A bridge from semantic value to content[*]

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A common view relating compositional semantics and the objects of assertion holds the following: Sentences ϕ and ψ expresses the same proposition (in a context) iff ϕ and ψ have the same modal profile (in context). Following Dummett (1973), Evans (1979), and Lewis (1980), Stanley (1997) argues that this view is fundamentally mistaken (and thus blocks Kripke's modal objection to descriptivism). According to Dummett, we must distinguish the semantic contribution a sentence makes to more complex expressions in which it occurs from its assertoric content. Stojnić (this volume) insists that views which distinguish the roles of content and semantic value must nevertheless ensure a tight *connection* between the two. But, she contends, there is a crucial disanalogy between the views that follow Lewis and the views that follow Dummett. Stanley's Dummettian view is argued to contain a fatal flaw: On such views, there is no way to secure an appropriate connection between semantic value and a theoretically motivated notion of assertoric content. I will review the background issues from Dummett, Evans, Lewis, and Stanley, and provide a principled way of bridging the gap between semantic value and a theoretically motivated notion of assertoric content.

1   Dummettian background

Michael Dummett's seminal 1959 paper "Truth" is a rich blend of Fregean themes with, among other issues, anti-realism, verificationism, and the theory of meaning. Within this mix is Dummett's discussion of the nature of assertion, and the upshot for bivalence. Without trying to unpack how all these themes relate, I will rehearse one of the lessons Dummett takes from the discussion of assertion. And then briefly comment on how this Dummettian lesson was endorsed, adapted, and eventually implemented in the early two-dimensionalist views associated with Evans, Davies, and Humberstone.

Dummett insists that reflection on *assertion* reveals that there is a single aim of assertion. And thus, the general purpose of assertion establishes the binary assignments of *truth* and *falsity*. To motivate this Dummett considers an analogy with winning and losing a game. A theorist of games might describe all the initial positions, all the permissible moves, and all the resulting final positions of a particular game. Further she might distinguish between two classes of final positions: W and L. But even given this complete description of the internal mechanics of the game crucial information is still lacking, namely what final positions a player is to *aim* at.


> It is part of the concept of winning a game that a player plays to win, and this part of the concept is not conveyed by a classification of the end positions into winning ones and losing ones. (Dummett 1959: 142)

Classifying statements as *true* and *false* (and perhaps *neither*) is likewise lacking without an account of the general point of assertion. For Dummett the point of assertion is to exclude various possibilities—that is, the point is to divide logical space into two: the possibilities left open and the rest.

> A statement, so long as it is not ambiguous or vague, divides all possible states of affairs into just *two* classes. For a given state of affairs, either the statement is used in such a way that a man who asserted it but envisaged that state of affairs as a possibility would be held to have spoken misleadingly, or the assertion of the statement would not be taken as expressing the speaker's exclusion of that possibility. If a state of affairs of the first kind obtains, the statement is false; if all actual states of affairs are of the second kind, it is true. It is thus *prima facie* senseless to say of any statement that in such-and-such a state of affairs it would be neither true nor false. (Dummett 1959: 150)

In this way, the content of an assertion (i.e. the sense of a statement) is determined by the way it divides the space of possibilities into the situations in which it is true and the rest. In others words, the content of an assertion is its *truth-conditions*.

Perhaps surprisingly, this picture seems to rule out truth-value gaps by fiat.[1] But truth-value gaps also seem to be needed to explain the embedding behaviour of certain sentences. To take a classic example discussed by Dummett, consider sentences involving definite descriptions. According to Dummett a statement such as 'The F is G' divides possibilities into two as follows:


$\exists!x(Fx \land Gx)$ | $\neg\exists!x(Fx \land Gx)$
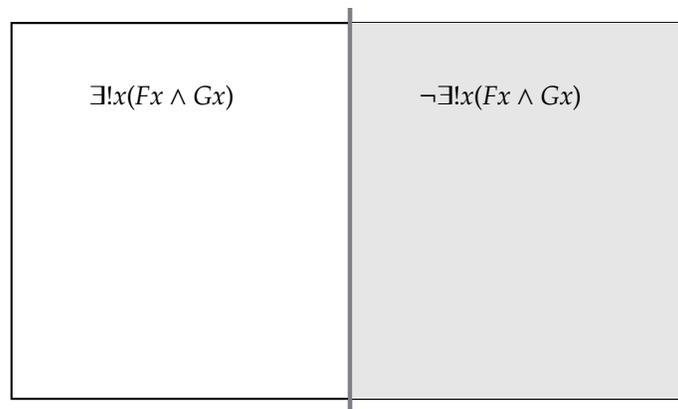
Thus, the statement 'The F is G' has the same content as its Russellian expansion '$\exists!x(Fx \land Gx)$'. But there is a well-known worry for such a view: the two sentences that are supposed to have the same sense don't seem to embed the same under negation. Consider embedding (1) and (2), which allegedly have the same sense, under negation:

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[1] See Shaw (2014) for a detailed and helpful discussion of the nature of assertion and Dummett's argument against truth-value gaps. See also the brief summary in Humberstone (1998), Section 4.

(1)   The king of France is bald.   [not true]

(2)   There is a unique King of France and he is bald.   [not true]

(3)   *not*: The king of France is bald.   [not true]

(4)   *not*: There is a unique King of France and he is bald   [true]

Since (3) is not true, while (4) is we have a case of sentences with the same content embedding differently under negation! Since this would constitute a violation of compositionality, it seems we ought to conclude that that content concerns more than just dividing the possible states into two in such a manner.

   Since Dummett thinks the binary structure of content follows from general consideration on the nature of assertion, he doesn't think this can given up. The lesson is something else. Dummett concedes that (1) and (2) embed differently under negation, and thus they must differ semantically. But he doesn't think this is in conflict with his claim that the sense of a statement is determined by its truth-conditions. There is, in a sense, different ways that a statement can be true or false (cf. Dummett 1959: 154), e.g. a statement such as 'the F is G' might be false because there just is no unique F, or on the other hand, it might be false because there is a unique F but it is not G.
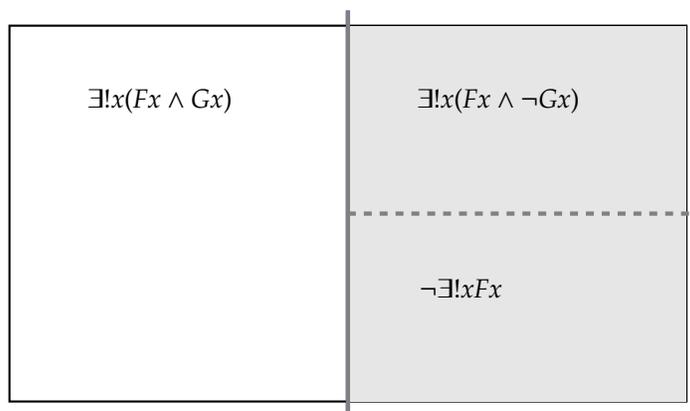
While these further distinctions among the possibilities in the right-hand side of the space may have semantic import they have no impact on the bivalent structure of assertoric content. Dummett insists,

> The point of such distinctions does not lie in anything to do with the sense of the statement itself, but has to do with the way in which it enters into complex statements. [...] The sense of a sentence is determined wholly by knowing the case in which it has a designated value and the cases in which it has an undesignated one. Finer distinctions between different designated values or different undesignated ones, however naturally they come to us, are justified only if they are needed in order to give a truth-functional account of the formation of complex statements by means of operators. (Dummett 1959: 154-157)

For example, we might provide a compositional semantics according to which sentence (1) and (2) are associated with different functions from possibilities to values in a three-valued domain.

	w_1	w_2	w_3	w_4	w_5	...
The KoF is bald	1	0	.5	1	.5	...
$\exists! x(Kx \wedge Bx)$	1	0	0	1	0	...

