

# Theories of time, presentism, persistence and the real problem of change

Philipp Keller\*

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## Problems of taxonomy

As in many areas in philosophy, a bewildering variety of different taxonomies makes it unnecessarily difficult to chart the logical space of positions. Here is my attempt: We have, first of all, a question in the *philosophy of language and mind*, about the (in)eliminability of tense. Some philosophers, like D.H. Mellor and J.J.C. Smart, think that everything true can be said in a tenseless language with expressions for temporal locations. Others, like Quentin Smith and Dean Zimmerman, hold that tenses are irreducible.

This, I now think, is not entirely a question about semantics. Even though most of the arguments (I know) in favour of the ineliminability of tense come from the epistemology and the philosophy of mind, they typically have metaphysical conclusions. Their general form is the one of the knowledge argument: in order to rationalise sound inferences essentially involving tensed sentences (“the meeting is now”, “thank goodness that’s over”, “I’m afraid of my future pain” etc.) we need to accept ‘tense-properties’ (presentness, futurity, pastness) in the *content* of our attitudes. To the same extent we accept traditional knowledge arguments as arguments in favour of phenomenal properties or aspects, we may do the same for arguments in the temporal domain. So we get:

**(Tense)** Presentness or pastness or futurity is a real property.

What is presentness supposed to be? A first stab may be the following: Let  $f$  be the fact that this apple (in front of me, ...) is red. Presentness is the property I know  $f$  necessarily to have if I come to know  $f$  e.g. by perception, but do not know  $f$  to have if I come to know it in some other way, e.g. by testimony or memory.

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\*University of Geneva, Switzerland, philipp.keller@unige.ch.

Another question concerns the *metaphysics* of time, i.e. questions about its nature: even if we accept presentness as a real property, we may still ask questions what it essentially is, what it means for reality to include it. One aspect of this question is whether time is sufficiently similar to space to be considered a dimension rather than a feature of reality. B-theorists like Broad, Lewis and Sider think that time is an internal parameter of the whole truth about reality, while A-theorists like Zimmerman think that the whole truth about reality will also tell you what time it is.<sup>1</sup> The question dividing A- and B-theorists is whether a complete description is biased to any particular time, whether there is a time-invariant description of reality, which is independent of change:

**(A-theory)** There is no time-invariant true complete description of reality.

A-theorists, in my use of the word, are committed to the claim that it is not the case that change is explanatorily prior to time: even a complete description of a Parmenidean universe (with no change independent of the ticking of clocks) would be biased towards a particular time. They do not have to pick out, however, any particular time as an ‘anchor’ of a complete description – they could also hold, e.g., that it is not the present (now), but rather the birth of Christ or the foundation of the philosophy department at the University of Geneva.<sup>2</sup>

Serious tenses do not have to be A-theorists: one might think, for example, that even though presentness is a real property, it is distributed in a time-invariant way. Depending on the details of Mary-style arguments, however, they may purport to establish not only that there is presentness, but also that it is an objective fact that it is exemplified in just one instant. I doubt, however, how convincing such arguments are. Consider their phenomenal analogue: it seems clearly possible to hold, for Mary-related reasons, that reality includes phenomenal facts (of which Mary is ignorant while in the black-and-white room), but still deny that it cannot be fully described except from one particular phenomenal perspective. Both Finean fragmentalism and relativism are such positions.

The converse argument from an A-theory to serious tensing, however, is much more compelling: it seems hardly possible to single out any one instant in the full description of reality without attributing to it a real property of presentness (or pastness, or futurity), if this is to be done in a way independent of (non-temporal)

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<sup>1</sup>That the debate between A- and B-theorists concerns the *metaphysics* of time is compatible with the fact that one may put the question, by semantic ascent, as one about the relative priority of descriptions of the temporal ontology in different vocabularies: “...as a first approximation, the B-theory is the view that all that can be truly about the A-series is grounded in the totality of facts about the B-series, while it is not the case that all that can truly be said about the B-series is grounded in the totality of facts about the A-series.” (Correia and Rosenkrantz 2011: 15). Hinchliff (2000: S577) calls “A-theorist” someone who thinks that there are properties of presentness, pastness and futurity.

