

Intrinsic, but relational

Philipp Blum, Themes from Baxter II, Ligerz October 22, 2013

October 22, 2013

Intrinsicity

The ‘scare quotes’ approach: Intrinsic properties of a

1. are / account for / ground ‘how a is by itself’, are exemplified by a ‘in virtue of the way it is in itself’;
2. make for ‘genuine’ similarity, are ‘non-disjunctive’, have ‘non-gerrymandered’ extensions;
3. are shared by a and its ‘duplicates’ / ‘replicas’ / perfect ‘copies’.

Theoretical roles: Intrinsic properties

1. are qualitative natures of combinatorial units;
2. make for real, as opposed to Cambridge change;
3. do not entail, nor are entailed by the existence of any other things wholly distinct from their bearers.

Definition 1 (Lewis₁-intrinsicness). F is intrinsic iff for all x and y , if x and y have the same natural properties, then Fx iff Fy (Lewis 1983: 26).

Definition 2 (Lewis₂-intrinsicness). A property F is intrinsic iff for all x and y , if x and y have the same pure, non-disjunctive and non-co-disjunctive properties independent of loneliness and of accompaniment, then Fx iff Fy (Lewis & Langton 1998).¹

There are at least four main problems with the Lewis/Langton account:

1. haecceitistic properties (the exemplification of which implies the existence of particular individuals) are not independent of accompaniment (Dunn (1990: 186), Sider (1996: 4), Humberstone (1996: 240) and Yablo (1999: 487)): they are had in only one world if particulars are world-bound.
2. properties involving relations across possible world (*having a duplicate in the world in which one exists* and *being a duplicate of Kofi Annan*) are independent of accompaniment and non-disjunctive and are falsely classified as intrinsic.
3. disjunctive properties: *being such that there is a cube* is independent of accompaniment and falsely classified as intrinsic (Marshall & Parsons 2001: 3) if it is non-disjunctive, i.e. not much less natural than either *being a cube* or *being accompanied by a cube*. But Lewis & Langton (2001: 354) bite the bullet.
4. maximal properties (Sider 2001b): A property F is *maximal* iff, roughly, large parts of an F are not themselves F . If *being a rock* is maximal, it has intrinsic duplicates which fail to be rocks because they are parts of rocks. So *being a rock* is extrinsic. As it is independent of accompaniment, however, Lewis has to claim that it is disjunctive, which does not seem very plausible. He is, however, prepared to bite the bullet (Lewis 2001: 382).

Lewis (2001: 387) proposes a less permissive criterion for ‘bad disjunctions’ (properties expressed by disjunctive predicates which are not intrinsic): a property is (badly) disjunctive iff it is equivalent to a disjunction such that each disjunct is more natural (not: much more natural) than the whole disjunction. He also makes a new attempt to characterise bad disjunctions directly, thereby cutting down his reliance on contentious judgements of comparative naturalness. The new definition runs as follows:

Definition 3 (Lewis₃-intrinsicness). A property P is intrinsic iff (i) P is independent of accompaniment, (ii) P is at least as natural as ($P \wedge$ being accompanied), (iii) P is at least as natural as ($P \wedge$ being lonely), (iv) $\neg P$ is at least as natural as ($\neg P \wedge$ being accompanied), (\neg) $\neg P$ is at least as natural as ($P \wedge$ being lonely).

More general problems:

¹A property is pure iff its exemplification does not imply the existence of anything else than the thing exemplifying it. Something is accompanied iff it does not coexist with a contingent wholly distinct thing and it is lonely iff it coexists only with its proper parts (if it has any). A property is independent of loneliness (accompaniment) iff it is both possible that it is had and that it is lacked by a lonely (accompanied) thing. A property is *disjunctive* iff it can be expressed by a disjunctive predicate but is not natural and much less natural than either of its disjuncts. The pure, non-disjunctive and non-co-disjunctive properties independent of loneliness and accompaniment are called “basic intrinsic” by Lewis and Langton. Def. 2 says that a property is intrinsic iff it supervenes on basic intrinsic properties, or, equivalently, iff it never differs between duplicates (where two things are duplicates iff they have the same basic intrinsic properties).

