

Real Change without Primitive Temporal Operators

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Background

- I've developed a theory of time
- But there are some problems
- Now I'm working on the modal analogue of the view
- And it faces analogous problems
- I'm interested in how to respond in both cases

Strategy

- I'll describe the theory of time
- I'll briefly say why I like it
- I'll describe **three** problems it faces
- I'll describe some possible responses

Theories of Time

- Theories of time are usually characterised as either **presentist** or **eternalist**
- I agree with Williamson that the presentism–eternalism distinction is not that helpful
- There are four* important distinctions among theories

- **1. A-theory–B-theory**
- **A-theory:** some time is absolutely present
- One moment – the present – is metaphysically distinct from all others
- **B-theory:** there is no absolutely present time
- Presentness is always relative

- **2. Permanentism–temporaryism**
- **Permanentism:** Always, everything always exists
- Existence is eternal
- **Temporaryism:** sometimes, there's something that *was* nothing, and sometimes, there's something that *will be* nothing
- Stuff is created and destroyed

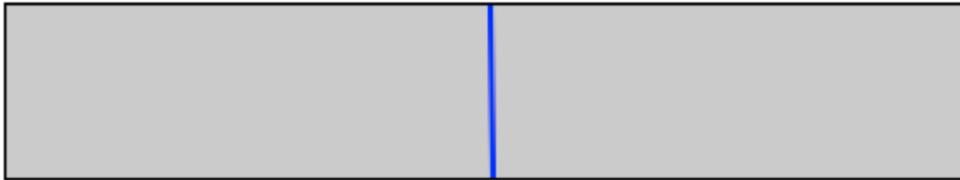
- **3. Temporalism–anti-temporalism**
- **Temporalism:** there are metaphysically primitive temporal operators
- ‘P’ (it was the case), ‘F’ (it will be the case)
- **Anti-temporalism:** there are no metaphysically primitive temporal operators
- $P(\text{There are dodos}) := \text{there are dodos located at some past time}$

- **4. Propositional temporalism–propositional eternalism**
- **Propositional temporalism:** some propositions change their truth-values simpliciter over time*
- [That Dan is happy]
- **Propositional eternalism:** all propositions are if true always true
- [That Dan is happy at 2016]

- Plausibly, propositional temporalism implies and is implied by the A-theory
- So I'll only need **three** distinctions:
- (i) permanentism–temporaryism
- (ii) temporalism–anti-temporalism
- (iii) prop. temporalism–prop. eternalism



The 4-D Block Universe
(Eternalism)



The Moving Spotlight
Model



The Growing Block
Model



Presentism

- **The Block Theory:** (i) permanentist; (ii) anti-temporalist; (iii) propositional eternalist
- **Presentism:** (i) temporaryist; (ii) temporalist; (iii) propositional temporalist
- But I'm interested in the **Moving Spotlight Theory** ('MST')

The Moving Spotlight Theory

- MST is permanentist and propositional temporalist
- I think MSTers should be anti-temporalists as well
- **All you need is presentness!**
- Here's how to do it:

- 1. Take the 'Block Universe'
- 2. Add fundamental presentness
- 3. Accept a reductive analysis of the standard temporal operators:
 - $P(\phi) := \text{at past } t, \phi$
 - $F(\phi) := \text{at future } t, \phi$
- This isn't a full reduction: we've still got temporal operator 'at t ' hanging around!

- Usually 'at t ' is characterised like this:
 At t , ϕ iff Always(t is present $\rightarrow \phi$)
- This won't do – it has 'always'!
- Here's my alternative (where ϕ is free of temporal operators or 'at t '):
 - At t , $\phi := \phi$ [with all instances of 'is present' in ϕ replaced with '= t ']
- In other words: 'at t ' functions to replace instances of 'is present' with '= t '

- 4. Posit lots of unvoiced quantification over the present in ordinary thought and talk
- ‘Dan is happy’ has the form:
$$‘\exists t(\text{Present}(t) \ \& \ \text{Happy}(\text{Dan}, t))’$$
- To be happy is to bear the permanent *happiness* relation to the present
- And that’s basically it!

