Two Propositions for Total Semantics

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TWO PROPOSITIONS FOR TOTAL SEMANTICS

by

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Two Propositions for Total Semantics

written by Lenhardt Sachs Stevens

has been approved for the Department of Philosophy

______________________________________________
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Date: ___/___/________

The final copy of this thesis has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above-mentioned discipline.
Abstract

Stevens, Lenhardt Sachs (MA Philosophy)
Two Propositions for Total Semantics
Thesis Directed by Professor Graeme Forbes

The history of two-dimensional semantics emanates from historical issues surrounding Kripke’s notion of rigidity. In this paper, I recreate the debate between Kripke, Dummett and Evans to arrive at early formulations of two-dimensional semantics by Lewis, Kaplan, and Stanley. In so doing, I argue that the semantic content and the assertoric content of a sentence are not identical. In the second section, I show that current advocates for two-dimensionalism (Rabern, Stojnić, Ninan) can (i) maintain that both the assertoric and semantic content of a sentence are propositions and (ii) that the semantics determine the assertoric content. The paper ends with a forward-looking approach to applications of two-dimensional semantics.
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1 Introduction

The historical developments of two-dimensional semantics are rich and from multiple directions. In this paper, I recreate the motivations for two-dimensional semantics from several key figures, including Dummett (2001), Evans (1985), Kaplan (1989), Lewis (1980), and Stanley (1997). These motivations were sparked by debates over the Rigidity Thesis, a notion central to Kripkean semantics (1980). While each of the formulations of two-dimensional semantics are different, each can read as having the same conclusion, namely, that sentences do not express a single proposition. This conclusion is a rejection of the Identity Thesis (henceforth IT), which says that the semantics of a sentence are identical with its assertoric content. The problem this paper is trying to solve is this: how can distinctions between the semantic and assertoric content of a sentence be understood to represent what a speaker intends to communicate and what a hearer correctly understands?

The structure of my argument is as follows:

(P1) If there are genuine counterexamples to IT, then IT is false (Assumption)

(P2) There are genuine counterexamples to IT. (Section 1)

∴ (C1) Identity Thesis is false (From P2, P1)

(P4) If there can be ensured a connection between the semantic and assertoric content of a sentence for a given theory, then we should stick with that theory. (Assumption)

(P5) We can ensure a connection between the semantic and assertoric content on two-dimensional semantics. (Section 2)

∴ (C2) We should stick with two-dimensional semantics. (From P5, P4)

The paper will proceed as follows. In section one, I give the background to the paper’s topic, starting with one of Kripke’s arguments against a descriptivist theory of names. Afterwards,
we will have our first formulation of the Identity Thesis. \( \text{(P1)} \) is a conditional whose consequent I establish through an application of \textit{modus ponens}. The counterexamples to \text{IT} and their subsequent analysis will demonstrate the need to establish a separation between the semantic and assertoric content of a given sentence. Section two is a discussion of two-dimensional semantics and its applications, featuring a disagreement between Stojnić (2017) and Rabern (2017) over the way in which we guarantee the semantics fixes the assertoric content of a sentence. I aim to make two points. First, Stojnić is right to claim that if semantic and assertoric content are to be two propositions in a sentence, one must be subfunction of the other. Second, although I agree with Rabern that two-dimensional semantics is able to take care of the worry, not enough was said about his and Ninan’s (2010) approach to convince Stojnić. In order to convince skeptics of Ninan’s and Stanley’s formulations of two-dimensional semantics, I discuss the worries about the theory in light of (i) a plausible theory of communication and (ii) guaranteeing a link between the assertoric and semantic content. The paper ends with the conclusion that two-dimensional semantics, despite being an early prospect, serves as an example of how we should expect our theory to go if we take instances of the failure of \text{IT} seriously.

1.1 A Historical Debate

Compositional semantics is the idea that a sentence gets its meaning from evaluating the sum of its constituents and the particular way in which they are composed. I may say that “My father owns a lawn mower”, and add that “My father’s father owns a lawn mower.” The effect of iterating “My father” creates another meaningful expression, namely, a sentence about my grandfather. The meaning of the sentence, then, is arrived at through first considering each of its constituents and then evaluating the expression summing each of their contributions together.
A sentence’s assertoric content is said to be that which represents a part of the world as it is. In other words, when we assert “Yorkshire is damp,” we mean that that sentence is true just in case Yorkshire is damp. Assertoric content is historically understood to track the kinds of things we believe, have opinions about, and is the thing uttered during an illocutionary act. We take the aforementioned way of understanding what is asserted in the sentence as being something that is also stating what must be the case. As Dummett says, the contents of an assertion are its truth conditions for the world at which it is evaluated. (1959)

In this section, I will first demonstrate one of Kripke’s arguments against descriptivism. This will introduce IT, or the notion that a sentence’s proposition, the function it expresses from worlds to truth values, is identical with its semantic content. Then, I will introduce Dummett’s arguments against IT, or the failure of the modal profile for a given sentence to be identical with the modal profile of another sentence that expresses the same assertoric content. This back and forth between supporters of descriptivism and its detractors hinges on support of or dissent from the Rigidity Thesis (henceforth RT). While this debate is rich and important, what we are concerned with for the time being is how sentences that allegedly contain Rigid and non-Rigid designators can nonetheless share assertoric content, despite their semantics being different. Lastly, I will go over some popular ways in which semantic and assertoric content have been discussed under early two-dimensional accounts from Lewis, Evans, and Stanley.

1.2 Kripke’s Argument Against Descriptivism

Following Russell, descriptivism about proper names is the view that the referent of a given name, say “John Coltrane”, is the individual that satisfies the descriptions we associate with with that name. For “John Coltrane,” we may describe the referent of that name as the Jazz musician who played saxophone on the album *A Love Supreme*. When we try to understand the meaning of a
proper name like “John Coltrane”, we ask ourselves: in virtue of what does the name “John Coltrane” have the referent that it does? On the descriptivist picture, the referent of “John Coltrane” is fixed by descriptions we associate with it. Unlike Millianism, which asserts that the referent of “John Coltrane” is just its referent, John Coltrane, descriptivism does not give any special consideration to an individual absent their salient qualities. In contrast, the rigidity thesis regarding proper names rejects descriptivism in a number of ways, one of which we are building up to. Possible-world semantics combined with the rigidity thesis troubles the picture of descriptivism as it introduces an account of modality that allows for philosophers to have the same individual appearing at other worlds that don’t share the descriptions we use to designate their referent at the actual world. In Naming and Necessity (1980), Kripke asserts that two sentences have different meanings if we substitute the name of an individual with a description and vice versa. I will now recreate Kripke’s argument against descriptivism with the modal objection.