1. *having an F-part* (for things with proper parts that exemplify *F* intrinsically) comes out intrinsic only if duplication of wholes requires duplication of their parts, which is debatable;²
2. *being a proper part of an F* (for things which are proper parts of things that exemplify *F* intrinsically) come out extrinsic, if we accept the supplementation principle;³
3. *having a as a part*: *a'* is a super-duplicate of *a* iff *a* and *a'* are duplicates and any part of *a* has a (similarly located and qualitatively indiscernible) part of *a'* as its counterpart (Humberstone 1996: 242). But this does not allow for counterpart relations heeding extrinsic similarities. Alternative (Bricker 1993: 274): in order for a part *b'* of *b* to be a (*a, b*)-duplicate of a part *a'* of *a*, *b'* does not only have to be a duplicate of *a'*, but also be related to other parts of *b* in a way similar to how *a'* is related to the other parts of *a*.
4. No extrinsic essential properties.

In all Lewis-definitions, “how a thing is by itself” is translated into “how a thing would be if it were lonely”. This transition, however, is far from being mandatory: Another possible way to spell out the “by itself” clause, as Sider’s examples show, is to count those features of a thing as intrinsic that are determined by what goes on inside its borders, i.e. on how its parts are and in what relations they stand. This point is well made by Humberstone:

“...the idea of an intrinsic property is the idea of a property a thing has in and of itself: but *considering* a thing *in itself* is not the same as *supposing* the thing to be *by itself*.” (Humberstone 1996: 229)

Hence we should distinguish two concepts of loneliness:

loneliness as independence : *x* is lonely in this sense iff it exists all by itself, i.e. if nothing other exists than its (proper and improper) parts;

loneliness as interiority : *x* is lonely in this sense iff all things outside it are abstracted away and the thing is considered ‘in isolation’.

Conceiving of the loneliness compatibility with which is required for intrinsicity as interiority rather than independence allows for parthood properties coming out intrinsic, at the prize of requiring another independent criterion for being a combinatorial unit.

Achille Varzi (1997: 42) distinguishes (topologically) “open” and “closed” entities, i.e. entities which include their boundaries and those that do not. Houses and rocks, if *being a house* and *being a rock* are maximal, are closed – the open counterparts of a house which are embedded in a larger house are not houses, for they lack (counterparts of) parts the original house had, namely its boundary. The boundary of the house, however, is not a part of the house, but it is part of the house considered in isolation.

Turning the tables: A substance is something which has intrinsic properties – intrinsic properties are properties had by substances.⁴ *a*’s *intrinsic nature* is the fusion of all those properties it has intrinsically. It is a (non-spatiotemporal) part of it; the intrinsic nature of a part is then ‘included’ in the intrinsic nature of the whole. We could even use inclusion of intrinsic natures to *define* what it means to say that *y* is part of *x*.

Definition 4. *A particular a is a substance iff it is a counterpart of a world.*

Any substance has intrinsic properties and thus an intrinsic nature:

Definition 5. *F is the intrinsic nature of a substance a iff it is the fusion of all universals that are part both of a and of all counterparts of a which are worlds.*

A substance is a maximal spatio-temporally interrelated whole; an intrinsic nature is a maximal nonspatiotemporal part of a substance.

Relationality

The ‘scare quotes’ approach: Non-relational properties of *a*

1. do not ‘essentially mention’ other things than *a*;
2. do not ‘stem from’ metaphysically / conceptually / explanatorily prior relations *a* has;
3. are ‘genuinely monadic’.

Theoretical roles: Non-relational properties

1. are wholly qualitative: their nature is exhausted by how the things that have them are;
2. are non-haecceitistic: may be shared by distinct indiscernibles;

²Consider a parallel case with essential properties. Suppose I have a heart and it is organic. It may be essential to me that I have a heart and essential to my heart that it is organic, but not essential that I have an *organic* heart – I could have an artificial heart (though, this would not be a counterpart of my actual heart). In this case, I will have counterparts that have hearts that are not counterparts of my heart.

³I.e. that, if *a* is a proper part of *b*, then they have a mereological difference (the common part of all things overlapping *b* but not overlapping *a*).

⁴Cf. Langton (1998) but also Rosefeldt (2001).

3. are pure, i.e. do not presuppose anything of the category of the particular.

Definition 6 (Implicational relationality). *P* is impure iff $\exists R \exists y \forall x (Px \leftrightarrow Rxy)$.

