

PROSPECTS FOR AN EXPRESSIVIST THEORY OF MEANING

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1. Introduction

This paper encourages Expressivists to abandon a traditional *content-centric* approach to semantic theorizing, in favor of an *update-centric* or *dynamic* approach.

It first develops an argument against traditional content-centric Expressivism, akin in many respects to Schroeder (2008a,b,c). Content Expressivists, I claim, are hard-pressed to avail themselves of a key tool in semantic theorizing: the use of *disquotation* to generate *Boolean interpretations* of object-language connectives. I identify two aspects of this problem. First, empirical: disquotation generates the *wrong meanings* in a class of cases. Second, structural: the modes of semantic explanation that disquotation affords look as if they are just unavailable to Expressivists. The Frege-Geach and Negation/Disagreement Problems for Expressivism are, I argue, versions of this more general problem.

The paper also outlines a way Expressivists can handle these difficulties. The Expressivist's empirical difficulties are solvable by appeal to the sorts of non-classical approaches to negation, disjunction, and so on, familiar from linguistic work in Dynamic Semantics. Her treatments of such connectives will not, therefore, be Boolean, in the usual sense of that notion, but that is not, I will suggest, fairly regarded as a cost. Her structural difficulties with disquotation are more serious: they raise a worry about whether semantic explanation as traditionally conceived — i.e., explanation of object-language meaning phenomena by appeal to facts in the model theory — is in any familiar sense *possible* for the Expressivist. Here I suggest that the Expressivist move away from a model theory that makes central use of attitude-individuating *contents*, toward a model theory that makes central use of *updates* or *constraints* on abstract or formal representations of states of mind (understood as familiar set-theoretic constructions out of *possibilia*). Provided the advice is heeded, Expressivists can offer explanations of a surprisingly wide array of semantic phenomena that perform well according to canonical standards in model-theoretic semantics.

In §2, I sketch how an Expressivist semantics for a certain kind

of language is motivated, and I describe Gibbard's standard content-centric way of pursuing it. In §3, I explain why a semantics in this vein runs into the sorts of difficulties mentioned above. In §4, I describe a different kind of Expressivist-friendly semantics, drawing inspiration from influential work on epistemic modals from the Dynamic Semantic tradition and on disjunction from the Alternative/Inquisitive Semantics tradition. Although most of the work here is in making an Expressivist-friendly semantic machinery perform at the same level as standard truth-conditional machinery, there are one or two points where this machinery may have an empirical leg up on the competition. Finally, in §5, I respond to an obvious charge — that Expressivists are not entitled to make use of the semantics of §4. Perhaps there is a reason no Expressivist semantics on the market looks like the one I give, namely, that it — a dynamic alternative semantics that makes central use of set-theoretic constructions out of possibilities and no (direct) use of mental states — is ruled out by the basic commitments Expressivists have themselves articulated. That charge is mistaken, I argue. Expressivists can make use of a semantics of possibilities (with all of its explanatory power) so long as mental states remain *fundamental*. I go on to describe the sense in which mental states might be fundamental for an Expressivist who makes use of my semantics.

2. Motivation

There are Expressivists (or something close enough) about many kinds of language: normative claims (Gibbard, 1990, 2003), epistemic modals (Yalcin, 2007, 2011, 2012; Swanson, forthcoming), conditionals (Adams, 1975; Gibbard, 1981; Bennett, 2003), probability claims (Barker, 2006; Yalcin, 2012; Swanson, forthcoming), knowledge claims (Chrisman, 2007, 2012a; Ridge, 2007), and more besides. To get a general view, start with the following fairly representative remark:

[A] story is recognizably expressivist in being guided by an independently motivated conception of the states of mind involved in accepting sentences of the target fragment, in claiming that assertions of sentences of the target fragment canonically serve to express states

of mind not equivalent to full belief in propositions, and in being a development of the idea that sentences of the target fragment are not straightforwardly factual. (Yalcin 2012: 125)

Let us unpack this. First, Expressivists are “guided by an independently motivated conception of the states of mind involved in accepting sentences of the target fragment”. Call sentences of the target fragment *E*-sentences. Expressivist theorizing about the meaning of an *E*-sentence ϕ privileges, in a sense to be precisified, the state of mind constitutively involved in accepting (or, perhaps, uttering) ϕ ; that state of mind is taken to be somehow fundamental in thinking about the meaning of ϕ . In Gibbard's well-known formulation, we “explain the meaning of a term” in such a fragment by explaining “what states of mind the term is used to express” (2003, 5–6). In Wedgwood's formulation, “the fundamental explanation of the meaning of normative statements, and the sentences that are used to make those statements, is given in terms of the type of *mental state* that the statements made by uttering those sentences *express*” (2007, 35). Expressivists embrace a distinctive view of the methodology and subject-matter of semantic theorizing. It thus seems appropriate to label this the distinctive **metasemantic** commitment of Expressivism.

Second, “assertions of sentences of the target fragment canonically serve to express states of mind not equivalent to full belief in propositions”. Call a state of mind *representational* iff it is equivalent to full belief in a propositional content,¹ and say that a sentence ϕ

¹ By *propositional content*, I will mean something fairly loaded, namely: a *representational content*. A representational content is an entity encoding what I will term a *locational perspective*: a property an agent can self-ascribe by way of self-locating in modal space (understood as a space of possible worlds or possibly more fine-grained entities) (cf. Lewis, 1979a). The mental state-type of self-location is functionally distinguished from motivational state-types like preference or desire, as well as from broadly representational state-types that nevertheless cannot be propositionally individuated (e.g., assigning p a credence of .5 conditional on q). In the above paragraph, then, I am understanding Expressivism's metasemantic commitments as precluding the assignment of representational contents as the semantic values of sentences with a non-representational function. There is a more general sense

has a representational *function* iff it canonically serves to express² a representational state of mind (and a non-representational function iff it canonically serves to express a nonrepresentational state of mind). According to Expressivism's central metase-mantic commitment, a semantics for ϕ must at least account for the state of mind ϕ canonically serves to express. Thus, if ϕ has a non-representational function, it cannot have a propositional semantics; a propositional semantics is fit for accounting for a representational function, but not, I have assumed, for accounting for a non-representational function. Simplified:

- a. The function of ϕ is non-representational
- b. If ϕ meant a proposition, its function would be representational
- c. So ϕ does not mean a proposition

Let us refer to (a) as the **empirical** claim of Expressivism; (b) is a consequence of Expressivism's distinctive metase-mantic commitments; (a) and (b) together yield a commitment to a nonpropositional semantics for ϕ , which I will call the **semantic** claim of Expressivism.³

of 'proposition' — namely, content that can "bear" truth-values and serve as the object of an attitude-type we might neutrally term 'acceptance' — which admits both representational and non-representational varieties and which Expressivists, therefore, might countenance (see esp. Schroeder, 2011c). Indeed, an Expressivism that assigned non-representational "propositional" contents as semantic values for *E*-sentences would be one way of developing the content-centric Expressivism that is the target of this essay. However, if this essay's main negative argument is right, then it is simply Expressivists' *use of contents* as semantic values that gets them into trouble. The negative argument nowhere makes use of the assumption that the contents assigned by a content-centric Expressivism are non-"propositional"; it assumes only that these contents are, of necessity, non-representational. Hence, an Expressivism that assigns non-representational (possibly "propositional") contents as semantic values should be abandoned for one that assigns updates (or, generally, things determining cognitive instructions) as semantic values.

² Complications arise in saying what *expression* amounts to. See Schroeder (2008b) and discussion in §5.

³ It is worth noting that Expressivism is not expected to be empirically visible in a semantics for representational language.

Evidence for the empirical claims that motivate Expressivism can take various forms. Often such evidence involves claims about what it is to be in a state of mind like:

- (1) Thinking murder is wrong
- (2) Thinking it might be raining
- (3) Thinking it's likely that the keys are on the table
- (4) Thinking Pete won if he called

No surprise, then, that the argument from motivational internalism — according to which, roughly, normative attitudes like (1) are non-representational attitudes (because, were they representational, they would not thereby motivate an agent possessing them, as normative judgments apparently do) — figures prominently in arguments for Expressivism about normative judgments (see, e.g., Gibbard, 1990; Smith, 1994). Expressivism about epistemic modals, judgments of probability, and conditionals is often motivated by appeal to standard Bayesian understandings of attitudes like (2)–(4), on which such attitudes involve, respectively, being representable with a probability function or information state that is compatible with the proposition that it is raining, that assigns high credence to the proposition that the keys are on the table, and that assigns credence near 1 to the proposition that Pete won conditional on Pete calling. (None of these states is equivalent to a representational — i.e., propositionally individuable — state of mind.)

It is natural to envision a semantics for an *E*-sentence ϕ being reverse-engineered from an independently motivated picture of ϕ 's characteristic function: we assign a meaning well-suited to explaining ϕ 's characteristic function (and code up this meaning in an appropriate formal metalanguage). There are three steps to separate out here (each with a distinctive body of terminology, concerns, methodology):

- a. **Functional.** Isolate ϕ 's characteristic function
- b. **Meaning.** Identify a meaning $M(\phi)$ for ϕ such that $M(\phi)$ can explain ϕ 's function

c. **Semantic.** “Code up” $M(\phi)$ in a semantic denotation for ϕ , $\llbracket \phi \rrbracket$

We first isolate ϕ 's characteristic function by isolating the state of mind it canonically expresses. Given an Expressivist metasemantics, this state of mind is fundamental in understanding ϕ 's meaning; ϕ 's meaning is a matter of the state of mind it expresses. This state of mind is exploited in assigning a semantic denotation for ϕ that is suited to explaining various semantic features: why ϕ is inconsistent with $\neg\phi$, for example.

Expressivists have tended to run these steps together; indeed, this is a very natural thing for them to do, given the extraordinarily central role that Expressivists give notions like *function* and *expression* in the theory of meaning. As Gideon Rosen notes in a representative comment, “The centerpiece of any quasi-realist ‘account’ is what I shall call a psychologistic semantics for the region: a mapping from statements in the area to the mental states they ‘express’ when uttered sincerely” (1998: 387). Clearly, on Rosen’s understanding of Expressivism (his “quasi-realism”) there is no bright line between the theory of ϕ 's meaning, the theory of ϕ 's function, and the theory of ϕ 's semantic value. This might seem a natural extension of the idea that, for the Expressivist, the functional realm is explanatorily fundamental in the theory of meaning (in the way that, say, reductive physicalism is to many philosophers a natural result of adopting a metaphysics on which physics is ontologically and explanatorily fundamental).

As an illustration, consider Gibbard (1990, 2003). For Gibbard, the semantic content of any atomic normative sentence is represented as a set of pairings of “Hyperplans” and worlds. (A Hyperplan is a plan that, for each contingency w and action α , either forbids α at w or permits, in the rough sense of *forbids forbidding*, α at w , but does not do both; see Gibbard 2003, 56.) Call such a set a **Gibbard Content**. The Gibbard Content of ‘murder is wrong’ is the set of pairs $\langle \pi, w \rangle$ such that the sentence ‘according to π , murder is forbidden’ is true at w .

At first glance, Gibbard seems not to assign mental states as the meanings of normative sentences (Gibbard Contents being the sort

of set-theoretic constructions familiar from model-theoretic semantics). For Gibbard, however, sets of Hyperplan-world pairs function as *representations of states of mind* (cf. Schroeder, 2008c; Dreier, 2006). In the representation of states of mind with planning content, Hyperplans play a role analogous to that played by possible worlds in the representation of belief. (So, as the beliefs of someone who is uncertain about p are often represented with a set of worlds, some of which satisfy p , some of which satisfy $\neg p$, the practical state of mind of someone who is uncertain about whether to do some action in some contingency can be represented with a set of Hyperplans.)

Gibbard Contents allow the usual Boolean treatment of the connectives: \wedge is associated with \cap , \neg with $'$, etc. Gibbard, however, is explicit that this Boolean representation is just that: a *representation* of a more fundamental psychological reality, chosen for (i) its formal properties (i.e., its treatment of contents as elements of a Boolean algebra and connectives as Boolean operations) and (ii) its suitability as a representation of the semantically interesting properties of that reality. He writes: “One way to think of fact-plan content is to mimic truth functions and quantification...These [mental] operations — combining, ruling out, generalizing — mimic standard logical operations on statements: conjunction, negation, and universal generalization” (2003, 54).

3. Problems for Expressivism

Expressivists about an E -sentence ϕ blend an empirical claim about ϕ 's function (that it is non-representational) with a metasemantic claim (that propositions are unfit meanings for sentences with non-representational functions) to yield a conclusion about ϕ 's semantics (that it does not mean a proposition). Objections to Expressivism have not tended to focus directly on its metasemantic program (and thus tend to have only an indirect bearing on its metasemantic commitments). Instead, they have tended to fall into one of the following piles:

Empirical. Argue that ϕ 's function is representational (using var-

ious data from, e.g., epistemology and moral psychology⁴)

Semantic. Bracket the question of ϕ 's function, argue directly against the Expressivist semantics

I will not address worries of the first sort here. My sense is that the Expressivist account of the function of normative language and judgment tends to be regarded as a *relative* strength of the view. (I expect this holds even more for Bayesian versions of Expressivism.) Further, the most prominent worries about Expressivism (e.g. the Frege-Geach Problem) have little to do with its Empirical commitments, and very much to do with its Semantic commitments.⁵

The central observation that motivates the semantic critique of Expressivism is that sentences of type *E* tend to embed relatively freely in environments normally taken to require propositional arguments, e.g., under connectives and attitude verbs and in indicative conditionals.

- (5) Bob should put up, or he should shut up
- (6) Mary thinks it might be raining
- (7) Mary thinks Pete won if he called
- (8) If it is likely to rain, you should bring an umbrella

⁴ Dorr (2002) gives, in this sense, an "Empirical" objection in the epistemological vein. For discussion, see Enoch (2003); Lenman (2003); Budolfson (2011); Schroeder (2011b); Mabruto (2013). The "Moral Attitude Problem" — i.e., the problem of identifying a psychologically appropriate non-representational state of mind that might be expressed by moral claims — is an "Empirical" objection in the moral psychological vein. For discussion, see Köhler (2013). Thanks here to Matthew Chrisman.

⁵ Worries of this sort might seem problematic on their face. For they mean denying Expressivism's (a) empirical and (b) metasemantic commitments, on apparently *a priori* grounds. Regarding (a): it simply seems wrong to approach the question of a sentence's conventional function in such an *a priori* way. As for (b): we normally allow that non-representational function implies non-propositional meaning (in the case of, e.g., interrogatives and imperatives). Thus, if we take the Expressivist's claim about the function of the relevant fragment at face-value, Frege-Geach objections seem to miss the point. I think there is probably something to these trains of thought, but I do not want to assume so here.

Expressivists of course require a theory of the meaning of such embeddings that is *compositional*: the meaning of the whole must be a function of the meanings of its constituents.⁶ Here I will present a simple version of the challenge of compositionality that seems to me to have been influential in this debate, as well as an influential type of solution.⁷

The basic worry: if Expressivism about some kind of *E*-sentence is true, compositionality will *require* a modification of the standard truth-conditional semantics for sentences whose function is representational. How, after all, could meanings of such different kinds (propositions and, roughly, states of mind) for sentences with such similar syntactic profiles co-exist in a single semantic theory? Consider:

- (9) Bob stole a book from the library, but he shouldn't have
- (10) It is overcast, but it may not be raining
- (11) Pete has a good hand, and he won if he called

It is linguistic orthodoxy that coordinating conjunctions (*and*, *but*, etc.) join constituents of the same semantic type τ , to yield a complex constituent of type τ (Partee and Rooth, 1983).⁸ So the default position for Expressivism — that *E*-sentences mean, roughly, states of mind, while

⁶ Traditional versions of the Frege-Geach Problem (Geach, 1965; Searle, 1962) have it that such a theory is impossible, since *E*-sentences embedded in *unasserted* environments cannot express, in the ordinary sense of that notion, the attitudes that Expressivists take to be their meanings (hence cannot contribute to the meanings of such environments). For why this is mistaken, see, e.g., Schroeder (2008d).

⁷ There will be much to dislike about the way the challenge is put, as well as the solution I present. My only aim here is to reconstruct a relatively "early" stage of the dialectic.

⁸ There are purported counterexamples to Partee and Rooth's generalization (e.g., coordination between definite noun phrases, often thought to denote individuals, and quantifier phrases, often thought to denote sets of properties). Coordination between definite NPs and QPs is generally handled by assuming that definite NPs have the same semantic type as QPs (Montague, 1973), or that, for purposes of computing the conjunction's semantic value, the semantic value of the definite NP undergoes a type-shifting operation (type raising) so that the semantic value of its node is of the same type as the semantic value of the QP (cf. Partee and Rooth, 1983).

ordinary declaratives mean propositions — seems untenable. Expressivists are committed to rewriting all of semantics — i.e., semantics for *E*-sentences and non-*E*-sentences alike — from the ground up.⁹

How serious is this problem? Ultimately, not very. Partee and Rooth famously provide a recipe for generating the meaning of a conjunction with conjuncts of any semantic type, propositional or otherwise (so long as the conjuncts are of the same semantic type). The official story is complicated, but the driving idea is not: so long as the semantic values of two coordinated items are (or are isomorphic to) sets of entities of the same type, we can think of the semantic value of their conjunction as the *intersection of these two sets*. (So, for example, the semantic value of a transitive verb like *hit* is usually typed as a relation between individuals, or a function from pairs of individuals to truth-values. The semantic value of the conjunction of two transitive verbs V_1 and V_2 , $\llbracket V_1 \text{ and } V_2 \rrbracket$, is also typed as a relation between individuals — the relation mapping a pair of individuals to true just if the pair is mapped to true by $\llbracket V_1 \rrbracket$ and $\llbracket V_2 \rrbracket$.)

To handle coordination using this sort of generalized semantics for conjunction, the Expressivist needs only to treat *E*-sentences and non-*E*-sentences as denoting *sets of entities of the same type*. Sets of what? Focus for a moment on the case of normative language. Gibbard's answer here is clear: sets of pairs of worlds and Hyperplans. All sentences, notice, have satisfaction conditions relative to such pairs: descriptive sentences are satisfied at a world in the usual way (so that the Hyperplan plays no role), whereas the satisfaction conditions for normative sentences make essential reference to a Hyperplan.

Normative Satisfaction, Base Cases

1. $\langle w, \pi \rangle \models p$ iff $w(p) = 1$

⁹ For a similar take, see Schroeder (2008a). Similar points hold for disjunctions. Conditionals are more complicated, since they do not generally require antecedent and consequent to be of the same semantic type. Witness conditional questions (Isaacs and Rawlins, 2008) and conditional imperatives (Schwager, 2007; Kaufmann and Schwager, 2011; Charlow, 2014a,b).

2. $\langle w, \pi \rangle \models \text{ought}(p)$ iff $\forall v \in \pi : v(p) = 1$

A condition of the form $\langle w, \pi \rangle \models S$ is dubbed a *satisfaction condition*, paraphrasable, for Gibbard, roughly, as: ‘according to π , S is true at w . When S is descriptive, the ‘according to π ’ adjunct is vacuous, and so $\langle w, \pi \rangle \models S$ iff S is true at w . In other words, when S is descriptive, S has its ordinary “possible worlds” truth condition. We suppose a simple story on which $\langle w, \pi \rangle \models \text{ought}(p)$ iff the “sphere of permissibility” characterized by π at w ¹⁰ entails p (cf. Lewis, 1979b; Yalcin, 2012). Thus, ‘according to π , $\text{ought}(p)$ ’ is true at w iff the “sphere of permissibility” characterized by π at w entails p .

For conjunction, the strategy is clear: a conjunction denotes a relation mapping a world-Hyperplan pair to 1 (i.e., satisfaction) just if the pair is mapped to true by each conjunct. Likewise, we may suppose, for the remainder of the connectives.