Descriptivists allow for the substitution of names for definite descriptions. For example, in the sentence below:

(1) Katsuhiro Otomo is Katsuhiro Otomo

(2) Katsuhiro Otomo is the author of Akira

Each of these sentences are true, yet they mean different things. One of the sentence’s is a statement of identity, and the other one is a statement of authorship. Yet we can substitute the description “is the author of Akira” with the second occurrence of “Katsuhiro Otomo” in (1) and the sentences retain their truth value. Thus, claims Kripke, the descriptivist says that the contents of the sentences are identical in sentences (1) and (2). However, if we discuss the writer within two counterfactual situations, thereby adding a modal dimension to the sentences, we have the following sentences:

(3) Katsuhiro Otomo could have not been Katsuhiro Otomo
(4) Katsuhiro Otomo could have not been the author of Akira

The (3) is necessarily false, and (4), on the face of it, appears obviously true. It may have been the case that Otomo went into television repair instead of drawing, which would have meant that he never authored the classic work of manga. In any event, under the modal conditions of a counterfactual, sentences (1) and (2) change truth values, so that substituting names for descriptions will not retain their meaning. Therefore, the meaning of proper names cannot be descriptions. This ends Kripke’s modal argument against descriptivism.

The argument against descriptivism ushered in a new view on proper names, one that has a Millian flavor, but is distinctly Kripkean, in that Kripke is famously agnostic about what the nature of an individual is. The modal objection is a negative result about descriptivism, but what about a positive picture from Kripke?

Stanley (1997) tries to bring out what is at work in how the content of two sentences are identical with what he calls the Identity Thesis (henceforth IT). The thesis, as formulated by Stojnić, is as follows:

**IT**: The compositional semantic content (henceforth, semantic content) of a sentence $S$ of a language $L$ in a context $c = \text{the proposition that a normal assertive utterance of } S \text{ expresses in } C$ (its assertoric content, for short).

(Stojnić 2017, p. 3)

At least one of our intuitions about how communication is possible are corroborated by the principle expressed in IT. That is, if I utter the sentence “John Coltrane is five feet eight inches” I mean to say that John Coltrane is five feet eight inches, which is good, because the meaning of “John Coltrane is five feet eight inches” comes from my predicating something true of John Coltrane. For another example, if I say I have successfully communicated to you that:

(5) Bobby Fischer moves his pawn to E4
It looks like the meaning of that sentence is just the combination of actors, i.e. Bobby Fischer, the things that they do, i.e. moving things to E4, and the things that are moved, i.e. a pawn. We then have the following structure of semantic types for the proposition expressed by a sentence:

```
  Proposition
   /       \        
  Individual    Function from Individuals to Truth-values
       \            
      Bobby Fisher  Moves a pawn to D4
```

This should be encouraging to the defender of IT because, as demonstrated, the proposition expressed by the sentence is the composition of semantic content of an individual (namely, an individual as the argument in a truth-function), which will be true or false at some given possible world in which it is evaluated.

Importantly, one may endorse IT because of her acceptance of the Rigidity Thesis (RT), in that insofar as an individual is referred to in a given sentence, it cannot be the case that the individual shifts even while the content of our sentence does not when we evaluate the sentence. We will then say that sentences like “Saul is in New York” just expresses the proposition that is understood when we understand the constituents of “Saul” and “New York.” Identity between the semantics and the assertoric content is thus preserved. I understand rigidity in the following way:

**RT.** For terms $\alpha$ and $\beta$, if $\alpha$ is rigid and $\beta$ is non-rigid, then the content of $\alpha$ is distinct from the content of $\beta$.

(Rabern 2017, p. 12)

If that’s right, then RT is a demonstration of how changing the terms in a given sentence changes the meaning of that sentence. We suppose if the content of two terms is distinct, then it follows they differ in either their semantic or assertoric content. Suppose they differ in their
semantics. Then, under RT, their modal profiles will be different. For names like “Katsuhiro Otomo”, the referent being rigid, the individual will not differ under modal analysis. Whereas, the description “the author of Akira”, the referent being non-rigid, changes under modal analysis, because, as argued, the author of Akira could have been someone other than Katsuhiro Otomo. This means that the assertoric content of the two sentences is different, and that (1) and (2) express different propositions. In this section, I have recreated the modal objection to descriptivism, and discussed the reasons Kripke has for believing in RT. The rest of this section will be discussions of the case made against the modal objection, as well as against IT.

1.3 Dummett Revisits Descriptivism, and Evans Cleans Up

Dummett claims that the content of an assertion is its truth-conditions. That is, for any meaningful statement $x$, its assertoric content divides “possible state of affairs” (Dummett 1959, p. 150) between those in which the statement is true, and those in which the statement is either false or undefined. For example, the sentence:

(6) The tennis player with the most grand slams is Margaret Court

Just expresses:

(6') ($\exists x)(Fx \& x = m)$

Where $F$ is the property of being the tennis player with the most grand slams and $m$ is a name for Margaret Court. But there is a problem with this picture. The content expressed by (6) will embed differently with a rigid designator. Now, we will add a second sentence that is meant to have the same content as sentence (6):

(7) The actual tennis player with the most grand slams is Margaret Court

(7) can be represented by the following formalization:

(7') ($\exists x)(\neg Fx \& x = m)$
Where \( A \) is the actual-operator added to sentence (6').

According to IT, because the propositions expressed by (6) and (7) are the same, in that they are satisfied by the same truth-conditions for a given context of utterance, they should share the same semantics that contributes to their meaning. But, the modal profiles of each of the sentences are different. That is, (6) is satisfied by different individuals at different worlds, but (7), once an actual world is determined, is satisfied only by the individual at that world, even if the sentence is evaluated at other worlds. The sentence “The actual tennis player with the most grand slams is Margaret Court” is true at a possible world \( W_1 \) (and every other possible world, for that matter), whereas “The tennis player with the most grand slams is Margaret Court” is false at \( W_1 \) where Serena Williams is the tennis player with the most grand slams.

The sentences embedding differently under the modal operator “actual”, says Dummett, indicates that their ingredient sense is different. But, the aforementioned consideration that the sentences are expressing the same proposition seemed correct. We then come to our first fork, which is either (6) and (7) express different propositions, so their assertions must be different, or they express the same proposition, and their semantics must be different. Either way this goes is a strike against IT. It looks like the operator “actual” changes the meaning of our sentence but does not change what the sentence is asserting. (6) and (7) are true under the same conditions at the context in which they are uttered, so the proposition they express is identical. Why is that? In this case, Margaret Court being the tennis player with the most grand slams satisfies the proposition represented by both sentences. The affixation of “actual” adds something new semantically, similar to how iterations of “The father of” adds something new semantically to sentences, but whereas the latter creates new assertoric content, one about grandfathers instead of fathers, the former retains its assertoric content, despite changing the sentence’s meaning. Dummett calls this distinction between semantic and assertoric content a difference of ingredient sense and assertoric content. That is the only
time I will use those terms in this paper, and instead will henceforth refer future discussions about
the two contents of a sentence as the \textit{semantic content} and \textit{assertoric content} respectively.