<sup>2</sup>Rather unhelpfully, Bourne (2006: 10) calls a theory of time “tensed” if it “postulates an ontologically significant notion of the present”.

change. The only way to do so I can think of is to provide independent arguments that the whole of reality, by metaphysical necessity, has to be temporally 0-dimensional.

A third question is one about *temporal ontology*, i.e. the temporal extension of temporal reality. While eternalists (Lewis, Sider and Rea) think that reality is four-dimensional and that both past and future things or events exist,<sup>3</sup> growing blockers, like Broad and Tooley, think that while reality is four-dimensional, there is an *ontological* difference between the past and the future, namely that past, but not future events and things exist. A third position – defended, e.g., by Zimmerman, Crisp, Markosian, – holds that everything there is is present, i.e. that no past or future things exist.<sup>4</sup>

**(Presentism)** Our most inclusive quantifiers do not range over past and future things.

I do not know of a (serious) argument from serious tensing to presentism: why should we think that, just because a property of presentness exists, it should be universal (except for atemporal things)? Serious tensing and eternalism are compatible, e.g., if presentness is exemplified at different times. Perhaps one way to argue for presentism from serious tensing would be that presentness cannot be a contrastive property: nothing can be present in contradistinction to anything else. Perhaps this could be underwritten by the observation from special relativity that every two events are simultaneous with respect to some light-cone (e.g. the one at the origin of the universe) – but this is better seen as a reductio of serious tensing. Nor does presentism imply or is good reason for serious tensing: our most inclusive quantifiers could very well be limited to present things without ascribing to them a property of presentness. I would expect arguments to show this is not possible to be suspiciously analogous to arguments to show that existence has to be a property.<sup>5</sup>

The argument from the A-theory to presentism is looser still – it generally takes the form of an inference to the best explanation. If no description of reality can be complete without singling out a particular point in time, why assume that this instant is not present? Fine has undermined this sort of argument, by sketching to positions that endorse **(A-theory)** without being committed **(Presentism)**: both fragmentalism and relativism hold that **(A-theory)** is vacuously true because there is no (and cannot be any) complete description of temporal reality – either because the constitution of reality itself is temporally qualified (relativism) or because reality

<sup>3</sup>“Four-dimensionalism” is used by Lewis and Rea for eternalism, by Sider sometimes for the perdurantist and exdurantist views of persistence, sometimes for the claim that there are temporal parts of persisting objects.

<sup>4</sup>Other positions are obviously possible. Łukasiewicz (1922), e.g., thinks that only those parts of the past are real that have effects in the present.

<sup>5</sup>The worst of such arguments I know of is from McGinn (2000) and basically consists in the observation that ‘thing’ occurs in ‘something’.

is, while ‘one’, not ‘of a piece’, and does not allow of a description that is both complete and coherent.

Quite clearly, presentism does not provide a reason for an A-theory. No matter what the temporal extent of reality is, it is quite another question whether it admits of a time-insensitive description. Quite the contrary is true: a presentist does not need to be an A-theorist, and it is not even very clear how he could be. If reality has no temporal extension, it is indeed very difficult to see how a complete true description of it *could* be biased to any particular time.

A fourth question, finally, concerns the nature of *persistence*. In virtue of what do things persist through time, i.e. exist at more than one moment in time? Endurantists analyse persistence in terms of things being wholly present at different times, while perdurantists say that things persist through time in virtue of having instantaneous temporal parts located at different times. Exdurantists say that things persist in virtue of standing in temporal counterpart relations to other things located at different times. I think different theories of persistence are best seen as different explanations of change. I was standing, and am no longer – how is this possible? If we understand change as change in what is true, then different theories of persistence are different theories of truth-at-a-time. The relation of this classification to the others is complicated – cf. below.

Corresponding to the Finean classification, we thus have four types of temporal realism, characterised by positive answers to four different questions:

“Does a maximally complete description of reality ...