- The view is **permanentist**:
- ' $\forall x \exists y y=x$ ' is equivalent to ' $\exists y \forall x y=x$ '
- It's also **propositional temporalist**:
- 'Dan is happy' expresses the proposition [that $\exists t(\text{Present}(t) \ \& \ \text{Happy}(\text{Dan}, t))$] – which is false when presentness shines on times at which Dan isn't happy
- But it is **NOT** temporalist – rather, it is **anti-temporalist**

- **Why do I like this view?**
- 1. I believe in 'real change'
- 2. But I think there are good reasons for believing in the past and future:
 - (i) From physics
 - (ii) From philosophy of language (names)
 - (iii) From metaphysics (the Being Constraint, Quinean methodology)

Problems

- MST has some virtues
- It also avoid some well-known objections, such as
 - 1. Sider's epistemic objection
 - 2. McTaggart's argument
- But it faces some fresh objections

1. The Metaphysical Problem

- “When it comes to change, you’re no better off than the B-theorist. Sure, you *say* that things ‘really change’ – but then you analyse facts about what *was* and *will be* the case in terms of relations to the absolute present. And then you analyse facts about change in which time is present in terms of permanent relations between times. You’re no A-theorist!”

- ‘Dilip was dancing’
- ‘ $\text{P}(\exists t(\text{Present}(t) \ \& \ \text{Dancing}(\text{Dilip}, t)))$ ’
- ‘ $\exists t^* \exists t^{**} (t^* \text{ is present} \ \& \ t^{**} \text{ is earlier than } t^* \ \& \ \text{at } t^{**} (\exists t(\text{Present}(t) \ \& \ \text{Dancing}(\text{Dilip}, t))))$ ’
- ‘ $\exists t^* \exists t^{**} (t^* \text{ is present} \ \& \ t^{**} \text{ is earlier than } t^* \ \& \ \exists t(t=t^{**} \ \& \ \text{Dancing}(\text{Dilip}, t)))$ ’
- ‘ $\exists t(\text{Past}(t) \ \& \ \text{Dancing}(\text{Dilip}, t))$ ’

- ME: [That Dilip dances at a past time] is a temporary proposition: after all, it was false when all the times at which Dilip dances were in the future!
- OBJECTOR: So change in which times are present grounds changes in Dilip (for example). Okay, explain change in which times are present then: for example, why isn't 2016 *always* present?

- '2016 is always present'
- ' $\forall t$ at t (Present(2016))'
- ' $\forall t(t=2016)$ '
- That's false! So there's change in which time is present. Similarly:
- '2015 was present'
- ' $\exists t$ (Past(t) & at t (Present(2015)))'
- ' $\exists t$ (Past(t) & $t=2015$)'

- OBJECTOR: Okay. You said the proposition p that Dilip was dancing is temporary: it is true but was false. What does that come to in your terms?
- 'p is true and was false'
- ' $\exists t(\text{Present}(t) \ \& \ \text{True}(p, t)) \ \& \ \exists t^*(\text{Past}(t^*) \ \& \ \neg\text{True}(p, t^*))$ '
- OBJECTOR: But that's a permanent fact!
- ME: No it's not! It was false when all of the times at which p is true were in the future

- What's going on?
- Objector says my view isn't *really* one on which things change
- But that seems to come down to a rejection of anti-temporalism
- Objector wants me to have *fundamental* facts about what was and will be the case
- But *there are* facts about what was and will be the case – why isn't that enough?

2. The Logical Problem

- You can state propositional temporalism using quantification into sentence-position:
$$'\exists p(\text{Sometimes}(p) \ \& \ \text{sometimes}(\neg p))'$$
- But on my analysis of 'sometimes', this is equivalent to
$$'\exists p(p \ \& \ \neg p)'$$

- This is a problem: I'd like to be able to express propositional temporalism in these familiar terms
- Maybe it shows that Objector was right all along
- What do I do?
- Here's a tentative suggestion:

- Suppose we think it makes sense to ask whether a given proposition p is “about” a given property F
- If so, we could say that the proposition [that $\exists t(\text{Past}(t) \ \& \ t=2015)$] is “about” the property of being present
- Then we could “extract” the relevant property to get a property-of-properties ‘[p - F]’