And we could provide the Kleene semantics for negation in a three-valued setting so that:

$\neg$	
1	0
.5	.5
0	1

This would provide an account of the difference in the projection behaviour of (1) and (2). But Evans—discussing just this example and echoing Dummett—insists:

> Nevertheless, it would be a great mistake to conclude from the fact that they are associated with different [semantic values], that the two sentences have different contents, or say different things. (Evans 1979: 177)

That is, one can still insist that the assertoric contents of (1) and (2) are the same, since they divide the space of possibilities into the true (designated value) versus the rest (the undesignated values) in the same way:

	w_1	w_2	w_3	w_4	w_5	...
The KoF is bald	1	0	.5	1	.5	
$\exists! x(Kx \wedge Bx)$	1	0	0	1	0	

This distinction between the values required for the semantics of complex expressions versus the content of an assertion is what Dummett later labeled the *ingredient sense* and *assertoric content* distinction. Here is how Dummett explains the distinction in a later work:[2]

> The assertoric content of a sentence is what is conveyed by an utterance of it on its own to make an assertion—what is added to the picture of the world of a hearer who accepts the assertion correct. But it is a fallacy, committed by Frege and by many others, to infer from two sentences' having the same assertoric content that they are equivalent... For the assertoric content of a sentence does not exhaust its meaning. It also has an *ingredient sense*, which determines the contribution it makes to the sense of a more complex sentence of which it is a subsentence. The identity of the assertoric contents of two sentences by no means implies that they have the same ingredient sense. (Dummett 2007: 179)

In his 1979 "Reference and contingency" Gareth Evans explicitly applies Dummett's distinction between content and ingredient sense to modality and Kripke's alleged cases of the contingent a

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[2]Earlier he introduced it, in the often quoted passage, as follows: "We must distinguish... between knowing the meaning of a statement in the sense of grasping the content of an assertion of it, and in the sense of knowing the contribution it makes to determining the content of a complex statement in which it is a constituent: let us refer to the former simply as knowing the *content* of the statement, and to the latter as knowing its *ingredient sense*." (Dummett 1973: 447)

priori (Kripke 1980). Evans employed Dummett's distinction as a kind of defense of the descriptive theory of names against Kripke's attack.[3]

It's illuminating to see the distinction put to use in this familiar setting. The relevant descriptivist view is the view that a definite description "gives the meaning" of a proper name—as opposed to the weaker view that a definite description merely "fixes the reference" of a proper name (see Kripke 1980: 55–60). On this view the semantic content of a proper name is the same as the semantic content of a definite description. So for example, an utterance of "Shakespeare was born in Stratford-upon-Avon" says the same thing as an utterance of "The author of Hamlet was born in Stratford-upon-Avon".

Kripke's modal argument concerns the substitution of names and definite descriptions in modal contexts. Since proper names are rigid designators, whereas definite descriptions, in general, are not, they cannot be substituted for each other in modal contexts *salva veritate*. Consider the following sentences.

(5)   Shakespeare might not have been Shakespeare.

(6)   Shakespeare might not have been the author of Hamlet.

Assume the descriptivist view that the semantic content of 'Shakespeare' and 'the author of Hamlet' are the same. Then the semantic content of (5) is the same as the semantic content of (6). But while sentence (5) does not have a true reading, sentence (6) clearly does (e.g. Shakespeare might have died from tuberculosis at the age of eleven). Thus, the descriptivist view is mistaken and the contents of 'Shakespeare' and 'the author of Hamlet' must differ.

To explicate Evans' response to this style of argument its helpful to introduce Evans' notion of a *descriptive name*: A descriptive name is a name whose reference is fixed by description. To use the Wittgensteinian metaphor, the reference-fixing description of a descriptive name *says* what the referent is and thereby *shows* its sense. For example, assume that exactly one person invented the zip fastener, and consider the reference-fixing stipulation (D).

(D) Let us use 'Julius' to refer to whoever invented the zip.

In uttering (D) we introduce the name 'Julius' and stipulate that it refer to the inventor of the zip (whoever that is). Given this stipulation it seems that one could use either of the following sentences to communicate who it was that invented the zip.

(7)   Julius is Whitcomb Judson.

(8)   The inventor of the zip is Whitcomb Judson.

In other words, given stipulation (D) it seems that utterances of the sentences (7) and (8) would say the same thing (or express the same proposition). But now if we look at how these sentences embed in a modal environment, we see a difference.

(9)   Necessarily, Julius is Whitcomb Judson.

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[3]The similar arguments from Kripke (1972) are discussed in an appendix to chapter 5 of Dummett (1973) and Dummett here provides a few important lines of defense—most notably the related wide-scope defense, which can be construed as implicitly employing the content and ingredient sense distinction. The distinction is explicitly appealed to as a reply to Kripke (1980) in Dummett (1991). This book was based off of the 1976 William James Lectures, so it's not clear at what point this line of defense actually occurred to Dummett.

(10) Necessarily, the inventor of the zip is Whitcomb Judson.

Sentence (9) says that it is necessary that *Julius*—the inventor of the zip (i.e. Whitcomb Judson)—is identical to Whitcomb Judson. And that's true. There are many properties that Judson could have lacked but being identical to himself is not one of them. Sentence (10), instead, says that it is necessary that the inventor of the zipper be Judson. And that is clearly false, since being the inventor the zip is merely contingent property of Julius. (In the Kripkean jargon: since 'Julius' is rigid while 'the inventor of the zipper' is not, the embedded sentences have different modal profiles.) So it seems that contrary to our initial impression the embedded sentences (7) and (8) must express different propositions.

  Thus we have a puzzle: On the one hand sentences (7) and (8) seem to have the same meaning given stipulation (D), but given that they embed differently under modal operators they can't have the same meaning. At this point Evans insists on Dummett's distinction, he says:

> I hold that the two sentences [i.e. (7) and (8)] do have the same content, despite their modal differences (*ibid.*: 187, footnote 10)

> . . . sentences with the same content might embed differently inside the scope of modal operators (*ibid.*: 177)

> It does not follow from the fact that one who utters the sentence '*a* is F' says that the ϕ is F, that the sentences '*a* is F' and 'The ϕ is F' will embed inside modal operators in the same way. (Evans 1979: 208)

Evans insists that there is no problem with the idea that the name 'Julius' is equivalent in meaning (in some important sense) with description 'the inventor of the zipper'—even though one is rigid and the other isn't.

  To reiterate: From the fact that (5) and (6) differ in truth value, Kripke infers that the embedded unmodalised sentences 'Shakespeare is Shakespeare' and 'Shakespeare is the author of Hamlet' have different contents—and thus 'Shakespeare' and 'the author of Hamlet' differ in content. According to Evans this is a mistake. Kripke's considerations concern failures of substitution, so they merely reveal certain constraints on ingredient sense—and from this one cannot directly infer a conclusion about assertoric content. Just as one shouldn't conclude that 'the F is G' and '$\exists!x(Fx \wedge Gx)$' express different propositions given the diverse ways they embed under negation operators, the descriptivist theory of the assertoric content of names cannot be refuted by appealing to the diverse embedding behavior of names and descriptions under modal operators.[4]

  Davies and Humberstone's 1980, "Two notions of necessity" develops these Dummettian themes further, and supplements Evans' discussion with a formal system and model-theoretic semantics (the system $S5A\mathscr{F}$).[5] For Evans the statement 'Julius is the inventor of the zip' is *deeply*

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[4]Dummett (1991) pushes essentially the same criticism of Kripke's argument: "The word 'proposition' is treacherous. What the two unmodalised sentences share is a common assertoric content; if Kripke is right about the modalised sentences with 'might have', the unmodalised sentences differ in ingredient sense, being (logically) subsentences of the modalised ones. The difference between them lies *solely* in their different contributions to the sentences formed from them by modalisation and negation; in a language without modal operators or auxiliaries, no difference could be perceived" (Dummett 1991: 48).