- ...attribute a property of presentness?” Realism about **Tense**: the Finean tense realist thinks there are irreducibly tensed facts, and that their being irreducibly tensed is a guide to their metaphysical nature.
- ...attribute a property of presentness to just some, but not all of the things that exist?” Realism about **Time**: Time is a real existent, it makes a difference by *making* some things present and not others, *itself* changing the things that enter into contact with it. This is what I mean by the A- vs. B-theory question, and what Fine misleadingly puts as the choice between presentism and neutrality. I think the best way to understand the Correia/Rosenkrantz distinction between ‘shifty-content’ and ‘fixed-content’ is as an elaboration of this question (though I also have my misgivings, cf. below).
- ...fall short of all of reality?” Realism about **Times**: The Finean fragmentalist makes a reality/appearance distinction with respect to times – temporal reality inevitably transcends all possible means of description.
- ...itself differs with respect to at what time it is given?” Realism about **Temporality**: The Finean relativist thinks that the most comprehensive truth-predicate applicable to descriptions of temporal reality is “truth-at-*t*”, and that there is no explanation of change – it has to be accepted with natural

piety that different things are true-at- $t_1$  than there are true-at- $t_2$ .  
The four choice points open a logical space of 36 possibilities:

tense	ontology	A or B	persistence	
no	eternalism	B	end	E.J. Lowe (?)
no	eternalism	B	per	David Lewis
no	eternalism	B	ex	Ted Sider
no	eternalism	A	end	Mark Johnston (?)
no	eternalism	A	per	5
no	eternalism	A	ex	6
no	present	B	end	Bigelow (?)
no	present	B	per	8
no	present	B	ex	9
no	present	A	end	10
no	present	A	per	11
no	present	A	ex	12
no	growing	B	end	13
no	growing	B	per	14
no	growing	B	ex	15
no	growing	A	end	16
no	growing	A	per	17
no	growing	A	ex	18
yes	eternalism	B	end	19
yes	eternalism	B	per	20
yes	eternalism	B	ex	21
yes	eternalism	A	end	Quentin Smith (?)
yes	eternalism	A	per	23
yes	eternalism	A	ex	24
yes	present	B	end	25
yes	present	B	per	26
yes	present	B	ex	27
yes	present	A	end	Dean Zimmerman
yes	present	A	per	29
yes	present	A	ex	30
yes	growing	B	end	31
yes	growing	B	per	32
yes	growing	B	ex	33
yes	growing	A	end	34
yes	growing	A	per	35
yes	growing	A	ex	36

## ***As Time Goes By – A B-wolf in A-sheep’s clothing?***

Some salient characteristics of the *framework* of Correia and Rosenkrantz (2011):

1. The so-called “new B-theory”, characterised by detensing by token-indexicals (“presently ...” goes over into “at the time of this utterance, ...”), is surprisingly set aside (Correia and Rosenkrantz (2011: 18) say that a “basic material A-statement” “is only temporarily satisfied”, on p. 2011: 18 they take for granted that A-statements cannot be translated into B-statements, because of problems to do with essential indexicals).
2. A-theories are characterised (e.g. in the ‘Reals’) as “views of tense”, not of theories of temporal ontology.
3. (Real-3) is importantly ambiguous wrt “the fact which constitute reality are different” – either it is meant that there are or obtain different facts at different times, or that the existing facts are different (have different qualities) at different times.
4. With (Real-4), the ambiguity is resolved, and a change of the first kind is required. Two implausible claims are made: (i) that all change is accompanied by a change in what time it is (i.e. atemporal change is excluded); (ii) all change is *implied* (!) by a change in what time it is. The two claims are backed up by the enigmatic statement: “If we identify the temporal perspective associated with a given time with all the A-statements that can truly be made at that time...” (2011: 32).
- 5.
- 6.
- 7.

My **main worry** about the Correia/Rosenkrantz theory: it is a version of fragmentalism. To “assume that statements of the type ‘The fact that  $n$  days from the present,  $p$  = the fact that  $m$  days from the present,  $p$ ’, where ‘ $n$ ’ and ‘ $m$ ’ refer to distinct numbers, are always false” (Correia and Rosenkrantz 2012: 8) is, in effect, to redefine coherence\*.

**Is it an A-theory?** It is not an A-theory because a complete true description does not tell you what time it is.

## **Desiderata for a theory of temporality: three problems of temporal objectivity**

There are, at least, three problems of temporal objectivity, which present different challenges to the different families of theories.