We now are in a position to trouble IT with the distinction as understood by
Dummett. Evans (1979) thought that he could use Dummett’s distinction in order to expressly
violate IT. The example will retain a notion of descriptivism in the domain of proper names, that is,
that the referent of a proper name is fixed by a definite description, what can be known as a
descriptive name. Evans devised a sentence which expresses a descriptive name. In this case, it is
the sentence:

(J) The name “Julius” refers to whoever invented the zipper if any one person did

The notion of a descriptive name is was met with some resistance, but, barring old hang ups,
your knowledge of the meaning of the sentence is contingent and \textit{a priori}. In other words, prior to
experience we know who the name will refer to; it just so happens to pick out the individual at this
world who invented the zipper, despite it being entirely conceivable that it was someone else who
invented it.

Suppose that it was Fumiko Enchi who invented the zipper at the actual world, take the
following two sentences:

(8) Julius is Fumiko

(9) Fumiko is the inventor of the zipper

(8) and (9) are asserting the same thing, that is, they are true just in case at the world of
evaluation it was Fumiko who was the inventor of the zipper, so (8) is true just in case the person
who is referred to by the name “Fumiko” is also the person who is referred to by Julius. But, as
before, when we add modal operators to the beginning of each sentence:

(10) Necessarily, Julius is Fumiko

(11) Necessarily, Fumiko is the inventor of the zipper
(10) is true from the actual world because the name Julius refers to whomever the name Fumiko also refers to. (11), however, is clearly false. Fumiko might have been struck by a meteoroid on her way to work before she invented anything. Evans insists that (8) and (9) do have the same content, even though their modal profiles differ. The controversy in the example stems from the idea that Evans claims that even though “Julius” is a rigid designator, and “The inventor of the zip” is not, their meanings are nevertheless equivalent.

At the end of this section, we have two reasons to believe that IT is false. This is a vindication of (P2), because we have examples of (i) the semantics of two sentences are identical but they express different propositions, and (ii) a rigid and non-rigid designator have the same meaning but possess different modal profiles, both of which the defender of IT must admit are cases under which semantic differences in sentences do not lead to differences in what those sentences assert.

1.4 More in the Split

In this final subsection of section 1, I discussed Stanley, Lewis, and Kaplan’s reasons for believing that we should be content to give up IT. Of the three justifications, Lewis’ is the only one according to which his understanding of assertion is a post-semantic concept. In other words, the proposition expressed by a given sentence is determined by the semantic content of that sentence. That means for Lewis that he can have a relation between the semantic and assertoric content that relates the two of them in such a way that maintains the something of the spirit of IT without committing himself to the letter. More on that shortly. Kaplan and Stanley, on the other hand, do not have a similar story to tell about the retrieval of assertoric content from semantic content.

For Stanley (1997), a difference between semantic and assertoric content follows naturally from the way in which our modal logic evaluates the above sentences. But, he also considers how spatial and temporal operators alter the semantics of a sentence, rather than its assertoric content.
will represent the semantics expressed in a sentence for Stanley, as well as the assertion that is expressed for Stanley in the following two sentences:

(12) The president is Donald Trump

(13) The president here is Donald Trump

In sentence (13), the role of “here” in the sentence is a presupposition that is cancelable, namely, that Donald Trump is the president over wherever the speaker is located. This notion, according to Stanley, is a pragmatic consideration. Whatever is additional about (13) does not change the fact that (12) must be true in order for (13) to be true.

Expanding on this consideration, we have in the following pair of sentences. The first sentence as true and the second sentence as false:

(14) Everywhere, it is the case that the president here is Donald Trump

(15) Everywhere, it is the case that the president is Donald Trump

The sentences having different semantic content is identifiable with (12) having the location operator “here” being treated differently under the scope of the “Everywhere.” The meaning of sentence (15) is that in every location $x$ it is the case that the president of $x$ is Donald Trump, whereas the meaning of (14) is that it is true everywhere that Donald Trump is the president of “here”, which is, from where I am writing, the United States, thus the sentence is true.

For that reason, whatever the assertion is in (12) it cannot be identified with its semantic content, because the semantic content of (14) differs from (15). Instead, we have the two propositions that a sentence expresses, the semantic content of sentence (13) and its assertoric content, which is expressed by both (13) and (12). Stanley, in discussing how the aforementioned spatial operator effect the meanings of sentences, means to point us to the idea that if the assertion of (12) is true at a given set of worlds, we can get more fine-grained with its truth value at the world at which it is true in terms of discussing it relative to some location. The location of the speaker in
uttering either sentence will mean different things to (12) and (13) when they are asserted. Nonetheless, Donald Trump being the president is what is asserted by the two sentences, despite their difference in semantic value.

For Kaplan, we relativize the extension of a given sentence to two parameters, which are context-sensitive parameters and the intensional displacement parameters. Extension here should be understand as the truth value of that sentence, while the intension is the function that takes worlds as its input and gives back a truth value. Below, I have illustrated what these parameters look like before they are given inputs. Kaplan’s semantics generate contents from the context in which we gain information about what is being represented. The indices evaluate that content, which is to say they tell us whether what’s been said is either true or false at the context. Kaplan is, at least partially, motivated by temporalism about propositions in order to get the contribution of context sensitivity. This is merely to say that for Kaplan the contribution that tense-operators make on a given sentence, if they are meaningfully interacting with the sentence content at all, mean that the proposition a sentence expresses is sensitive to time. Kaplan insists: “[t]emporal 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)

Let’s see how this analysis plays out. We have a sentence:

(16) There was an emperor of China

Which is understood as the conjoining of the temporal operator “It was the case” with the sentence “There is an emperor of China.” More formally, we have a past tense operator ‘PAST’ that is included among the set of indices.

So the sentence:

(17) There is an emperor of China
Is just the proposition that is embedded under a temporal-operator in (16).

That allows Kaplan to say that there are propositions whose truth-values vary across time. Moreover, Kaplan can then identify the assertoric content of (16) to be “There is an emperor of China”, combined with with the temporal operator “It was the case” that adds to the semantics of (16), but not its assertoric content. This is good news for arriving at new intuitions surrounding the failure of IT and the acceptance of a split between semantic and assertoric content. The added feature of Kaplan’s temporalism is that we cannot simply evaluate the assertion of “There is an emperor of China” as just being a proposition that is true or false at a world, but require a temporal operator to be acting on the assertoric function as well, because the sentence, claims Kaplan, “There is an emperor of China” is neutral with respect to the time at which it is uttered.

Whatever the verdict is on temporalism surrounding propositions, I claim that Kaplan’s analysis of sentences with temporal operators is support for (C1), which is (to remind us) that IT is false. This is a benefit to the general point that Kaplan is making, namely, that we do not evaluate the truth value of sentences absent understanding (i) the compositional semantics of that sentence and (ii) the assertion that is subordinate within the sentence. The subordinate sentence in (16) is (17), given that (17) has a truth value that varies across temporal-world parameters, Kaplan was led to believe that propositions are temporal. I’m not so sure, but that’s another day’s work.

