He elects, for reasons I'll ignore here, to answer them thus.

- **Expression as performance conditions.** A speaker  $S$  performing an utterance  $U$  expresses attitude  $A$  iff having  $A$  is a necessary condition for  $S$ 's proper performance of  $U$  ([Schroeder 2008b](#): 108-11).
- **Semantic mentalism.** The semantic value of (thing expressed by) a normative sentence  $\varphi$  is a relational attitude of the form  $\text{FOR}(R, \alpha)$ , where  $\text{FOR}$  is a generic pro-attitude,  $R$  is some sort of response to act-types (blaming, feeling guilt, feeling shame, etc.), and  $\alpha$  is an act-type ([Schroeder 2008a,c](#)).

Mentalism involves a radical revision of semantics in the generative tradition. Expressivists might have hoped to get by with something more conservative.

If there were some way of developing the semantic program of expressivism without having to rebuild our semantic theories from the ground up, there would be prima facie reason to prefer it. Here is a sketch of a view, building on our work on the semantics of imperatives, that is both recognizably expressivist and theoretically conservative. Details and development are saved for another venue.

- The *static semantics* (model theory) for normative sentences is done on the model of the static semantics for imperatives (see §3.1). We define

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108. Closely related worries, which are often placed under the umbrella of the "Frege-Geach Problem" (cf. [Searle 1962](#); [Geach 1965](#)).

- **Compositionality.** How do normative predicates, auxiliaries, and sentences contribute to the meanings of constructions in which they are embedded? If  $\varphi$  is normative, what are the meanings of  $\lceil \neg\varphi \rceil$  and  $\lceil \varphi \supset \psi \rceil$ , and how do they arise compositionally from the meaning of  $\varphi$ , together with the meanings of  $\neg$  and  $\supset$ ?
- **Validity and entailment.** What explains the validity of inferences like the following?
  - (114) If lying is wrong, then lying for money is wrong.  
Lying is wrong.  
So, lying for money is wrong.
  - (115) Lying is never wrong.  
So, lying for money is never wrong.

What does validity of normative arguments amount to, if not truth-preservation? How is it characterized?

The problems here are extraordinarily difficult (as [Schroeder 2008a,b,c](#) argues at considerable length), and it is not clear what an expressivist should say in response to them. The source of the difficulty is expressivism's commitment to the idea that the meaning of an expression is a function of the state of mind it is used to express in unembedded environments.

a normative fragment  $\mathfrak{N}$  and a suitable non-normative fragment  $\mathfrak{D}$  and a translation map  $\tau : \mathfrak{N} \mapsto \mathfrak{D}$  that is homomorphic wrt  $\models_{\mathfrak{N}}$ .<sup>109</sup> The fundamental semantic relation for  $\mathfrak{D}$ ,  $\models_{\mathfrak{D}}$ , is understood as satisfaction, while  $\models_{\mathfrak{N}}$  is understood in terms of some less truth-y notion, perhaps *being in force*.

- The *pragmatics* for normative sentences has it that the update potentials for normative sentences involve a sort of (non-propositional) “global comment” on a cognitive state containing both information-tracking and action-guiding parameters (cf. von Fintel & Gillies 2007). Update potentials are traditionally understood as performing restrictive operations on cognitive states: restricting a state’s doxastic or practical alternatives (assertoric and directive force, respectively). But other operations are possible. A state  $s$  might, for instance, *pass a test* specified by a sentence, in which case the update potential for that sentence would return  $s$  as a value (otherwise doing something else).<sup>110</sup> Test programs can be thought of as characterizing sets of states (those that meet the test), or, equally, properties of states (that of satisfying the condition that is tested for). They yield information about the states they are executed in, *without having that information as their propositional content*.<sup>111</sup>

Some general comments about the proposal.

- It is nonfactualist: normative sentences do not express propositions, according to either the static or dynamic parts of the proposal.
- It is noncognitivist: normative judgments are the psychological analogue of sincere normative utterances (as beliefs are the psychological analogue of sincere assertions). Since the latter express properties of the cognitive state (or context) from which they are made, the former do too.
- It invokes a special class of normative speech-acts. We might usefully taxonomize speech-act types (kinds of illocutionary force) according to their update potentials, as follows (column headings corresponding to the *parameter* of states on which the update potential for the relevant kind of discourse operates, rows to the *type of operation* performed).

	<b>Doxastic</b>	<b>Practical</b>
<b>Restriction</b>	Descriptive	Directive
<b>Comment</b>	Epistemic (?)	Normative

Descriptive discourse corresponds to restriction of doxastic alternatives (assertion), directive discourse to restriction of practical alternatives.

109. If  $\varphi \in \mathfrak{N}$ ,  $\tau(\varphi)$  might just be a description of the performance conditions for the speaker’s proper utterance of  $\varphi$ . Another natural candidate would be a formula from the augmented deontic language.

110. On the use of tests in update semantics, see von Fintel & Gillies (2007); Veltman (1996).

111. So they avoid the pitfalls of Speaker Subjectivism, detailed in Schroeder (2008b: 89-92).

Epistemic discourse (discourse in the language of subjective uncertainty) corresponds to expression of properties of an informational state (possibility or necessity) (cf. von Fintel & Gillies 2007), while normative discourse corresponds to expression of properties of a practical, action-guiding state.

- It is compatible with the notion that elucidating the use of normative language elucidates its meaning (so long as we take the canonical discourse function of normative utterances to be a fact about their meaning, as those working in the dynamic tradition are happy to do).
- We see that a static expressivist semantics for normative language needn't have any remarkable formal properties. Indeed, we can, for the most part, simply do static, model-theoretic semantics as we have always done it. In the context of static, model-theoretic semantics, expressivism can be construed as a proposal about *how best to conceive of* the fundamental semantic relation for a normative fragment of natural language. (Note also that compositionality and logic come basically for free.)
- Natural language contains both normative and non-normative bits (and hybrids that are constructed out of their members). Something needs to be said about the ability of normative bits of syntax to syntactically coordinate with non-normative bits of syntax (in conjunctions, conditionals, etc.). Supposing that the classes of models for the normative and non-normative fragments are identified (the only difference being in how we conceive of their respective semantic relations), there is no semantic barrier to coordination: normative and non-normative (and imperative!) sentences alike might characterize sets of points in a model. We conjecture that normative and imperative sentences have different embedding profiles (imperatives cannot embed as conditional antecedents, for instance) for purely syntactic reasons.<sup>112</sup>

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