Normative Satisfaction, Inductive Cases

1. $\langle w, \pi \rangle \models \neg\phi$ iff not: $\langle w, \pi \rangle \models \phi$
2. $\langle w, \pi \rangle \models \phi \wedge \psi$ iff $\langle w, \pi \rangle \models \phi$ and $\langle w, \pi \rangle \models \psi$
3. $\langle w, \pi \rangle \models \phi \vee \psi$ iff $\langle w, \pi \rangle \models \phi$ or $\langle w, \pi \rangle \models \psi$

It is striking to notice that — save for the appearance of Hyperplans in the semantics — this is exactly how a classical, propositional semantics for these connectives would look. In particular, the semantics for complex sentences is *disquotational*, in the following sense:

Definition 1. A semantic theory T for the connectives of a language \mathcal{L} , with fundamental semantic relation R_T between sentences of \mathcal{L} and model-theoretic objects x , is *disquotational* iff the inductive definition of R_T meets the following conditions:

¹⁰The easiest way for a Hyperplan π to characterize such a sphere would be to take π as a special kind of ordering source and, making the Limit Assumption, use π to construct a domain of possibilities that cannot be improved on according to the ordering characterized by π . Relevant formal details are in Kratzer (1981). On this idea's limitations, see Charlow (forthcoming).

1. $R_T(\neg\phi, x)$ iff $\neg R_T(\phi, x)$
2. $R_T(\phi \wedge \psi, x)$ iff $R_T(\phi, x) \wedge R_T(\psi, x)$
3. $R_T(\phi \vee \psi, x)$ iff $R_T(\phi, x) \vee R_T(\psi, x)$
4. $R_T(\phi \rightarrow \psi, x)$ iff $R_T(\phi, x) \rightarrow R_T(\psi, x)$

Far from having to rewrite semantics from the ground up, it seems the Expressivist can think about the meaning of environments that embed normative sentences in a largely standard way.

This strategy readily generalizes to other forms of Expressivism. For, e.g., Expressivists about epistemic modals, an epistemic possibility modal expresses a non-representational attitude: a condition on a belief state that does not reduce to belief in a proposition, namely, the condition of the prejacent not being ruled out by one's information. The satisfaction conditions for epistemic possibility modals thus make essential reference to an information state — for our purposes, a set σ of possible worlds.

Epistemic Satisfaction, Base Cases

1. $\langle w, \sigma \rangle \models p$ iff $w(p) = 1$
2. $\langle w, \sigma \rangle \models \text{might}(p)$ iff $\exists v \in \sigma : v(p) = 1$

As before, $\langle w, \sigma \rangle \models \text{might}(p)$ iff 'according to σ , $\text{might}(p)$ ' is true at w iff σ is compatible with p . (The inductive cases are handled simply by switching out π 's for σ 's.)

3.1 Content Expressivism

We have noted that the Expressivist is committed to explaining the meaning of an E -sentence in terms of *the state of mind it canonically expresses*. But a Hyperplan is obviously not such a state of mind. Similarly, take any σ such that $\langle w, \sigma \rangle \models \text{might}(p)$. Such a σ is hardly *the state of mind* expressed by $\text{might}(p)$, although it might represent one way (among others) of thinking that $\text{might}(p)$.

In model-theoretic semantics, the relationship between the entities relative to which sentences are *evaluated for satisfaction* (e.g., possible

worlds) and *meanings* is customarily taken to be \in : the meaning of a sentence is (or determines) a set of worlds in which that sentence is true. Similarly, Expressivists may represent the relevant states of mind with *sets of relevant objects*. For an E -sentence ϕ , the relevant state of mind is picked out with $\{X : X \models \phi\}$; for a normative sentence ϕ , the state of mind would be represented with the set $\{\langle w, \pi \rangle : \langle w, \pi \rangle \models \phi\}$. This is exactly how Gibbard Contents are constructed.

How do the entities collated in a set individuate the relevant state of mind? A first pass: think of a condition of the form $\langle w, \pi \rangle \models \text{ought}(p)$ as representing a particular kind of agent's *acceptance* of the sentence $\text{ought}(p)$. What kind of agent? One whose plan for contingency w is representable with Hyperplan π : a *Hyperplanner*. More specifically, an agent whose contingency plan for w requires that p . Then $\{\langle w, \pi \rangle : \langle w, \pi \rangle \models \text{ought}(p)\}$ represents a property such agents have in common, namely, the property of having a plan for some relevant contingency that requires that p .¹¹ Let $\llbracket \text{ought}(p) \rrbracket$ be this set. To accept $\text{ought}(p)$ is, then, to have the attitude of acceptance toward the content $\llbracket \text{ought}(p) \rrbracket$ — for, roughly, all of the $\langle w, \pi \rangle$ compatible with your state of mind to be in $\llbracket \text{ought}(p) \rrbracket$ (where, again roughly, $\langle w, \pi \rangle$ is compatible with your state of mind just if w is compatible with how you represent the world and π is compatible with your plans for w).¹² Thus $\llbracket \text{ought}(p) \rrbracket$ represents the attitude canonically expressed by $\text{ought}(p)$.

¹¹Note that for a "categorical" normative claim like (we will assume) $\text{ought}(p)$, if $\langle w, \pi \rangle \in \llbracket \text{ought}(p) \rrbracket$ then for any v , $\langle v, \pi \rangle \in \llbracket \text{ought}(p) \rrbracket$: categorical normative claims prescribe their prejacent independent of any contingency. Another way of putting the point is that for categorical normative claims, the possible worlds parameter is semantically idle. This is an idealization: how many (if any) claims might be plausibly thought to be thoroughly world-independent in this way?

¹²To deal with some concerns: first, I do not seriously assume a Hintikka-style treatment of attitudes like acceptance; I am leaving problems like logical omniscience to the side, to be addressed once basic ideas are laid down. Second, perhaps there is pressure to say more fully what the state of mind *directed at* this sort of content might be. (Schroeder 2008a suggests *being for*.) I do not find the pressure compelling (at this stage of theorizing, anyway): so long as the contents successfully individuate, in some fashion, the intended states of mind, the theory is doing the job it needs to do. More on this in §5.

Explanations in the Expressivist's theory of meaning for *ought*(p) are subsequently stated in terms of the characteristics of $\llbracket \textit{ought}(p) \rrbracket$.

These are the (rough) defining characteristics of what I term **Content Expressivism** about the normative. The general form of Content Expressivism, for an E -sentence ϕ and entity of evaluation X , is: (i) Let $X \models \phi$ represent acceptance of a particular kind of agent of ϕ ; (ii) let $\llbracket \phi \rrbracket = \lambda X.X \models \phi$ represent a shared characteristic of such agents: acceptance of ϕ ; (iii) model acceptance of ϕ as bearing the attitude of acceptance toward content $\llbracket \phi \rrbracket$; (iv) state semantic explanations for ϕ in terms of characteristics of $\llbracket \phi \rrbracket$.

Such contents function to represent states of mind. So they are properly explanatory of the phenomena in which we are interested only if (i) they *accurately represent* the relevant characteristics of the states of mind they purport to represent, (ii) the states of mind they purport to represent are *themselves explanatory* of the relevant phenomena (cf. Schroeder, 2008a). We will see reasons to doubt both (i) and (ii). It will be handy to have names for these problems; I will unimagatively refer to them as problems of:

- **Type 1.** The content assigned by the semantic theory misrepresents relevant characteristics of the associated state of mind
- **Type 2.** The associated state of mind (or content by which it is individuated) is unexplanatory of the relevant phenomenon

I will suggest ultimately that the problems here are due to an apparent disanalogy with the possible worlds semantics after which the Expressivist semantics was modeled. Semantic explanations in possible worlds semantics can be stated "at the level of" individual possible worlds; this is where semantic explanations in possible worlds semantics "bottom out". Take the inconsistency of a world-describing sentence p with its negation: p and $\neg p$ are inconsistent because there is no possible world w such that both p and $\neg p$ are true at w (as I will flesh out below). Semantic explanations in Expressivist semantics *want to be* stated in a similar manner. But this creates difficulties when paired with the broader Expressivist commitment to explain the meaning of

E -sentences by appeal to the states of mind they canonically express.

3.2 Negation

The disquotational treatment of negation sketched above has a widely noticed problem. Notice that a negation's attitude-individuating content is given by:

$$\llbracket \neg\phi \rrbracket = \lambda X.X \not\models \phi = \llbracket \phi \rrbracket'$$

While a disquotational treatment of negation yields a treatment of negation as content complementation, the resulting content — one that collates members that fail to accept ϕ — does not correspond to the state of mind we would expect to be expressed by $\neg\phi$ (Unwin, 1999, 2001; Dreier, 2006).¹³

- (12) Not thinking giving to UNICEF is a moral duty
 $\not\sim$ Thinking giving to UNICEF is not a moral duty
- (13) Not thinking it might be raining
 $\not\sim$ Thinking it can't be raining

This is a problem of Type 1: the assigned content misrepresents the state of mind it purports to represent. To avoid it, Expressivists may either: (i) abandon the disquotational treatment of negation, (ii) understand the objects of semantic evaluation so that their failing to accept ϕ *does* imply their accepting $\neg\phi$.

Content Expressivists have opted for (ii). Gibbard (2003), in particular, understands Hyperplans as *complete and consistent*: like possible worlds (which lack no "opinions" about the truth of any proposition, so that a possible world's failing to have the opinion that p is true can be taken to imply its having the opinion that p is false), Hyperplans lack no opinions about the pursuit-worthiness of any course of action

¹³Schroeder (2011a) discusses this same problem, albeit in a different idiom. (The worry, for him, is about the Expressivist validating an implausible principle about attitude ascriptions — his \neg -importation.)

in a given contingency (so that failing to view p as forbidden may be taken to imply ruling out viewing p as forbidden, hence treating p as permitted). Thus, the Hyperplans that fail to forbid some thing are just the Hyperplans that actively permit that thing. Thus the complement of $\llbracket\text{ought}(\phi)\rrbracket$ is the right sort of content for representing the state of mind of thinking that $\neg\text{ought}(\phi)$.

This response has experienced pushback (see Schroeder, 2008a,c; Dreier, 2006, 2009). The general view, even among those sympathetic to Expressivism, is that it is stipulative (see Yalcin, 2012; Charlow, 2014c; Silk, 2013, 2015). I will briefly characterize the problem here. Any semantics should *explain* the inconsistency of a normative sentence with its negation (a point that is liable to be overlooked when the explanation is, as it tends to be, trivial). For the Content Expressivist, the explanation must be given in the form of an answer to the question: *what is inconsistent about the states of mind represented with $\llbracket\text{ought}(\phi)\rrbracket$ and $\llbracket\text{ought}(\phi)\rrbracket'$* ? Trivially, *there is no $\langle w, \pi \rangle$ compatible with both: $\llbracket\text{ought}(\phi)\rrbracket \cap \llbracket\text{ought}(\phi)\rrbracket' = \emptyset$* . But the notion that $\llbracket\neg\text{ought}(\phi)\rrbracket = \llbracket\text{ought}(\phi)\rrbracket'$ has a Type 1 problem — it seems to individuate the wrong state of mind — unless, for any alternative, a Hyperplanner either forbids or permits it (but never, on pain of ruling $\text{ought}(\phi)$ and $\neg\text{ought}(\phi)$ consistent, both).

Why assume that Hyperplanners have this characteristic? I see two possibilities: a Hyperplanner that forbade (e.g.) $\neg\phi$ and permitted $\neg\phi$ would be (i) impossible, (ii) inconsistent. Option (i) is a non-starter: such a Hyperplanner is logically, probably even psychologically, possible.¹⁴ As for (ii), what is it that makes such a Hyperplanner incon-

sistent? But this is not meaningfully different from the question with which we began: what is inconsistent about a state of mind — in this case, the special state of mind associated with the relevant type of Hyperplanner — that forbids and permits ϕ 's absence? It is a question Expressivists have so far failed to answer. To insist on the inconsistency is to beg the question. It is not the sort of inconsistency involved in representing both ϕ and its negation as true. Nor could it be the sort of thing that is inconsistent about intending both ϕ and its negation (see esp. Schroeder, 2008c).¹⁵

For $\llbracket\text{ought}(\phi)\rrbracket'$ to adequately represent the state of mind expressed by $\neg\text{ought}(\phi)$, Hyperplans must be assumed to be like possible worlds: complete and consistent. The justification for treating Hyperplans in this way is obscure. This is a problem of Type 2. In treating the objects of semantic evaluation like *possibilia*, Content Expressivists rely on something for which their semantics is supposed to give us an account: the inconsistency involved in accepting a sentence and its negation.

A better option is to abandon, in some fashion, the disquotational treatment of negation (as well as the standard Boolean treatment of content-level negation). More on this below.

but no independent account of why failing to live up to this ideal is irrational is forthcoming. (The contrast with propositional content is instructive: believing the proposition that $\phi \wedge \psi$, but failing to believe that ϕ , means representing the world as making both ϕ and ψ true, but failing to represent the world as making ϕ true. The irrationality here is manifest.)

¹⁴Here I go contra Schroeder (2011a). He writes: “It is very plausible that necessarily, if you believe that $\neg P$, then you don’t believe that P , and it is similarly very plausible that necessarily, if you believe that $P \wedge Q$, then you believe that P and believe that Q ” (6). I cannot identify an uncontentious sense of *necessarily* on which this comes out true. For conjunction, while failure to accept ϕ and ψ when one accepts $\phi \wedge \psi$ is certainly a *rational failure*, it is nevertheless a logical, probably even psychological, possibility. The Hyperplanner formalism, on which it is stipulated that a Hyperplan satisfies $\phi \wedge \psi$ iff it satisfies ϕ and ψ , is apparently functioning to represent a rational ideal,

¹⁵Gibbard (2012, 288) reads the argument of Charlow (2011, Appendix A) (see also Charlow 2014c) as suggesting that the theoretical standard invoked here is artificial and overly demanding, since a similar standard could not be met in accounting for (e.g.) the inconsistency of imperatives and contrary permissions. I would characterize my position differently: either the standard is artificial, or it is genuine but can be met by a non-psychologistic Expressivist account of both imperatives and normative language. I ultimately endorse the latter of these alternatives. Not that Gibbard has misunderstood me; rather, I take it that he finds the positive line I sketch in Charlow (2011, 2014c) and develop further here unappealing.

3.3 Disjunction

The problem here is not just with negation. A similar — in fact, more illuminating — problem arises for disjunction. The attitude-individuating content of a disjunction is given by:

$$\llbracket \phi \vee \psi \rrbracket = \lambda X.X \models \phi \text{ or } X \models \psi = \llbracket \phi \rrbracket \cup \llbracket \psi \rrbracket$$

A disquotational treatment of disjunction yields a set-union treatment of disjunction at the level of content. As before, a content built of members that accept ϕ or accept ψ seems not to correspond to the state of mind we would expect $\phi \vee \psi$ to express. It is a mistake to conflate acceptance of either ϕ or ψ (which seems to be the attitude obtained by taking the union of $\llbracket \phi \rrbracket$ with $\llbracket \psi \rrbracket$) with acceptance of $\phi \vee \psi$.¹⁶

- (14) Thinking Bob should put up, or he should shut up
 ✎ Thinking Bob should put up or thinking Bob should shut up
- (15) Thinking the keys are on the table or dresser
 ✎ Thinking the keys are on the table or that they are on the dresser

This seems to be a problem of Type 1: the content assigned by the semantics seems to misrepresent relevant characteristics of attitude of accepting a disjunction. It might seem to admit of an easy resolution.¹⁷ Consider the common representation of an agent's information using sets of possible worlds. Possible worlds are *very* opinionated objects. For a possible world to satisfy a disjunction, it has to satisfy at least

¹⁶As before, Schroeder (2011a) discusses a version of this problem, albeit in a different idiom. His worry is about validating an implausible principle about the semantics of attitude ascriptions — his \vee -exportation. Ultimately, as I'll discuss below, the problem with disjunction I lay out here is distinct from the version that Schroeder lays out. (Specifically, he does not challenge the Expressivist's use of the strategy I refer to below as IPR.)

¹⁷In fact, as I'll discuss later in this section, the Type 1 problem admits of a direct resolution: the Hintikka account of the relationship between $\llbracket \phi \rrbracket$ and the attitude of accepting ϕ discussed just above. I ask the reader to play along while I set up the Type 2 problem for Expressivist disjunction that is this section's main upshot.

one disjunct: for the keys to be on the table or the dresser at w , they must be either on the table at w , or else on the dresser at w . By the reasoning above, apparently, a set of possible worlds should be a very opinionated object. In particular, a set of possible worlds all of whose members satisfy a disjunction should itself accept at least one disjunct.

The reasoning here, of course, is badly mistaken. Properties like *accepts a disjunct* do not scale up in this way: take a group of opinionated individuals, some of whom assent to $\phi \vee \psi$ in virtue of accepting ϕ , the rest of whom would do so in virtue of accepting ψ . What these individuals have in common is nothing beyond their acceptance of $\phi \vee \psi$. From the fact that individuals in a given group accept a specific disjunct, it does not follow, of some specific disjunct, that the individuals in the group accept that disjunct. Thinking otherwise is akin to thinking that, whenever each x has the property $\lambda x.\exists yFxy$, there is some y with the property $\lambda y.\forall xFxy$. It is a very bad mistake indeed.

But the problem I have identified with disjunction does make such a basic mistake. From the fact that individuals in a given group accept a specific disjunct, it trivially follows that these individuals have in common the property of accepting *a disjunct*. This is not akin to thinking that, whenever each x has the property $\lambda x.\exists yFxy$, there is some y with the property $\lambda y.\forall xFxy$; the property we are attributing to each x is simply the property in terms of which the x 's are collated to begin with — a property of the form $\lambda x.\exists yFxy$. The state of mind apparently individuated by the set of opinionated objects that accept ϕ or accept ψ is, therefore, the state of mind of accepting at least one of the following disjuncts: ϕ , ψ . That, again, is the wrong state of mind.

It might be thought that the analogy to possible worlds content still offers hope. By the reasoning above, apparently, a set of possible worlds all of whose members satisfy $\phi \vee \psi$, if it is regarded as a representation of the state of mind of believing the proposition that $\phi \vee \psi$, represents the state of mind of accepting at least one of the following disjuncts: ϕ , ψ . Of course, this is not the state of mind it represents. So the reasoning has gone off the rails somewhere.

Yes, but for an instructive reason. Sets of worlds represent attitudes

indirectly. What they *directly* represent is a representational content, i.e., a proposition. Propositions are coarsenings of maximal bodies of information (individual possible worlds). They are portions of a complete story of what the world is like, pictures of a part of the world. The picture extracted by taking the set of worlds at which $\phi \vee \psi$ holds is one in which ϕ or ψ is true; it is a picture on which we have an independent grip — independent, that is to say, of any reference to an attitude of thinking that $\phi \vee \psi$. This picture can be used to indirectly represent a state of mind: the state of mind of an agent who accepts this set of worlds as locating the actual world. This is the state of mind of believing, roughly, that either ϕ is true at the actual world, or ψ is.

This familiar story *explains* why, in the case of the possible worlds content, it is a mistake to infer, from the fact that a set of worlds that agree on an “opinion” with content p or content q represents a state of mind M , that M has content p or content q . It is a story that, in general, works roughly as follows:

Indirect Psychological Representation (IPR)

1. Describe a non-psychological relation R between an entity e and a sentence ϕ that obtains in virtue of e 's bearing R to ϕ
2. Characterize the state of mind of accepting ϕ in terms of a relation between an agent and the set of entities that bear R to ϕ

IPR is a strategy for extracting a content from a set of entities and, thereby, individuating an attitude indirectly: the attitude of accepting that content. That R be non-psychological seems key to the IPR strategy for disjunction: it allows the theorist to make sense of the idea that the set of objects that bear R to $\phi \vee \psi$ does not directly function to represent a state of mind (and hence of the idea that the property of bearing the relevant relation to ϕ or to ψ does not scale up). What it directly represents is something *abstract* — a point of view on a (possibly non-factual) subject-matter — toward which an agent can take an attitude (e.g., acceptance). In this way, the state of mind involved in accepting

the sentence can be characterized, via an individuating content.¹⁸

Can Expressivists use IPR to explain why the attitude individuated by $[\phi \vee \psi]$ is not the disjunctive “attitude” of accepting ϕ or accepting ψ ? Consider the normative case. Whatever relation a Hyperplan bears to a disjunction $\phi \vee \psi$ is, we supposed, a (representation of a) psychological relation. What, then, are we characterizing with a set of entities that bear this psychological relation to $\phi \vee \psi$? Apparently we are characterizing *this very psychological relation*. What is this relation? It is the relation of bearing the relevant psychological relation to ϕ or bearing it to ψ . The state of mind thus characterized is, apparently, the wrong state of mind. Note the asymmetry with possible worlds content: the relation between a possible world and a sentence describing that possible world is a non-psychological *true at* relation. Hence collecting all the possible worlds which are related to the sentence in this way yields content intelligible independently of any psychological notions.