[5]In Oxford's Hilary Term of 1976 Lloyd Humberstone read a paper to the Semantics Discussion Group called "Ingredient sense and assertive content", where he applied Dummett's distinction to issues in metaethics—the discussion foreshadows

necessary (since its epistemically equivalent to 'the inventor of the zip is the inventor of the zip') but its not *superficially necessary* (given the way it embeds under 'necessarily'). Davies and Humberstone provide "a formal rendering" of these two notions of necessity and with it a characterisation of Dummett's distinction.

> . . . just as it is possible to characterize the notions of deep and superficial necessity and contingency in terms of the truth of sentences of the language of $S5A\mathscr{F}$ . . . so a similar characterization of the relations of sharing assertive content and sharing ingredient sense falls out if . . . shaken a little. (Davies and Humberstone 1980: 25)

Thus, there is a direct line of influence from Dummett (1959; 1973) and Evans (1979) through Davies and Humberstone (1980) to the contemporary "two-dimensionalists" such as Chalmers (2006). The different strands of two-dimensionalist thought have been implemented in various ways but perhaps at the core is the idea that there is one kind of sentential meaning that is the object of assertion or belief or knowledge, while there is also a second kind of sentential meaning that accounts for embedding behavior—sentences that are equivalent in terms of meaning$_1$ can nevertheless embed differently under certain operators given that they differ in meaning$_2$.

2   Semantic value and propositional content

Around the time that Evans, Humberstone, and Davies were applying Dummett's distinction to Kripke's detachment of epistemic modalities from metaphysical modalities, Lewis and Kaplan were having a disagreement over the role of assertoric content in semantic theory. Lewis ended up insisting on a distinction between semantic value and content. This distinction was motivated essentially by considerations involving the interaction of compositionality and assertoric content, and thus arguably coincides with Dummett's sense/content distinction.[6] But the discussion from Lewis comes at it from a different angle, so it is worth rehearsing the basic motivations and Lewis' resulting picture.

The background issues concern the appropriate semantic frameworks for intensional and context-sensitive languages. Kaplan's highly influential work "Demonstratives" (1989) incorporates and further develops on pioneering work such as Montague (1968), Scott (1970), and Lewis (1970). But Kaplan made some unique choices along the way in developing his framework. For example, Kaplan took issue with the notion of a "point of reference" employed by early theorists, claiming that it blurred an important conceptual difference between the "context of utterance" and the "circumstance of evaluation". Contexts play a content-generating role—resolving context-dependence in order to determine what's said—and indices play a content-evaluating role—they're

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the contemporary literature on embedding objections to expressivism (e.g. Yalcin 2017). Much of this material was incorporated into the last section of "Two notions of necessity" (1980).

[6]It is unclear to what extent Evans connected Lewis' distinction with Dummett's. What are the historical connections between Lewis' "Index, context, and content" and Evans "Reference and contingency"? What I know for sure is this (i) Evans doesn't cite Lewis, and Lewis doesn't cite Evans (nor Dummett), (ii) in the acknowledgements to "Index, context, and content" Lewis does thank Evans (among others) for "valuable discussion of the material in this paper", (iii) Evans' "Does tense logic rest on a mistake", completed in the spring of 1979 but published as Evans (1985), cites an unpublished version of Lewis' "Index context and content" presented in 1977 at Uppsala University, (iv) in a 1979 (May 25) letter Lewis writes to Evans critically discussing the "tense logic paper", and Lewis mentions that his "Uppsala paper" will soon appear in a collection (Box B-000664, Folder 19 from the David Lewis Papers (C1520)). See McIntosh (2014) for discussion of the connection between Evan's tense paper and Dummett's distinction.

the things of which what's said is either true or false. According to Kaplan, this two-step procedure is crucial, since a central task of a semantic theory is to tell us what sentences *say* in various contexts—what propositions or pieces of information do they express in a given context.[7] Lewis agreed that "[c]ontexts and indices will not do each other's work" (Lewis 1980: 89), thus the framework developed in Lewis (1980) shares many structural features with Kaplan's picture. In fact it is now common for theorists to adopt a "Kaplan-Lewis"-style semantic framework that relativises extension to two main parameters—a context and an index—where the context includes the parameterisation required to handle context-sensitivity in the language and the index includes the parameterisation required for intensional displacement.

But the formal analogies between Lewis' and Kaplan's pictures obscure some crucial differences. In fact, it is highly misleading to speak of "Kaplan-Lewis" frameworks, given that their preferred frameworks harboured some major disagreements. For one, Lewis insisted that the two-step procedure isn't theoretically motivated—he contends that an equally good option is just to evaluate at both a context and index in one-step. The disagreement on this point stems from a much more fundamental disagreement concerning the role of assertoric content in the semantic theory. A helpful way of bringing out the disagreement here is to consider the so-called "operator arguments".

For Kaplan the content of an expression is compositional: "the Content of the whole is a function of the Content of the parts" (507). And he understands the content of a sentence to be the object of various sentential operators. Thus, contents are constrained depending on the operators of the language, to be the right semantic type to enter into compositional relations with those operators. It is for these reasons, that Kaplan is led to endorse *temporalism* about propositions—the view that propositions can vary in truth value across times. Kaplan insists that contents cannot be specific with respect to time, since if they were this would give the wrong result for the the compositional semantics of temporal operators.[8]

> If we built the time of evaluation into the contents. . . , it would make no sense to have temporal operators. . . . Temporal operators applied to eternal sentences (those whose contents incorporate a specific time of evaluation) are redundant. . . . intensional operators must, if they are not to be vacuous, operate on contents which are neutral with respect to the feature of circumstance the operator is interested in. (Kaplan 1989: 503-504)

For example, consider a sentence in the present tense and past tense:
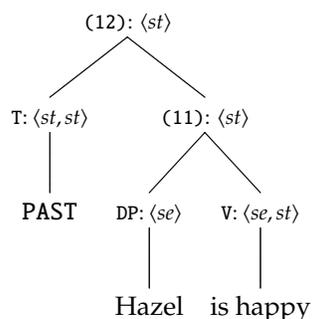
(11)   Hazel is happy.

(12)   Hazel was happy.

A common strategy, historically, for analysing the past tense sentence (12) is to construe it as built up from the past tense operator 'PAST' applied to the present tense sentence (11) (see Prior 1968a:

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[7]It should be noted that Kaplan's character/content distinction is importantly different than Dummett's sense/content distinction. Kaplan insists that the content of a sentence is determined by the contents of its parts, thus it is always the content (not the character) of an expression which determines the contribution it makes to the content of a more complex sentence of which it is a constituent.

[8]Tichý makes a similar plea for temporal propositions as follows: "As has been recognized by leading tense logicians, the first step on the way to understanding temporal discourse is to liberate oneself from the received dogma that truth is timeless. If truth were atemporal, tenses would be idle. . . Tenses can only make a difference if what is true at one time may be false at other times and vice versa. And since it is propositions which may be true or false, what must be recognized is that the truth-value of a proposition depends, in general, on time" (Tichý 1980: 343).

7-8). Since, 'PAST' is an operator that maps sets of times to sets of times, its argument, which is the semantic value of (11) must be a set of times.[9] Thus, simplifying a bit, we have the following structure and assignment of semantic types for the past tense sentence (where the types s, t, and e are for time, truth-value, and individual, respectively):

$$
\begin{array}{c}
(12): \langle st \rangle \\
\diagup \qquad \diagdown \\
\text{T}: \langle st, st \rangle \qquad (11): \langle st \rangle \\
| \qquad \diagup \quad \diagdown \\
\text{PAST} \quad \text{DP}: \langle se \rangle \quad \text{V}: \langle se, st \rangle \\
| \qquad | \\
\text{Hazel} \quad \text{is happy}
\end{array}
$$

The semantic type of (11) which occurs as a constituent of (12) is shown to vary in truth-value across times. Kaplan concludes from this that "what is said", i.e. the content of an assertion, is the type of thing that can vary in truth value across times. This is a standard argument for propositional *temporalism*. Breaking down the argument into its two main premises and conclusion we have the following.[10]

>   SENTENTIALITY: There is a sentence Ψ that is syntactically constituted by a temporal operator T plus a subordinate sentence Φ.