Problem (cf. Khamara (1988: 146) and Humberstone (1998: 218)): If we introduce the predicate “tinthree” by the following definition:

$$\forall x, y (x \text{ tinthrees } y \leftrightarrow (x \text{ is made of tin} \wedge y \text{ is the number } 3))$$

the property of being made of tin comes out as impure because, necessarily, something is made of tin iff it tinthrees 3. Relational properties are properties that are individuated with reference to relations (Hochberg 1988: 196): to say that, generally and as a matter of logical truth, if $a = b$, then $\lambda x(aRx) = \lambda x(bRx)$, we need to quantify over relations.⁵

That relational properties may be pure has been pointed out by Khamara (1988: 144–145), who characterises relational properties in terms of whether their truth- and falseness are relational facts:

A positive relational property is one which is true or false of individuals in virtue of their having relations to other individuals; whereas a negative relational property is one which is true or false of individuals in virtue of their lack of relations to other individuals.

He then goes on to provide a “more precise characterisation” thus (cf. Humberstone (1996: 210), who also points out (1996: 216) that “*R*” has to be restricted to pure relations):

Definition 7. *P* is a positive relational property iff $\exists R \forall x (Px \leftrightarrow \exists y (Rxy))$.

Khamara’s claim (1988: 145) that all impure properties are relational, has been refuted by Humberstone (1996: 211), who distinguishes three ways to obtain relational properties from binary relations (1996: 212–213): quantification, reflexivization and place-fixing. As Humberstone (1996: 216) points out, these are just three of the infinitely many patterns in the general case. While place-fixing may be said to make for impurity, it is far from clear on what grounds this might be plausibly be claimed for reflexivization and quantification.

Let us, following Humberstone (1996)’s rephrasing of Dunn (1987) and Dunn (1990), call a property “Dunn-pure” iff it is, whenever it is truly predicated of *a*, a relevant property of that individual, i.e. a property such that the hypothesis that an arbitrary *x* is *a* relevantly implies that *x* has the property.

Definition 8 (Dunn purity). *A property P of a is Dunn-pure iff for all x, if x is a, then x is P.*

The class of Dunn-pure properties is closed under negation, conjunction, disjunction, (relevant) implication and even under relevant implication of arbitrary formulae (e.g. if *a* is relevantly *F*, then it is relevantly *F* and such that ϕ , because any formula ψ relevantly implies $\psi \vee \chi$ in **R**) (Dunn 1987: 362–363). Let us say that a logic **L** has the *dumming-in property* iff, for every formula *A* and every any sentence letter *p* of the language of **L**, there is a formula $B(q)$ such that $\mathbf{L} \vdash A \leftrightarrow B(p)$ (Humberstone 1996: 264, n. 45). Dunn’s logic **R** and the disjunction-free fragment of Positive **R** have this property.

The general problem with def. 8, as Humberstone (1996: 264, n. 46) has pointed out, is that it is not clear what such a relevant predication amounts to. Take any ordinary predication *Fa*. In Dunn’s logic **R**, *Fa* is not equivalent to the relevant predication $\forall x(x = a \rightarrow Fx)$. It is, however, equivalent to $\forall x((Fa \rightarrow Fx) \wedge x = a) \rightarrow Fx$. Another problem: it turns out that on Dunn’s account we can, from any formulae *Fx* and *Gy* that determine relevant properties of all their instances, we can construct a ‘relation’, namely $(Fx \rightarrow Gy) \vee \neg(Fx \rightarrow Gy)$, such that any two things are relevantly (internally) related by it (Dunn 1990: 199). The most important problem with this approach to define ‘real’ properties is that it is entirely based on the syntactic behaviour of predicates and takes their logical form for granted.

Impure properties, i.e. properties making essential reference to particulars, were excluded from candidates to Lewis-intrinsicness from the start: As Sider (1996: 20) has remarked, only purely qualitative properties have a chance of supervening on the natural ones. In the two later definitions, Lewis & Langton (1998: 118) and Lewis (2001: 382, n. 6) make it clear that they restrict intrinsicness to purely qualitative properties, on account of the fact that impure properties cannot be shared between counterparts nor (perhaps a fortiori) between duplicates. All of Lewis, Langton and Lewis/Langton acknowledge, however, that there seem to be intrinsic impure properties like *having Howard’s nose as a part*. (Lewis & Langton 1998: 118), *being shaped like the Eiffel tower* (Langton 1998: 39) or structural properties of the form *having an *F* part*. (Lewis 1986: 62) or *being such that my legs are longer than my nose*. (Wasserman 2003: 4). We lack a theoretical justification for saying that they are intrinsic.

⁵The reason why loving-Superman and loving-Clark-Kent is one and the same property (and Lois Lane, as a matter of logic, exemplifies one iff she exemplifies the other), is that Superman is Clark Kent; therefore, the properties are not atomic, but derelativisations of the prior relation of loving.

