

Temporal Parts

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Temporal parts are analogous to spatial parts: just as the conference has one spatial part which occupies the seminar room, and another which occupies the lecture hall, it has one temporal part which ‘occupies’ Friday and another which ‘occupies’ Saturday. These temporal parts of the conference have half-hour coffee-breaks as temporal parts of their own; these coffee-breaks are also temporal parts of the whole conference.

It is relatively uncontroversial that events, e.g. conferences, have temporal parts; perhaps only a presentist, who denies the existence of past and future, would reject this claim. It is much more contentious whether material objects, e.g. cats, cars and continents, have temporal parts too. There are two main theories of the persistence of material objects – perdurantism and endurantism. Of these, perdurantism is often identified with the claim that persisting objects have temporal parts, or indeed that each has an instantaneous temporal part (a ‘time slice’) at every moment at which it exists. Conversely, endurantism is identified with the claim that persisting objects are ‘wholly present’ – not just partially present – whenever they exist.

Theodore Sider provides the following definition:

x is an *instantaneous temporal part* of *y* at instant t =_{df} (1) *x* exists at, but only at, t ; (2) *x* is part of *y* at t ; and (3) *x* overlaps at t everything that is part of *y* at t .

He writes “This captures the idea that my current temporal part should be a part of me now that exists only now but is as big as me now. It should overlap my arms, legs –

everything that is a part of me now. [Perdurantism] may then be formulated as the claim that, necessarily, each spatiotemporal object has a temporal part at every moment at which it exists.” (2001, 59)

Sider argues that it is difficult to provide a positive characterisation of the central endurantist claim that persisting objects are ‘wholly present’ whenever they exist. Roughly, this is because endurantists are restricted to a notion of *parthood-at-t* rather than atemporal *parthood*. Suppose that *a* exists at *t*. Then it is trivial that anything which is a part-at-*t* of *a* is present at *t* (in that sense, it is trivial that *a* is wholly present at *t*). Yet provided *a* gains and loses parts, it is false that anything which is at any time part of *a* is present at *t* (in that sense, it is false that *a* is wholly present at *t*). Debate continues about how best to formulate the endurance-perdurance distinction, and about whether the notion of ‘temporal part’ should play a central rôle (McKinnon 2002, Crisp and Smith 2005).

Supposing that we have grasped the central notion, why believe that persisting material objects have temporal parts? The main reason is that this enables us to solve puzzles about change, about coincidence, and about vagueness. Accordingly, those who reject temporal parts should show that they have solutions of their own to these puzzles, and/or show that the temporal-parts ‘solutions’ are ineffective.

The first puzzle is the problem of change or ‘problem of temporary intrinsics’ as David Lewis called it (1986, pp. 202-204). Ordinary persisting things change: the cat is first asleep then awake. Yet Leibniz’s Law tells us that one and the same object cannot have incompatible properties – properties like *being awake* and *being asleep*.

If the cat has temporal parts, the puzzle is resolved: an earlier temporal part of the cat is asleep, and a later temporal part of the cat is awake, and it is in virtue of this that we may truly say that the cat itself is first asleep and then awake. Those who reject temporal parts propose alternative explanations of how the passage of time makes it possible for one and the same object to have apparently incompatible properties (Merricks 1994 surveys some options). In addition, some claim that the temporal parts picture simply eliminates change, on the grounds that no single thing has both *being awake* and *being asleep* non-derivatively.

The second puzzle is that of temporary coincidence. The sculptor moulds the lump of clay into a statue. Now the statue and the lump are distinct yet coinciding material objects. The puzzle is to explain how they can differ in their properties (e.g. their historical and sortal properties) whilst apparently sharing all their parts. If the objects have temporal parts, they do not in fact share all their parts, and the puzzle is resolved. Those who reject temporal parts may deny the existence of statue, lump or both (van Inwagen 1990), or else provide some other explanation of how objects may differ despite sharing all their parts (Baker 2002). They may also argue that the temporal parts solution does not generalise to similar puzzles in which apparently distinct objects coincide permanently.

The third puzzle concerns vagueness in persistence. Many objects, including ourselves, appear to have fuzzy beginnings or endings; some have trajectories which become obscurely entangled with those of other objects. If objects have temporal parts and if the various overlapping pluralities of such parts have sums, then there are very many nearly-coincident persistents. We can then blame vagueness either on our

inability to discern which of the many overlapping persistents we refer to (an epistemic theory of vagueness) or else on our failure determinately to refer to any particular persistent (a semantic theory of vagueness). Those who reject temporal parts may propose an ontic theory of vagueness, according to which some objects are vague in and of themselves, or insist that we are simply ignorant of the exact trajectories of the few persisting objects there are, or posit a proliferation of coinciding objects (van Inwagen 1990 opts for ontic vagueness).

To do this puzzle-solving work, temporal parts must be abundant (enough to underpin every intrinsic change), and readily combinable (enough to underpin a semantic or epistemic account of vagueness in persistence). Advocates of temporal parts typically accept that every persisting object has an instantaneous temporal part at every moment at which it exists, and that such temporal parts obey the principles of classical extensional mereology, in particular the principles of unrestricted fusion and unique fusion. Sometimes they also presuppose that instantaneous temporal parts are in some sense more basic than the persistents they compose. But these principles and presuppositions are not built into the very notion of a temporal part.

Further Readings

Lewis, D., 1986, *On the Plurality of Worlds*, Oxford: Blackwell. Sets the terms of debate in three pages (202-204).

Sider, T., 2001, *Four-Dimensionalism*, Oxford: Oxford University Press. Provides definitions, examines arguments, and advocates temporal parts.

Merricks, T., 1994, "Endurance and Indiscernibility" *Journal of Philosophy* 91, 165-84. Against temporal parts.

Hawley, K., 2004, "Temporal Parts", in E.N. Zalta (ed.) *The Stanford Encyclopedia of Philosophy* (Winter 2004 Edition),

URL = <<http://plato.stanford.edu/archives/win2004/entries/temporal-parts/>>. An extended overview, which includes a lengthy bibliography.

Short Bibliography

Baker, L. R., 2000, *Persons and Bodies: A Constitution View*, Cambridge: Cambridge University Press.

Crisp, T.M. and Smith, D.P., 2005, "'Wholly Present' Defined", *Philosophy and Phenomenological Research* LXXI.2, 318-344.

Hawley, K., 2001, *How Things Persist*, Oxford: Oxford University Press.

Heller, M., 1984, "Temporal Parts of Four-Dimensional Objects", *Philosophical Studies* 46.3, 323-334.

McKinnon, N., 2002, "The Endurance/Perdurance Distinction", *Australasian Journal of Philosophy* 80, 288-306.

Van Inwagen, P., 1990, *Material Beings*, Ithaca, NY: Cornell University Press.