Thus far a problem of Type 1. To avoid it, Expressivists may either: (i) abandon the disquotational treatment of disjunction, (ii) understand the objects of semantic evaluation so that IPR can be utilized. As indicated by his attempt to analogize planning content to possible worlds content (and his commitment to a disquotational semantics for disjunction), Gibbard will opt for IPR: for extracting a non-representational content with the right features from the relevant set of objects.

Here is how that will work in the normative case.¹⁹ Begin with the

¹⁸IPR is also at the heart of how mushy credences are modeled in Imprecise Bayesianism, in which a state like thinking that it is between .7 and .8 likely to rain today is understood in terms of a set of point-valued probability functions (the set of Pr such that $.7 < Pr(\text{rain}) < .8$) (Levi, 1985; Joyce, 2005). From a set of probability functions — what Joyce (2005) terms a “set of hypotheses about objective chances” — we extract a hypothesis about objective chances equivalent to the (infinite) disjunction of the hypotheses represented within the set. The attitude individuated by such a set is the attitude of accepting this disjunctive chance hypothesis.

¹⁹It is slightly misleading to present this as a response to the worry being developed here. This really just *is* Gibbard's treatment of disjunction. I mention it in this context because (i) it is an easy — effectively off-the-shelf — way of avoiding the Type 1 problem developed in this section, (ii) its explanatory blind-spots are, in the context of the earlier discussion of IPR, fairly clear.

disquotational treatment of disjunction. Add to this a more explicit formulation of the Hintikkan assumptions of §3.1: (i) an agent A is associated with information I and plans P (with I the possible worlds compatible with A 's information, P the Hyperplans compatible with A 's plans), (ii) $\mathcal{A} = I \times P$ gives A 's "total" mental state, (iii) A accepts X just if $\mathcal{A} \subseteq \llbracket X \rrbracket$, with $\llbracket X \rrbracket$ the Gibbard Content for X . The following, then, are obvious. First, A accepts $\phi \vee \psi$ iff $\mathcal{A} \subseteq \llbracket \phi \rrbracket \cup \llbracket \psi \rrbracket$. Second, A accepts ϕ or accepts ψ iff $\mathcal{A} \subseteq \llbracket \phi \rrbracket$ or $\mathcal{A} \subseteq \llbracket \psi \rrbracket$. Thus, the fact that A accepts $\phi \vee \psi$ does not imply that A accepts ϕ or accepts ψ . Here we have an effectively off-the-shelf resolution of the Type 1 problem.

Note, however, that there is no real attempt to fill in an IPR story here. No justification is supplied for thinking that a suitable non-representational content — one that properly characterizes acceptance of $\phi \vee \psi$ — can be extracted from the entities in $\llbracket \phi \rrbracket \cup \llbracket \psi \rrbracket$. While we have a good handle on the psychological property unifying the Hyperplans compatible with $\llbracket \phi \vee \psi \rrbracket$ — it is just the disjunctive property of accepting ϕ or accepting ψ — the properties of the referenced content are totally obscure. What we have is a Gibbard Content $\llbracket \phi \rrbracket \cup \llbracket \psi \rrbracket$ paired with a *stipulation* that the attitude of accepting $\phi \vee \psi$ be understood in terms of $\llbracket \phi \rrbracket \cup \llbracket \psi \rrbracket$. This is an IPR story, but an incomplete one.

One would hope for more. Why, say, is disjunctive syllogism valid? Trivially, given the disquotational treatment of \neg and \vee , $\llbracket \phi \vee \psi \rrbracket \cap \llbracket \neg\phi \rrbracket \subseteq \llbracket \psi \rrbracket$. But it is the content *extracted* from $\llbracket \phi \vee \psi \rrbracket$ that is supposed to explain this validity (since it is this content that individuates the state of mind of accepting $\phi \vee \psi$, rather than the psychological property unifying the Hyperplans compatible with $\llbracket \phi \vee \psi \rrbracket$). In the absence of any independent description of the relevant content, we lack any explanation of the inference's validity. A problem of Type 1 becomes one of Type 2.

Second (but ultimately more ambiguously), the solution here does not even seem to work for its stated target. In an interesting discussion, Schroeder (2011a) proves that, given plausible assumptions, the view on offer cannot generate the right sort of content for *mixed disjunctions*: sentences of the form $\phi \vee \psi_E$, where ϕ expresses an ordinary possi-

ble worlds proposition, but ψ_E receives an Expressivist interpretation. (More carefully, he proves that the attitude picked out by the content of a mixed disjunction for the sort of Expressivist we are discussing is the attitude of accepting at least one disjunct.)

Consider again the normative case. Let $\mathcal{A} = I \times P$ represent A 's state of mind. Then, to represent the sort of indecision or uncertainty that is typically associated with accepting $\phi \vee \psi_E$ (without accepting either ϕ or ψ_E), \mathcal{A} must meet these conditions: (i) $\mathcal{A} \cap \llbracket \phi \rrbracket' \neq \emptyset$; (ii) $\mathcal{A} \cap \llbracket \psi_E \rrbracket' \neq \emptyset$; (iii) $\mathcal{A} \subseteq \llbracket \phi \rrbracket \cup \llbracket \psi_E \rrbracket$. This, however, is impossible.²⁰ The most straightforward (i.e. Hintikkan) relationship between the semantic value of $\phi \vee \psi_E$ and the corresponding attitude ends up picking out the wrong attitude.

This may seem like an instance of a more general problem which this section's discussion of disjunction has tried to describe. As Schroeder (2011a) describes it, "[T]he method of world-[Hyperplan] pairs provides us with a formal system which outstrips any interpretation that we have given it... [It] tells us nothing at all about what attitude is expressed by complex sentences with both normative and non-normative parts." Nevertheless, there are differences between Schroeder's disjunction problem and mine. His is specifically a Type 1 problem for mixed disjunctions, while mine is a Type 2 problem (though Schroeder would presumably agree that his problem sets up a Type 2 problem somewhere downstream). More importantly, notice that Schroeder's problem relies on the assumption that propositional and non-propositional content are "independent" (in particular the assumption that the incompatibility of some $\langle w, \pi \rangle$ with ψ_E means the

²⁰Notice the three conditions above respectively entail the following three formal conditions on $\mathcal{A} = I \times P$:

$$\begin{aligned} &\exists w \in I : \langle w, \pi \rangle \notin \llbracket \phi \rrbracket \quad (\text{Hence, } \exists w \in I : \forall \pi \in P : \langle w, \pi \rangle \notin \llbracket \phi \rrbracket) \\ &\exists \pi \in P : \langle w, \pi \rangle \notin \llbracket \psi_E \rrbracket \quad (\text{Hence, } \exists \pi \in P : \forall w \in I : \langle w, \pi \rangle \notin \llbracket \psi_E \rrbracket) \\ &\forall w \in I : \forall \pi \in P : \langle w, \pi \rangle \in \llbracket \phi \rrbracket \text{ or } \langle w, \pi \rangle \in \llbracket \psi_E \rrbracket \end{aligned}$$

The first two conditions entail that $\exists w \in I : \exists \pi \in P : \langle w, \pi \rangle \notin \llbracket \phi \rrbracket$ and $\langle w, \pi \rangle \notin \llbracket \psi \rrbracket$, contradicting the third.

incompatibility for any v of $\langle v, \pi \rangle$ with ψ_E). There are various plausible ways of relaxing this assumption consistent with maintaining the Hintikkan understanding of the relationship between semantic values and attitudes articulated above (see, e.g., Silk, 2015).

But it is hard to see how any of this helps with the version of the disjunction problem sketched in this section. This problem is not resolved by demonstrating (as Silk does) that a straightforward Hintikkan understanding of the relationship between semantic values and attitudes needn't have a Type 1 problem for mixed disjunctions. (Recall that this problem was raised for a view which was assumed to resolve the Type 1 problem.) Resolving Schroeder's problem still does not give us any sort of handle on the content expressed by a disjunction. The attitude-individuating contents of disjunctions — in particular, how they are derived from sets of opinionated quasi-psychological entities — remain obscure.

3.4 Disquotation

Because Expressivists commit themselves to explaining meaning in terms of attitudes, they have an obvious difficulty in making use of the sorts of disquotational techniques standardly used in natural language semantics. As Schroeder (2011a) notes, “[T]he conditions under which you believe that $\neg P$ are not the complement of the conditions under which you believe that P ... and the conditions under which you believe that $P \vee Q$ are not the union of the conditions under which you believe that P and those under which you believe that Q .” Wanting to retain disquotational techniques, Content Expressivists like Gibbard claim that, while attitudes are fundamental, they do not appear in the semantics. Instead, sets of objects — serving both to individuate the intended attitudes and as arguments to the Boolean operations expressed by connectives — serve as the semantic values for E -sentences. This, we saw, generates Type 1 difficulties. To resolve these, the Expressivist exploits an analogy between ordinary possible worlds content and the sort of non-representational content assigned by her seman-

tics. In each case, it is unclear why the non-representational contents of negations and disjunctions (hence, the states of mind these contents function to individuate) would have the explanatory powers the Expressivist needs them to have.

It is worth emphasizing why such problems do not arise in the possible worlds semantics after which Content Expressivism was modeled. We have a good understanding of why (i) truth for a complex sentence relative to a *possible world* is disquotational in the sense of Definition 1, (ii) collating possible worlds via a specific disquotational condition in the metalanguage yields a content whose characteristics are fairly transparent and well-understood. Regarding (i), we know that a world w that made true $\neg\phi$ but failed to fail to make true ϕ (hence, made true ϕ) is impossible (because contradictory). Similarly, we know that a world w that made true $\phi \vee \psi$ but failed to make it true that ϕ or that ψ is impossible (because contradictory). Regarding (ii), collating the worlds that make true $\neg\phi$ (or alternatively $\phi \vee \psi$) thus yields a clearly well-founded metalinguistic condition on a possible world: the condition of failing to make ϕ true (alternatively, making ϕ true or ψ true). A condition thus-described — a proposition — is subsequently fit for playing any number of well-founded theoretical roles (e.g., characterizing attitudes via IPR).

This is an appealing way of rationalizing the sorts of smooth transitions from negations, disjunctions, etc., within the object language to negations, disjunctions, etc., *within the metalanguage* spoken by semantic theorists that are so central to semantic theorizing and explanation. (I say more on the importance of these transitions below.) But its availability to the Expressivist is doubtful. The Expressivism we've been considering tries to mimic such transitions by (i) evaluating E -sentences relative to hyper-opinionated, quasi-psychological entities, (ii) making the fundamental semantic relation between E -sentences and those entities disquotational, (iii) extracting attitudes from sets of such entities via IPR. This project seems fated to raise explanatory questions that Expressivists will despair of answering.

Why care about disquotation (and the attendant analysis of connec-

tives as Boolean operations)? A first answer: this is simply how natural language semantics (at least of the sort sketched in the prior two paragraphs) *is done*. Compare Lewis' well-known remark that non-truth-conditional semantics (specifically, in this context, for indicative conditionals embedded under connectives) "requires too much of a fresh start" (1976: 305). Similarly, Schroeder (2011a) laments the fact that "an expressivist semantics can't work by simply applying the same sorts of techniques to its ultimate semantic values as a truth-conditional semantics can". Far from Expressivists being able to "think about the meaning of environments that embed *E*-sentences in a largely standard way", it looks like Expressivists will need to reinvent some perfectly well-functioning wheels in semantic theorizing.

The critique requires elaboration. For it is wrong to view the loss of *Boolean semantics*, per se, as a cost. Many well-developed semantic theories (e.g., those of Dynamic Semantics²¹) do not think of connectives as expressing operations on elements of a Boolean algebra at all. Instead, atomic sentences are treated as expressing *update operations* defined on contexts or representations of information states, while the connectives are treated as expressing various types of operations on such updates (e.g., \wedge is the operation of executing two updates in sequence).

Further, there is reason to think \wedge (if \wedge is to represent natural language conjunction) does not behave like \cap ; natural language conjunction is, for instance, plausibly non-commutative.²²

- (16) Bob put the stunt double in a heat suit and lit him on fire
 $\not\sim$ Bob lit the stunt double on fire and put him in a heat suit
 (17) Drink another beer and you'll feel sorry
 $\not\sim$ You'll feel sorry and drink another beer

²¹Some standard references: Kamp (1981); Heim (1982); Groenendijk and Stokhof (1989, 1991); Veltman (1996).

²²For arguments that this data is semantic in origin, see Bjorkman (2013); Klinedinst and Rothschild (2012).

Similarly, there is reason to think that \vee (if \vee is to represent natural language disjunction) does not behave like its Boolean counterpart \cup .²³

- (18) It might rain $\not\Rightarrow$ It might rain or it might snow
 (19) It might rain or it might snow \Rightarrow It might rain
 (20) You may have an apple $\not\Rightarrow$ You may have an apple or have a pear
 (21) You may have an apple or have a pear \Rightarrow You may have a pear

If Expressivists can make profitable explanatory use of the sorts of tools that semanticists have independently devised for representing non-Boolean interpretations of the connectives, the charge of theoretical immodesty loses much of its bite.

Still, there is a cost to this departure from the tried-and-true. Semantic theorizing is a technique for *generating sentences in a theoretical metalanguage*, on the way to generating semantic explanations and theoretical entities (like contents) that can subsequently play various theoretical roles. The purpose of this metalinguistic ascent is (i) to generate sentences the theorist is competent to understand (and evaluate) in virtue of her competence with respect to that metalanguage, (ii) to deploy this understanding to demonstrate various facts and construct

²³While there is controversy about whether these facts are semantic or pragmatic in origin (and about the bearing of this on the analysis of disjunction), a prevalent view is that: (i) at least some of these implications (or failures thereof) are entailments (or failures thereof) (see Kamp, 1974; Zimmermann, 2000; Geurts, 2005; von Stechow and Gillies, 2008), (ii) they are to be (partially) explained by appeal to a non-classical semantics for disjunction (e.g. a semantics on which the semantic function of a disjunction is to *present its disjuncts as alternatives*; see Alonso-Ovalle 2006; Aloni 2007; Groenendijk and Roelofsen 2009). Whether they are entailments is actually immaterial given my aims (although I generally will assume that they are). As Alonso-Ovalle (2006) argues, the standard Boolean semantics for disjunction cannot generate the relevant implications (or failures of implication) pragmatically; a pragmatic story should be supplemented with a non-classical alternative semantics for disjunction. Kratzer and Shimoyama (2002) tell a similar story for indefinites, on which they have a non-classical alternative semantics (so are not equivalent to classical existential quantifiers), but on which free-choice effects arising from indefinites are given a pragmatic account.

various entities within the metalanguage, towards various theoretical ends.²⁴ *Disquotation* is a key tool in this sort of practice.

To take a simple example, note that *object-language inconsistency*, of the sort that holds between a sentence and its negation, is canonically explained by showing that two inconsistent sentences allow the theorist to derive a contradiction within the theoretical metalanguage. Consider a disquotational semantic theory T for a language \mathcal{L} with fundamental semantic relation R_T between sentences of \mathcal{L} and model-theoretic objects. T 's explanation of the inconsistency of a sentence ϕ of \mathcal{L} and its negation $\neg\phi$ is canonical just if a contradiction is derivable from the assumption that both ϕ and $\neg\phi$ bear R_T to arbitrary model-theoretic object x . Canonicity, in this sense, is typically achieved by exploiting disquotation:

Canonical Inconsistency

1. Suppose that $R_T(\phi, x)$ and $R_T(\neg\phi, x)$
2. Then, since T is disquotational, $\neg R_T(\phi, x)$. *Contradiction.*

A simple example is the disquotational clauses for valuations in the classical semantics for propositional logic. Making disquotation unavailable means making it difficult to replicate the canonical accounts of the logical properties of any of the basic propositional connectives. This is an unenviable position to be in.

Is this worry too strong? A non-Boolean semantics for the connectives is, of necessity, non-disquotational (since a disquotational semantics, in the sense of Definition 1, implies a Boolean semantics). If we

²⁴The idea that one can give an explanatory Expressivist semantics simply by formulating a "logic of attitudes" and a map between the object language and the logic of attitudes (as in Blackburn, 1988; Horgan and Timmons, 2006) seems to me misguided. A logic of attitudes is itself a language in need of a semantics — it is, like Markerese, an *uninterpreted* formal language (cf. Lewis, 1970). To interpret it, one must associate terms in the logic with semantic values, which will themselves be attitudes in the metalanguage of either folk or empirical psychology. The detour through a logic of attitudes ultimately serves no clear theoretical function.

take what I am saying seriously, the post-Boolean age in which semanticists largely find themselves should be seriously reevaluated. While I agree that this would be a bad thing to say, it is not what I am saying.

Consider, by way of illustration, a Veltman-type Dynamic Semantics for a basic *propositional* language:

Definition 2. Let σ be a set of worlds and $\sigma[\phi]$ the result of updating σ with a sentence ϕ . Then σ **supports** a sentence ϕ ($\sigma \Vdash \phi$) iff $\sigma[\phi] = \sigma$ and $\sigma \neq \emptyset$.

Definition 3. ψ is a **dynamic consequence** of ϕ_1, \dots, ϕ_n ($\phi_1, \dots, \phi_n \Vdash \psi$) iff $\forall \sigma : \sigma \Vdash \phi_1, \dots, \sigma \Vdash \phi_n$ implies $\sigma \Vdash \psi$

Definition 4. The **dynamic interpretation function** $[\cdot]$ is such that:

1. $\sigma[p] = \{w \in \sigma : w(p) = 1\}$
2. $\sigma[\neg\phi] = \sigma - \sigma[\phi]$
3. $\sigma[\phi \wedge \psi] = \sigma[\phi][\psi]$

According to these definitions, the semantic value of any sentence is an update program or instruction for a state or context; a state supports a sentence just if the update expressed by the sentence is redundant at that state; and logical consequence is a matter of preserving support.²⁵ Such a semantics is non-Boolean and non-disquotational (cf. Yalcin, 2007, 1005–6). Note first that $\sigma \not\Vdash \phi$ does not imply $\sigma \Vdash \neg\phi$; consider, e.g., some σ such that $\sigma \not\subseteq \llbracket \phi \rrbracket$ and $\sigma \subseteq \llbracket \phi \rrbracket'$.²⁶ Thus, if $|\phi|$ gives the set of σ 's such that $\sigma \Vdash \phi$, $|\neg\phi| \neq |\phi|'$.

²⁵Other entailment relations are natural and definable (Veltman 1996: 224). I do not see the choice mattering for purposes of this paper.

²⁶I am treating \Vdash as the "fundamental semantic relation" (in the sense of Def. 1). In one sense, \Vdash is non-fundamental in Dynamic Semantics: it is *defined* in terms of $[\cdot]$. But it is fundamental in the sense I care about: it is a satisfaction relation, and hence is the relation preserved under logical consequence. Compare the satisfaction relation of first-order logic, which is non-fundamental in the sense of being defined in terms of (i) the denotations of individual terms, (ii) the denotations of n -ary predicates, (iii) a membership relationship (\in) between n -length sequences of denotations for individual terms and denotations of n -ary predicates. Nevertheless, the satisfaction relation of first-order logic is paradigmatically fundamental in the sense relevant here.

A widely-noted fact about such a Dynamic Semantics is that it is isomorphic to a classical possible worlds semantics: for any ϕ , if $\llbracket \phi \rrbracket$ is the set of worlds at which ϕ is true, $\sigma[\phi] = \sigma \cap \llbracket \phi \rrbracket$. Canonical proofs of object-language inconsistency thus remain available. To see this, suppose we extend Definition 4 with a clause for a 0-place connective \perp , such that $\forall \sigma : \sigma[\perp] = \emptyset$. It is easy to see that dynamic inconsistency ($\phi, \psi \Vdash \perp$) reduces to dynamic entailment ($\phi \Vdash \neg\psi$), which reduces to classical entailment ($\phi \models \neg\psi$).