I would like to end this section by discussing Lewis’ view, and the post-semantic nature of assessing a proposition. Rather than being something that is contributing to the overall meaning, for Lewis, once we know what the sentence means, we are able to derive what it is asserting. I would like to suggest that this proposal is on target for how the assertoric and semantic content are connected. What might this look like?
For a given sentence, we have a function from that is looking for a context. So absent a context of utterance, the above sentence is understood as, where \( \epsilon \) is context of utterance, \( w \) is world, \( t \) is time:

\[
\lambda<w,t>.\llbracket \text{There was an emperor of China} \rrbracket^\epsilon,<w,t>^g
\]

Therefore, the semantic content of “There was an emperor of China” in a context \( \epsilon \) is a function going from world-time pairs to extensions, which are truth values. This is promising, because absent a context of utterance, we will not yet know whether the sentence “There was an emperor of China” is true. If the sentence is thought by a sentient amoeba floating in the primordial soup of the ancient earth, then the sentence is false. But, after we have supplied a context of utterance, which determines the time portion of our semantic content, we arrive at:

\[
\lambda<w>.\llbracket \text{There was an emperor of China} \rrbracket^\epsilon,<w,tc>^g
\]

Which is a function from worlds to truth values. Per our Dummettian analysis of assertoric content, this proposition is precisely the sort of thing that can be believed or asserted. A sentence in a context \( \epsilon \) for Lewis will not possess a single content, but rather two propositions, one of which is determinable from the other. We will explore what those propositions are in greater detail in the next section.

The demonstrations of this section have shown that IT is false. What our sentences mean is not the same thing as what we are assert when we utter them. Now that we have established that a sentence has two propositions behind it, we will discuss in greater detail how the two propositions relate to one another. In this section, Lewis was the only one who could bring them together in such a way as to make sense of how they relate. Expanding on Lewis’ post-semantic analysis in conjunction with a theory of two-dimensional semantics, I claim, provides the account we are looking for.
2.1 Two-Dimensional Theories of Semantics

Ninan defends Stanley’s view that the semantics of a sentence in a context $c$ is an n-tuple function from indices to truth values against a paper by King (2003, 2007), which says that the semantics of a sentence is a function from possible worlds to truth values. This starts off a debate that I will close with Stojnić and Rabern into the next two subsections. I will argue that (i) Stojnić’s criticisms of the aforementioned two-dimensional semantic stories goes through, and that split content proposal from the previous section requires an explanation for how they come back together, (ii) Rabern’s treatment of 2-dimensional semantics with the Determination Thesis connects the assertoric and semantic content, and (iii) we can use Weber’s recentering model to begin filling in the gaps between two-dimensional semantics and a suitable theory of communication. While I make no promises surrounding the ongoing worries of trying to account for semantics with a single, unified theory, I claim that the direction of recentering models is a plausible candidate for how we can make sense of, at least in some cases, bringing semantic and assertoric content back together. This will complete the paper’s goals of arriving at (C2) through a demonstration of (P5).

2.2 What Ninan’s two-dimensionalism has to offer

This subsection will prepare us for Stojnić’s objections to Ninan. In order to do so, we first have to see how (i) we can use two-dimensional semantics to explain the two contents of sentences and (ii) how the semantics of a sentence, being a function from n-tuples to truth values, is consistent with arriving at the assertoric content of a sentence, which is also a function from worlds to truth values. At its core, two-dimensional semantics describes a sentence as possessing two meanings. The first meaning that a sentence possesses occurs along what is call its diagonal-proposition, or the function that is evaluated at the world at which it is uttered. On discussing Stalnaker, Chalmers
refers to them as “token-reflexive contextual intensions.” (2006, p. 112) That is how I intend to understand them here.

We'll take an initial pass at the distinction between the diagonal proposition and the proposition expressed in the following sentence:

(18) The manager of the NY Mets is going to the reception

where \( a \) is the manager at \( W_1 \), \( b \) is the manager at \( W_2 \), and \( c \) is the manager at \( W_3 \). Suppose that if any of the individuals did not get the job, they do not go to the reception at the world in which another individual did. Let us also suppose that in the world were \( c \) got the job, he gets the flu and does not attend the reception. This generates the following matrix:

<table>
<thead>
<tr>
<th></th>
<th>( W_1 )</th>
<th>( W_2 )</th>
<th>( W_3 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>([\text{The manager of the NY Mets is going to the reception}])</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(&lt;W_1, a&gt;)</td>
<td>T</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>(&lt;W_2, b&gt;)</td>
<td>F</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>(&lt;W_3, c&gt;)</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

Matrix 1

The content of the sentence “The manager of the NY Mets is going to the reception” is understood to be two propositions. The first proposition we’re calling proposition expressed, which is a function from worlds and individuals (in the Matrix 1 example) to a truth value at a context. Saturated with contextual information from world \( W_1 \), we see it looks like this:

\[ \lambda w. [\text{The manager of the NY Mets is going to the reception]}^{<W_1, a>, <w>} \]

Which is a function looking for worlds at which \( a \) is going to the reception. The above function will be our semantic content for a sentence. Its modal profile is shifty, in that its truth
value changes depending not merely upon which world it is evaluated, but also which world is the context of utterance. It is the proposition that is affected by intensional operators, which were demonstrated in the previous section to change the semantics of a sentence. That is to say that on the horizontal and vertical axis, the worlds shifting designate a change in semantics. This brings me to the next proposition expressed by the sentence, which is its diagonal, represented in the following function:

$$\lambda w. [\text{The manager of the NY Mets is going to the reception}]^{<w, a>, <w, a>},$$

On this function, the world determined by the index and the world of the context are the same. That means that we are talking about the individual of some world $w$ at that world $w$. We have arrived at a promising result in our discussion. Whatever we are communicating in (18), it looks like it doesn’t matter whether we have an “actual” embedded in it or not. That is, saying:

(19) The actual manager of the NY Mets is going to the reception

Uttering (19) or (18) does not change what has been asserted to a listener, the idea being that because the diagonals of (19) and (18) are the same, they express the same proposition when we discuss their assertoric content. But, because their modal profiles differ, their semantics are different.

Let’s have a closer look at the traditional analysis of a sentence such as:

(20) Marlowe could have written Hamlet

The sentence can be understood as having a truth value in virtue of “Marlowe wrote Hamlet” being true at some possible world, expressed as:

$$(20') \diamond [\text{Marlowe wrote Hamlet}]$$

So traditionally, the Logical Form (LF) for the above sentence would be of the form:

$$(20'') \lambda w. [\text{Marlowe wrote Hamlet}]^w$$
Where (20") is true just in case the sentence “Marlowe wrote Hamlet” has as its extension True at some possible world. Importantly, the content of “Marlowe wrote Hamlet” is therefore not a truth value, but rather an intension, something that takes different truth values at different possible worlds or, as the case may be, different indices. That will mean that the semantic value of a given sentence $\varphi$ will be mapped to true just in case there is a world at which the semantic value of $\varphi$ is true.