>   SHIFTINESS: In the semantic composition T evaluates the truth of its complement clause Φ at various indices shifted along the temporal parameter (nontrivially).

>   TEMPORALISM: Thus, the semantic content of the sentence Φ varies in truth value across a temporal parameter.

It may seem that Lewis (1980) agrees with, and in fact provides his own version of, the operator argument, when he says the following:

>   Often the truth (-in-English) of a sentence in a context depends on the truth of some related sentence when some feature of the original context is shifted. 'There have been dogs' is true now iff 'There are dogs' is true at some time before now. ... In such a case, it may be good strategy for a compositional grammar to parse one sentence as the result of applying a modifier to another:

>   'There have been dogs' = 'It has been that...' + 'There are dogs'

>   Then if the semantic value of the first sentence ... is to be determined by the values of constituents, then the value of the second sentence must provide information about how the second sentence varies in truth value when the relevant feature of context is shifted. (Lewis 1980: 84)

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[9] And it can't be the set of all times nor the empty set or else 'PAST' would map the value of any co-extensional sentences at a time to the same values, which would render 'PAST' a truth-functional operator.

[10] See Cappelen and Hawthorne (2009), chapter 3, for a more detailed regimentation of the operator argument. See also the helpful discussion in Weber (2012).

But to construe Lewis as endorsing the operator argument for propositional temporalism would greatly misconstrue the situation. Unlike Kaplan, Lewis didn't build into his semantic framework an identification between assertoric content and sets of indices (i.e. semantic values in a context), so while Lewis does take such consideration from compositionality to, of course, yield a conclusion about the *semantic values* of sentences, he explicitly doesn't take it to yield a conclusion about propositional *content*.

For Lewis, assertoric content is a post-semantic notion. He concedes that "we can assign propositional content to sentences in context" and that "propositions have an independent interest as suitable objects for attitudes such as belief, and [illocutionary acts]" (37), but he doesn't identify content with semantic values (in context). Lewis doesn't equate sets of indices with propositional content because he doubts that one type of semantic entity can play both the role set out for content and the role set out of semantic value. In particular, he worries that the parameters that will be required in the indices to provide an adequate compositional semantics might result in sets of indices that are unfit to play the content role.[11] Yalcin provides a nice summary of Lewis' worry as follows:

> It is possible that, owing to the operators the language in question contains, the semantic value of a sentence relative to context must be some complicated intension, variable with respect to an array of parameters—say, parameters for world, time, location, standard of taste, orientation, standard of precision, state of information, etc. The details here will be a contingent matter concerning the particular architecture of the language in question. It has to do with what expressions (if any) are best semantically modeled as intensional operators. (Yalcin 2014: 23)

If there is no *a priori* constraint on semantic theorizing that a single type of entity plays both the content and semantic value roles, we should not be worried when the demands of compositional semantics shape sentential "meaning" in a way that is different from our preferred account of propositional content. Nevertheless, the things we say and the meanings of our words stand in a intimate and theoretically important relationship. After all, we utter words with certain meanings (and certain syntax) in order to say the things we say. This platitude, Lewis insists, does not call for the *identification* of the two notions—all it calls for is that the propositional content of a sentence in a context should be systematically *determined* by its semantic value in a context. Lewis states:

> It is enough that the semantic value of a sentence in context should somehow determine the assignment of propositional content. And it does. . . (Lewis 1980: 37-38)

And Yalcin echoes this point as follows:

> It would suffice if sentential semantic values plus context can (often enough) systematically determine the relevant contents, in some way mutually known by competent speakers. That is, it would suffice if there were commonly known pragmatic (or 'postsemantic') bridge principles indicating how an item of informational content is to be recovered, given an input context and sentential semantic value. (Yalcin 2014: 24)

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[11]In this often quote passage Lewis states: "It would be a convenience, nothing more, if we could take the *propositional content* of a sentence in a context as its *semantic value*. But we cannot. The propositional contents of sentences do not obey the composition principle, therefore they are not semantic values" (Lewis 1980: 39). Perhaps the best case for the pulling apart of propositional content and semantic value is the *argument from variable binding* (Rabern 2012; Rabern 2013).

One picture might go like this: Assume that the semantic values of sentences (in context) are relatively simple, namely functions from world-time pair to truth values. Then for each sentence ϕ, and every context, world and time, the following is defined: $[\![\phi]\!]^{c,t,w}$. Now to extract the content start with the sentential semantic value at a context and then for all parameters of the index except the world parameter, fix its value to the value provided by the context—this leaves us with a function from worlds to truth-values, i.e. the propositional content.[12] In this way there is a post-semantic bridge from semantic value to content:

CLASSIC CONTENT: the content of ϕ in $c = \left\{ w \mid [\![\phi]\!]^{c,t_c,w} = 1 \right\}$

Given this there can clearly be sentences with different semantics values at c, $[\![\phi]\!]^c \neq [\![\psi]\!]^c$, that nevertheless have the same content at c:

$$\left\{ w \mid [\![\phi]\!]^{c,t_c,w} = 1 \right\} = \left\{ w \mid [\![\psi]\!]^{c,t_c,w} = 1 \right\}$$

Thus, we see that Lewis and Dummett both distinguish the theoretical roles corresponding to "assertoric content" and "compositional value", and thereby make more or less the same fundamental distinction: Lewis' in terms of *semantic value* and *content* and Dummett's in terms of *ingredient sense* and *content*.[13]

3   The Rigidity Thesis

Stanley (1997; 1997b; 2002) develops a fresh take on the Dummett-Evans defense of descriptivism. Stanley puts the point by arguing that Kripke's modal argument against descriptivism crucially relies on the following thesis:

RIGIDITY THESIS: The rigidity of proper names demonstrates that utterances of sentences containing proper names, and utterances of sentences differing from those sentences only in containing nonrigid descriptions in place of the proper names, differ in content.[14]

Stanley contends that this thesis is not well-supported. Stanley reconstructs the argument for the thesis by pulling out various tacit assumptions, and he then pinpoints which premise he thinks

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[12]See Ninan (2010) and Rabern (2012: 88-89). The procedure here follows Lewis's suggestion: "... we have the relation: sentence s is true at context c at index i. From that we can define the propositional content of a sentence s in context c as that proposition that is true at world w iff s is true at c at the index i_c^w that results if we take the index i_c of the context c and shift its world coordinate to w" (Lewis 1980: 37-38). Of course, to make things more realistic we would want to add other parameters besides a single world and single time, e.g. the assignment of values to variables.

[13]Note that Dummett himself puts the distinction to use with respect to the tension between assertoric content and temporal modification: "The sentences 'It is raining here' and 'It is raining where I am' have the same assertoric content: they provide just the same information to a hearer. But, subjected to the temporal quantifier 'always', they yield sentences with different contents: 'It is always raining here' and 'It is always raining where I am' do not say the same at all. This is because the adverb 'here' is temporally rigid, while 'where I am' is temporally flexible" (Dummett 2001: 259).