Proof. $\phi, \psi \Vdash \perp$ iff, by Def. 3, for any σ , $\sigma \Vdash \phi$ and $\sigma \Vdash \psi$ implies $\sigma \Vdash \perp$, iff, by Def. 2, $\sigma[\phi][\psi][\perp] = \sigma[\phi][\psi]$ iff $\sigma[\phi][\psi] = \emptyset$ iff $\sigma[\phi] - \sigma[\phi][\psi] = \sigma[\phi]$ iff $\sigma[\phi][\neg\psi] = \sigma[\phi]$ iff $\phi \Vdash \neg\psi$ iff $\phi \models \neg\psi$. \square

The move to Dynamic Semantics, *per se*, implies no loss of explanatory power — even by lights of the (very demanding) theoretical standards on which we are insisting here. Whether \Vdash is itself a disquotational relation is, in this case, immaterial.²⁷

Expressivism's position is different. Semantic explanations for Expressivists are supposed to trade on the properties of the attitudes expressed by *E*-sentences. The semantics for *E*-sentences, however, makes use of sets of entities that (i) are assumed to behave disquotationally,

(ii) thereby allow the ordinary “exportation” of object-language connectives into the metalanguage (with the attendant theoretical benefits), (iii) are supposed to individuate the attitude conventionally expressed by the sentence. Items (i–ii) and (iii) are, I've claimed, in tension. A set of entities meeting conditions (i–ii) will have difficulty meeting (iii): we are hard-pressed to represent the relevant characteristics of an attitude answering to (iii) with a set of entities meeting conditions (i–ii). We observed this for negation: for $\llbracket \phi \rrbracket'$ to represent acceptance of $\neg\phi$, it was necessary to assume away (without obvious justification) certain kinds of Hyperplan. We also observed it for disjunction: for $\llbracket \phi \rrbracket \cup \llbracket \psi \rrbracket$ to represent acceptance of $\phi \vee \psi$, it was necessary to assume (again without obvious justification) that entities compatible with $\llbracket \phi \rrbracket \cup \llbracket \psi \rrbracket$ had some unifying characteristic over and above the obvious (namely: accepting ϕ or accepting ψ).

Without well-founded appeals to disquotationality, it is unclear how to generate well-founded metalinguistic interpretations of complex object-language sentences. How, then, is the Expressivist to generate well-founded semantic explanations that can be regarded as replacing the truth-conditional explanations it rejects? It is unclear. Disquotationality is a key tool in accounting for core object-language semantic phenomena, like inconsistency, in the metalanguage — even within ostensibly non-classical approaches like Dynamic Semantics. Semantics *sans* disquotationality risks explanatory oblivion.

To close, a note on the relationship of this problem to the Frege-Geach Problem. It is true that discussions of the Frege-Geach Problem in the literature are focused, as I am, on the problem for Expressivists of giving theoretically adequate compositional semantics for *E*-sentences. However, charges of theoretical inadequacy are typically predicated on worries about whether the sort of inconsistency Expressivists must assume between the attitudes expressed, e.g., by a normative sentence and its negation is a genuine kind of logical inconsistency (similar to the inconsistency involved in representing both p and $\neg p$ as true) (see esp. Schroeder, 2008a,c,d). While this is part of the worry voiced here, it is not the whole worry. I am not so much

²⁷More generally, while many of the sorts of theories one finds in contemporary semantics are non-Boolean (thus non-disquotational), they tend to be layered *on top of* a standard, Boolean semantics for a “base” language. Standard explanations of semantic phenomena within the base language can be retained. It is important to note that, like Expressivist theories, Dynamic theories generally have proprietary explanations for phenomena that are difficult to account for with the standard semantics for the “base” language. *By design* such theories lack access to truth-conditional accounts of the semantic properties of such sentences; indeed, truth-conditional accounts of such sentences tend to be viewed as theoretically or empirically deficient. Certain authors (e.g., Schroeder 2011a) have regarded this as yielding a challenge for dynamic accounts of, e.g., epistemic possibility modals (albeit for reasons not directly having to do with the unavailability of standard explanatory strategies, i.e., a Type 2 challenge, instead for the reason that it yields a Type 1 challenge for the dynamic view). I come back to this below.

concerned with the ability of Expressivists to explain inconsistency as I am concerned with their ability to engage in anything resembling standard practice in semantic theorizing. The Frege-Geach Problem is a symptom of a more general and troubling feature of Expressivism: it has difficulty generating well-founded metalinguistic interpretations of complex object-language sentences.

4. Semantics for Expressivists

In this paper's remainder, I sketch an Expressivism with some promise for resolving this problem. My main suggestion is that Expressivists err in individuating the attitudes expressed by *E*-sentences by appeal to *content* (contents, for our purposes, being sets of objects that behave disquotationally and individuate an attitude in a more-or-less Hintikkan fashion). A better idea is to take a cue from Dynamic Semantics: evaluate sentences relative to representations of attitudes that are not assumed to behave disquotationally — representations, in other words, of basically *ordinary* (e.g., non-hyperopinionated) states of mind. Collecting the ordinary states that accept (more carefully: "support") a sentence yields a set of objects that corresponds to a property of a mental state, what Swanson (forthcoming) refers to as a "constraint". If we do things right, the property will correspond to the state of mind a speaker conventionally expresses by uttering that sentence. This sort of strategy offers *prima facie* solutions to some of Expressivism's more serious problems with semantic explanation. Most strikingly, it allows us to generate well-founded metalinguistic interpretations of complex object-language sentences without presupposing disquotation.

Disjunction, however, remains vulnerable to a problem of Type 1. I will state a semantics for disjunction that avoids this — one on which the core semantic function of a disjunction is to present its disjuncts as alternatives. I suggest a model on which treating something as an alternative amounts to its availability as a candidate for the evolution of one's state of mind (hence, I will suggest, amounts to treating the semantics of disjunction as essentially modal in nature; cf. Zimmermann, 2000). The account yields a sensible, canonical (if not classical)

account of the semantic properties of disjunctions (not only the validity of central inference patterns like disjunctive syllogism, but also some interesting free-choice phenomena, like those mentioned in §3.4).

This section is titled "Semantics for Expressivists". Here are some caveats about what that will mean. First, there are several choicepoints within the basic Dynamic framework I describe, in particular when it comes to designing an Expressivist-friendly semantics for disjunction. I don't claim that my way is the only way — only that it is a way. Second, the semantics I describe here has no intrinsic meta-ethical content. Worryingly, it is a semantics of possibilities, rather than mental states. I will save it for §5 to argue that the Expressivist can make use of it.

Last, the semantics is for a small fragment of a regimented version of English: the fragment made up of atomic declaratives, various connectives, and the sentential modals *must*, *might*, *ought*, and *may*. I will refer the reader to other work for an idea of how to generalize the semantic program of this section to a larger fragment of English. There is a body of Dynamic work on conditionals (e.g. Gillies, 2009; Starr, 2014) and quantification (e.g. Groenendijk and Stokhof, 1991). An Expressivist who favors the strategy of this paper can choose effectively any semantics here (for my own attempt, see Charlow 2011: Ch. 4). The Expressivist must at some point supply a credible story about the psychological content of the semantics she elects to adopt (as in §5). How this will work will depend on the semantics adopted.

4.1 Updates and Tests

Dynamic semantic values are typed as *update programs*: functions that map an input state to a unique output state. In §3.4, we considered a semantics on which sentences expressed only one kind of update program — one equivalent to the addition of a sentence's propositional content to a standing body of information. In this sort of setup, a sentence ϕ is supported by a state σ ($\sigma \Vdash \phi$) just if ϕ 's propositional content is already part of the information borne by σ ($\emptyset \subset \sigma \subseteq \llbracket \phi \rrbracket$).

For sentences not thought to have propositional content — impera-

tives, interrogatives, and, perhaps, epistemic modals, conditionals, normative claims — different operations on states (and enriched understandings of the nature of states) are required. Beyond this, for sentences that seem to go in for *assertion*,²⁸ a notion of assertion that goes beyond Stalnaker’s (1978) model (on which update on an asserted sentence simply amounts to addition of that sentence’s propositional content to a relevant body of information) will be required for a plausible dynamic treatment of such sentences.

The main task for a Dynamic Semantics for Expressivists is to state a model of non-propositional update in a broader dynamic system. To this end, I will describe Veltman’s (1996) non-propositional *test semantics* for modalities in natural language (and eventually marry it to a notion of assertion on which sentences expressing tests may be asserted and evaluated for truth, while failing to express propositions).²⁹ Standard methods of generating metalinguistic interpretations of complex object-language sentences remain, I will argue, available to us.

Test semantics for epistemic modals stems from a dual insight. First, while executing some updates on a state means *changing* certain characteristics of the state (e.g., enriching the state’s information), others might involve *testing* the state for the presence of certain characteristics. Second, epistemic modals are *prima facie* used in ways that do not seem to recommend enriching one’s information, but rather seem to recommend testing the state for the presence of certain non-propositionally-individuable characteristics. Thus Veltman writes:

²⁸Is there a general specification of which sentences go in for assertion? The standard answer from linguists: any sentence in the declarative “mood” will go in for assertion (see e.g. Portner, 2004). In light of, e.g., Dreier’s (1996) ‘Hiyo’ sentences, I prefer a richer notion of assertion: a sentence goes in for assertion iff the sentence is *evaluable for truth*. More below.

²⁹I will not be concerned with describing the empirical case for adopting this semantics, so much as with briefly motivating and explaining the view. For some of the motivation, see von Fintel and Gillies (2007).

[A]ll you can do when told that it might be the case that ϕ is to agree or to disagree. If ϕ is acceptable in your information state S , you must accept *might* ϕ . And if ϕ is not acceptable in S , neither is *might* ϕ . Clearly, then, sentences of the form *might* ϕ provide an invitation to perform a test on S rather than to incorporate some new information in it. (1996: 229)

The idea is that *might*(ϕ) is evaluated for acceptability simply by checking whether ϕ is compatible with the relevant information.³⁰ If ϕ is compatible, *might*(ϕ) is accepted — but since this sentence’s acceptance condition is ϕ ’s compatibility with the information, the information itself *does not change*. If ϕ is not compatible, *might*(ϕ) is rejected; attempting to update on the sentence must yield something unacceptable. These informal reflections are reified in the following “test semantics” for epistemic *might*.

$$\text{“Testy” Dynamic might} \quad \sigma[\textit{might}(\phi)] = \begin{cases} \sigma, & \text{if } \sigma[\phi] \neq \emptyset \\ \emptyset, & \text{otherwise} \end{cases}$$

Notice that the inconsistency of a *might* and its negation is immediate.

Proof. Suppose $\sigma \Vdash \textit{might}(\phi)$ and $\sigma \Vdash \neg \textit{might}(\phi)$. Then $\sigma[\phi] \neq \emptyset$ and $\sigma = \sigma[\neg \textit{might}(\phi)] = \sigma - \sigma[\textit{might}(\phi)]$. Since $\sigma = \sigma - \sigma[\textit{might}(\phi)]$, $\sigma[\textit{might}(\phi)] = \emptyset$, hence $\sigma[\phi] = \emptyset$. Contradiction. \square

The support condition of *might*(ϕ) requires that ϕ is compatible with the state ($\sigma[\phi] \neq \emptyset$). The support condition of $\neg \textit{might}(\phi)$ requires that ϕ is incompatible with the state ($\sigma[\phi] = \emptyset$). These two conditions are logically incompatible; supposing both are met yields a contradiction. In the simplest case, when ϕ is a sentence of the base propositional language, the condition that $\sigma[\phi] \neq \emptyset$ corresponds to the condition that there is some possible world satisfying ϕ in σ , while the condition

³⁰Note: this is to be distinguished from evaluating a proposition to the effect that ϕ is compatible with some relevant body of information (cf. Yalcin, 2011).

that $\sigma[\phi] = \emptyset$ corresponds to the condition that there is no possible world satisfying ϕ in σ ; obviously no state meets these conditions.

Here is a template for generating canonical explanations of object-language inconsistency that does not appeal to the characteristics of propositions, or to disquotation. Epistemic modals, on the semantics in question, lack propositional contents: from the content of an epistemic modal, it is not possible to isolate a set of worlds X such that $\sigma[\text{might}(\phi)] = \sigma \cap X$. Coming to accept an epistemic modal is not a matter of coming to accept some proposition: in general there is clearly no X such that $\sigma \Vdash \text{might}(\phi)$ iff $\sigma \subseteq X$.³¹ As for disquotation, it suffices to note that assumptions regarding the disquotational behavior of σ play no role whatever in the explanation of the inconsistency of epistemic modals and their negations. Epistemic modals and their negations alike express “positive” conditions on σ . These conditions just turn out to be contradictory. That \Vdash licenses the lifting of negation into the metalanguage — i.e., $\sigma \Vdash \neg \text{might}(\phi)$ implies $\sigma \not\Vdash \text{might}(\phi)$ — is derived as a prediction of the semantics, rather than stipulated.³²

There is no question about whether advocates of this semantics are “entitled” to such explanations. The explanations follow from an ostensibly empirically motivated (i) test semantics for epistemic modals, (ii) definition of the operation expressed by negation. Barring some challenge to the account’s empirical underpinnings, the explanations should be regarded as genuine.

³¹Epistemic modals also lack *persistence*. A sentence ϕ is persistent iff, when $\sigma \Vdash \phi$ and $\sigma' \subseteq \sigma$, $\sigma' \Vdash \phi$ (Veltman 1996: 223). Obviously ϕ may be possible relative to a relatively uninformed information state σ — hence $\sigma \Vdash \text{might}(\phi)$ — but ruled out relative to a more informed information state $\sigma' \subseteq \sigma$ — hence $\sigma' \not\Vdash \text{might}(\phi)$. Rothschild and Yalcin (forthcoming) take issue with attempts to link dynamic properties (like non-persistence) to non-propositionality. But I am using ‘proposition’ in a different sense than they seem to be.

³²Two caveats. First, note that $\sigma \not\Vdash \text{might}(\phi)$ implies, apparently incorrectly, $\sigma \Vdash \neg \text{might}(\phi)$. There are ways around this that do not affect the account of inconsistency offered here (see fn61). Second, this is not yet to argue that *Expressivists* can make use of these explanations. I return to this in §5.

4.2 Deontic Modals

For Expressivists interested in a non-propositional semantics for deontic *may*, a test semantics for *may*, modeled on the test semantics for *might*, is a natural thing to pursue (see Charlow, 2013a; Starr, forthcoming). Indeed, similar empirical rationales could be constructed for both. Veltman might have written:

All you can do when told that it may be the case that ϕ is to agree or to disagree. If ϕ is permitted in view of your preferences, you must accept *may*(ϕ). And if ϕ is not permitted, you must reject *may*(ϕ). Clearly, then, sentences of the form *may*(ϕ) provide an invitation to perform a test rather than to incorporate some new information.

The idea would be that *may*(ϕ) is evaluated for acceptability by checking whether ϕ is permitted relative to the relevant preferences.³³ If ϕ is compatible, *may*(ϕ) is accepted — but since this sentence’s acceptance condition is ϕ ’s compatibility with the relevant preferences, the relevant preferences and information *do not change*. If ϕ is not so compatible, *may*(ϕ) is rejected; attempting to update on with *may*(ϕ) must yield something unacceptable.

Pursuing this idea requires enriching the notion of a state:

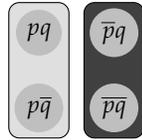
Definition 5. $\sigma \subseteq W$ is an *information space*

³³As before, this is to be distinguished from evaluating a proposition to the effect that ϕ is compatible with some relevant preferences. Note that *preference* admits of two readings: an attitude (e.g., Bob’s preference for coffee over tea) and an abstract criterion determining rankings on outcomes, actions, and the like (e.g., morality’s preference for impartiality). I will initially use ‘preference’ in the latter sense; the former sense will come into play when we imbue the formal apparatus with psychological content (§5.3). Preference may, in the end, not be the right sort of attitude for deontic modals to express; perhaps an attitude like planning would be better (as Gibbard 2003 argues). There is also the tricky question of how to distinguish the sort of attitude expressed by, e.g., a moral reading of a deontic modal from the one expressed by a legal reading of the same deontic modal. Are both attitudes preferences? If so, how are they distinguished? These are hard questions that I will not settle here. I aim only to outline a semantic architecture that addresses worries about the very possibility of explanatory Expressivistic semantic theorizing (§3). While I can see ways to adapt the basic architecture to address such questions, I cannot pursue this here. (Thanks here to Matthew Chrisman.)

Definition 6. $\pi(\cdot)$ is a *selection function* mapping an information space σ into a subset of σ ; $\pi(\sigma)$ is a *permissibility sphere*

Definition 7. $S = \langle \sigma, \pi(\sigma) \rangle$ is a *state* iff σ is an information space and π is a selection function.

A state $S = \langle \sigma, \pi(\sigma) \rangle$ provides an “information-tracking” parameter σ and a loosely “action-guiding” parameter π , now styled as a *selection function* selecting the best (in view of relevant criteria) possibilities from σ to yield something like a Lewisian *sphere of permissibility* (cf. Lewis, 1979b).³⁴ A state whose information is compatible with p , $\neg p$, q , and $\neg q$, but with a p -entailing sphere of permissibility can be visualized as follows. Note the shading (due to Starr, forthcomingb).



What state of mind does a pair $\langle \sigma, \pi(\sigma) \rangle$ represent? It represents the state of mind in which (i) an agent’s information is representable with σ , (ii) her preferences (given σ) are representable with $\pi(\sigma)$. Part (i) is, I take it, familiar. As for (ii): one’s preferences (given σ) are representable with $\pi(\sigma)$ iff, roughly, one strictly prefers (conditional on the information represented in σ) any world in $\pi(\sigma)$ to any world not in $\pi(\sigma)$. More roughly: this represents a strict preference (conditional on σ) for the proposition characterized by $\pi(\sigma)$ to the proposition characterized

³⁴Every Hyperplan characterizes a selection function, but not every selection function will correspond to a Hyperplan, given plausible assumptions about the distinction between weakly permitting p and strongly permitting p (Anderson, 1966). More on this in §5.3 (fn61). For now, this is the simplest treatment of deontic modals compatible with the Kratzer (1977, 1981) paradigm. To keep things simple, I suppress some issues: what the relevant information is (the nature of the modal base), what the relevant preferences are (the nature of the ordering source), how a selection function is derived from a body of preferences, etc.

by $\pi(\sigma)'$. I will have more to say on the semantics’ psychological content below, but this will give an initial sense.

States are now understood as having more structure than simple information spaces: they supply an information space *as well as* a selection function. This complicates the semantics. While support can continue to be understood in terms of trivial update — $S \Vdash \phi$ iff $S[\phi] = S \neq \langle \emptyset, \emptyset \rangle$ — updates were originally defined on information spaces; they must now be defined on more complicated objects. The present suggestion is that *may*(ϕ) tests for ϕ ’s compatibility with the sphere of permissibility. Epistemic modals continue to express conditions on the information parameter.³⁵

Dynamic may

$$\langle \sigma, \pi(\sigma) \rangle [\text{may}(\phi)] = \begin{cases} \langle \sigma, \pi(\sigma) \rangle, & \text{if } \pi(\sigma)[\phi] \neq \emptyset \\ \langle \emptyset, \emptyset \rangle, & \text{otherwise} \end{cases}$$

Dynamic might, take two

$$\langle \sigma, \pi(\sigma) \rangle [\text{might}(\phi)] = \begin{cases} \langle \sigma, \pi(\sigma) \rangle, & \text{if } \sigma[\phi] \neq \emptyset \\ \langle \emptyset, \emptyset \rangle, & \text{otherwise} \end{cases}$$

I assume that (i) sentences of the base propositional language \mathcal{L}_P contract σ and, correspondingly, $\pi(\sigma)$,³⁶ (ii) updating information spaces and permissibility spheres (and more generally sets of worlds) with such sentences remains well-defined: for any $X \subseteq W$ and $\phi \in \mathcal{L}_P$, $X[\phi] = X \cap \llbracket \phi \rrbracket$. Thus:

Base Update

For atomic $p \in \mathcal{L}_P$: $\langle \sigma, \pi(\sigma) \rangle [p] = \langle \sigma[p], \pi(\sigma)[p] \rangle$

³⁵Bookkeeping note: these sorts of updates are assumed to distribute to the sub-parts of the state, so that $\langle \sigma, \pi(\sigma) \rangle [\phi] := \langle \sigma[\phi], \pi(\sigma)[\phi] \rangle$.