That lets Ninan give a Kaplanian analysis of (20), which has the following LF:

\( (21'') \Diamond \llbracket \text{Marlowe wrote Hamlet} \rrbracket^{\cdot, w} \)

Possibly is now an operator on an intension that possesses a context of utterance. We are then not merely interested in whether the proposition “Marlowe wrote Hamlet” is true at some possible world, but also, relativized to a speaker’s context, the sentence’s content becomes saturated with context-relevant information. In other words, the content of a sentence $\varphi$ has two responsibilities, the first is in establishing the semantics, which is compositional in nature and contributes contextual information to the truth-conditions of the sentence (which can use the richness of our possible indices, but needn’t), and the assertoric content of the sentence, which are its truth-conditions of a sentence that are evaluable at a world provided we possess the relevant contextual information.

It is not obvious from the previous section what indexes should be included in our functions. Common indexes include worlds, individuals, times, and speakers. We will now examine our first objection to the two-dimensional account from King. He argues that (i) the semantic value of a sentence is a function from possible worlds to truth values and that (ii) the previous argument’s counter examples to RT fail to go through on the truth of (i).

The argument King makes for (i) is by claiming that coordinates like tense and location are best understood as object language quantifiers, and therefore not appearing in the index of the
function. If the only index acting as an intensional operator of a given sentence proposition is worlds, then, argues King, we have no reason to believe that the semantic content of the sentence is anything other than the assertion that the sentence is expressing, because the semantics of the sentence does not change over time, just over worlds, which is the role that our assertoric content is meant to play.

But, if we limit our contents to the extensional treatment of tense (or extensional treatments of location, or individual, etc.), we can still have temporalism with regards to the assertoric content of sentences. How is that? Ninan argues that we can have world specific semantic propositions even on King’s lights with the addition of world specific assertoric propositions. Despite not having an indice containing a given parameter $x$, objects of assertion can still be $x$ neutral. Let me illustrate the claim with the following example:

(21) Kengo ran

According to King, what we have here is a sentence that possesses an object language quantifier PAST, which quantifies over $t_1$, a free variable over times which is given the utterance time $t_c$. So we have:

$$\lambda w.\llbracket t_1 \text{ PAST } \lambda t_2 t_2 \text{ Kengo runs} \rrbracket^{c, w, g}$$

But this construal of the meaning of (15) can be revised to include Ninan’s stipulation, namely, that the original free variable of time is now bound by a $\lambda$-binder at the top of the structure. So even if time is not included in our index, we can still have the following LF for (15):

$$\lambda w.\llbracket t_1 \text{ PAST } \lambda t_2 t_2 \text{ Kengo runs} \rrbracket^{c, w, g}$$

$$= \lambda w.\llbracket \lambda t_1 t_1 \text{ PAST } \lambda t_2 t_2 \text{ Kengo runs} \rrbracket^{c, w, g}$$

$$= \lambda w\lambda t.\llbracket \lambda t_1 t_1 \text{ PAST } \lambda t_2 t_2 \text{ Kengo runs} \rrbracket^{c, w, g}$$
This is a temporal proposition, which means that King’s argument that time not appearing in
the index means that the semantic content being a proposition is compatible with the assertoric
content of the sentence being an assertion, as well.

We will use Ninan’s analysis of Kaplan’s temporalism to generate the following matrix with
regards to our analysis of (21):

<table>
<thead>
<tr>
<th>“Kengo ran”</th>
<th>W₁</th>
<th>W₂</th>
<th>W₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;W₁, K&gt;</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;W₂, K&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;W₃, K&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Matrix 2.1

We arrive at the top corner square once we fill in the context ε with the world in which we
express the sentence and have a world in which we evaluate the sentence. Then, with our world
parameter saturated, within the square with a circle inside of it, we have a new matrix that is looking
for times:

<table>
<thead>
<tr>
<th></th>
<th>&lt;W₁, t₁&gt;</th>
<th>&lt;W₁, t₂&gt;</th>
<th>&lt;W₁, t₃&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;W₁, t₁ K&gt;</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>&lt;W₁, t₂ K&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;W₁, t₃ K&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Matrix 2.2

The diagonal in Matrix 2.2 expresses the proposition “Kengo runs”. This is going to be a
temporal proposition whose truth-value changes relative to the time at which it is evaluated. For
example, assume in our sentence that at $W_i$, Kengo runs at $t_1$ and stops before the beginning of $t_2$. That means, “Kengo ran” will be true in times $> t_1$. When we evaluate “Kengo ran” at some future time to the time at which we evaluate the sentence “Kengo runs”, we have our evaluation of “Kengo ran” evaluate to true, which in 2.2 is the desired result.

So even though our objects of assertion may be tense-neutral, we may still have an extensional account of temporal propositions. These questions, although interesting in their own right, are orthogonal to the main reason they are raised. King believes that we cannot have extensional semantics with regards to time-neutral contents. If Ninan’s argument is right, King’s argument is relative to only a kind of extensional semantics, but not all. The work of this subsection remains unscathed on either the intensional or extensional semantics of content; we can still talk about the two contents in virtue of their semantic and assertoric content.

The above account is good news for those keeping score on some rather thorny issues that we are trying to understand based on explaining identical belief states despite their being different propositions. The example I have in mind comes from the case of Hume and Heimson (Lewis, 1979). Briefly, Heimson is mad and believes that he is 18th century philosopher David Hume. Heimson believes that he wrote the *Inquiry*, that he knows Voltaire, and that he lives in Edinburgh (maybe we can even grant Heimson that the last property is true). But it was only ever true when David Hume said, “I am David Hume,” and it is only ever false when Heimson says, “I am David Hume.” Yet we want to assert that the two men are having the same belief, namely, that they are David Hume. In that case, we need a story regarding how the proposition expressed by Heimson can be false in the same manner that the proposition expressed by Hume can be true. That is, the reasons for why Heimson’s sentence is false should be on par with the reasons for why Hume’s sentence is true. Let us go over how Ninan’s two-dimensional story will get us the answer we need.
Both speakers believe the diagonal of the sentence “I am David Hume,” which in this case is true when it is uttered by David Hume. Relativists suggestions that the individual should appear in the index means that a sentence changes in truth value given which individual, which might give us the desired results, namely, the mistaken belief that Heimson believes he is Hume, and the accurate belief, that Hume believes he is Hume, and that neither believe that their belief is false. But, their proposal does not give us the right semantics in determining who has the right belief and who has the wrong belief. “It’s true for me, David Hume,” thinks Heimson, “that every time I think (or utter) the sentence ‘I am David Hume’.” And indeed, when the proposition represented by “I am David Hume” is evaluated by anyone other than David Hume, it must be necessarily false. Anyone other than David Hume who asserts “I am David Hume” is going to be saying something false, hence the proposition communicated by an utterance of “I am David Hume” is represented by the horizontal, namely, an individual who is not David Hume uttering sentence “I am David Hume” is false. For Heimson, the thing he believes is how he believes the world is.

If that was not clear enough, we will revisit the problem of representing beliefs in the final subsection of this section, where hopefully (under Weber’s lights) we can get clear on what happens to our beliefs when we attempt to communicate them. While two-dimensional semantics makes it out against King’s objection, we will not turn to see if Stojnić’s objections to Ninan and Stanley’s formulation puts them at odds with the preferred explanation from Lewis.