[14]For this formulation see Stanley (1997b). As Stanley notes this is just a rough and intuitive version of the thesis. We don't want to count the following as a counterexample: Let a be rigid and b non-rigid, then the following sentences express the same set of worlds: $(Fa \wedge (P \wedge \neg P))$; $(Fb \wedge (P \wedge \neg P))$. So there has to be some care taken in the way it is actually stated. Ninan (2012: 408 note 12) suggests that for the rigidity thesis, and the argument for it, to make sense contents have to be construed as structured (or one must assume a kind of reverse compositionality principle). This seems right if we go with the rough version in the text. But I want to avoid this commitment, thus when I unpack the thesis more formally below, I will instead opt for Stanley's original statement of the thesis, which side-steps this issue: Stanley (1997) originally stated the thesis as the claim that if the term t is rigid and the term t' is not, then t and t' differ in content.

is suspect. The questionable premise, Stanley argues, is the anti-Dummettian assumption that sameness of content implies sameness of semantic value. What follows is my reconstruction of Stanley's reconstruction.[15]

If for any sentence ϕ, the terms α and β can be substituted for each other while preserving truth, then the semantic values of α and β are the same. Or the other way round: If the semantic values of α and β are distinct, then there is a sentence where substitution of one for the other doesn't preserve truth. And since if α is rigid while β is non-rigid, then there is some world w where they have a different designation, it also follows that if α is rigid while β is non-rigid, then the semantic values of α and β are distinct.[16] Letting $[\![.]\!]$ map an expression to its intension, we can put together the above reasoning into our first premise:[17]

> **P1.** For terms α and β, if α is rigid and β is non-rigid (and thus $[\![\alpha]\!] \neq [\![\beta]\!]$), then for some open sentence ϕ, $[\![\phi_\alpha]\!] \neq [\![\phi_\beta]\!]$.

The premise P1 is basically uncontroversial, it is just a consequence of standard assumptions within a compositional possible-worlds semantics. In order to get from differences in rigidity to differences in *content* we need some further assumptions. In particular, we need an assumption about how content is related to intension. This is what Stanley calls the Semantic Value Principle, which we state as follows:

> **P2.** For sentences ψ and χ, if $[\![\psi]\!] \neq [\![\chi]\!]$, then the content of ψ is distinct from the content of χ.

We've now got a link between the semantic values of terms and the contents of sentences, but we want to conclude something about the content of *terms*. Thus, we need to appeal to a principle concerning the compositionality of content. Intuitively, if two sentences that only differ in substitution of α and β differ in content, it would seem that it must be due to a difference in content between α and β. We will put this idea in the following form:

> **P3.** If for some open sentence ϕ and terms α and β, the content of ϕ_α is distinct from the content of ϕ_β, then the content of α is distinct from the content of β.

With these premises in place the Rigidity Thesis follows:

> **RT.** For terms α and β, if α is rigid and β is non-rigid, then the content of α is distinct from the content of β.

Clearly, RT is in direct conflict with the descriptivist thesis that proper names have the same content as definite descriptions—assuming, of course, that Kripke (1980) is right names are rigid while definite descriptions, generally, are not.

Stanley insists that Kripke has not provided sufficient justification for the premises that support RT. In particular, there is no mention of anything in the vicinity of the crucial P2.

> Kripke's argument is something of a *non sequitur*. What needs to be established is that the modal status of an utterance is relevant to it assertoric content. That is, what needs to be shown is that (metaphysical) necessity and contingency are properties of the assertoric content of an utterance. . . . But Kripke's argument assumes, rather than argues, for this thesis. (Stanley 1997: 150)

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[15]See also Ninan (2012) for a helpful discussion of these issues.

[16]Kripke's (1980) notion of a *rigid designator* is a term that designates the same object in every possible world (48). If terms α and β are both rigid and for some world w, $[\![\alpha]\!](w) = [\![\beta]\!](w)$, then $[\![\alpha]\!] = [\![\beta]\!]$.

[17]This is more-or-less what Stanley calls the *Meaning Assumption* (Stanley 1997: 141).

Stanley points to the long history of theorists questioning P2—Dummett, Evans, Davies, Humberstone, and Lewis—and insists that there is plenty of reason to be doubtful about P2. For example, Stanley would insist that (13) and (14) have different modal profiles exemplified by their different embedding behaviour under 'Necessarily' in (15) and (16), yet (13) and (14) have the same assertoric content.

(13)   The 44th president was Obama.

(14)   The actual 44th president was Obama.

(15)   Necessarily, the 44th president was Obama.

(16)   Necessarily, the actual 44th president was Obama.

Of course, one needn't agree that these examples involving 'actually' (or analogous ones involving 'now') are the best counter-examples to P2—though they make for nice illustrations. The point is that there are both a diversity of alleged counterexamples to P2 (cited above), and general theoretical reasons to be skeptical of P2. Thus, it seems that the motivation for RT is undercut. Stanley concludes:

> . . . the ultimate motivation for RT is the idea that a necessary condition for two utterances to have the same assertoric content. . . is that they have the same truth-value when evaluated with respect to every metaphysically possible world. This is a significant, non-obvious thesis about the identity conditions of assertoric contents. It thus requires either some independent justification, or the production of a philosophically interesting notion of content according to which it *is* obvious. It remains to be seen whether either of these tasks can be accomplished. (Stanley 1997: 154)

Stanley thus presents a strong challenge to RT, and with it a challenge to one of Kripke's main arguments against descriptivism.

4   Post-semantic bridges

In her article "On the connection between semantic content and the objects of assertion" (this volume), Stojnić argues that Stanley's position contains a fatal flaw. She insists that there is a crucial disanalogy between the views that follow Lewis and the views that follow Dummett, respectively. In particular, the charge is that Stanley can't avail himself of the Lewisian story about the connection between semantic value and content. For Lewis content is extractable from semantic value (perhaps plus context), whereas, she insists, for Stanley's Dummett-Evans inspired view this doesn't hold.

> . . . the tradition from Dummett and Evans continued by Stanley fails: the straightforward way of establishing the connection proposed by Lewis is unavailable to them, as well as any plausible alternative. Thus, Stanley's attack on the Rigidity Thesis is unsuccessful. (Stojnić 2017)

And, in fact, Stanley admits at the end of his paper that he has not "attempted a positive account of the relation between the intuitive notions of assertoric content and semantic value" (Stanley 1997: 155). Stojnić's charge is that this is not only an open question for Stanley, it is one that can't even

in principle be closed. If its not possible to tell a story about how the meanings of our sentences are related to what we say when we utter those sentences, then something has gone wrong—distinguishing between semantic value and content shouldn't amount to a complete severing of semantic value and content such that there are two independent and fundamentally unrelated theories of value and content, respectively.[18]

The charge is that there is a disanalogy between Lewis' picture and Dummett's picture in terms of how content is related to semantic value. Let's look at this more closely. For Lewis, as we saw above, the content of an assertion is extractable from the semantic value of the sentence uttered (plus the context).[19]

$$\text{the classic content of } \phi = \left\{ w \mid [\![\phi]\!]^{c,t_c,w} = 1 \right\}$$

That is, Lewis adheres to the following principle:

DETERMINATION PRINCIPLE. If the semantic value of ϕ and ψ are the same, then for a given context c, the content of ϕ in c is the same as the content of ψ in c.

Thus for Lewis the semantic value of a sentence at a context is more fine-grained than the classic content at a context. The semantic value at a context is a function from world-time pairs to truth values, and thus can be displayed by the entire matrix below, whereas the content in c is the highlighted subset of this function, which only concerns the time of the context t_c.

$[\![\phi]\!]^c$	w_1	w_2	w_3	w_4	$\ldots$
t_1	0	1	1	0	$\ldots$
t_c	1	1	0	1	$\ldots$
t_2	0	1	0	1	$\ldots$
t_3	1	1	0	0	$\ldots$
$\ldots$	$\ldots$	$\ldots$	$\ldots$	$\ldots$	$\ldots$

The important point is that the content at a context is *extractable* from the semantic value, since a subset of a function is extractable from a function.

Let's turn to Dummett. Does Dummett accept the Determination Thesis? And if so can he avail himself of a straightforward connection between semantic value and content analogous to Lewis? It seems that the answers are: *yes* and *yes*. Dummett states:

> A grasp of the ingredient sense of a sentence always includes a grasp of its content, whereas the converse does not, in general, hold. (Dummett 1981: 572)

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[18]That said, its not obvious that a notion of "assertoric content" must even be involved in our theory of linguistic communication. As Yalcin (2014) insists "it may be questioned whether some notion of content will in fact appear, or loom centrally, in the best theoretical account of linguistic communication". For example, certain dynamic frameworks aim to be an account of linguistic communication, but don't seem to appeal to propositions expressed or assertoric contents in their account of communication. Thus, there may in fact be no role for a traditional notion of assertoric content in light of alternative accounts. Yet, for the purposes of this paper, I'm assuming that a notion of assertoric content which is connected to semantic value, is theoretically motivated (for one reason or another). For more on this issue consult Yalcin (2014: 24).