³⁶I thus assume that π is *monotonic*: when $\sigma' \subseteq \sigma$, $\pi(\sigma') \subseteq \pi(\sigma)$. I do this only for simplicity: I would in fact reject the notion that π is monotonic. For critical discussion of monotonicity, see Charlow (2013a,b).

Propositional Sub-Update

For $\phi \in \mathcal{L}_P$ and $\tau \subseteq W$: $\tau[\phi] = \{w \in \tau : w(p) = 1\}$

We will consider the connectives individually. Per Definition 4, $\neg\phi$ removes ϕ -possibilities (from the state's information). This idea fails for negated *may*.³⁷ While we do know what conditions $\neg\text{might}(\phi)$ and $\neg\text{may}(\phi)$ should test for — respectively, ϕ 's incompatibility with the relevant information and ϕ 's incompatibility with the permissibility sphere — generating these tests compositionally is another matter. The simplest solution is to continue to understand negation in terms of set-subtraction, but to generalize the idea so that negation operates separately on each parameter of a state.

Generalized Negation

$S[\neg\phi] = S \ominus S[\phi]$

Note: $\langle \sigma, \pi(\sigma) \rangle \ominus \langle \sigma^*, \pi^*(\sigma^*) \rangle := \langle \sigma - \sigma^*, \pi(\sigma) - \pi^*(\sigma^*) \rangle$

We can thus visualize update on a propositional negation $\neg q$ (at a state whose information is compatible with p , $\neg p$, q , and $\neg q$, but with a p -entailing sphere of permissibility) as follows. (Note: crosshatched regions correspond to possibilities that have been eliminated.)



As desired, $\neg\text{might}(\phi)$ and $\neg\text{may}(\phi)$ test for ϕ 's incompatibility with the relevant domain.

Proof. $S[\neg\text{might}(\phi)] = S$ iff $S = S \ominus S[\text{might}(\phi)]$ iff $S[\text{might}(\phi)] = \langle \emptyset, \emptyset \rangle$ iff $\sigma_S[\phi] = \emptyset$ □

³⁷There is no parallel issue for \wedge : we can always understand \wedge as expressing sequencing on update functions, i.e., function composition. Disjunction is more complicated; we postpone it until §4.3.

Proof. $S[\neg\text{may}(\phi)] = S$ iff $S = S \ominus S[\text{may}(\phi)]$ iff $S[\text{may}(\phi)] = \langle \emptyset, \emptyset \rangle$ iff $\pi_S(\sigma_S)[\phi] = \emptyset$ □

The inconsistency of a *may* and its negation is immediate:

Proof. Suppose $S \Vdash \text{may}(\phi)$ and $S \Vdash \neg\text{may}(\phi)$. Then $\pi_S(\sigma_S)[\phi] \neq \emptyset$ and $S = S[\neg\text{may}(\phi)] = S \ominus S[\text{may}(\phi)]$, hence $S[\text{may}(\phi)] = \langle \emptyset, \emptyset \rangle$. But $\pi_S(\sigma_S)[\phi] \neq \emptyset$, so $S[\text{may}(\phi)] \neq \langle \emptyset, \emptyset \rangle$. Contradiction. □

As with dynamic *might*, the acceptance condition of *may*(ϕ) is that ϕ is compatible with the sphere of permissibility, while $\neg\text{may}(\phi)$ requires that ϕ is incompatible with the sphere of permissibility (otherwise, $S[\text{may}(\phi)]$ is nonempty, hence $S \neq S - S[\text{may}(\phi)]$). These two conditions — that $\pi_S(\sigma_S)[\phi] \neq \emptyset$ and $\pi_S(\sigma_S)[\phi] = \emptyset$ — are logically incompatible; supposing both are met generates a contradiction.

In the simplest case, when $\phi \in \mathcal{L}_P$, the condition that $\pi_S(\sigma_S)[\phi] \neq \emptyset$ corresponds to the condition that there is some possible world satisfying ϕ in $\pi_S(\sigma_S)$, while the condition that $\pi_S(\sigma_S)[\phi] = \emptyset$ corresponds to the condition that there is no possible world satisfying ϕ in $\pi_S(\sigma_S)$; obviously no state meets these conditions. More generally, in cases where $\phi \in \mathcal{L}_P$, *may*(ϕ) behaves as we would expect: as an existential quantifier over the relevant domain:

$$S \Vdash \text{may}(\phi) \text{ iff } \exists w \in \pi_S(\sigma_S) : w \in \llbracket \phi \rrbracket$$

Although on a test semantics *may*(ϕ) does not express an existentially quantified proposition (for the same reasons that, on a test semantics, *might*(ϕ) does not function to express an existentially quantified proposition), the explanation of the inconsistency of it with its negation looks the same as if it did: *may*(ϕ) requires that there be a ϕ -world compatible with the domain defined by the relevant preferences and information, while $\neg\text{may}(\phi)$ requires that every ϕ -world compatible with the domain is a $\neg\phi$ world.

Whether this explanation is available to the proponent of test semantics for deontic modals is an empirical question. Opponents of test

semantics for deontic modals are welcome to challenge the empirical considerations that will be used to motivate it. Until they do, the explanations look as if they are workable and canonical. (Again, I return to the question of whether *Expressivists* about deontic modals can use this sort of strategy to explain normative inconsistencies in §5.)

4.3 Disjunction

It would be very natural to state a generalized notion of disjunction, modeled after generalized negation:

Generalized Disjunction

$$S[\phi \vee \psi] = S[\phi] \sqcup S[\psi]$$

$$\text{Note: } \langle \sigma, \pi(\sigma) \rangle \sqcup \langle \sigma^*, \pi^*(\sigma^*) \rangle := \langle \sigma \cup \sigma^*, \pi(\sigma) \cup \pi^*(\sigma^*) \rangle$$

But this turns out to be problematic: given a test semantics for *might* or *may*, we run into Schroeder's Type 1 disjunction problem (§3.3); I will review this below. A solution is to move away from thinking of disjunction as a Boolean operation on sets of points, toward the idea that disjunctions function primarily to present their disjuncts as alternatives (with ordinary Boolean interpretations arising as a special case). Before beginning, I will note that my goals here are modest: first, to further complicate with some suggestive data the simple picture of \vee on which its meaning is a Boolean operation on sets of points; second, to suggest a different semantics for \vee of which the Expressivist can eventually make use.

4.3.1 Problems with Generalized Disjunction

When ψ is a test, Generalized Disjunction predicts: $S \Vdash \phi \vee \psi$ iff $S \Vdash \phi$ or $S \Vdash \psi$.³⁸

³⁸Both referees note that this problem does not arise on a common Dynamic understanding of disjunction, on which $S[\phi \vee \psi] := S[\neg(\neg\phi \wedge \neg\psi)] = S \ominus S[\neg\phi][\neg\psi]$. But how would this understanding of disjunction be justified? (This is not a question that normally arises, but it makes sense to ask here.) As a proposal about logical form, it is noncompositional: negations, e.g., are posited ex nihilo. Of course, routing the semantics for disjunction

Proof. (\Rightarrow) Suppose $S \Vdash \phi \vee \psi$. Then $S = S[\phi \vee \psi]$, so $S = S[\phi] \sqcup S[\psi]$. Since $[\psi]$ is a test, there are two cases: $S[\psi] = S$ or $S[\psi] = \langle \emptyset, \emptyset \rangle$. If $S[\psi] = S$, then $S \Vdash \psi$. If $S[\psi] = \langle \emptyset, \emptyset \rangle$, then $S[\phi] \sqcup S[\psi] = S[\phi]$, in which case $S \Vdash \phi$. In each case, $S \Vdash \phi$ or $S \Vdash \psi$. (\Leftarrow) Immediate. \square

I will eventually argue that this creates a problem for understanding disjunction along the lines of Generalized Disjunction. But I disagree with Schroeder about the nature of this problem, for two reasons.

Reason (i): It is *desirable* that $S \Vdash \phi \vee \psi$ imply that $S \Vdash \phi$ or $S \Vdash \psi$.

Reason (ii): What is problematic is the other direction: that $S \Vdash \phi$ or $S \Vdash \psi$ implies $S \Vdash \phi \vee \psi$.³⁹ I will take these claims in order.

Reason (i). While disjunctions over bare possibility modals do seem to license inferring the possibility modal — cf. (19) and (21) (and later

through \wedge and \neg is not essential: we might simply say that $S[\phi \vee \psi] := S \ominus ((S \ominus S[\phi]) \ominus (S \ominus S[\psi])[\psi])$. This is compositional, but (so far) unmotivated — it is inter-definition of \vee with \neg and \wedge in all but name. What is wanted is a principled answer to the question *what operation does \vee express?* The natural such operation, I'd suggest, is \cup over sets of objects (modulo some provision for presupposition projection in disjunctions, as in Rothschild, 2011). Much work in Dynamic Semantics — recognizing perhaps that syncategorematic treatments of logical constants are hard to sustain in natural language semantics — does understand disjunction in terms of \cup over sets of objects (see, e.g., Veltman, 1996; Rothschild, 2011). Regardless of how we answer the question *what operation does \vee express?*, it would seem desirable for the Expressivist to have an account of disjunction on which its logical connections to \neg and \wedge are not a matter of stipulation. Defining \vee in terms of \neg and \wedge , whether literally or in-all-but-name, seems wrongly to make these connections a matter of stipulation.

³⁹Though these claims supply motivation for my semantics for disjunction, its success does not *depend* on them; I will be content to present some suggestive data in their favor. The data — particularly for free-choice effects — is quite intricate, especially the semantic effect of varying the relative scope of the modal and \vee . von Fintel, e.g., thinks free-choice implications are entailments when the disjunction takes wide scope (von Fintel and Gillies, 2008), but implicatures when the modal takes wide scope (von Fintel, 2012). Aloni (2007) appears to favor the opposite view, while Zimmermann (2000) favors an account on which they are all entailments. So things are very complicated. Here my goal is (i) to present a relatively restricted data set (focusing on cases where \vee takes widest scope) and, later, (ii) to suggest some strategies for accounting for that data that the Expressivist can ultimately take on.

discussion in §4.3.3) — the following are problematic on their face:

- $S \Vdash \phi \vee \neg \text{might}(\psi)$ only if $S \Vdash \phi$ or $S \Vdash \neg \text{might}(\psi)$
 $S \Vdash \phi \vee \neg \text{may}(\psi)$ only if $S \Vdash \phi$ or $S \Vdash \neg \text{may}(\psi)$

Negated possibility modals express a kind of necessity; they express “decided” states of mind. But disjunctions ordinarily function to express indecision about their disjuncts. While indecision directed at sentences expressing indecision may perhaps imply indecision about those sentences — see (19) and (21) — indecision directed at sentences expressing decision does not seem like it should imply decision about any of those sentences. When ψ is a negated possibility modal, then, it seems $S \Vdash \phi \vee \psi$ should not imply $S \Vdash \phi$ or $S \Vdash \psi$.

Schroeder (2011a) illustrates the point with a case: “Jill finds out that Jack took a vacation last year to one of the non-contiguous U.S. states... [S]he concludes that [(22)].”

- (22) Either Jack went to Alaska, or he must have gone to Hawaii

Letting $a =$ Jack went to Alaska and $h =$ Jack went to Hawaii, here we have a case where Jill accepts $a \vee \neg \text{might}(\neg h)$, but does not accept a and does not accept $\neg \text{might}(\neg h)$.

I find this unpersuasive. Note that addition of a discourse particle *else* that is anaphoric to the negation of some earlier-introduced condition apparently effects no change in meaning to (22):

- (23) Either Jack went to Alaska, or else he must have gone to Hawaii

This indicates that the second disjunct is *modally subordinated*, meaning that it is interpreted with its domain of quantification restricted to worlds where Jack did not go to Alaska (see esp. Roberts, 1989). On this interpretation, however, Jill *does accept* the second disjunct, since its meaning is, on the standard Kratzer (1991) semantics for indicative conditionals (on which indicative antecedents are domain-restrictors

for modals in the consequent), equivalent to:⁴⁰

- (24) If Jack did not go to Alaska, he must have gone to Hawaii

Notice further that reversing the order of the disjuncts renders the original sentence unacceptable:

- (25) ??Either Jack must have gone to Hawaii, or he went to Alaska

Understanding (23) under the rubric of modal subordination explains this contrast, if we suppose, plausibly, that modals occurring in disjunctions prefer to be subordinated.⁴¹ Modal subordination is order-sensitive: subordinated modals make use of domain restrictions that have *been* introduced into the discourse. In (25) no restriction is yet available, so the modal’s preference for being subordinated is violated.

More generally, when we have a disjunction whose right disjunct has a domain-sensitive semantics, appealing to modal subordination to explain away the apparently problematic nature of the relevant entailment seems appealing. Consider two other of Schroeder’s cases. In

⁴⁰Schroeder (2011a) dismisses the idea that the disjunction has a reading where its second disjunct has a conditional meaning, on the grounds that “there is something very suspicious about needing to postulate special ad hoc rules for special readings that arise only in certain contexts” (24). But Klindedinst and Rothschild (2012) argue on a variety of grounds that the core meaning of disjunction forces this sort of domain restriction in right-disjunct modals.

⁴¹The preference is generally strong. Notice how difficult it is to assign a sensible reading to a sentence like the following: *John must be in London or he must be in Paris, but I don’t know which*. The only way to read the emendation is as elliptical for *I don’t know whether he is in London or Paris* (though I find this reading hard to access). Reading it as elliptical for *I don’t know whether he must be in London or must be in Paris* is nonsensical. In other words, when \vee takes widest scope over two epistemic necessity modals, the sentence is uninterpretable. This is readily explained if modals occurring in disjunctions strongly prefer to be modally subordinated.

the first, Shieva asks her magic 8-ball if she should give up on her paper. Since most of the 8-ball's answers are positive, we infer:

(26) Either Shieva finished her paper by now or she probably gave up

In the second, we believe Karen got a Ph.D. from Columbia, NYU, or CUNY, so we infer:

(27) Either Karen went to Columbia, or if she didn't go to NYU, then she went to CUNY

We seem to read the right disjunct as modally subordinated by the left disjunct's negation:

(28) If Shieva didn't finish her paper by now, she probably gave up

(29) If Karen didn't go to NYU and didn't go to Columbia, then she went to CUNY

Someone who accepts (26) and (27) simply *accepts* (28) and (29). Far from problematic, the fact that a test semantics for, say, *probably* or *if* would predict that acceptance of $\phi \vee \psi$ (where ψ is a *probably* or an *if*) implies acceptance of ϕ or of ψ should be regarded as a desirable property of the semantics. Indeed, we would hope to predict something even stronger: when ψ is a test, acceptance of $\phi \vee \psi$ should imply acceptance of ψ , on its modally subordinated reading.

Reason (ii). What is, I will now argue, problematic is that $S \Vdash \phi$ would imply $S \Vdash \phi \vee \psi$. Why? Most clearly, as (32) and (33) illustrate, there are counterexamples, plausibly explained by the fact that disjunctions of the form *might*(ϕ) \vee *might*(ψ) or *may*(ϕ) \vee *may*(ψ) entail each of their disjuncts, as in (19) and (21).⁴² Generalized Disjunction fails here.

⁴²The acceptability of such disjunctions might appear puzzling against the unacceptability of corresponding disjunctions with strong necessity modals, as in fn41). The difference: with disjunctions of possibility modals, "double en-

Further: if $\phi \vee \text{must}(\psi)$ implies, as claimed, its (modally subordinated) right disjunct, then acceptance of ϕ should not imply acceptance of $\phi \vee \text{must}(\psi)$ (since this implies acceptance of the right disjunct, on its modally subordinated reading). (30) seems not to imply (31). But (31) will be an entailment of (30), if disjunction introduction is validated.⁴³

(30) Jack went to Alaska

(31) If Jack didn't go to Alaska, he went to Antarctica

The core problem. To be explicit, let $M(\phi)(\psi)$ represent a modal with a *domain restriction* ϕ and a *scope* ψ . (Unrestricted modals can be represented as special cases, with a vacuous restriction to \top .) The restriction device does what you'd expect: it restricts the domain on which the test expressed by the relevant modal is executed. For example:

Restricted Dynamic *may*

$$S[\text{may}(\phi)(\psi)] = \begin{cases} S, & \text{if } \pi_S(\sigma_S[\phi])[\psi] \neq \emptyset \\ \langle \emptyset, \emptyset \rangle, & \text{otherwise} \end{cases}$$

I have argued that a semantics for disjunction should predict: (i) $\phi \vee M(\neg\phi)(\psi)$ *does imply* $M(\neg\phi)(\psi)$; (ii) ϕ *does not imply* $\phi \vee M(\neg\phi)(\psi)$.⁴⁴

tailment" readings in which the prejacent of the left modal restricts the domain of the right modal (see Klinedinst and Rothschild 2012: 173–4). make good sense. With disjunctions of necessity modals, such readings generally do not make sense. These facts fall out of the semantics I will state below.

⁴³While the *unacceptability* of (31) at a state that accepts (30) might be traced to the fact that indicative conditionals presuppose the compatibility of their antecedents with the relevant domain (Stalnaker, 1975; von Stechow, 1998), it remains embarrassing to treat this as an *entailment* for a number of reasons. Here is one: if it is an entailment, it seems we should be able to infer, from the fact that (30) is probably true, that (31) is probably true, without violating any presuppositional requirements of the conditional's antecedent.

⁴⁴I assume, for disjunctions whose right disjunct is modal, the modal is obligatorily subordinated by the negation of the left disjunct. This is a strong assumption, but a motivated one (see Klinedinst and Rothschild, 2012). Here, it will be codified syntactically: I discuss only disjunctions of the form $\phi \vee M(\neg\phi)(\psi)$, implicitly treating cases like $\phi \vee M(\top)(\psi)$ as ill-formed.

But, on Generalized Disjunction, $S \Vdash \phi \vee \text{must}(\neg\phi)(\psi)$ iff $S \Vdash \phi$ or $S \Vdash \text{must}(\neg\phi)(\psi)$. Generalized Disjunction thus fails with respect to these desiderata. It does, to be clear, have the (desirable) property that $\phi \vee \text{must}(\neg\phi)(\psi)$ entails $\text{must}(\neg\phi)(\psi)$.

Proof. Suppose $S \Vdash \phi \vee \text{must}(\neg\phi)(\psi)$. Then: $S \Vdash \phi$ or $S \Vdash \text{must}(\neg\phi)(\psi)$. The latter case is trivial. So suppose $S \Vdash \phi$. Then $S \Vdash \text{must}(\neg\phi)(\psi)$ iff $S[\text{must}(\neg\phi)(\psi)] = S$ iff $\sigma_S[\neg\phi][\psi] = \sigma_S[\neg\phi]$. But since $S \Vdash \phi$, $S[\neg\phi] = \langle \emptyset, \emptyset \rangle$. So $\sigma_S[\neg\phi] = \sigma_S[\neg\phi][\psi] = \emptyset$. Hence $S \Vdash \text{must}(\neg\phi)(\psi)$. \square

But, since ϕ implies $\phi \vee \psi$, Generalized Disjunction predicts that ϕ implies $\text{must}(\neg\phi)(\psi)$; for instance, (30) implies (31). This is something we would hope to avoid. I will call it the *core problem* with disjunction for the proponent of test semantics for epistemic and deontic modals.

4.3.2 Alternative Semantics

I will now sketch a semantics that makes good on the above discussion. The key idea: disjunction does not work as Generalized Disjunction would have it, i.e., as Boolean union on sets of points. Disjunction rather serves to *present alternative possibilities*, à la Kratzer and Shimoyama (2002); Krifka (2004); Alonso-Ovalle (2006); Aloni (2007); Groenendijk and Roelofsen (2009) (among many others).