## The problem of change

Things change: we grow older, acquire new properties and lose old ones, until we eventually die. This much is certain. The problem of change is to understand how this is possible. How can one and the same thing have incompatible properties? The problem, as it is the case with many others, may be alternatively put as an inconsistent set of intuitively plausible claims, as a paradox (plausible inference from plausible premisses to an implausible conclusion), as a dilemma or as an aporia.

The inconsistent quatuor:

- (i) If there is change, it is in respect to one and the same thing.
- (ii) If there is change, it is in respect to one and the same property.
- (iii) There is change.
- (iv) Nothing both has and lacks the same property.

Denying each one of the premisses comes at a considerable price: denying (i) violates what they call “the proper subject condition”, denying (ii) makes all change extrinsic, denying (iii) implies commitment to a certain kind of Parmenideanism, while denying (iv) violates the principle of non-contradiction.

The transformation into a paradox is immediate:

- (i') If there is change, it is in respect to one and the same thing.
- (ii') If there is change, it is in respect to one and the same property.
- (iii') Nothing both has and lacks the same property.
- (iv') Hence, nothing ever changes.

Three main families of responses may be distinguished:

**denying (i)** successions of different things may constitute change

**denying (ii)** successions of different properties may constitute change

**denying (iii)** there is no change

Correlative to the three (families of) ‘solutions’, we have three different conceptions of how things are in time:

**endurantism** Things persist and they persist by being identical at different times.

strict identity The identity in question is strict: it is the relation anything stands only to itself.

genidentity The identity in question is a weaker relation, of genidentity

**perdurantism** Things persist and they persist by being located at different times.

‘4D’ Things are located at times by having temporal parts.

mystery Things are otherwise temporally located.

**error theory** Things do not persist.

presentism

exdurantism ordinary things are like cartoon characters

All of these are unsatisfactory. Some of the stock objections are:

**endurantism** too few atoms

strict identity How may you be said to have changed if you're still the same?

genidentity How can you do duty for something that does not exist?

**perdurantism** too many worms

'4D' does not allow for alteration, only for generation and corruption of temporal parts

mystery

**error theory** presentism change with ersatzist times is only ersatzist change

exdurantism not everything is an event

We are thus well advised to keep looking for other solutions.

Zimmerman (1998: 208) thinks serious tensors have another way out because they don't have the first problem of ascribing (apparently) contradictory properties: "The serious tensor says that it is simply not true that I have the property *being straight* if I am bent now. I was straight, and will be again; but I am not now, and so there is no problem of my having incompatible intrinsic properties." (Zimmerman 1998: 212)

Contrary to Zimmerman, I do not think serious tensing, in this sense, is implied by (and also, plausibly, implies) presentism. Rather, it seems to me a statement of a member of the family of theories that go by the name of "adverbialism": the temporal modifier cannot be analysed as a adjectival modification of either the subject term or the predicate. The other alternatives are:

- (a) treat "at *t*" is an adverbial modifier on the atomic statement;
- (b) treat "at *t*" is an adverbial modifier on the copula;
- (c) treat "at *t*" is an adverbial modifier on the predicate.

## The problem of persistence

I think that Sider's argument from vagueness does not establish Fourdimensionalism, but a weaker premiss, *Instantaneous Plenitude*. Let us use, following Sider (2001: 59), "four-dimensionalism" for the following claim:

**4D** Necessarily, each spatio-temporal object has a temporal part at every time at which it exists.

(??) follows from three other claims, *Instantaneous Plenitude* (??), *No Permanent Coincidence* (??) and *Unrestricted Diachronic Composition* (??):

**IP** Necessarily, for every time that some spatiotemporal objects exists, there is something coincident with it at that time that exists only at that time.

**NPC** No two objects are coincident at every time at which any of them exists.

**UDC** For all things that exist at some times, there is something that overlaps them and is overlapped by them at all and only the times at which they exist and that exists at all and only the times at which at least one of them exists.