2.3 Stojnić And Which Is Best

In this subsection, I will discuss Stojnić’s objections to the picture outlined above. It is important to recognize that whereas Lewis’ account can bring back the assertoric content once the semantics of the sentence is determined, a similar strategy may be unavailable for Stanley and Ninan. Stojnić’s concern is expressed in the following quotation: “Without an account of how semantic
content can play a role in fixing assertoric content, it becomes an idle wheel in a theory of communication, and how assertoric content is expressed becomes completely mysterious.” (2017, p. 12) Stojnić is more than happy to grant that Lewis retains a connection between the assertoric and semantic content. We will explore how he does this below. As per our previous section, we can derive the assertoric content from a sentence once we have determined what the semantics is, which for Lewis is just a function from possible worlds, times, and locations to truth-values.

For Lewis, once the semantic content is fixed onto a given set of indices, we just have to supply the possible worlds and then it returns a truth value. That is just what Lewis says a proposition is, and so we have our relation. To illustrate, the semantics of a given sentence for Lewis are worlds to n-many indices evaluated at some context \( \epsilon \) where \( i \) are possible indices:

\[
\lambda<w, i>. \llbracket \phi \rrbracket_{c, <w, i>}
\]

After the context determines the parameters of the indices, we then retrieve the assertoric content of the sentence:

\[
\lambda<w>. \llbracket \phi \rrbracket_{<w, i>}
\]

This is good news for our original commitments, which including the notion that the assertoric content of a sentence is a proposition, a function going from worlds to truth values. First, Stojnić argues against what she believes in the Stanley-type contents of semantic and assertion of a sentence. Stanley extends the Lewisian argument to modal operators as well, such that worlds appear in the unsaturated indices of a sentence \( \varphi \). Thus, Stanley's LF for the semantics of a sentence looks like this.

\[
\lambda<w>. \llbracket \varphi \rrbracket_{<w>}
\]

But then, says Stojnić, we will not be able to say that assertoric contents are maintained across words. Indeed, assertions will become relativized to the worlds in which they are evaluated,
so sentences, once their indices are saturated with contextual information, are under Stanley’s argument committed to the following formulation:

\[ \ell [\phi] c, <wc> \]

Suppose we plug in the sentence “The closest black hole to earth is 27,000 light years away”, we get the function form:

\[ \lambda w. [\text{The closest black hole to earth is 27,000 light years away}] @,<wc> \]

\[ [\text{The closest black hole to earth is 27,000 light years away}] @,<@> \]

So the assertoric content of the sentence = 1

But that’s not good, because once we get the semantics the assertoric content is just a truth value, it can no longer be an object of belief, because the objects of our beliefs and our assertions are not truth values, i.e. I do not believe true if I believe that the actual manager of the New York Mets is Mickey Callaway, even if what I believe is true. Moreover, Stojnić asserts that an appeal to structured propositions will not do, because Stanley’s semantics are is too coarse grained to distinguish between propositions. Furthermore, if structured propositions are supposed to appear not just in the assertoric content of but also in the semantic content, that’s going to be disastrous for our compositional semantic interests because structured propositions are not the sort of things that are composed of function-arguments. We will accept Stojnić’s criticisms of Stanley that neither contents can be structured propositions, and furthermore we will agree that Stanley’s view commits to believe that the semantic content of a sentence is a function from worlds to truth values.

Secondly, Stojnić levels an objection against Ninan’s two-dimensional semantics. We’ll take a look at her criticism that I believe motivates a richer story to Ninan’s two-dimensional account. To put it plainly, Stojnić observes that the diagonal is not the assertoric content in some embedded sentences. She asserts that we cannot identify the objects of assertion with diagonals because when we have a
sentence embedded within another, we are communicating something that is not representable as it. For example, suppose the following sentence is true:

(22) Wang believes that Li is angry

And Li believes:

(23) Wang believes that I am angry

The content of “I am angry” and “Li is angry” are different, in that one contains an indexical and the other contains a proper name. Stojnić claims that Ninan’s two-dimensional semantics does not have an account that can transmit the agent-directed belief that Wang is having and the diagonal content of “I am angry” that is a general descriptive claim about a person who is angry. I will leave these objections and my additions to them as they are here for now. We will now turn to Rabern’s treatment of Stojnić’s objections and evaluate their effectiveness.

2.4 Rabern and Ensuring the Connection

I think it is important to stop here and take stock. We have a rejection of IT and a proposal to understanding the assertoric and semantic content of a given sentence. Ninan has offered a way to understand these contents via a two-dimensional semantics, where the horizontal is identified with the semantic content, things that are evaluable with indices like modal and temporal operators, whereas the assertoric content is what is identified with the diagonal, namely, that thing that the sentence is asserting to be the case once it is saturated with contextual information. The reason this was proposed in the first place was to give us something that did not reduce assertion to a post-semantic notion, so that we would be able to see how one could be grasped without the other. Before we get back to Ninan, I will discuss an example by Rabern in which he points out that multiple-indexing which requires two-dimensional semantics is already part of our general semantic picture, even if we restrict our index to worlds. Rabern’s argument demonstrates that there is
nothing in principle that we can say to limit the number of worlds we can have as part of our worlds index. Take the following sentence:

(24) It is possible for everyone who actually survived the Titanic’s maiden voyage to have died on the maiden voyage

The argument, in short, is that we cannot represent whatever is expressed by (23) without relativizing it to an actual world and a possible world that the sentence is evaluated from. That gives us the following structure:

(24') ♢ [∀x(A(survive(x)) ⊃ die(x))]

(24) is not merely true or false at a given world, and has to be relativized to a context. Part of the semantics of the sentence is determining its actual world. Indeed, this process can be iterated indefinitely, such that we create requirements for new worlds to evaluate the sentence’s proposition. Rabern observes that “...the compositional semantic values of sentences (in context) must be sets of infinite sequences of worlds (or functions from infinite sequences of worlds to truth-values).” (2012, p. 120) With this understanding, we already have a prima facie justification to believe that Rabern has given us motivation to understand the semantic value of a sentence in terms of worlds, which, contra Stojnić, does not lead to a problem for Stanley, insofar as Stanley is willing to agree that the pairs of worlds criteria is satisfied rather than just one for his semantic content. Sentence (24), however, still observes what Rabern considers to be a Lewisian principle, namely, the determination of assertoric content from semantic content. It can be understood as follows:

**Determination Principle.** If the semantic value of \( \varphi \) and \( \psi \) are the same, then for a given context \( c \), the content of \( \varphi \) in \( c \) is the same as the content of \( \psi \) in \( c \).

(Rabern 2017, p.14)

While it is clear that Lewis follows the Determination Principle, the issue remains over whether or not Ninan and Stanley do. I think that Stojnić’s worries with Stanley’s articulation of
semantic/assertoric distinctions comes from her accepting, even if only implicitly, the Determination Principle, and the Stanley’s silence on whether he would assent to it. While this question is interesting in its own right, it cannot be resolved in this paper. Instead, what I will address is building up Ninan’s two-dimensionalist account from concerns by Stojnić and King with the arguments made by Rabern. The first point of is over the concern of whether or the assertoric content of a statement is simply the True or the False. It had better be the case that assertions are propositions in functions sense, because otherwise we will not have fine-grained enough propositions to be the objects of belief. The second point is over whether or not Ninan observes the determination principle, which I claim that he does.