- Then we could have a new ‘higher-order’ analysis of ‘sometimes’:

$$S(\phi) := \exists t([\phi\text{-presentness}](\text{being} = t))$$

- ‘ $S(\text{Dilip is dancing})$ ’
- ‘ $\exists t([\text{that Dilip is dancing at a present time-presentness}](\text{being} = t))$ ’
- This is true iff $\exists t(\text{Dancing}(\text{Dilip}, t))$

- Now take
- ‘ $\exists p(\text{Sometimes}(p) \ \& \ \text{sometimes}(\neg p))$ ’
- This goes to
- ‘ $\exists p(\exists t([p\text{-presentness}](\text{being} = t)) \ \& \ \exists t([\neg p\text{-presentness}](\text{being} = t)))$ ’
- This is true!
- There’s a proposition p such that there’s a time that p ’s “about” and another time that p ’s not “about” (e.g. [that Dilip is dancing in the present])

3. The Attitude Problem

- Take the sentence
- ‘In 2016, Dilip believes that 2016 is present’
- On my analysis this goes to
- ‘ $\exists t t=2016 \ \& \ \text{at } t(\exists t^* \text{ Present}(t^*) \ \& \ \text{Believes}(\text{Dilip}, t^*, \text{that } 2016 \text{ is present}))$ ’
- ‘ $\exists t t=2016 \ \& \ \text{Believes}(\text{Dilip}, t, \text{that } 2016 =t)$ ’

- In other words:
- Dilip believes as of 2016 that 2016 is 2016
- But Dilip might believe that 2016 is present and *not* that 2016 is 2016
- For instance he might have weird views about identity
- Or just be confused!

- What's to do?
- 1. The 'substitutional analysis' of 'at t ' is applied to the *fundamental* language – the language of the 'Final Analysis'
- But maybe 'believes', 'desires', etc. won't show up in that language
- In that case, there's no problem

- But the problem arises if there are *any* intensional operators in the fundamental language
- This should be false:
- ‘At 2016, necessarily, 2016 is present’
- But it’s equivalent to the true sentence
- ‘ $\exists t t=2016 \ \& \ \Box(2016=2016)$ ’
- Block substitution into intensional contexts?

Thank you!

Modal Orphans

Theories of Modality

- **Necessitism [contingentism]:** necessarily, everything is necessarily something
- **Modalism [anti-modalism]:** there are metaphysically primitive modal operators
- **Propositional contingentism [propositional necessitism]:** some propositions could have different truth-values simpliciter

- **Lewisian Modal Realism:** (i) necessitist; (ii) anti-modalist; (iii) propositional necessitist
- **Actualism:** (i) contingentist; (ii) modalist; (iii) propositional contingentist
- But I'm interested in the **Modal Spotlight Theory** ('MMST')

- 1. Take the Lewisian Pluriverse
- 2. Add fundamental actuality (a la Bricker)
- 3. Accept a reductive analysis of the standard modal operators:
 - $\diamond(\phi) :=$ at some world w , ϕ
 - At w , $\phi := \phi$ [with all instances of 'is actual' in ϕ replaced with '= w ']
- 4. Posit lots of unvoiced quantification over actuality in thought and talk

- The view is **necessitist**:
- ‘ $\Box \forall x \Box \exists y y=x$ ’ is equivalent to ‘ $\forall x \exists y y=x$ ’
- It’s also **propositional contingentist**:
- ‘Dan is happy’ expresses the proposition [that $\exists w(\text{Actual}(w) \ \& \ \text{Happy}(\text{Dan}, w))$] – which would have been false had actuality shone on a world at which Dan isn’t happy
- But it is **NOT** modalist – it is **anti-modalist**

- Why do I like this view? (*Do I like this view?*)
- 1. I believe in 'real contingency'
- 2. I'm a necessitist (*MLAM*, counting possible knives)
- But... do we need all that necessary structure?
- It has a certain *élégance*
- But it might clash with physics (Williamson)