Take some spatio-temporal object  $a$ . At any time  $t$  at which it exists, there is, by (??), some  $b_t$  coincident with  $a$  at  $t$  that exists only at  $t$ . By (??), there is a fusion of all and only those  $b_t$ s that exists at the same times than  $a$ . By (??), this fusion is identical to  $a$ . Hence  $a$  has instantaneous temporal parts at all times it exists (??).

David Lewis' argument from vagueness for unrestricted composition goes as follows:

- |        |   |                        |
|--------|---|------------------------|
| (i)    | For every thing, definitely (it exists) or definitely (it does not exist)           | no ontic vagueness     |
| (ii)   | For every things, definitely (they are identical) or definitely (they are not)      | no ontic vagueness     |
| (iii)  | Definitely $(p \rightarrow q) \vdash$ Definitely $(p) \rightarrow$ Definitely $(q)$ | logic                  |
| (iv)   | For every $n$ , definitely (there are just $n$ things) or definitely (not so)       | from (i), (ii), (iii)  |
| (v)    | Definitely (there is a cat iff $\phi(a_1, \dots, a_n)$ )                            | composition            |
| (vi)   | Definitely (there is no cat iff there are just $n$ things)                          | composition            |
| (vii)  | Definitely (there is a cat) or Definitely (there is no cat)                         | from (vi), (iv), (iii) |
| (viii) | Definitely $(\phi(a_1, \dots, a_n))$ or Definitely $(\neg\phi(a_1, \dots, a_n))$    | from (vii), (v), (iii) |

The argument shows that " $\phi(x_1, \dots, x_n)$ " must be definitely true or false of any  $n$  objects that may or may not be a cat. The argument then continues as follows:

- |        |  |  |
|--------|--|--|
| (ix)   | Every non-trivial condition $\phi$ on composition is vague         | argument from elimination                                |
| (x)    | No vague condition $\phi$ on composition satisfies (viii)          | metaphysical non-arbitrariness                           |
| (xi)   | Only the empty and the impossible conditions $\phi$ satisfy (viii) | from (ix) and (x)  |
| (xii)  | There are composite objects.                                       | common sense   |
| (xiii) | $\phi(a_1, \dots, a_n)$ iff $a_1, \dots, a_n$ exist                | from (xi) and (xii)                                      |
| (xiv)  | There is a cat iff $a_1, \dots, a_n$ exist                         | from (xiii), (v), (iii) and 'Definitely $(p) \vdash p$ ' |

*Sider's argument from vagueness* is an adaptation of Lewis' argument to the temporal case. It consists in a restriction of (v) to diachronic composition, where  $a_1, \dots, a_n$  all exist at (possibly) different temporal instants. He concludes that there is no non-trivial restriction of diachronic composition, because any would be vague. This establishes (??), but not yet (??).

Suppose all your temporal parts exist, and you are (at any time) identical to them (i.e. the temporal part of you existing at that time). Two important questions remain unanswered:

Do you exist (at that time) in virtue of them existing, or do they exist (at their times) in virtue of you existing?

Do you persist in virtue of them, of them existing, of them being  $F$  (for some  $F$ ), of them being  $R$ -related among themselves (for some  $R$ )?

## The problem of temporal becoming

Kit Fine (2005c: 270-2, 2006: 399-400) reconstructs McTaggard's argument against the reality of tense as a set of four inconsistent principles:

- (i) Realism: There are tensed facts.
- (ii) Neutrality: No instant is privileged.
- (iii) Absolutism: The constitution of reality is an absolute matter, independent of any standpoint.
- (iv) Coherence: Reality is not constituted by incoherent facts.

A crucial question concerns how to spell out the notion of ‘incoherent facts’. For Fine (2005c: 272, 2006: 400), two facts are incoherent if they have incompatible ‘contents’. It has been justly remarked by Correia and Rosenkrantz (2012) that Fine’s notion is non-standard insofar as he denies that fragmentalism – the denial of coherence – implies that there are true contradictions (2005c: 282, 2006: 402). Fragmentalism holds that while the constitution of reality is standpoint-independent (Absolutism), reality is not “of a piece” (2005c: 262, 2006: 413), but is fragmented into mutually incoherent classes of mutually coherent facts we may identify with times (2005c: 281).