Ninan’s assertoric contents, being the proposition expressed along the diagonal, is not a truth-value. That should suffice as good enough reason as any to notice that it is a function from worlds to truth values. Secondly, the the total semantic value of a sentence is what allows us to extract the diagonal and horizontal from any given sentence, which means that the assertion will be a subfunction of the semantic proposition, or the primary function. I will demonstrate two possibilities. On the first, the diagonal is extracted from a sentence whose truth-values along the diagonal alternate. On the second, the diagonal is extracted from a sentence whose truth-values stay true along the diagonal.

The first sentence under consideration is:

(25) Gareth Evans was actually a professor at Oxford
Gareth Evans was actually a professor at Oxford

<table>
<thead>
<tr>
<th></th>
<th>$W_@$</th>
<th>$W_1$</th>
<th>$W_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$W_@$ is actual</td>
<td>T</td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td>$W_1$ is actual</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>$W_2$ is actual</td>
<td>F</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

Matrix 3

Where the worlds on the vertical column are each taken to be the actual world, with respect to the assertion that Gareth Evans is a professor at Oxford. Suppose that at $W_1$ that Evans had become a pastry chef in Sheffield, and that in $W_2$ he had become a fisherman in Liverpool. The diagonal of that the sentence is proposition represented by the formula, where the indices only contain worlds, is understood as:

$$\lambda w. \lbrack \text{Gareth Evans was actually a professor at Oxford} \rbrack \langle w \rangle$$

So that the sentence is true just it is true at where the world of utterance and the world of evaluation are the same. That diagonal proposition is the same as the diagonal in the sentence:

(26) Gareth Evans was a professor at Oxford

Which is consistent with our previous discussion regarding the modal profile of the two sentences being different but their assertoric content being the same. The horizontal of the sentence, being understood as:

$$\lambda w. \lbrack \text{Gareth Evans was actually a professor at Oxford} \rbrack \langle w \rangle$$

Which gives us a function from worlds to truth values, insofar as we evaluate the information provided from the context, in this case a fixed actual world, at worlds that may not be the actual world. For example, when $W_@$ is the actual world, where Gareth Evans was a philosophy
professor at Oxford, it will be true at all worlds of evaluation that Gareth Evans was actually a philosophy professor at Oxford. This ends my analysis of the two contents of sentence (26).

Our next sentence contains three indexicals, “I”, “here” and “now”:

(27) I am here now

We imagine a situation in which Evans, Strawson, and Dummett are having a pint at a pub in Oxford. After having a particularly testy conversation earlier that day, the three of them will not be at the pub at the same time, although they will be content with varying combinations of attendees. Suppose that Evans will be at the pub if Strawson offers, but he won’t if Dummett offers. Strawson will go to the pub only if he is the one who offers, and Dummett would go if Evans offers but not Strawson. That generates the following matrix:

<table>
<thead>
<tr>
<th>[[I am here now]]</th>
<th>W₁</th>
<th>W₂</th>
<th>W₃</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;W₁,t₀, GE&gt;</td>
<td>T</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>⟨w₂, t₀, MD⟩</td>
<td>F</td>
<td>T</td>
<td>F</td>
</tr>
<tr>
<td>⟨w₃, t₀, PFS⟩</td>
<td>F</td>
<td>F</td>
<td>T</td>
</tr>
</tbody>
</table>

Matrix 4

The diagonal of the sentence “I am here now” will always be true when it is uttered by the person who offered to go to the pub when they are at the pub. That comes out as true all the way down the diagonal. Whereas, the semantic content of “I am here now” is going to vary in truth value depending on which world we evaluate the sentence when its context is fixed. A world at which the individual in the vertical column is fixed is then evaluated at worlds where they do or do not send the invitation, such that when they utter the sentence “I am here now” its truth value changes. These considerations reflect the intuition that when Strawson believes, “I am here now,” it
is because he believes he is at the pub, whereas when we hear Strawson utter, “I am here now,” we evaluate the sentence based on what we know about the location of Strawson at the world of evaluation. In other words, the sentence’s semantic content is the truth value of whether or not the person in question is at the location in question.

On both of these sentences, we know there are two contents expressed by (25) and (27) respectively. We still require the words to be double indexed in both of them, and if we look at only the horizontal of each of them we observe that we can derive the assertoric content from the sentences. The Determination Thesis is observed, as in, there are no current examples of two sentences with identical semantic content that also differ in their assertoric content. And indeed, evaluating (24) and (26) at a context $\epsilon$ saturates them to the degree that we get their respective assertoric contents, a sub function which are single-worlds looking for a truth value.

It becomes plain to me, then, that the role our assertoric content of our sentences should play for Ninan is upheld. Stojnić’s criticisms are unavailed when they are discussed with reference to Ninan’s approach. There, the assertoric content of a sentence will never be a truth value, and it will fulfill the things that we want our assertions to be, namely, (i) are the objects of communication and (ii) are the objects of belief. Moreover, whatever the objects of belief are will require an explanation about how the diagonal can be something that is both asserted by the believer and yet rejected by the listener. We will get to those worries momentarily.

The history of Dummett and Evans is met with similar findings, in that Rabern concludes his discussion of Evans, suggesting that “Evans intends to respect the Determination Thesis, and Davies and Humberstone provide an elegant way for him to do so.” (2017 p. 20) Finally, we need to see how two-dimensional semantics can fit into a theory of communication where the diagonal and the semantics of the sentence are alternated between the speaker and the listener.
2.5 Weber and the Route Forward

Let me end the paper by making some brief remarks against the notion that centered content is the role that assertoric contents should play. The first three subsections of this section of the paper gave us the confidence to assert that two-dimensional semantics is able to take care of the semantic and assertoric content of any particular sentence, but, perhaps, still in line with the general concerns expressed therein, we have yet to been given a theory regarding how communication qua the delivery of information from a speaker to a listener is going to play out within a two-dimensional framework. In fact, all that has been described in the previous sections is how we will connect the assertoric content with the semantic, but nothing has been said about how speakers play any role beyond being the subjects of the things that are predicated of them. Lewis observes that semantics “...must concern itself at least implicitly with the relations between the propositional objects of the speaker's attitudes and the propositional content of his sentences.” (1980, p. 93) In the spirit of that proposal, we will view how to retrieve speaker's intentions from a given utterance explicitly.