[19]Lewis allows that there may be multiple contents extractable from a semantic value plus context (see Lewis 1980: 38). I'm making the simplifying assumption that we are only concerned with classic content for now to make the comparison with Dummett more straightforward. More on this below.

Thus the Dummettian picture seems to be as Humberstone states in his 1976 lecture at Oxford:

> ... sameness of ingredient sense implies sameness of assertive content, while the converse does not hold (Humberstone 1976: 2)

But how then is assertoric content extracted from the ingredient sense? Recall the simple framework we started with where the ingredient sense of a sentence maps a world into a three-valued co-domian:

$$[\![\phi]\!] : W \to \{0, 1, .5\}$$

The assertoric content concerns how the sentence divides the space of worlds into the designated value, 1, versus the rest, thus it is extractable as follows:

Assertoric Content of $\phi = \left\{ w \mid [\![\phi]\!]^w = 1 \right\}$

Thus for Dummett, on analogy with Lewis, the ingredient sense of a sentence is more fine-grained than the assertoric content. The ingredient sense is a function from worlds to values, and thus can be displayed by the entire matrix below, whereas the content is the highlighted subset of this function.

$[\![\phi]\!]$	w_1	w_2	w_3	w_4	...
	.5	1	0	1	...

Again the important point is that the content is *extractable* from the sense, since a subset of a function is extractable from a function. Therefore with respect to Dummett's original case from multi-valued logic there is a straightforward connection between sense and assertoric content.[20]

Now the key question: Do Evans and Stanley, in their application of Dummett's distinction to modal embeddings, also respect the Determination Thesis? Start with Evans. Evans considers what is essentially a version of Stojnić worry, he puts the potential worry as follows:

> 'One cannot simply say that two equivalent sentences can embed differently inside modal contexts, and leave matters there. ... we cannot have two separate parts of the semantic theory, one giving absolute truth conditions, and thereby their content, and the other assigning $true_w$ conditions, and thereby explaining how the sentence will embed under modal operators. On the contrary, there is a single theory, assigning $true_w$ conditions; ... the content of the sentence, must be derivable from that assignment. ... [But] if two sentences are associated with different [$true_w$] conditions, so that there are worlds with respect to which one is true and the other is not, the associated properties which determine the functions from worlds to truth values must be different. How, then, could the two sentences have the same content, since one is tantamount to the claim that the actual world satisfies one property and the other is tantamount to the claim that it satisfies a different property?' (Evans 1979: 203-204)

Evans' concedes that these considerations "certainly preclude any large-scale, or even very interesting, detachment of content and [ingredient sense]" (*ibid.*: 204).[21] But he insists that his picture is nevertheless coherent. To motivate this Evans puts forward the following analogy. Consider these properties:

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[20]Thanks to Jonny McIntosh for helpful discussion on these issues.

[21]It seems clear that Evans endorses the constraint that the content of a sentence must be derivable from the semantic theory. In fact, the difficultly in establishing a connection between $true_t$ conditions and absolute truth is the driving force behind the tense logic paper: "I do not believe that a theory without implication for the correctness or incorrectness of utterances can lay claim to the title of a semantic theory" (Evans 1985: 345).

$\lambda x[x \text{ is as tall as John}]$

$\lambda x[x \text{ is as tall as } x]$

Evans says that these are certainly different properties—objects satisfying the second needn't satisfy the first—but when both properties are ascribed to John "the results are the same". Applying both properties to John and reducing via lambda conversion results, for both cases, in the sentence 'John is as tall as John'. The idea is that the predicates have different satisfaction conditions, but they are equivalent, in some sense, when applied to John. Evans insists on an analogy here concerning the relation between the true$_w$ conditions of some sentences and their assertoric content. In particular, Evans insists that a similar relation will hold in the cases in which the true$_w$ conditions "make reference to what is actually the case".

> In the case of 'Julius is F' and 'The inventor is the zip is F', this is exactly what we find. The former sentence requires of a world w that the man who invented the zip *in the actual world* be F in w, while the latter sentence requires of a world w that the man who invented the zip in w be F in w. (Evans 1979: 205)

Thus, the two sentences have different true$_w$ conditions, since the former is, and the latter isn't, tied to the inventor of the zip (i.e. the IoZ) in the actual world, w^*. Compare their respective modal profiles:

$\lambda w[\text{the IoZ in } w^* \text{ is F in } w]$

$\lambda w[\text{the IoZ in } w \text{ is F in } w]$

But Evans insists they nevertheless have the same content, since "when applied to the actual world they yield the same result":

the IoZ in w^* is F in w^*

There is a key insight here, but I think Evans puts it in a misleading way. Taking things at face value it seems that he has simply gestured at the claim that when applied to the actual world the two sentences have the same truth-value! It is uncontroversial that sentences with different modal profiles can nevertheless have the same truth-value. In terms of extracting the content from the ingredient sense, it would seem that the suggestion is to simply saturate the world parameter with the actual world, and extract a trivial proposition:[22]

Content of $\phi = \left\{ w \mid [\![\phi]\!]^{w^*} = 1 \right\}$

Soames (2005) interprets Evans in this way and complains as follows: "...this is highly dubious, since it has the seemingly absurd consequence that whenever one asserts any true proposition p in world-state w, one also asserts the necessary truth that w is a world-state with respect to which p is true, as well as the consequence that whenever anyone asserts anything false one also asserts

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[22]Such a view whereby all propositions are necessary true if true at all is endorsed by Schaffer (2012). Note that this is essentially the same as the option that Stojnić explores, but she puts it as the view that the content ϕ at c is simply $[\![\phi]\!]^{c,w_c}$, and thus a truth-value—she complains that according to this account there are just two assertoric contents: the True and the False. The same complaint can be made against the proposal in the text. See also Soames (2005: 116-121)

a necessary falsehood" (118). But it is clear that this is not what Evans was intending.[23] Evans presents us with a truth-value by displaying "the IoZ in w^* is F in w^*" but by doing so he should be understood as *showing* us the relevant content.

Let's unpack what Evans is really pointing to here. Consider the following sentences.

(17)   The inventor of the zip is F.

(18)   The actual inventor of the zip is F.

Evan insists that these have the same content since they are made true by the same worlds. But he also agrees that the sentences have different true_w conditions. Now that sounds a lot like saying that the sentences are both made true by the same worlds but their truth with respect to some worlds also differ. How can these two claims be consistent? Evans says "we must use the notion of *what makes a sentence true* with a great deal of care", since there "are two ways in which one can use the notion of what makes a sentence true" (180). The key here is to distinguish between "truth with respect to (or at) a world" and "truth in a world"

Consider a world w where there is an individual x who invents the zip and is F (but Judson is not F). Given this Evans puts the distinction in these terms.

 (i) 'The actual inventor of the zip is F' is not true with respect to w.

(ii) If w were actual, then the sentence 'The actual inventor of the zip is F' would be true.

The notion involved in (i) is *truth at a world* and is a theoretical notion completely 'internal to the semantic theory': it is the notion of true_w conditions—the notion responsible for the semantics of □. Whereas (ii) is *truth in a world* and is the notion relevant for correct assertion—what it would be true to say, were so and so the case.[24]

Evans insists that the true_w conditions of (17) and (18) both yield the same result when applied to the actual world. But he is not claiming that they simply have the same truth value. Instead he should be understood as saying that the true_w conditions of (17) and (18) both yield the same result when applied to the actual world *no matter which world is actual*. That is (17) and (18) are *true in* exactly the same worlds, since exactly the same worlds satisfies the following conditionals:

If w were actual, then the sentence 'The inventor of the zip is F' would be true.

If w were actual, then the sentence 'The actual inventor of the zip is F' would be true.