Dunn (1990: 185) objected to Lewis' account of intrinsic properties as those invariant under duplication that the property *being a duplicate of a* will come out intrinsic:

“...Lewis in conversation has responded to my complaint that *being a perfect duplicate of b* turns out to be an intrinsic property on his account. As best as I can recall his reply, he thinks that this is perfectly fine. Although the property is *identified* with reference to *b*, *in itself* it amounts to only an infinite conjunction of intrinsic properties of *a*, and hence is itself intrinsic.” (Dunn 1990: 203, n. 7)

Cross-cutting

Examples of the relational intrinsic:

1. *having a as a part*
2. the value of Diana's dress
3. *being of a crime* of some punishment

Examples of the non-relational extrinsic:

1. *not being accompanied by a unicorn*
2. *being all there is*
3. *being surprising* of an event

Relative location combines the two: “being left” (as in “my left hand”) expresses a extrinsic, non-relational monadic property, while “being to the left of” (as in “the tower is to the left of the house”) expresses a relational monadic property.

Interlude: the case of colours

According to Massin (2010: 99), the “proper sensibles” (colours, sounds etc) are monadic extrinsic properties, because they both depend on our perceptual apparatus and qualify only their bearers.

Milieu dependence: Colour experiences have to be individuated relationally: individually indiscriminable stimuli look different (become distinguishable) if set against different backgrounds.

Revelation: “The intrinsic nature of canary yellow is fully revealed by a standard visual experience as of a canary yellow thing. [...] It is just this idea that visual experience is transparently revelatory which Descartes denied when he wrote of our visual sensation as arbitrary signs of the properties that cause them, employing the analogy of the sensations which a blind man receives of texture as a result of using a cane to “see.” (Johnston 1992: 223,223–224)

Colours don't look like dispositions: “When one enters a dark room and switches on a light, the colours of surrounding objects look as if they have been revealed, not as if they have been activated.” (Boghossian & Velleman 1989: 86)

Representational properties are intrinsic, but relational

Many things may be said to have content, but most of them do so indirectly: they have content in virtue, for example, of having been produced in a certain way or with certain intentions, or of standing in some relation to other things that have content. The most important such relation is that of some things expressing other things. It is in virtue of expressing my beliefs that my utterances have content, and – subject to certain constraints – the beliefs expressed determine what content they have.

Most contentful things thus have their content extrinsically: they mean what they do in virtue of other things having a certain content. At some point, however, the bucket must stop: if there are any representational properties at all, some things must have them intrinsically. Because they are representational, however, they are relational even when exemplified intrinsically: they represent something other than themselves, creating a relation between their bearer and the things they make their bearer be about.

Representational properties like *meaning that Fa*, *representing a to be F* or *thinking of a as F* are intrinsically exemplified by some thing *x* iff *x* exemplifies the property independently of how matters stand with respect to other things than *x* – no further properties have to be exemplified for other things for my thought, e.g., to represent *a* to be *F*. That some representational properties are exemplified intrinsically by some things follows from the following argument:

- (i) Some things have representational properties.
- (ii) If something exemplifies a representational property extrinsically, it does so in virtue of there being something else that bestows it with this representational property.
- (iii) In order for something to bestow something else with a representational property, the first thing needs to exemplify this representational property itself.

- (iv) The transmission of representational powers can neither go on forever, nor go in circle: it must be started by something.
- (v) A thing that has a representational property that is not bestowed upon it by something else exemplifies it intrinsically.

Even when they are exemplified intrinsically, however, representational properties are still relational: they connect their bearers to the things they are about. If my thought, for example, represents *a* to be *F*, it stands in the relation of aboutness to *a* and in the predication relation to the universal *F*. It is in virtue of these relations that my thought can stand in for *a*'s being *F*, and be in some sense further to be specified a substitute of this external fact.⁶

Intentional properties are extrinsic, but non-relational

According to what Chisholm (1952: 56) calls “Brentano’s Thesis” – that intentionality is the mark of the mental – intentional properties are extrinsic, but non-relational. They are extrinsic, because they are signs, but non-relational, because they are characterised by “intentional inexistence”: psychological states may exist even in the absence of what they are about.