Overview. There is independent motivation for this sort of idea, and the supplied references give a great deal of it. The key idea⁴⁵ is that disjunctions have a dual function — they both *provide information* (regarding the acceptability of the disjunction) and *raise an issue* (regarding which disjunct is true). Disjunctions, in other words, have both an informational and (something rather like an) inquisitive function. In fact, the fundamental function of a disjunction is to raise an issue; disjunctions inform *by* raising issues that jointly cover a *proper sub-region* of the relevant region of logical space. (To contrast, questions do not inform

⁴⁵This overview (and the semantics I go on to state) draws most on Groenendijk and Roelofsen (2009).

because the issues they raise are generally thought to jointly cover the whole of the relevant region of logical space.) These ideas are normally implemented in a static framework building on the standard semantics for interrogatives (on which interrogatives express *questions*, which are in turn understood as *partitions* of logical space — divisions into mutually exclusive and jointly exhaustive cells corresponding to the question's complete answers (Hamblin, 1958; Karttunen, 1977; Groenendijk and Stokhof, 1984). A question can thus be thought of as a special kind of issue: an uninformative issue.⁴⁶

Definition 8. $\mathcal{I} = \{A_1, \dots, A_n\}$ is an *issue* iff $A_i \subseteq W$, for each $1 \leq i \leq n$

1. \mathcal{I} is **informative** relative to a set of points \mathcal{S} iff $\mathcal{S} \cap \bigcup \mathcal{I} \neq \mathcal{S}$.
2. \mathcal{I} is a **question** relative to \mathcal{S} iff $\{A : \exists A' \in \mathcal{I} : A = A' \cap \mathcal{S}\}$ partitions \mathcal{S} .

Instead of thinking of the semantic value of a disjunction $\phi \vee \psi$ as a set of objects that witness the truth of ϕ or the truth of ψ , we are invited to think of its semantic value as consisting, very roughly, of the set of answers to the question *is it the case that ϕ or ψ ?*, i.e., $\{\llbracket \phi \rrbracket, \llbracket \psi \rrbracket\}$.⁴⁷ More generally:

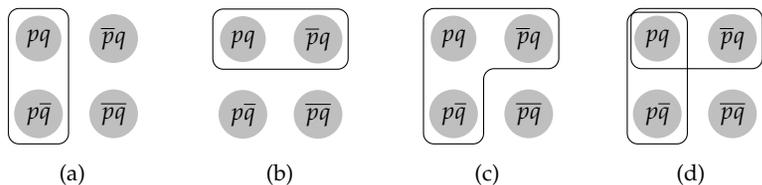
Alternative Disjunction (Static)

$$\llbracket \phi \vee \psi \rrbracket_{\text{ALT}} = \{\llbracket \phi \rrbracket_{\text{CLASSICAL}}\} \cup \{\llbracket \psi \rrbracket_{\text{CLASSICAL}}\}$$

Figs. (a) and (b) represent, respectively, propositions p and q . Classical disjunction identifies $\llbracket p \vee q \rrbracket$ with their union, Fig. (c). Alternative disjunction identifies $\llbracket p \vee q \rrbracket$ with the issue in Fig. (d).

⁴⁶There is also the requirement of mutual exclusivity, i.e., that questions express sets of complete answers that are pairwise incompatible. I follow Isaacs and Rawlins (2008) in endorsing the idea that questions express partitions (which entails mutual exclusivity). Probably disjunctions too should be required to express mutually exclusive cells, as I note later (cf. Alonso-Ovalle, 2006).

⁴⁷This is not to say that disjunctions partake in the distinctive pragmatic characteristics of questions. In particular, since disjunctions are generally informative, they are evaluable for truth; questions are not. (Even when uninformative, disjunctions are typically evaluable for truth via conveying something informative non-semantically.)



The informational content of $p \vee q$ is the same whether we choose (c) or (d) for $\llbracket p \vee q \rrbracket$: the disjunction is inconsistent with worlds where both p and q are false, hence is potentially informative, while the question $?p$ (which partitions the relevant space) is not.

Dynamicized. It is natural — and for our purposes essential — to dynamicize these ideas, by letting disjunctions introduce *distinct states* as alternatives for the input state, so that the result of updating with a disjunction is a set of alternative states (here cf. Krifka, 2004). For uniformity, we will understand the objects of update — Inquisitive States — as sets of states in the sense of Definition 7.

Definition 9. If S is a state, then $\Sigma = \{S, \langle \emptyset, \emptyset \rangle\}$ is an *inquisitive state*. If Σ and Σ' are inquisitive states, then $\Sigma \cup \Sigma'$ is also an inquisitive state. Nothing else is an inquisitive state.

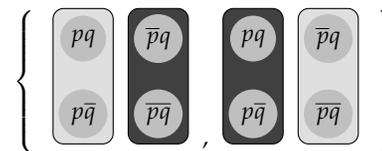
An inquisitive state (hereafter “state”) is an object like the following.⁴⁸

⁴⁸Given the relatively expansive understanding of inquisitive states we have adopted, it might make sense to consider correspondingly revising our understanding of issues and questions as follows:

Definition 10. Σ is an *issue* iff, for each $S \in \Sigma$, S is a state

1. Σ is **informative** relative to Σ^* iff either $\bigcup_{S \in \Sigma} \sigma_i \subset \bigcup_{S^* \in \Sigma^*} \sigma_i^*$ or $\bigcup_{S \in \Sigma} \pi_i(\sigma_i) \subset \bigcup_{S^* \in \Sigma^*} \pi_i^*(\sigma_i^*)$.
2. Σ is a **question** relative to Σ^* iff, for all $S \in \Sigma$, $S^* \in \Sigma^* : S \sqcap S^* = S^*$ or $S \sqcap S^* = \langle \emptyset, \emptyset \rangle$ or $S \sqcap S^* = \langle \sigma^*, \emptyset \rangle$ [Note: $S \sqcap S^* := \langle \sigma \cap \sigma^*, \pi(\sigma) \cap \pi^*(\sigma^*) \rangle$]

This would allow us to think of notions like informativeness and questionhood free of the presuppositions that (i) only propositions are informative, (ii) only partitions of logical space are questions. There may be, e.g., questions with potentially informative answers that are irreducibly practical —



Note: when nothing turns on it, I tend to ignore the membership of the absurd alternative $\langle \emptyset, \emptyset \rangle$ in inquisitive states.

Non-issue sentences distribute updates “across” a state. If Sal says Jack went to Alaska or Hawaii, then adds that he flew, this *percolates* to each alternative: the possibility that Jack went to Alaska is evaluated supposing that he flew there. It is thus trivial to extend our earlier update definitions to cover inquisitive states. If ϕ does not introduce an issue, update on ϕ percolates throughout the state.⁴⁹

Percolation

For non-disjunctive ϕ : $\Sigma[\phi] = \bigcup_{S \in \Sigma} \{S[\phi]\}$

$S[\phi]$ is as defined previously. The core idea for disjunction is this: updating Σ on $\phi \vee \psi$ introduces ϕ and ψ as alternatives.

Alternative Disjunction (Dynamic)

$\Sigma[\phi \vee \psi] = \Sigma[\phi] \cup \Sigma[\psi]$ ⁵⁰

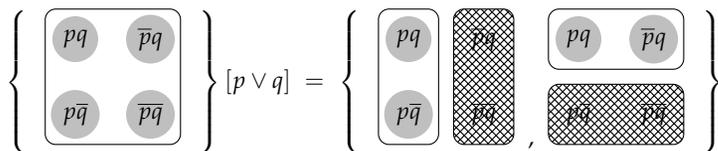
that concern what to prefer or plan, rather than how to represent the world. I will not pursue this here, but see Charlow (2011, Ch. 4) for some discussion.
⁴⁹Percolation resembles Willer’s “Updates on Information States” (2013: 57). The resulting treatment of possibility modals thus appears similar to Willer’s. I will ultimately, however, suggest thinking of modals as tests on inquisitive states, rather than tests on non-inquisitive components of inquisitive states. More generally, while Willer will think of the pragmatics of modalities in terms of the alternatives they *eliminate*, I do not, as I explain below.

⁵⁰Note that when $\phi \models \neg\psi$ and $\Sigma \Vdash \phi$, $\Sigma = \Sigma[\phi] \cup \Sigma[\psi]$, so $\Sigma \Vdash \phi \vee \psi$. This, I have suggested, is to be avoided. Inspired by Zimmermann (2000), I will officially suppose that the semantics of disjunction requires treating each disjunct as (roughly speaking) possible, hence that the alternatives introduced by the disjunction support the corresponding disjunct. Thus:

Alternative Disjunction (Official)

$\Sigma[\phi \vee \psi] = \begin{cases} \Sigma[\phi] \cup \Sigma[\psi], & \text{if } \Sigma[\phi] \Vdash \phi \text{ and } \Sigma[\psi] \Vdash \psi \\ \{\langle \emptyset, \emptyset \rangle\}, & \text{otherwise} \end{cases}$

For propositional disjunctions, dynamic and static alternative disjunction are equivalent: $\Sigma[\phi \vee \psi]$ is just the result of collecting each $S[A]$, for each $S \in \Sigma$ and alternative $A \in \llbracket \phi \vee \psi \rrbracket$. For example, updating a maximally unopinionated state with $p \vee q$ yields:



Support and consequence are unchanged: $\Sigma \Vdash \phi$ iff $\Sigma[\phi] = \Sigma$ and $\Sigma \neq \langle \emptyset, \emptyset \rangle$; $\phi_1, \dots, \phi_n \Vdash \psi$ iff $\forall \Sigma : \Sigma \Vdash \phi_1, \dots, \Sigma \Vdash \phi_n$ implies $\Sigma \Vdash \psi$.

Testy Disjunctions. A test-embedding disjunction like $\phi \vee M(\neg\phi)(\psi)$ seems to lack a well-defined static alternative semantic value.⁵¹ So, when ψ expresses a test, it is not generally possible to obtain $\Sigma[\phi \vee \psi]$ in the way just suggested: collecting each S -updated-with- A (for each $S \in \Sigma$ and $A \in \llbracket \phi \vee \psi \rrbracket$) is not viable when $\llbracket \phi \vee \psi \rrbracket$ is undefined.

Dynamic alternative disjunction shows one way forward. Using it, $\Sigma[\phi \vee M(\neg\phi)(\psi)] = \Sigma[\phi] \cup \Sigma[M(\neg\phi)(\psi)]$. By Percolation, this = $\Sigma[\phi] \cup$

When talking of $\Sigma[\phi \vee \psi]$, I generally assume that $\Sigma[\phi] \Vdash \phi$ and $\Sigma[\psi] \Vdash \psi$. Informally, I assume that updating on a disjunction will generally force treating each disjunct as a robust alternative. In assuming this, we assume away certain failures of what Rothschild and Yalcin (forthcoming) dub Idempotence. In any system containing tests in which \wedge means sequencing, Idempotence occasionally fails. (For instance, let $\psi = \text{might}(p)(q) \wedge \neg q$.) Such failures are (in my view) empirically and theoretically peripheral; it does little harm to bracket them. Alternative Disjunction, by the way, supplies its own Idempotence failures when the disjuncts are propositional: notice $\{S\}[p \vee q] = \{S\}[p] \cup \{S\}[q]$, but $\{S\}[p \vee q][p \vee q] = \{S\}[p] \cup \{S\}[q] \cup \{S\}[q][p]$. I avoid these by appeal to the obligatory exclusivity of propositional disjunction: for non-defective $p \vee q$, $S[q][p] = \langle \emptyset, \emptyset \rangle$ (cf. Alonso-Ovalle, 2006).

⁵¹There is a sense in which an epistemic modal might express what Rothschild and Yalcin (forthcoming) term an “information-sensitive” proposition on which the information can update: if its support condition is met by the state, the state updates on \top ; if not, it updates on \perp . While such “propositions” are a formal possibility, it is hard to see how to put them to theoretical work. I will ignore them.

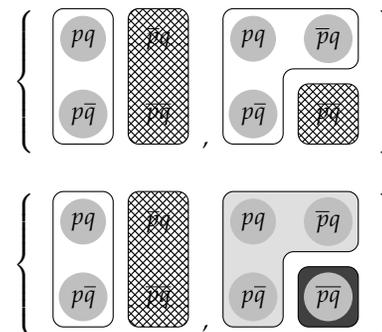
$\cup_{S \in \Sigma} \{S[M(\neg\phi)(\psi)]\}$. In the simplest case (where ϕ is non-disjunctive and propositional, and $\Sigma = \{S\}$, and letting D_M give the relevant domain for modal M and C the condition for which M tests D_M):

$$\Sigma[\phi \vee M(\neg\phi)(\psi)] = \{S[\phi], S[M(\neg\phi)(\psi)]\}$$

$$\{S[\phi], S[M(\neg\phi)(\psi)]\} = \left\{ S[\phi], \begin{cases} S, & \text{if } D_M[\neg\phi][\psi] \text{ meets } C \\ \langle \emptyset, \emptyset \rangle, & \text{otherwise} \end{cases} \right\}$$

In general, updating on $\phi \vee M(\neg\phi)(\psi)$ yields a state in which the following two operations are treated as alternatives: (i) incorporation of ϕ , (ii) acceptance or rejection of $M(\neg\phi)(\psi)$.

Characteristic states in which $p \vee \text{must}(\neg p)(q)$ and $p \vee \text{ought}(\neg p)(q)$ are, respectively, accepted can be visualized as follows:



I offer this as a serviceable notion of \vee for a semantics in which some sentences (i) express tests, (ii) are embedded (with restrictions like enforced modal subordination) under \vee .⁵²

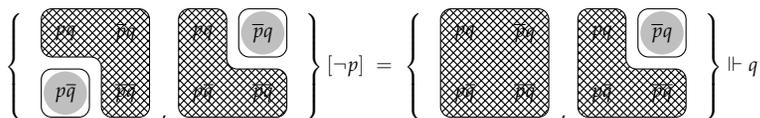
⁵²What happens when a disjunction is embedded? As before, the major problem is not with conjunction — which functions as an update-sequencer — but with negation. I will follow Groenendijk and Roelofsen (2009) in treating negation as an alternative-flattener: a disjunction’s negation does not intro-

4.3.3 Logic of Alternatives

Though the semantics is non-classical, it secures the core instances of disjunctive syllogism.

Proof-sketch. $\Sigma[\phi \vee \psi][\neg\phi] = (\Sigma[\phi] \cup \Sigma[\psi])[\neg\phi]$. By Percolation, this $= \Sigma[\phi][\neg\phi] \cup \Sigma[\psi][\neg\phi]$. By Percolation, $\Sigma[\phi][\neg\phi] = \{\langle \emptyset, \emptyset \rangle\}$. Thus, whenever $\Sigma[\psi][\neg\phi] \Vdash \psi$, $\Sigma[\phi \vee \psi][\neg\phi] \Vdash \psi$. \square

Here is a simple illustration of a state that supports $p \vee q$, subsequently updates on $\neg p$, and finally as a result ends up supporting q :⁵³



duce alternatives, since negations of disjunctions rule the alternatives out. We predict this easily: by Percolation, $\Sigma[\neg(\phi \vee \psi)] = \bigcup_{S \in \Sigma} \{S[\neg(\phi \vee \psi)]\}$. By Generalized Negation, this $= \bigcup_{S \in \Sigma} \{S \ominus S[\phi \vee \psi]\}$. When updating a *non-inquisitive state* with a disjunction, Generalized Disjunction applies: $\bigcup_{S \in \Sigma} \{S \ominus (S[\phi] \sqcup S[\psi])\}$. This is equivalent to a classical analysis of negations over disjunctions when $\phi, \psi \in \mathcal{L}_P$ — a happy result if negation flattens out inquisitiveness in its scope. (If the appeal to Generalized Disjunction seems ad hoc, notice that we need boring classical disjunction — i.e., a Boolean operation on sets of (pairs of) points — around anyway, e.g., to handle cases where disjunctions scope under modals.)

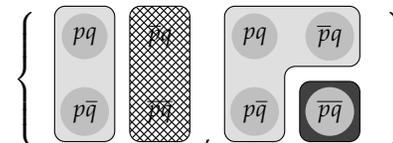
What about *negated testy disjunctions* of the form $\neg(\phi \vee M(\neg\phi)(\psi))$? Here I am at a loss for data around which to build a theory. Embedding sentences of the form $\phi \vee M(\neg\phi)(\psi)$ under negation seems to render them defective — try it with (22). I am inclined to stipulate away such sentences due to defectiveness. Of course, there are perfectly acceptable sentences that seem like they should be equivalent in meaning to such negated disjunctions (*Jack didn't go to Alaska, and he might not have gone to Hawaii*), but we have a perfectly good story to tell about sentences of the form $\neg\phi \wedge M(\neg\phi)(\neg\psi)$.

⁵³Why does it often seem wrong to say that ϕ “follows” from $\phi \vee M(\neg\phi)(\psi)$ together with $\neg M(\neg\phi)(\psi)$ (see Klinedinst and Rothschild 2012: 147; Schroeder 2011a)? I agree this is a bad *inference*, but I doubt it shows anything about *validity* (cf. Harman, 1986). (In fact, I have argued that $\phi \vee M(\neg\phi)(\psi)$ together with the negation of the right disjunct is itself a *contradiction*.)

The semantics avoids the “core problem” with disjunction (§4.3.1). First, disjunction introduction is *invalid*: disjunctions introduce robust alternatives, so generally $\Sigma[\phi] \neq \Sigma[\phi][\phi \vee \psi]$. Second, it predicts that $\phi \vee \text{ought}(\neg\phi)(\psi)$ does imply $\text{ought}(\neg\phi)(\psi)$ (similarly for *must*).⁵⁴

Proof-sketch. Suppose $\Sigma \Vdash \phi \vee \text{ought}(\neg\phi)(\psi)$. Then $\Sigma = \Sigma[\phi] \cup \Sigma[\text{ought}(\neg\phi)(\psi)]$. Consider any $S \in \Sigma[\phi]$. Since $\pi_S(\sigma_S[\neg\phi]) = \pi_S(\sigma_S[\neg\phi])[\psi] = \emptyset$, $\Sigma[\phi] \Vdash \text{ought}(\neg\phi)(\psi)$. Since $\Sigma[\text{ought}(\neg\phi)(\psi)] \Vdash \text{ought}(\neg\phi)(\psi)$, $\Sigma \Vdash \text{ought}(\neg\phi)(\psi)$. \square

As an illustration, consider the following state, which supports $p \vee \text{ought}(\neg p)(q)$. Due to its right member, it also supports $\text{ought}(\neg p)(q)$.



It is worth noting that the support relation for this semantics is one with, depending on your mood, *modal* or *super-valuational* (cf. Willer, 2013) content: Σ supports a non-disjunctive sentence when, for each alternative in that state, the alternative supports the sentence.

Modal Support, 1

For non-disjunctive ϕ : $\Sigma \Vdash \phi$ iff $\forall S \in \Sigma: S[\phi] = S$ (and $\exists S \in \Sigma: S \neq \langle \emptyset, \emptyset \rangle$)

⁵⁴This story is somewhat simplified. I favor treating sentences with a conditional meaning as introducing suppositions, à la Kaufmann (2000) (Charlow, 2011, 2013a). So $M(\neg\phi)(\psi)$ is evaluated by (a) updating the relevant domain on $\neg\phi$, (b) checking whether ψ is acceptable at this domain. Second, it would be desirable to explain not only the failure of entailment, but also the *unacceptability* of $\Sigma \Vdash M(\neg\phi)(\psi)$ when $\Sigma \Vdash \phi$. As noted above, domain restrictions (e.g., in conditional antecedents) generally presuppose compatibility with the domain (Stalnaker, 1975; von Stechow, 1998). On this picture, ϕ is *strongly incompatible* with $M(\neg\phi)(\psi)$.

The analogy to modality is evocative: an alternative's membership in a state is analogous to its accessibility. Indeed, it is natural to introduce some novel modalities — a necessity modality $[A]$ and, more interestingly, a related possibility modality $\langle A \rangle$ — that pick up on the modal import of \Vdash .

Modal Support, 2

$\Sigma \Vdash [A]\phi$ iff $\forall S \in \Sigma: S[\phi] = S$ (and $\exists S \in \Sigma: S \neq \langle \emptyset, \emptyset \rangle$)

$\Sigma \Vdash \langle A \rangle \phi$ iff $\exists S \in \Sigma: S[\phi] = S$ (and $S \neq \langle \emptyset, \emptyset \rangle$)

These modalities are interesting for two reasons. First, they illustrate vividly that it remains possible to derive *formal contradictions* by way of accounting for object-language inconsistencies between sentences expressing tests.⁵⁵

Proof. Suppose $\Sigma \Vdash M(\phi)(\psi)$ and $\Sigma \Vdash \neg M(\phi)(\psi)$. Then $\Sigma \Vdash [A]M(\phi)(\psi)$ and $\Sigma \Vdash [A]\neg M(\phi)(\psi)$. Hence $\Sigma \Vdash [A]M(\phi)(\psi)$ and $\Sigma \Vdash \neg \langle A \rangle M(\phi)(\psi)$. Contradiction.