Weber appropriately argues that centered content cannot be what is communicated by a given utterance. Why not? Suppose the centered proposition for the sentence uttered by Hans is “I am a German” when centered for Hans expresses the proposition I am a German. When Hiro hears it, then, if he understands the sentence it would mean that he hears I am a German. But that’s not right, because Hiro’s Japanese, so he will believe that Han’s sentence is false, despite it being true. Therein lies the problem for our theory, in that it now has to take into consideration the speaker’s intentions when we evaluate the meaning of a given expression, which is to say the speaker means to communicate I am German, the speaker believes I am German, but the listener comes to believe Hans is German. A problem arises for the two-dimensional picture, namely, what is happening during communication when the diagonal is swapped for the horizontal? The recentering model, proposed by Weber, is on the right track.
Additional violations of the IT are demonstrable in indexical statements. When Hans states that “I am German”, the expressed content of the sentence matches up with the content of the belief the speaker is expressing, but the acquired content is not the expressed content, but rather the content the hearer acquires “...by accepting the utterance.” ([my emphasis] Weber 2013, p. 5) The expressed content is that which is identified by the assertoric content of the sentence, but what about the acquired content? We acknowledge that “[e]ven though hearer and speaker share the same world, they don’t share the same centered world.” (Weber 2013, p. 6) With the recentering model, we can combine the insights from two-dimensional semantics into getting a theory of communication that is compatible with our theory of meaning.

I’m going to give an example. Imagine the Hiro is telling Hans that he is late. We then have the sentence:

(28) You are late

The speaker in producing the sentence believes its diagonal, namely, that the context saturates the the indexes of the sentence until it is looking for a truth value at the world at which is was uttered, which, we will assume, is true. Hans, hearing the sentence, perceives it as being produced at a context, but, in understanding the sentence, knows that the sentence is true of the individuals of whose addressees are late. The listener, believing what the speaker has said, centers the belief to be true of them, which means that, as one of Hans addressees, it is true that he is late.

Before we close, let me quickly highlight an issue with the recentering model. It comes from the fact that some of our communication makes this model downright unintuitive when we think about how we come to know some propositions. For example, while indexicals and other obviously context-dependent utterances may require a recentering model, it looks like sentences like

(29) There is no largest prime
Don’t require so much shifting in order to understand their content. In other words, the diagonal of necessary truths and the horizontal of necessary truths are always set to true, making the machinery described to get two propositions from them looks superfluous at best and theoretically dismissable at worst. The worry is articulated by Zalta, who writes: “[n]ecessarily equivalent propositions may be distinct. If the theory of propositions is not fine-grained enough to distinguish necessarily equivalent propositions, the ability to accurately represent belief is lost.” (1988, p. 57) Still, the proposal here, insofar as we are committed to possible world semantics, should be considered a good one. In fact, the above discussion illustrates cases where we will want to say that IT is successful, whereas many of the examples in this paper have been discussing cases where IT fails. While there remains to be a unified theory accounting for how and why a communication and semantic theories will account for IT’s failures and its successes, we nonetheless have a good start towards understanding how one route might go.

Conclusion

In this paper, I have tried to argue that on the two-dimensional semantics story, the horizontal and the diagonal counting as semantic and assertoric content respectively fulfills Stojnić’s *desiderata* that there is some way of uniting the proposition asserting by a sentence $s$ in a context $c$ the meaning of the sentence uttered in the same context. That means of uniting them is found in following the Determination Principle, which reliably derives the assertoric content from the semantic content. While philosophers and linguists are still a house divided over what the nature of propositions are, whatever theories are advanced going forward must reconcile the issues of how the things we say and the things that we mean come apart.
References


Stojnić, U.: 2017, On the connection between semantic content and the objects of assertion, *Philosophical Topics* J. Stanley (ed.).


Appendices and Supplemental Materials

Sentences Discussed

(1) Katsuhiro Otomo is Katsuhiro Otomo
(2) Katsuhiro Otomo is the author of *Akira*
(3) Katsuhiro Otomo could have not been Katsuhiro Otomo.
(4) Katsuhiro Otomo could have not been the author of *Akira*.
(5) Bobby Fischer moves his pawn to E4.
(6) The tennis player with the most grand slams is Margaret Court
(7) The actual tennis player with the most grand slams is Margaret Court
(8) The name “Julius” refers to whoever invented the zipper if any one person did
(9) Julius is Fumiko
(10) Necessarily, Julius is Fumiko
(11) Necessarily, Fumiko is the inventor of the zipper
(12) The president is Donald Trump
(13) The president here is Donald Trump
(14) Everywhere, it is the case that the president here is Donald Trump
(15) Everywhere, it is the case that the president is Donald Trump
(16) There was an emperor of China
(17) There is an emperor of China
(18) The manager of the NY Mets is going to the reception
(19) The actual manager of the NY Mets is going to the reception
(20) Marlowe could have written Hamlet
(21) Kengo ran
(22) Wang believes that Li is angry

(23) Wang believes that I am angry

(24) It is possible for everyone who actually survived the Titanic's maiden voyage to have died on the maiden voyage

(25) Gareth Evans was actually a professor at Oxford

(26) Gareth Evans was a professor at Oxford

(27) I am here now

(28) You are late

(29) There is no largest prime

Appendix 1

Derivation of “Kengo ran” under Ninen’s model:

\[ \lambda<w,t>.[t^* \text{PAST } \lambda t_2 t_2 \text{ Kengo runs}]_{<w,t,x,c,w,g>} \]

\[ = \lambda<w,t>.[[[\text{PAST}]}_{<w,t,x,c,w,g>} (\lambda t_2 t_2 \text{ Kengo Runs})_{<w,t,x,c,w,g>} (][t^*]_{<w,t,x,c,w,g>})] \]

\[ = \lambda<w,t>.[[[\text{PAST}]}_{<w,t,x,c,w,g>} (\lambda t'. \text{ Kengo runs at } t' \text{ in } w)(t)] \]

\[ = \lambda<w,t>. \text{there is a time } t'' < t \text{ such that } [\lambda t'. \text{ Kengo runs at } t' \text{ in } w](t'') = 1 \]

\[ = \lambda<w,t>. \text{there is a time } t'' < t \text{ such that Kengo runs at } t'' \text{ in } w \]

Appendix 2

Here is an example of centering:

1. B perceives the utterance “You are late” (being produced at the speaker’s present spatio-temporal location). [Perceiving]
2. B understands “You are late”: the set of individuals such that \( \varphi \) is true of the set of individuals whose addressees are late. [Understanding]

3. B believes that “You are late” is true of the speaker: the set of individuals such that \( \varphi \) is true of the speaker. [Trusting]

4. B believes that the expressed content of “You are late” is true of speaker: the set of individuals such that the addressee of the speaker is late. [Centering]

Here is an example of a centered to a recentered belief:

1. B perceives the utterance “There is a glass of spilled milk over here”. [Perceiving]
2. B understands “There is a glass of spilled milk over here”: the set of individuals such that \( \varphi \) is a location near the individual and \( \psi \) is found near them. [Understanding]
3. B believes that “There is a glass of spilled milk over here” is true of the speaker: the set of individuals such that \( \psi \) is found at \( \varphi \). [Trusting]
4. B believes that the expressed content is true of the speaker: the set of individuals such that the speaker is co-located with a glass of spilled milk. [Centering]
5. B believes that she is near the speaker, i.e. she believes she is a member of the set of individuals that are near the speaker. [Locating]
6. B infers information about herself from 4 & 5.: the set of individuals that are near a glass of spilled milk. [Recentering]