PLING 228: Subject matter and truth-makers

Nathan Klinedinst, Daniel Rothschild, and Yasu Sudo

Review: from partial truth to aboutness to truth-makers

Recall Yablo's examples of partial truth. For example: you ought to ϕ does not imply You ought to ϕ or ψ, but does imply some implications of ϕ.

We want, then, to characterize a certain set of special implications of ϕ which are part of the content of ϕ.

Yablo's definition of part of ψ being a part ϕ: ψ is a logical implication of ϕ and ψ's subject matter is a part of the subject matter of ϕ.

The subject matter of a sentence ϕ is given by a relation m_ϕ on W such, w is m_ϕ relate to w' iff w and share the same truth or false-makers (Yablo says actually that it's to share at least one truth or false maker..) A subject matter m' is a part of m iff two worlds are not m' related only if they are not m related i.e. m cuts more finely than m' (this isn't a quote so please correct me if this seems wrong).

So it's a rather complex structure:

ψ is a part of ϕ iff ϕ implies ψ and ϕ's subject matter is a part of ψ's subject matter, iff ψ is entailed by ϕ and any change in truth/falsity-maker for ψ is also a change in truth/falsity-maker for ψ. (Again, let's make sure this is correct.)

As we will see Fine has a more simple and elegant story here.

Example: 'Everyone came' and 'a came'.

Truth-maker for Everyone came = composite fact that a, b, c came
Falsity makers: a didn't come, b didn't come, c didn't come.
Truth-maker for everyone came = fact that a came.
Falsity maker: a didn't come.

Compare: a didn't come or a ate a cookie.

Across worlds any change in truth or falsity maker for a came leads to a change in truth or falsity maker for b came, but not vice versa.

This notion is simply not recoverable from propositions as sets of worlds alone as their we just have entailment relation.

Two visions of compositional truth-makers

Recursive

Let's first talk about the common core to the general notion of truth-makers. Here I'll follow Fine's recent work, as it's a bit easier than van Fraassen and more explicit than Yablo's reconstruction of van Fraassen.

Let's start with the notion of a state-space, which has a mereological structure (van Fraassen does this by making the elements sets, but we'll dispense with that here so that we don't confuse states with sets of states). A state space is an ordered pair $(S, \sqsubseteq)$, where S (states) is a non-empty set and $\sqsubseteq$ (part) is a binary relation on S. The relation $\sqsubseteq$ is a partial order:

(1) Reflexivity: s $\sqsubseteq$ s

(2) Anti-symmetry:$s \sqsubseteq t \,\&\, t \sqsubseteq s$ implies $s = t$.

(3) Transitivity: $s \sqsubseteq t \,\&\, t \sqsubseteq u$ implies $s \sqsubseteq t$.

We also assume that for any set $T \subseteq S$, there is a least upper bound of u in S according to $\sqsubseteq$. So there is a set for each $t \in T$, $t \in u$ and there is for any other such u', $u' \subseteq t$. We write the least upper bound of t_1 and t_2 as $t_1 \sqcup t_2$, LUBs are called fusions.

States are just our truth-makers, and this represents the minimal structural assumptions needed. Fine (and Yablo) maintain besides this complete ontological neutrality on what these objects are. They are primitives in the same way as worlds are primitives from the perspective of modal logic.

So we assume a language with atomic sentences where each atomic sentence is assigned a set of truth makers in S and a set of falsity makers in S. $|a|^+$ will be the truth-makers of a and $|a|^-$ are the falsity makers. We take as primitively assigned by the semantics the truth and falsity makers of atomic sentence (with appropriate treatment of variables, to not be discussed).

Then we give the following recursive treatment of the logical connectives:

$s \vDash a$ iff $f \in |a|^+$ (where $s \vDash a$ means that s is a truth-maker for a)

$s \dashv a$ iff $f \in |a|^-$ (where $s \dashv a$ means that s is a falsity-maker for a)

Note here the separate truth and falsity conditions (confirming and disconfirming). This is adds some more complexity to the semantics which we might expect payoffs from later to justify. For now the recursive clauses:

$s \vDash \neg a$ iff $s \Dashv a$

$s \Dashv \neg a$ iff $s \vDash \neg a$

$s \vDash a \wedge b$ iff for some t and u $t \vDash a$ and $u \vDash b$ and $s = t \sqcup u$

$s \Dashv a \wedge b$ iff $s \Dashv a$ or $s \Dashv b$

$s \vDash a \vee b$ iff $s \vDash a$ or $s \vDash b$

$s \Dashv a \vee b$ iff for some t and u $t \Dashv a$ and $u \Dashv b$ and $s = t \sqcup u$

This system then gives us a recursive definition of what it is for a state s to either confirm of disconfirm a sentence a. But wait? What about truth and all that shit? Well, of course, what it is for a sentence to be true is for it to have a state verifying that is *actual*. (I guess this is not directly in the model?)