The crucial move from $\Sigma \Vdash [A]\neg M(\phi)(\psi)$ to $\Sigma \Vdash \neg \langle A \rangle M(\phi)(\psi)$ is licensed by an earlier result that there is (on pain of contradiction) no S such that $S \Vdash \neg M(\phi)(\psi)$ and $S \Vdash M(\phi)(\psi)$. Access to canonical accounts of object-language inconsistency does not depend on supposing that the sentence or its negation expresses a proposition — something that remains true when states are understood inquisitively.

The modality $\langle A \rangle$ is interesting for another reason: with some minor tweaks to the test semantics for epistemic and deontic modals,

⁵⁵For sentences that do not contain tests — even disjunctions — inconsistency is fully standard. The inconsistency between, e.g., $(p \vee q)$ and $\neg(p \vee q)$ reduces to ordinary possible-worlds inconsistency. Suppose that $\Sigma \Vdash (p \vee q)$ and $\Sigma \Vdash \neg(p \vee q)$. Then $\Sigma = \Sigma[p] \cup \Sigma[q]$ and $\Sigma = \bigcup_{S \in \Sigma} \{S \ominus S[p \vee q]\}$. Then for $S \in \Sigma$: $S \Vdash p$ or $S \Vdash q$, and (by applying Generalized Disjunction; cf. fn52) $S \Vdash \neg p$ and $S \Vdash \neg q$. These conditions on S can be shown to be classically inconsistent using the technique of §3.4.

free-choice entailments come for free (for some detail, see Charlow, 2011, §4.4.6). Recall (19) and (21), repeated here:

(32) It might rain or it might snow \Rightarrow It might rain

(33) You may have an apple or have a pear \Rightarrow You may have a pear

On the dynamic alternative semantics for disjunction we have given, successful update on *it might rain or it might snow* yields a state Σ in which *it might rain* and *it might snow* are alternatives. Hence $\Sigma \Vdash \langle A \rangle \text{might}(\text{rain})$ and $\Sigma \Vdash \langle A \rangle \text{might}(\text{snow})$. Similarly, a state Σ' that has been successfully updated with *you may have an apple or have a pear* is such that $\Sigma' \Vdash \langle A \rangle \text{may}(\text{apple})$ and $\Sigma' \Vdash \langle A \rangle \text{may}(\text{pear})$. To secure the desired entailments, it would suffice to ensure that the following hold:

- If $\Sigma \Vdash \langle A \rangle \text{might}(\phi)$ then $\Sigma \Vdash \text{might}(\phi)$
- If $\Sigma \Vdash \langle A \rangle \text{may}(\phi)$ then $\Sigma \Vdash \text{may}(\phi)$

These things follow if possibility modals test, not for compatibility with *every* alternative, instead for compatibility with *some* alternative — if, in other words, possibility modals behave like stacked existential quantifiers ($\exists\exists$).⁵⁶ Should we wish to change the semantics in this way, the needed revisions are simple. For example:

⁵⁶The duals of possibility modals thus have a supervaluational semantics ($\approx \forall\forall$), as in Willer (2013). Contra Willer, possibility modals have a “sub-valuational” ($\approx \exists\exists$) rather than supervaluational ($\approx \forall\exists$) semantics. Willer's approach is handy if one objects to the fact that updating on a test never itself changes a state: for Willer, a possibility modality *eliminates* from a state any member that does not support it, yielding a state in which each member supports the possibility modality (hence a state that supports the supervaluational possibility modality). I think this is thin motivation for a Willer-style semantics over my own: a non-eliminative pragmatics makes good sense, as I will argue in the next section. How the accounts compare on other dimensions is a further question. I would briefly suggest that the desire to associate sentences semantically with definite updates rather than broad cognitive directives tends to result from a questionable impulse to write answers to epistemological questions about rational attitude-revision into one's semantics (more on this below). Thanks here to one of my referees.

Subvaluational Restricted Dynamic *might*

$$\Sigma[\text{might}(\phi)(\psi)] = \begin{cases} \Sigma, & \text{if } \exists S \in \Sigma : \sigma_S[\phi][\psi] \neq \emptyset \\ \{\langle \emptyset, \emptyset \rangle\}, & \text{otherwise} \end{cases}$$

Note: this will mean that some non-disjunctive updates — in particular, updates on modals — do not percolate throughout the alternatives, but rather test for *global* features of inquisitive states. I think there are solid reasons to revise the semantics for possibility modals in this way. But I will remain officially neutral on this here.⁵⁷

⁵⁷The gist, in two slogans: a permitted permission is just a permission; a possible possibility is just a possibility. This is similar in motivation to the treatment of free-choice effects proposed by Zimmermann (2000). It is interesting to note that disjunctions of necessity modals are, as promised in fn42, *predicted* to be defective in this framework. Notice first: $\text{must}(\phi)(\psi)$ will test Σ for the following property: for each $S \in \Sigma$, $\sigma_S[\phi][\psi] = \sigma_S[\phi]$. Notice further: Σ updated with $\text{must}(p) \vee \text{must}(\neg p)(q)$ will treat as alternatives tests for the following conditions: (i) for each $S \in \Sigma$: $\sigma_S[p] = \sigma_S$, (ii) for each $S \in \Sigma$: $\sigma_S[\neg p][q] = \sigma_S[\neg p]$. If Σ satisfies (i), then it satisfies (ii) but only due to rejection of the right modal's restriction (thus rendering the modal subject to presupposition failure). If Σ satisfies (ii), then it satisfies (i) only if $\Sigma = \{\emptyset\}$. Any state other than $\{\emptyset\}$ must therefore *positively reject* at least one disjunct of $\text{must}(p) \vee \text{must}(\neg p)(q)$. Disjunctions with this property — e.g. disjunctions whose left disjunct presupposes p and whose right disjunct presupposes $\neg p$ — are generally defective. (As an example: #*John realizes that the keys are on the table or he realizes that the keys are not on the table.*)

5. Expressivist Metasemantics and Pragmatics

The semantics of §4 differs from standard Expressivist semantics in declining to treat the meaning of *E*-sentences in terms of their contents (with contents understood as objects at least as fine-grained as sets of objects that behave disquotationally with respect to the connectives). Nevertheless, it manages to achieve canonical (if not classical) explanations of a fair range of facts. I think this is reason for Expressivists to be interested in this sort of semantics (and the general strategy it exemplifies). Perhaps it is also reason to acknowledge that seduction by the techniques of standard truth-conditional semantics has thwarted Expressivists' theoretical ambitions in both linguistics and the philosophy of language.

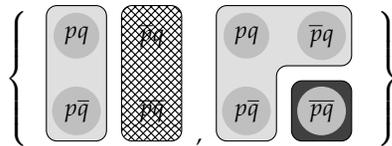
There is a further question about the semantics to which I have alluded: Is the Expressivist *entitled* to make use of it? Is it compatible with her core theoretical commitments? At first blush, the answer seems *yes*. Recall the characterization of Expressivism from §2. Expressivism's key claims are *metasemantic* (to explain an *E*-sentence's meaning, explain its function — specifically, what state of mind it is used to express) and *empirical* (the function of the sentence is non-representational). Together these claims commit the Expressivist to a nonpropositional semantics for *E*-sentences. The sort of semantics for epistemic and deontic modals I have described is nonpropositional. It seems to assign them a non-representational function. And states of mind seem to be playing a fairly central role in the theory: we evaluate sentences relative to formal representations of attitudes.

5.1 A Wrinkle

Note, however, that *psychological concreta* appear nowhere in the semantics I have sketched. States are set-theoretic constructions out of possibilities. The semantics is, then, not obviously Psychologistic in Rosen's sense (cf. §2): it does not map sentences "to the mental states they 'express' when uttered sincerely". Nor does it map sentences to contents that indirectly individuate the mental states those sentences express

when uttered sincerely (i.e., for each content, the mental state of accepting that content).

Nevertheless: the objects of semantic evaluation are obviously meant to *represent* states of mind. For instance, I have suggested that the following state represents (one way of) *accepting* $p \vee \text{ought}(\neg p)(q)$.



Since such representations are non-mental, it is actually not clear what theoretical role they are supposed to play. We defined Expressivism as a view on which states of mind are *fundamental* in the theory of meaning. If our objects of semantic evaluation are non-mental, then it looks like our semantic theory, like Gibbard’s Boolean Hyperplan Semantics, is just a collection of formally tractable heuristics for thinking about what is going on in the actually fundamental, psychological model theory. Further: on most (though, as I explain below, not all) interpretations of Expressivism, it is committed to a distinctively *Expressivist semantics*. No semantics of possibilities is proprietary to any particular theory of meaning: it is easy to imagine a (e.g.) Relativist spin on the relevant formal machinery (cf. Dreier, 1999; Silk, 2013). The “true” Expressivist semantics is Psychologistic. The semantic theory we have stated looks to have a wholly heuristic function.

It is, as ever, a live question whether the semantic theory is a *good* heuristic for thinking about what is going on in the fundamental model theory: is, e.g., the inconsistency we observe when we derive a contradiction in the semantic metalanguage (the one making use of possibilities) matched by a corresponding inconsistency in the attitudes expressed by the apparently contradictory sentences? Recall that Gibbard was able to derive contradictions in the semantic metalanguage by supposing that (i) Hyperplans behaved disquotationally, (ii) negation ex-

pressed Boolean complementation; from this it followed immediately that, e.g., supposing that $[\text{ought}(\phi)] \cap [\neg\text{ought}(\phi)] \neq \emptyset$ meant being able to derive a contradiction. But we faulted Gibbard for taking this to explain the inconsistency of $\text{ought}(\phi)$ and $\neg\text{ought}(\phi)$, since it did not tell us *what* was inconsistent about the attitudes these sentences expressed. Although we have carefully avoided making use of disquotation, isn’t our own semantics, when viewed as part of a broader Expressivist theory, in exactly this situation? Formal contradictions in a metalanguage that is taken to represent the relevant psychological facts are a poor substitute for a properly psychological account of the relevant inconsistencies (particularly if we take seriously the idea that there is no such account to be had).

The rest of this section pushes back against these claims.⁵⁸ My key contention is that endorsing the metasemantic and empirical claims that are definitive of Expressivism does not commit one to endorsing a Psychologistic Semantics — or, indeed, to thinking that any fundamental semantic notions need to be given a psychological account. *I do not think there is any such account to be had*, for the reasons given in §3 (and more besides): psychological states are not endowed with the sorts of characteristics that would allow them to underwrite properly *canonical* accounts of inconsistency, validity, and so forth. Rather, the metasemantic and empirical claims that are definitive of Expressivism only require the Expressivist to assign a semantic value to an *E*-sentence that, when embedded in a pragmatic theory linking semantic values to characteristic functions, encodes that sentence’s characteristic function. To meet this demand, the semantic theory must be non-propositional, but it need not be Psychologistic. It can, in principle, be used by a variety of

⁵⁸I give a sketch of the sort of picture I defend here in Charlow (2014c). Yalcin (2012) has a similar take on the relationship between semantics and use: “knowledge of the compositional semantic value of the sentence, together with any standing mutually known pragmatic norms and relevant facts of context, must be sufficient to determine” the property of information states determined by the semantics (142). The “Constraint Semantics” of Swanson (forthcoming) is another key antecedent for this view.

accounts of the meaning of the relevant sentence; a noncommittal semantic theory, in a sense, can (within certain limits) *become Expressivist* when couched in the right kind of pragmatics.

This is *not* to say that I think there is no Expressivist-friendly account to be given of the inconsistency of, e.g., the attitudes expressed by *ought(p)* and \neg *ought(p)* — or, more carefully, of the irrationality of having these attitudes together. When married to an account linking the semantic value of a sentence to its pragmatic profile, this irrationality can be given a fairly straightforward account: roughly, acceptance of *ought(p)* is inconsistent with acceptance of \neg *ought(p)* because the sentential objects of these attitudes express inconsistent conditions on a representation of a state of mind. (Roughly: *ought(p)* expresses the condition of having preferences representable in such a way that every preferred world is a *p*-world, while \neg *ought(p)* expresses the condition of having preferences representable in such a way that some preferred world is a *p*-world.) Crucially, however, as we have seen, this irrationality is *not used to do any work in accounting for any fundamental semantic notions*. I will say more on the attitudes shortly.

5.2 Semantics and Metasemantics

Endorsing an Expressivist metasemantics, on which states of mind are fundamental in a theory of meaning, does not commit the Expressivist to a Psychologistic Semantics.⁵⁹ To show this, it suffices to describe a coherent kind of theory in which states of mind are recognizably fundamental in the theory of meaning, but in which states of mind do no explanatory work within the semantic theory.

This is not difficult (cf. Charlow, 2014c). A familiar notion of fundamentality allows domain *D* to be explanatorily fundamental, without requiring that explanations within non-fundamental domains *reduce* to

explanations within *D*. A distinction like this is commonly used to distinguish Reductive from non-Reductive forms of Physicalism. Being a Physicalist does not require being a reductionist (or, otherwise, an instrumentalist or error theorist) about explanations within a special science like biology or psychology. Instead, it requires only the *supervenience* — better, *dependence* — of phenomena within a non-fundamental domain on phenomena within the physical domain.

I have not yet given a pragmatic account that links a sentence's characteristic function to its semantic value in the desired way. (I will shortly.) But supposing such an account is viable, it seems possible to hold that a sentence's semantic value *depends on* its characteristic function (hence that the latter is fundamental), without thereby holding that explanations within the special science of semantics reduce to explanations within the theory of its characteristic function. This latter commitment, in fact, is to be avoided.

How might a sentence's semantic value depend on its characteristic function? Here I have something relatively specific in mind: to know a sentence's semantic value is to be in a position to know which state of mind is constitutively involved in the acceptance of that sentence (hence to know what state of mind one must come to instantiate, should she come to accept the sentence). The sentence's semantic value thus depends on the state of mind constitutively involved in the acceptance of that sentence.

5.3 Pragmatics and Cognitive Directives

The test semantics of §4 declines to specify *what an agent learns* — how her state of mind changes — when she comes to accept a modal.⁶⁰

⁵⁹This sort of claim is becoming common: see Chrisman (2012b); Yalcin (2012); Silk (2013); Ridge (2014); Charlow (2014c). Though there are major differences in this camp, all take Expressivism primarily to be a metasemantic-cum-pragmatic, rather than semantic, thesis about \bar{E} -sentences.

⁶⁰I here part ways with Willer (2013). Willer — translating from his system into mine — suggests that (i) update on *might(p)* percolates a test throughout Σ , (ii) for any $S \in \Sigma$ that fails the test, S is eliminated in $\Sigma[\text{might}(p)]$, i.e., $\Sigma[\text{might}(p)] = \Sigma - \{S : S[\text{might}(p)] = \langle \emptyset, \emptyset \rangle\}$ (2013: 57–8). I have no view about what to do with a component state $S \in \Sigma$ when S fails a test percolated throughout Σ . As I will note, I am uncomfortable with writing such a rule — effectively a belief-revision rule — into the semantics of modals. (Note: I officially prefer a treatment of modality on which modals test Σ rather than

Though she surely learns something, the semantics is mum about what. The only *change* a test can yield is *catastrophic*. Insofar as pragmatics is in the business of relating an utterance to a proposed change (to a context, state of mind, etc.), it may seem difficult to give any sort of intelligible pragmatics for the test semantics we've suggested.

This is incorrect, but for an interesting reason. Consider an utterance of *might*(ϕ) that is accepted. There are two cases: (i) the prior information is compatible with ϕ , (ii) it is not. The latter is the central case — if the relevant domain already passes the relevant test, then it is not clear that one learns anything when one updates on the associated modal.⁶¹ So let us consider it. Presumably the relevant change involves making ϕ compatible with the information. This means expanding the information space, by adding at least one world to at least one of the alternatives that are considered live, thereby giving up some information

components of Σ , as in §4.3.3.)

⁶¹What of the often-noted difference between (34a) and (34b) — one naturally glossed as coming to realize that *might*($\neg\phi$)?

- (34) a. Not thinking that *must*(ϕ)
 b. Thinking that \neg *must*(ϕ)

My view is that (i) the distinction here is analogous to the weak/strong permission distinction (Anderson, 1966), (ii) this is a side-issue in the semantics of modals. Unsurprisingly, a test semantics on which modals are evaluated relative to unstructured domains — sets of possible worlds — cannot represent this distinction (see Yalcin, 2011). To remedy this, Yalcin enriches information spaces to represent the condition of treating something as an issue. (34a) says the subject's information is compatible with $\neg\phi$, while (34b) says this, *plus* that the subject treats the question $?\phi$ as a live issue. So long as we (i) imbue our representation of the relevant domain with this sort of additional structure, (ii) make the support relation for modals is sensitive to such structure, we can represent the difference between a state characterized with (34a) and one characterized with (34b). So long as support for a modal (and negated modal) still entails that the desired quantificational condition on the relevant domain is met, a quantificational account of the inconsistency between a modal and its negation is not threatened. For an application of Yalcin's idea to deontic modals, see Charlow (2011, §4.3.8). For an alternative, supervaluational approach to distinguishing between failure to support an epistemic modal and support for its negation, see Willer (2013). An idea akin to Willer's is taken up for deontic modals in Silk (2015).

previously taken for granted. In other words, the information must be *revised* in some way — a way that is presumably conservative with respect to its priors.

How, exactly, this revision will or ought to proceed is a topic for epistemology. There is no reason for the semantics or pragmatics for modals to address it (Veltman 1996, 229; Charlow 2014a, §5.6.2; Charlow forthcoming). Here, I would note only that writing substantive theories of attitude revision into an update function will effectively make any such theory a *theorem* of the semantics, precluding the possibility of semantically competent disagreement about the nature of the correct theory of rational attitude revision (see Charlow, forthcoming). The semantics and pragmatics' job is to furnish a theory associating sentences with cognitive directives — the directive to be in the state of accepting that sentence, supplemented with an account of what sort of state is involved in the acceptance of that sentence. The epistemologist subsequently furnishes a substantive theory of diachronic compliance for these directives.

5.3.1 Coordination via Approximation

What is the specific directive associated with a test-expressing sentence? To answer this question, we need a general account linking semantic values to cognitive directives: a *pragmatics*. Such a pragmatics might, at first, seem trivial. First, notice that the dynamic semantic value of any sentence corresponds directly to a property of states: the property a state has just if it supports that sentence. If $|\phi|$ notates the property of states associated with a sentence ϕ , then:

$$|\phi| = \lambda\Sigma . \Sigma \Vdash \phi$$

Given this, it would be natural to endorse the following pragmatics (for authors that do endorse something like this pragmatics, see Yalcin, 2012; Swanson, forthcoming):

Coordination Pragmatics

An utterance of ϕ by S to A is normally interpreted as a proposal by S that A psychologically approximate $|\phi|$

Psychological Approximation

A psychologically approximates $|\phi|$ iff $\exists \Sigma \in |\phi|$: A is representable with Σ

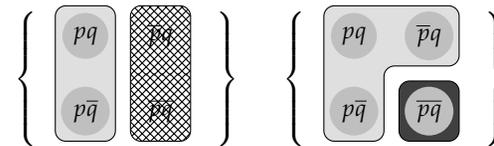
I assume, for now, that the relevant features of an agent’s state of mind are representable with inquisitive states (which are interpreted constructions out of possibilities). I also assume that agents have a tacit grasp of the relationship between our interpreted constructions out of possibilities and the psychological states that they serve to represent, in the following sense: in computing the semantic value for ϕ (and thereby computing $|\phi|$), a competent agent is thereby able to come to know what state of mind approximates $|\phi|$. For this to be so, there must of course be a regular relationship between entities like $|\phi|$ and states of mind that approximate them. I have been implicitly relying on features of this relationship in §4. I will now be explicit about what I take the relationship to be.