They propose to make (i)-(iv) coherent by denying that facts have a fixed content, i.e. allow that the *same fact* may be at one time the fact that Kit Fine is sitting and at another time be the fact that Kit Fine is standing.

I am doubtful this strategy succeeds:

1. don’t you have the same problem one level higher up (what *makes* facts change their content?)?
2. don’t you make time look *very* different from space? Consider the analogue of the inconsistent quatuor for cosmological space:
  - (i’) Realism: There are facts about location.
  - (ii’) Neutrality: No location is privileged.
  - (iii’) Absolutism: The constitution of reality is an absolute matter, independent of any standpoint.
  - (iv’) Coherence: Reality is not constituted by incoherent facts.
 Would it be plausible to have facts change their contents wrt where they exist?
3. Even if it succeeded, it is a B-theory in A-clothing: the whole truth about the world, according to Correia and Rosenkrantz, does not tell you the time.

## Arguing for the A-theory

## Arguing for the growing block view

## Arguing for coherence

## Arguing for fragmentalism

## A common solution? An adverbialist theory

Suppose we may, at  $t_1$ , truly say of  $a$  that it is  $F$ . Hence “ $a$  is  $F$ ” is true at  $t_1$  and so is “ $a$  is  $F$  at  $t_1$ ”.  $a$  might cease to be  $F$ . It will then be true, at some other time  $t_2$ , that  $a$  is not  $F$ . “ $a$  is not  $F$  at  $t_2$ ” will then be true at  $t_1$ . The problem of change is to explain how this is possible. If both  $t$  and  $t'$  exist, we may say that  $a$  bears the following relation only to  $t_1$ , but not to  $t_2$ :

- (1) For any  $a$  and  $t$ ,  $aF^*t \iff$  “ $a$  is  $F$ ” is true at  $t$

The problem with (1) is to understand how these relational predicates can satisfy the  $T$ -schema. It is, after all, also true at  $t_2$  that it is true at  $t_1$  that  $a$  is  $F$  true at  $t_1$ . If the  $T$ -schema holds at  $t_2$  for truth-at- $t_1$ , contradiction ensues.

So why don't we put the temporal element into the property?

- (2) For any  $a$  and  $t$ ,  $aF^*t \iff$  “ $a$  is  $F$ -at- $t$ ” is true

While this explains how  $a$  can have seemingly incompatible properties, it raises a different problem: some properties are intrinsic, i.e. exemplified by particulars independently on what (intrinsically) goes on in the outside world; they do not differ between duplicates and supervene on properties that are quantitative, non-disjunctive, and can be had or lacked by things independently of whether there are any other things in their world than their parts. Obviously, there are some such intrinsic properties and some of them are temporary, i.e. things change with respect to them.

The problem of temporary intrinsics is to explain how  $aF^*t$ , understood as in (1), is compatible with  $F$  being a property exemplified intrinsically. An advocate of temporal parts will analyse  $F^*$  as follows:

- (3) For any  $a$  and  $t$ ,  $aF^*t \iff a$  has a temporal part at  $t$  which is  $F$

Because  $F$  is here ascribed to a temporal part that does not undergo an intrinsic

change, the ascription to  $a$  of seemingly incompatible properties has been resolved into the ascription of incompatible properties to different parts of  $a$ .

Cases of the exemplification relation solve the problem neatly:

$$(4) \quad \text{For any } a \text{ and } t, \quad aF^*t \iff \text{ex}_1(a, F(\chi)) \wedge \text{ex}_2(\text{ex}_1 \text{ is at } t)$$

Our ontological picture points us to a different solution, not generally recognised in the discussion of temporary intrinsics.

$$(5) \quad \text{For any } a \text{ and } t, aF^*t \iff \exists e e \text{ is at } t \text{ and } e \text{ makes it a fact that } a \text{ is } F$$

Whenever two successive intrinsic properties of some thing  $a$  are incompatible, different events will make these facts exist. The facts are incompatible because they cannot be made to exist by one and the same event. The temporal modification inside the state of affairs indicates the temporal location of the fact-making event and does not ascribe a temporal property to the atemporal fact.

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