We can also add a notion of modality to our state space by including a set $S^\diamond$ of *possible* state spaces, which is a subset of S, so our model is not $\langle S, S^\diamond, \sqsubseteq \rangle$. We assume that $S^\diamond$ is closed under parts: if s is in $S^\diamond$ so is any part of s. We can now define some important notions: e.g. s and t are compatible if $s \sqcup t \in S^\diamond$.

We can also define possible worlds in this system: maximally compatible fusions (state w such that any states s is either part of s or incompatible with it.) We could stipulate that every state s in $S^\diamond$ is part of a world, but Fine does not see any benefits from this.

Note that S will generally included impossible states: since it include the fusion of any two states, so includes the fusion of incompatible states. These will come in handy later.

Features:

Verification is not hereditary (necessarily). If a is verified by s it is not verified necessarily by any state $t \sqsupseteq s$

$p \wedge p$ can have different verifiers than p

> One immediate odd consequence of the clauses is that $p \vee p$ may not have the same verifiers as p. For suppose that s and t are the two verifiers of p, where neither is a part of the other. . . . I believe that this odd consequence is not a problem for natural language applications but that it may be a problem for more theoretical applications. If, for example, our interest is in the partial truth or confirmation or verisimilitude of a statement, then it seems to me that we would not want to distinguish in this way between the statements p and $p \wedge p$.

I don't however understand his fix of this p. 8 by redefining verification of disjunction. (But basic idea seems that we now close verifiers under fusion)

Reductive alternative

Here we reduce every sentence to a disjunction of conjunctions of atomic formulas and its negations. Call each of these conjunctions a minimal witness. This treats logically equivalent systems equivalently unlike the recursive system.

A minimal model of sentence is any of these conjunctions that is true. A minimal countermodel is the any of the disjunctions of the reduced form of its negation (?).

Yablo proposes (p. 61) that we can define truth-makers this way: the truth maker of a are its minimal models, false makers are its minimal countermodels.

Yablo often favors this idea of truth-makers, but Fine (obviously) has anted in to his van Fraassen inspired recursive system.

Subject matters for Fine

Fine's definition of subject matter: the fusion of all the verifiers (positive subject matter), the fusion of all the negative ones (negative subject matter = subject anti-matter).

Subject matter of $a \wedge b$ = subject matter of $a \vee b$.

Note that subject matters fuse all verifiers so are *impossible* states. Impossible states are perfectly tractable things in this semantic–unlike impossible worlds in standard semantics.

Applications of Recursive Theory

Partial content

Again we have a definition of partial content, and hence partial truth. This is going to be the same as on Yablo, but without recourse the mechanism of Lewiston subject matters (since we don't have this any more).

ψ is a part of ϕ iff every exact verifier of ϕ contains an exact verifier of ψ and every exact verifier of ϕ is contained in an exact verifier of ψ. [1]

Fine relates this to some super-obscure (to me) work by Angell.

Conditionals

An extremely robust inference:

If A or B then C.

This is not captured on Lewis/Stalnaker semantics (though it is on a strict conditional—see extensive literature on sobel sequences and like).

Fine: verifier relation relative to worlds $s \to_w t$ means s leads to t in w: Definition of counterfactual:

$w \vDash A > C$ if for any states t and u for which $t \vDash A$ and $t \to_w u$, $u \vDash C$.

(Or more complex clause footnote p 17)

Seems like we no longer get a contradiction to imply just anything...

Scalar Implicatures

Typical SI:

(1) I had cake or ice-cream $\rightsquigarrow$ I didn't have both.

Gricean account: speaker didn't make stronger utterance. So speaker doesn't know stronger utterance is true. Since he knows what he ate, it's false.

Problem:

[1]Exactly verified, just means verifies, and A is a part of B iff B analytically implies A. Also the second clause can be replaced by the condition that the subject matter of ψ is part of the subject matter of ϕ.

(2) I had cake or ice-cream or both $\not\rightsquigarrow$ I didn't have both.

Fine's solution (also taken up by van Rooij?)

The Origin of Scalar Implicature (OSI) Scalar implicature arises from the presupposition that a statement is not merely true but exactly true.

What is 'exactly true':

> Any subject-matter s will have an actual part $s_@$, which is the fusion of all those parts of s that are actual. Where s is the relevant subject-matter of a statement A, we may now say that A is exactly true if $s_@$ is an exact verifier of A. We might call $s_@$, when s is the relevant subject-matter, the relevant situation. Then for A to be exactly true is for it to be exactly verified by the relevant situation.

This allow us to differentiate between (1) and (2).

Basic questions: context and truth-makers

A truth maker for A (and hence its subject matter for either) will depend on what we take to be its logical structure: i.e. what basic states are verifying it.

Subject matters might also be given without sentences, i.e. as what we are talking about, what is relevant, etc.

Does logical structure get fixed by context?

SIs and question:

Who ate cake? versus How much cake did John eat? as questions for John ate some cake.

Again how do we get eating something to be part of eating cereal.