Representation

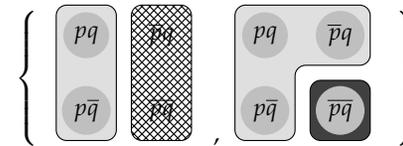
1. $\langle \sigma, \pi(\sigma) \rangle$ represents the state of mind of A wherein:
 - (a) $w \in \sigma$ iff it is compatible with A ’s information that she is in w
 - (b) $w \in \pi(\sigma)$ iff it is compatible with A ’s preferences (given σ) that she is in w
2. Σ represents A iff (i) for each non-absurd $S \in \Sigma$, A regards the state of mind represented by S as an alternative for what to think, (ii) for no $S' \notin \Sigma$, A regards the state of mind represented by S' as an alternative for what to think
3. $|\phi|$ represents the psychological property Ψ such that $\Sigma \in |\phi|$ iff Σ represents the state of an agent A of satisfying Ψ

For example, $|p|$ represents the psychological property Ψ such that $\Sigma \in |p|$ iff Σ represents the state of an agent satisfying Ψ . Ψ , then, is the property of self-locating in a p -world. More interestingly, $|p \vee q|$ represents the psychological property Ψ such that $\Sigma \in |p \vee q|$ iff Σ represents the state of an agent satisfying Ψ . Ψ , then, is the property of treating acceptance of p and acceptance of q as alternatives for what to think.

Approximation works up from component states to sets of such states (inquisitive states) to sets of inquisitive states (i.e., full-blown psychological properties). Here is an illustration. Below, the left state represents a state of A wherein A accepts p , i.e., A ’s information locates her in a p -world; the right state represents the state of A wherein A accepts $ought(\neg p)(q)$, i.e., A ’s preferences (given $\neg p$) are such that she strictly prefers any eligible q -world to any eligible $\neg q$ -world.



The following inquisitive state represents the state of A wherein A accepts $p \vee ought(\neg p)(q)$, i.e., treats p and $ought(\neg p)(q)$ as alternatives for what to think.



Finally, the set of all such inquisitive states — the set of all inquisitive states in which p and $ought(\neg p)(q)$ are treated as alternatives for what to think — gives $|p \vee ought(\neg p)(q)|$.

Approximation might at step (ii) seem to appeal to a questionable attitude — the attitude of treating something as an alternative for acceptance. In a sense, yes: so-described, this is probably not one of the stock attitudes of folk psychology. But we have good reason for thinking there are such attitudes. They are the sorts of attitudes generally thought — on fairly standard semantics for questions embedded under attitudes — to be attributed by ascriptions like (35–36):

- (35) Sally wondered whether the play began at 9pm or at 10pm
 (36) Sally wondered whether to have the red or to have the white

And if an inquisitive account of disjunction is correct — a claim with some empirical plausibility — they are also the sorts of attitudes attributed by ascriptions like (37–38):

- (37) Sally thought the play began either at 9pm or at 10pm
 (38) Sally decided to have the red or to have the white

Approximation plays a theoretical function (here, in the pragmatics) that is roughly analogous to IPR. But it differs from IPR in individuating a state of mind (e.g., accepting ϕ) *directly* — by simply reading off the psychological property represented by each member of $|\phi|$. It thus appears to sidestep at least one of the Type 2 worries associated with the content-centric forms of Expressivism (§3.3).

It is natural to wonder if it sidesteps them all. Recall the objection to Gibbard’s explanation of inconsistency between, e.g., *ought*(p) and its negation. Gibbard explains this by appeal to the fact that, on his semantics, $\llbracket \text{ought}(p) \rrbracket \cap \llbracket \neg \text{ought}(p) \rrbracket = \emptyset$. But a Hyperplanner who thinks p required and $\neg p$ permitted seems possible, in which case the semantics would appear to be representing a rational ideal without giving any account of it. Are we not in the same situation? It is true that, on our semantics, $|\text{ought}(p)| \cap |\neg \text{ought}(p)| = \emptyset$. But the state that $|\text{ought}(p)| \cap |\neg \text{ought}(p)|$ represents is possible, so our semantics too would appear to be representing a rational ideal while still failing to

account for it.

Unlike Gibbard’s account of the inconsistency of these sentences, however, ours has nothing to do with the notion that $|\text{ought}(p)| \cap |\neg \text{ought}(p)|$ represents an inconsistent state of mind. It has to do with the fact that these sentences enforce logically incompatible conditions on semantic objects of evaluation (i.e., states). States of mind do not figure in semantic explanation in our theory. Rather, they determine the semantic values that do figure in semantic explanation in our theory: the semantic theory is designed to assign to sentences semantic values that, in conjunction with Approximation, correctly individuate the states of mind those sentences conventionally express. Semantics is dependent on states of mind, but semantic explanations are *sui generis*. There remain some questions here — in particular concerning the detachability of this part of the account from the semantics of §4. I will postpone these for the moment.

5.3.2 Against Coordination

Why “coordination” pragmatics? It is natural to understand $|\phi|$ ’s psychological approximation as the state of mind a speaker *expresses* when she utters ϕ . Putting the pieces together, an utterance of ϕ by a speaker S to addressee A is normally interpreted as a proposal by S that A and S coordinate on the state of mind S expresses in uttering ϕ . Note that Coordination Pragmatics manages to associate sentences that express tests with *non-trivial directives* to update one’s state of mind, in spite of the fact that the semantics expressly does not. Epistemology then furnishes an account of how best to comply with these directives, given some description of an agent’s prior state.

Coordination via Approximation is a natural picture, and I have tried to elaborate and defend it at some length here. Nevertheless I ultimately think it is the wrong one. It does not cut things finely enough. There are a couple of different ways to appreciate this.

First, an *imperative* of the form $!\phi$ (read: *see to it that ϕ*) is plausibly interpreted as a proposal that the spheres of permissibility com-

patible with a state come to contain only ϕ -worlds — or, more generally, that the spheres of permissibility compatible with a state come to require that ϕ (for references that endorse roughly this picture for imperatives, see Lewis, 1979b; Portner, 2007; Starr, forthcomingb; Charlow, 2011, 2014a,b). But then the states that support an imperative $!\phi$ are *exactly* those that support a corresponding deontic modal *ought*(ϕ). In my view, this is the correct result; these states *are* the same: $|\!|\phi|\!| = |\text{ought}(\phi)|$ (Charlow, 2013a). But according to Coordination Pragmatics, it follows from this that imperatives and their corresponding deontic modals receive the same interpretations: both are interpreted as proposals by a speaker that the addressee approximate the property of requiring their common prejacent.⁶² That is as wrong as could be. Deontic modals are suited for many things that imperatives are not: they are *evaluable for truth* and *apt for assertion*. Imperatives are neither.

Second, notice that, when ϕ is propositional, an epistemic necessity claim of the form *must*(ϕ) and the bare prejacent ϕ are also supported by the same states, namely, those states such that updating on ϕ is redundant. In my view, this is the correct result: a state that accepts ϕ accepts *must*(ϕ), and vice versa; $|\phi| = |\text{must}(\phi)|$ (cf. von Stechow and Gillies, 2010). According to Coordination Pragmatics, it follows that they receive the same interpretations: both are interpreted as proposals by a speaker that the addressee approximate the property of accepting ϕ . This, too, I find objectionable (though for different reasons). Uttering ϕ normally asserts that ϕ , while uttering *must*(ϕ) normally does not; rather, it offers some sort of non-assertive comment on the proposition that ϕ or one's evidence for ϕ (cf. Swanson, 2005; von Stechow and Gillies,

⁶²Also potentially worrying: it is clearly not the case that a speaker who utters an imperative $!\phi$ proposes to coordinate with her addressee on the property of requiring ϕ . Coordination on planning, at least in the most obvious sense of that notion, is clearly not the point of an utterance of an imperative; it is to change the plans or goals of the addressee. I'll sidestep this, by supposing there is an extended sense of coordination, such that a speaker who utters $!\phi$ and an addressee who comes to regard ϕ as required are coordinated regarding their views about the desirability of the state of affairs in which the addressee sees to it that ϕ .

2007). In spite of this, the epistemic modal is clearly evaluable for truth, and it does function to assert; *must*(ϕ) is not, however, evaluated for truth in the way that ϕ is evaluated for truth, and it does not function to assert in the same manner that ϕ functions to assert.

5.3.3 Stage-Setting

Accommodating such distinctions means the pragmatics must recognize the difference between *enforcing* property Φ on a state (or component state) — the sort of operation performed by an imperative and utterance of a bare proposition-expressing sentence — and *checking* the state for the presence of Φ — the sort of operation performed by deontic and epistemic necessity modals.

There is a relatively clear sense in which test-expressing sentences are evaluable for truth. We have been understanding tests as updates on states, but we might just as easily have understood them as *queries* concerning the features of a state, such that a positive response to the query amounts to a judgment of truth, a negative response to a judgment of falsity. When ϕ expresses a test, the idea is that $\Sigma[\phi]$ can be understood to give, instead of the update of Σ on ϕ , rather a judgment regarding the truth (if Σ passes) or falsity (if Σ fails) of ϕ .⁶³ This suggests an enrichment of Coordination Pragmatics:

Enriched Coordination Pragmatics

1. If $[\phi]$ is not a query, an utterance of ϕ by S to A is normally interpreted as a proposal by S that A approximate $|\phi|$
2. If $[\phi]$ is a query $Qu(|\phi|)$, then:

⁶³To remain neutral on questions left open in §4.3.3, I here understand the notion of a *test* in an extended sense, so that updates that percolate a test throughout a state count as tests, express queries, and so on. A referee notes that the proposal here does not really fully *explain* why sentences expressing tests are evaluable for truth (beyond gesturing at a querying metaphor); rather, it begins with classes of obviously truth-evaluable and obviously non-truth-evaluable sentences and reverse engineers a semantic criterion that sorts them correctly. I would agree that it is important to do better here.

- (a) An utterance of ϕ by S to A is normally interpreted as an invitation by A to agree (if A approximates $|\phi|$) or disagree (otherwise)
- (b) If A disagrees with S , then S 's utterance is normally interpreted as a proposal by S that A approximate \mathcal{P}

According to Enriched Coordination Pragmatics, imperatives and corresponding deontic modals have the same *upshot*: both tend to yield coordination on the common cognitive feature expressed by each sentence. But individuating the speech act expressed by a sentence according to its characteristic upshot cuts things too coarsely. Some moves in a conversation are (what we might call) *stage-setting* moves: they set the stage for subsequent coordination, rather than proposing it directly.

Although this is speculative, it is perhaps not hard to imagine why stage-setting moves would be part of the conversational moves available to speakers of a natural language. A speaker may lack *direct* evidence for a proposition that is nevertheless *entailed* by her evidence, in which case she may want to set the stage for negotiation about the addressee's acceptance of that proposition by first inviting her addressee to agree or disagree about that proposition's truth (cf. von Stechow and Gillies, 2007). Or a speaker may wish to avoid the presumption of authority that goes along with the issuance of an out-and-out command, instead setting the stage for conversational negotiation about her addressee's adoption of a certain plan or goal by first inviting her addressee to agree or disagree about the desirability of that plan or goal.

On the view of the semantic-pragmatic interface suggested here, there is a robust pragmatic difference — matching, on our account, a robust semantic difference — between, on the one hand, utterances of epistemic and deontic modals and, on the other hand, utterances of bare propositions and imperatives.⁶⁴ Further, these differences seem to

⁶⁴Since evaluability for truth is not just a syntactic feature of a sentence — it is, rather, grounded in its semantic and pragmatic profile — the account also seems well-suited to dealing with Dreier's Hiyo problem (Dreier, 1996).

at least offer the hope of making sense of the platitude that epistemic and deontic modals are evaluable for truth (hence go in for assertion).

5.4 *Fundamentality*

So far we have (i) a general argument for the possibility of a theory of meaning in which a sentence's semantic value depends on its characteristic function (§5.2), and (ii) an account of the pragmatic profile of sentences that have tests as their semantic values (§5.3). In what sense might the semantic values of sentences that express tests be dependent on their pragmatic profiles?

Here I can imagine various things someone with Expressivist sympathies might naturally say. I will say only one. (Someone without those same sympathies is, I stress, free to say none.) The *primary job* of the semantic theory for a sentence is to encode that sentence's pragmatic profile. The **primary characteristic** of a sentence ϕ 's pragmatic profile is the state of mind it engenders coordination around — the state of mind we might say it expresses. The semantics of §4 encodes this as $|\phi|$. A **secondary characteristic** of a sentence's pragmatic profile is the manner in which it normally expresses this state of mind, whether by directly proposing coordination around that state of mind (as with bare propositions or imperatives) or by setting the stage for negotiation between speaker and addressee about whether to coordinate around that state of mind (as with modals). The semantics of §4 encodes this too, at the level of the *type of update function* assigned by $[\cdot]$ to ϕ : a non-querying intersective update (bare propositions and imperatives) or a querying non-intersective update, i.e., a test (modals).⁶⁵

⁶⁵Someone with Expressivist sympathies might cite the ability of a test semantics to make these sorts of fine-grained distinctions between the pragmatic profiles of, e.g., imperatives and deontic modals as a motivation for the test semantics. Conversely, someone, like Veltman, who cites the ability of a test semantics to make these sorts of fine-grained distinctions as a motivation for the test semantics (cf. §4.1) is arguably betraying evidence of Expressivist sympathies (since they would be evincing a commitment to the idea that the primary job of the semantic theory for a sentence is to encode that sentence's pragmatic profile).

As I mentioned, there remains a question about the detachability of the account I have sketched in this section from the semantics of §4. Consider a broadly “static” or “truth-conditional” version of this semantics that — rather than assigning sentences updates as semantic values — evaluated sentences as follows (cf. Yalcin, 2007, 2011, 2012; Klinedinst and Rothschild, 2012; Rothschild and Yalcin, forthcoming):

Staticized Dynamic Semantics

1. $\llbracket p \rrbracket^{w,\Sigma} = 1$ iff $p \in w$
2. $\llbracket \neg\phi \rrbracket^{w,\Sigma} = 1$ iff $\llbracket \phi \rrbracket^{w,\Sigma} \neq 1$
3. $\llbracket \phi \wedge \psi \rrbracket^{w,\Sigma} = 1$ iff $\llbracket \phi \rrbracket^{w,\Sigma} = \llbracket \psi \rrbracket^{w,\Sigma[\phi]} = 1$
4. $\llbracket \phi \vee \psi \rrbracket^{w,\Sigma} = 1$ iff $\llbracket \phi \rrbracket^{w,\Sigma} = 1$ or $\llbracket \psi \rrbracket^{w,\Sigma[\neg\phi]} = 1$
5. $\llbracket M(\phi)(\psi) \rrbracket^{w,\Sigma} = 1$ iff $\Sigma \Vdash M(\phi)(\psi)$ (\Vdash as defined above)

On such an account, acceptance of ϕ is naturally individuated, not via $|\phi|$, rather via $\llbracket \phi \rrbracket = \{\langle w, \Sigma \rangle : \llbracket \phi \rrbracket^{w,\Sigma} = 1\}$.⁶⁶ This style of Expressivism is, thus, broadly traditional in its individuation of attitudes by way of contents — sets of pairs of type $\langle w, \Sigma \rangle$ that behave disquotationally with respect to the connectives — via, one would guess, IPR. It is non-traditional in taking (at least potentially) the role these contents play in semantic explanation to be sui generis: Expressivism’s distinctness is taken to lie not in psychologistic explanations of semantic phenomena, rather in grounding its account of a sentence’s semantics in primary and secondary characteristics of its pragmatic profile.

Does this blend of traditional (Content Expressivism) with non-traditional (non-Psychologism) pass muster? No. Individuating attitudes in this way, via IPR (and a broadly Hintikkan understanding of

⁶⁶Or, a truth-conditional account can individuate acceptance of ϕ with $|\phi|$, as defined in Approximation. (Note that this means giving up the disquotational clauses here. For example, Clause (iv) needs to be replaced with a Σ -sensitive semantics for disjunction: $\llbracket \phi \vee \psi \rrbracket^{w,\Sigma} = 1$ iff $\Sigma \Vdash \phi \vee \psi$, as defined above.) This is quite close — approaching notational variance — to the view I’ve stated. Notice, however, that it will be hard to represent a distinction in meaning between imperatives and deontic necessity modals without distinguishing between different ways of updating a state.

the relevant attitude), whether via the relatively less-sophisticated semantics of §3.3, or the state-based semantics of §4, is just an *explanatory dead-end*. To flesh this out: Schroeder has objected to Expressivistic theories of meaning because the meanings their semantic theories assign to sentences outrun any corresponding psychologistic interpretation.

[O]nce we take the expressivist plunge and hold that believing that P and believing that Q are two quite different kinds of state of mind, no formal trick gets us off the hook for saying what it is to believe that $P \vee Q$. Plausibly, it can’t be just the same kind of state as believing that P , and it can’t be just the same kind of state as believing that Q . But as we’ve seen, it can’t just be the state of either believing that P or believing that Q , either... Saying what this state is, is a philosophical problem [for the Expressivist]. (2011a: 14)

I see no way for Content Expressivism to give a constructive story about the states of mind living at the theory’s fundamental level. The version of the theory considered here does improve on the one critiqued in §3: it does not insist that semantic explanations be given in (or reducible to explanations within) a psychological model theory. But, so long as attitude-individuation goes by way of IPR, the characteristics of the psychological entities living at the theory’s fundamental level remains obscure (see §3).

By contrast, the view I have defended does give a constructive story about the nature of the states of mind living at the theory’s fundamental level: given a sentence ϕ , it is the psychological state Ψ such that $\Sigma \in |\phi|$ iff Σ represents a state of an agent A wherein A satisfies Ψ (where this is in turn understood via Approximation). Speaking roughly, it is the psychological characteristic that *all and only the members of $|\phi|$ represent*. A similar strategy fails for the Content Expressivist. On pain of identifying the wrong psychological characteristic, the Content Expressivist cannot say that the psychological characteristic extracted from the members of $\llbracket \phi \vee \psi \rrbracket = \{\langle w, \Sigma \rangle : \llbracket \phi \rrbracket^{w,\Sigma} = 1 \text{ or } \llbracket \psi \rrbracket^{w,\Sigma[\neg\phi]} = 1\}$ is the psychological characteristic that all and only those members share, i.e., accepting ϕ or ψ (given $\neg\phi$) (see §4.3.1). Nor can she say that the psychological characteristic extracted from

the members of $\llbracket \neg\phi \rrbracket = \{\langle w, \Sigma \rangle : \llbracket \phi \rrbracket^{w, \Sigma} \neq 1\}$ is the psychological characteristic that exactly those members share, i.e., failing to accept ϕ .

There is more to be said — in particular, about the nature of an attitude like treating $\{A_1, \dots, A_n\}$ as alternatives. Here I have not said much, beyond relying on our intuitive understanding of attributions of inquisitive states of mind. This is a topic ripe for work in the philosophy of mind and natural language semantics (for a promising start, see Friedman, 2013). For now, though, I would say this: in divorcing the semantic theory for a sentence ϕ from the (fundamental) theory of ϕ 's pragmatic profile, we free ourselves to explore ϕ 's semantic characteristics in the absence of a complete (or even well-understood) account of ϕ 's pragmatic profile (in particular, of the state of mind that approximates $|\phi|$). Similarly, given a commitment to non-reductive physicalism, evolutionary biologists can ply their trade with a clear conscience, even in the absence of any account (or, indeed, understanding) of the physical correlates of the phenomena in which they are interested.

In the course of semantic theorizing, Expressivists, of course, incur psychological commitments (to the *existence* of corresponding psychological states) that, *if false*, would render Expressivism about the target fragment unacceptable. Expressivists, for instance, are committed to the existence of the state of mind accepting a mixed disjunction (and, moreover, to the notion that this state of mind cannot be fully understood as the attitude of acceptance toward a proposition — that the state of mind is not representational). Expressivists should take care, then, that their semantics (and their understanding of the semantics-pragmatics interface) is not leading them to incur evidently absurd psychological commitments. But Expressivists, qua semantic theorists, are under no obligation to *vindicate* these psychological commitments in order to be productive participants in natural language semantics. Insofar as Expressivists can credibly claim to be opening up new vistas in semantic theorizing — something that seems increasingly to be the case — their psychological commitments should be regarded with some indulgence. A semantics, whether Expressivist or not, should be judged in the way a semantics is always judged: according to (and only

according to) its predictions about the semantic profile of sentences of the target fragment. Expressivists who heed this paper's advice should be welcomed into the fold of natural language semantics.

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