Thus, the assertoric content of both (17) and (18) is the following:

$$\left\{w \mid \exists! x (IoZ(x,w) \land F(x,w)\right\}$$

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[23]Here are two reasons: (i) In "Does tense logic rest on a mistake?", Evans (1985: 362-363) himself considers and rejects the proposal that every utterance expresses a "world-indexed content"—this is the modal analogue of T_3, (ii) utterances of the following sentences would have the same content: "The morning star is bright"; "The evening star is is bright".

[24]For truth-at-a-world Evans uses true_w, whereas for truth-in-a-world Evans uses true'. Evans says that while 'true'(ϕ, w)' should be glossed as 'if w were actual, ϕ would be true', '$\text{true}_w(\phi)$' should not. With this notation in place the claim is that the following are consistent: $\neg \forall w[\text{true}_w(\textbf{the actual IoZ is F}) \leftrightarrow \text{true}_w(\textbf{the IoZ is F})]$; $\forall w[\text{true}'(\textbf{the actual IoZ is F},w) \leftrightarrow \text{true}'(\textbf{the IoZ is F},w)]$. The latter holds since, if w were actual, $w^* = w$. Thus, if w were actual, the IoZ in w^* would be the F in w is equivalent to the claim that if w were actual, the IoZ in w would be the F in w.

But this still doesn't tell us how on Evans' story the content is extractable from the compositional semantic theory. And there is certainly not going to be a systematic story about extracting (non-trivial) contents from the true_w conditions (construed as a set of worlds), under the constraint that the contents of 'ϕ' and 'Actually ϕ' are identical.

This is a point where Evans' just didn't say enough, or didn't quite develop the view enough. His was groundbreaking work, so perhaps forgivable. But nevertheless the following is a good challenge to Evans: *Is assertoric content extractable from ingredient sense, and if so what's the story?* Stojnić insists that this challenge can't be meet. The challenge for Evans is to flesh out the locution "if w were to be actual". This would make good on the suggestion that the true_w conditions of (17) and (18) both yield the same result when applied to the actual world *no matter which world is actual*. Perhaps there is a coherent Evans-internal story to tell here, perhaps not.[25]

In any case, Davies and Humberstone's (1980) development of Evans' insights shows the way forward. But we don't need the full power of the Davies and Humberstone logical system to appreciate the key ingredient. To simplify, just consider a fairly standard possible worlds framework. A model $\mathfrak{A}$ specifies a set of worlds W, one of which is designated the "actual world" (w^*), an accessibility relation R between worlds, and an interpretation I mapping atomic sentences and worlds to 0 or 1. Given such a model one can recursively provide the semantics relative to a world as follows:

- For atomic sentence α, $[\![\alpha]\!]_{\mathfrak{A}}^w = I_w(\alpha)$

- For sentence ϕ, $[\![\neg\phi]\!]_{\mathfrak{A}}^w = 1$ iff $[\![\phi]\!]_{\mathfrak{A}}^w = 0$

- For sentence ϕ and ψ, $[\![\phi \wedge \psi]\!]_{\mathfrak{A}}^w = 1$ iff $[\![\phi]\!]_{\mathfrak{A}}^w = 1$ and $[\![\psi]\!]_{\mathfrak{A}}^w = 1$

- For sentence ϕ, $[\![\Box\phi]\!]_{\mathfrak{A}}^w = 1$ iff for all $w'Rw$, $[\![\phi]\!]_{\mathfrak{A}}^{w'} = 1$

Since we want to capture the sense in which pairs 'ϕ' and 'Actually ϕ' have the same content we will add an actuality operator '$\mathtt{A}$' to the language.[26] And we simply add a clause that says that $\mathtt{A}\phi$ is true with respect to a world just in case ϕ is true with respect to the model's designated world w^*.

- For sentence ϕ, $[\![\mathtt{A}\phi]\!]_{\mathfrak{A}}^w = 1$ iff $[\![\phi]\!]_{\mathfrak{A}}^{w^*} = 1$

It is clear that there are sentences ϕ and $\mathtt{A}\phi$ that have different modal profiles: $[\![\phi]\!]_{\mathfrak{A}} \neq [\![\mathtt{A}\phi]\!]_{\mathfrak{A}}$. (This corresponds to the difference in true_w conditions between, e.g. (17) and (18).) We want to capture the sense in which pairs such as ϕ and $\mathtt{A}\phi$ have different modal profiles but can nevertheless have the same content. Evans' thought seemed to be that pairs such as ϕ and $\mathtt{A}\phi$ have the same content since they have the same truth value at the actual world *no matter which world is actual*. Thus, to extract the content of a sentence we have to vary our models by varying which world is playing the role of the actual world. Let $\mathfrak{A}[w^* := w]$ be a model that differs from $\mathfrak{A}$ at most in that w is the designated world. A sentence is *true in a world* just in case, if that world were actual, the sentence would be true: ϕ is true-in-w iff $[\![\phi]\!]_{\mathfrak{A}[w^*:=w]}^w = 1$. The content of a sentence is the set of worlds such

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[25]Evans is working under the influence of a Fregean and Davidsonian blend, and the idea that the true_w conditions could serve as a theory of sense. Thus, anyone who knew the true_w conditions would thereby be in a position to speak and understand the language, and thus also in position grasp the content. See Yalcin Yalcin (2017) for critical discussion of this idea that sense of a sentence is something "shown" by specifying its semantic value in a certain way.

[26]For early work on this see Crossley and Humberstone (1977).

that the sentence is true *in* those worlds:

Content of $\phi = \left\{ w \mid \llbracket \phi \rrbracket^w_{\mathfrak{A}[w^* := w]} = 1 \right\}$

Thus, although ϕ and $\text{A}\phi$ have different modal profiles, since they are not true *at* the same worlds,

$$\llbracket \phi \rrbracket_{\mathfrak{A}} \neq \llbracket \text{A}\phi \rrbracket_{\mathfrak{A}}$$

they nevertheless have the same content, since they are true *in* exactly the same worlds:

$$\left\{ w \mid \llbracket \phi \rrbracket^w_{\mathfrak{A}[w^* := w]} = 1 \right\} = \left\{ w \mid \llbracket \text{A}\phi \rrbracket^w_{\mathfrak{A}[w^* := w]} = 1 \right\}$$

Here we have an answer on behalf of Evans. This picture doesn't posit two separate parts of the semantic theory, instead there is a unified semantic theory, whereby the assertoric content is determined by the semantic theory.

This was essentially the way that Davies and Humberstone understood Evans. In addition, Davies and Humberstone added the $\mathscr{F}$-operator to the language, which could be used to vary which world was the designated actual world. This afforded their language with the expressive power to say when a sentence was true no matter which world was considered as actual: $\mathscr{F}\text{A}\phi$. Given this expressive power they are able to provide a "characterization of the relations of sharing assertive content and sharing ingredient sense" (Davies and Humberstone 1980: 25). And they in fact say that for σ and σ' to have the same assertive content is for $\mathscr{F}\text{A}(\sigma \leftrightarrow \sigma')$ to be true (*ibid.*). This does, I think, make good sense of what Evans was gesturing at.[27]

In passing Davies and Humberstone also provide a "slightly different way of dressing up the semantical ideas" in terms of a two-dimensional modal logic—this has proved highly influential. The idea here is to simply relativise truth to a pair of worlds instead of a single world, so that the clauses define $\llbracket \phi \rrbracket^{w,w'}$, for any ϕ and worlds w and w' (and models $\mathfrak{A}$, which we suppress here). Given this then clearly there will be sentences ψ and $\text{A}\psi$ such that $\llbracket \psi \rrbracket \neq \llbracket \text{A}\psi \rrbracket$, but have the same content, since the content of a sentence ϕ is define as follows:

Diagonal content of $\phi = \left\{ w \mid \llbracket \phi \rrbracket^{w,w} = 1 \right\}$

In the two-dimensional setting the semantic value of a sentence is more fine-grained than the content. The semantic value of a sentence is a function from world-world pairs to truth values, and thus can be displayed by the entire matrix below, whereas the content is the highlighted subset of this function, *the diagonal*.

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[27]In a letter to Davies and Humberstone, Evans revealed that he was suspicious of the $\mathscr{F}$-operator, its 'hitherto unknown form of embedding', and the "utterance difficulties" involved (see Evans 2004; Davies 2004). Yet it is important to notice that one needn't introduce the $\mathscr{F}$-operator in order to make the above sort of proposal concerning assertoric content. This is analogous to how a sentence can be valid without there being an operator in the language that expressed this fact.

$\llbracket \phi \rrbracket$	w_1	w_2	w_3	w_4	...
w_1	1	1	1	0	...
w_2	1	1	0	1	...
w_3	0	1	1	1	...
w_4	1	1	0	1	...
...	...	...	...	...	...

Thus again the content at a context is *extractable* from the semantic value, since a subset of a function is extractable from a function. So I conclude that Evans intends to respect the Determination Thesis, and Davies and Humberstone provide an elegant way for him to do so.

But, finally, what about Stanley—how is he understanding content? As Stanley admits he doesn't say much about this issue. But, in so far as Stanley is following in the footsteps of Evans (and Davies and Humberstone) it seems that he too should be understood as construing assertoric content as diagonal content. And in fact, we do find Stanley saying things very much in accord with diagonal content. He says: "if two utterances *u* and *u'* have the same assertoric content, then in any possible circumstance in which *u* is uttered, *u'* could have been uttered, without change in truth-value" (Stanley 1997: 153). (See also the discussion of strong/weak validity for languages with 'actually' in footnote 38). In a later paper he even says "one could take the proposition expressed by an occurrence of a sentence to be what David Chalmers has called its 'primary intension' in a two-dimensional modal semantic theory" (Stanley 2002: 343 footnote 29).[28] Whether or not this is Stanley preferred position, it seems like a natural and well-motivated position, and one taken by others in the tradition he is following. This seems to suggest that the application of the Dummettian sense/content distinction as a defense of descriptivism places one in the direction of the two-dimensionalist views associated with, e.g., Davies and Humberstone (1980) and Chalmers (2004). This, I think, should be Stanley's considered answer to Stojnić's challenge.

Stojnić acknowledges that if content is understood as diagonal content then Stanley has an answer. But she thinks this is no help, since diagonal content is not suited to play the theoretical role of assertoric content.[29] Thus, her argument could be understood as presenting a dilemma for Stanley: Stanley's argument against the Rigidity Thesis commits him to either rejecting the determination thesis or accepting that content is diagonal content. Either position is untenable. So, one might conclude, Stanley's argument fails.

Stojnić presents two related objections to the view that assertoric content is diagonal content. These are traditional and well-known worries, so I will just briefly state them and how I think advocates of diagonal content should respond:

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[28]Stanley does make a few other suggestions in this footnote. E.g. he suggests that "one might take the proposition expressed by an occurrence of a sentence to be a subset of its modal content, namely that subset in which the denotations of its terms possess the properties attributed to them by their meanings?" (Stanley 2002: 343 footnote 29). This seems like an unpromising suggestion: Consider "the actual 45th president is Clinton" and "the 45th president is Clinton". Since the modal profile of the first is the empty set, then the only way for them to have the same content is for their content to be the empty set. Or on the flip side consider "Hesperus is not Hesperus" and "Hesperus is not Phosphosus". These have the same modal profile: the empty set. Thus there is no way to find subsets of their modal profiles that differ. But Stanley does suggest that he is noncommittal on both the nature of modal semantic value and assertoric content, so its not clear that this is a counterexample to his proposal. Without a commitment on the nature of at least one of the key notions its difficult to argue that he is violating the determination thesis.

[29]Actually she initially objects that such a proposal does not establish a connection between semantics and assertoric content, she says: "semantic content does not *determine* assertoric content" (Stojnić forthcoming). But this complaint relies on thinking of semantic value as the *horizontal* intension. Of course, the diagonal is not extractable from that. But as we've seen the diagonal is perfectly extractable from the total semantic value. Thus, the challenge is met.

Objection from propositional attitude reports: If content is diagonal content, then propositional attitude reports would express relations between individuals and diagonal contents. And that would get the semantics of propositional attitude reports wrong.

> *reply.* That is only true if one assumes that the semantic value of the complement clause of an attitude reports is its content. But this is precisely what the opponent here is denying: distinguish semantic value and content! In other words, giving an account of attitudes is not the same as giving an account of attitude ascriptions, and a proponent of attitude content as diagonal content should reject the simplistic account of attitude ascriptions, that this objection assumes.[30]

Objection from propositional anaphora: If content is diagonal content, then propositional anaphors always pick up on the diagonal content expressed. But this seems like the wrong result in many cases, e.g. when an interlocutor follows up with 'That's false' as a way of expressing disagreement.

> *reply.* Propositional anaphora is notoriously flexible in terms of what content is picked up on. There is no reason to suppose that such anaphors always pick up the diagonal content, as opposed to the horizontal content, or the entire semantic value for that matter.[31]

The debate over diagonal content opens up a familiar can of worms, and one that we can't hope to settle here. But the thesis that the content of assertion is the diagonal content is clearly a contender.[32]

- Stalnaker (2014): ".. if we want to identify a proposition that is the assertoric content of an utterance, which of these [i.e., the horizontal or the diagonal] should it be. [The] diagonal proposition comes closest to what we want..." (216-7)

- Heim (2004): It is always is the diagonal proposition that the listener must recover in order to understand an utterance (55).

And one could also mention here the various defences of the related views that advocate *centered content* (see, e.g., Ninan 2010b, Weber 2013). Of course, whether or not something like diagonal

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[30]The compositional semantics of an attitude report may very well appeal to the entire semantic value of the complement clause, e.g. the entire two-dimensional intension, while the content of the relevant *attitude* itself, e.g. the diagonal intension, is merely implicated in the semantics of the report. Consider the account of apriority and the corresponding semantics of apriority reports in Chalmers and Rabern (2014). This package could be construed as holding that while the the object of a priori knowledge is the primary intension, the semantics of "It is a priori that ϕ" doesn't just look to the primary intension of ϕ, instead looks to the entire two-dimensional intension of ϕ. Notice also that advocates of centered content, rightly, don't take objections from attitude reports too seriously (see, e.g., Weber 2013).

[31]Consider "I believe I am Hume, and Heimson believes that too; so Heimson believes he is Hume". This is just to echo the long discussion of propositional anaphora in relation to the Kripke's modal arguments in §VII of Stanley (2002)—Stanley convincingly argues that " 'that' sometimes denotes the ingredient sense, rather than the assertoric content" (cf. Stanley (1997: 148-150) and Schaffer (2012: §3.3) for more critical discussion of the vexed issue of propositional anaphora). In any case, there is no need to assume that disagreement in such cases is simply a matter of expressing incompatible contents. Assume speaker A utters 'I have Groat's disease' and speaker B utters 'You don't have Groat's disease'. There are accounts of the disagreement between A and B available even assuming that they have expressed (compatible) centered contents. See Weber (2013: 216-218) for discussion.

[32]Note that Lewis (1980) doesn't merely discuss what we called above "classic" content (i.e. horizontal propositional content) he also defines diagonal propositional content. He states: "a sentence in context has both a horizontal and diagonal content;... these may or may not be the same; ... they enter in different ways into an account of communication" (Lewis 1980: 38).

content (or centered content) can play the theoretical role of assertoric content depends on exactly what theoretical roles assertoric content is supposed to play. A dominate tradition, associated with Stalnaker, takes diagonal content as a plausible satisfier of such roles. But other traditions, with diverse theoretical roles for "assertoric content", may (correctly) conclude that diagonal content is ill-suited for their aims. At this point we just need to get especially clear on exactly what we take the role of assertoric content to be, and then given that role we can ask whether or not assertoric content is, or ever ought to be, extractable from semantic value.

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