The representationality of some properties has to be sharply distinguished from their intentionality. A property of something is intentional iff it is *taken to be* about something else than itself. It is so taken to be if we attribute to it conditions under which it may be said to be correct. Correctness conditions specify the intentional content, but – being conditions – do not themselves require this content to be satisfied. If I am looking for the Holy Grail, for example, my activity is directed towards, and rationalisable only with respect to the Holy Grail, which, or so let’s assume, does not exist. I am intentionally directed towards the Holy Grail, without standing in a relation to it: there is nothing, after all, for me to stand in a relation to.⁷

Because they are outward-directed, and cannot be accounted for without reference to their intentional objects, intentional states are extrinsic: they are what they are in virtue of participating in a complex process, which not only involves their objects, their bearer, but also a process of interpretation or understanding.⁸

My life and me

We may naïvely think that the whole truth about temporal reality factorises into what is true of temporal objects at given instants, where this may involve relations they may have to things at other instants. Looking at the world from this perspective, the fundamental question seems to concern the relation that enduring objects, say Aristotelian substances, have to their spacetime regions, or, by semantic ascent, whether everything that is true of them may be said to be true of them *at* some instant or other. This is the familiar debate about how substances persist in time, often misleadingly called the 3D/4D controversy.⁹

Take me and my life, and assume that I am wholly present at every instant at which I exist, while my life has temporal parts. In at least one, hopefully unproblematic, sense, both I and my life exist. Different predications are true of us, however: my life may be short, even if I am tall, I may be boring even though my life is not. Most importantly, we all think, I hope, that our lives might have been different. Presumably, some of us even believe that they might have had lived the life of another person, living or dead. Even though we both exist, and are different, I have a very intimate relation to my life: my life began with my birth; if you end my life, you kill me. The interdependence is not only one of existence: if I die young, my life will be short; if my life is boring, it is me who is dissatisfied with it; if I am a philosopher, my life will in part be a philosophical one.

Some philosophers have argued that I am my life, and have either tried to provide truthmakers for predications about me in terms of properties had by and relations among my temporal parts or else ‘tense’ the true predications about my life so as to make them attributable to me.¹⁰ Even if such a reductive project were to succeed, however, it would leave the metaphysical question unanswered.

⁶Different accounts of this relation of standing-in have been proposed, from Aristotle’s ‘being-a-token-of’ – “It is not possible to converse by bringing in the objects themselves, but instead of the objects we use words as tokens”, *Sophistici Elenchi* 1, 165a6-8 – to the scholastic modes of objective existence.

⁷It is only as an analysis of intentionality, not of representationality, I think, that Aristotle’s theory of thoughts being likenesses of objects has any plausibility.

⁸This has been made particularly clear by Charles W. Morris, one of the founders of the theory of signs: “The properties of being a sign, a designatum, an interpreter, or an interpretant are relational properties which things take on by participating in the functional process of semiosis.” (1939: 82)

⁹Misleadingly, because the dimensionality of objects is a question orthogonal to the question of persistence: four-dimensional objects may well be ‘wholly present’ along one of their dimensions, while three-dimensional objects may have temporal parts, but still not persist *in virtue of* them.

¹⁰These two strategies map onto the two most prominent dissolutions of the so-called “problem of temporary intrinsics”: to explain why the contradiction inherent in “*a* is both *F* and not *F*” is removed by adding “at *t*₁ and *t*₂ respectively” (for *t*₁ ≠ *t*₂), perdurantists interpret the sentence as attributing *F* to *a-at-t*₁ and ¬*F* to *a-at-t*₁, while endurantists interpret it as attributing *being F at t*₁ and *being F at t*₂ to the very same *a*.

Even if necessarily, each spatio-temporal object has a temporal part at every time at which it exists,¹¹ and is, at this time, identical to this temporal part, this still leaves open the crucial question whether the object (i) exists and whether it (ii) persists in virtue of (the existence of) these parts (cf. Hawthorne 2006: 99–100).

Neither is the metaphysical question answered by endurantists. Even if we suppose that the whole truth about my life factors into truths made true by how I am at different instants, we may still ask what accounts for the unity of my life, i.e. what ties together the separate temporal parts into a unified whole. The course of events that is my life is traced out by the substance, so much we assume, but how exactly is this tracing out accomplished? Not all events in which I participate are parts of my life, after all.¹²

Persisting things and their temporal parts: perdurance and unfolding

Unfinished as the contrary reductive projects are, they also both rest on an unargued-for assumption: that temporally extended entities such as my life are resolvable into, or ‘nothing but’ their temporal parts. If things may be temporally extended without perduring, the question about the relative priority of temporal wholes and parts will not help us find out how objects persist, nor will it provide a solution to the ‘problem of change’. I think that there are temporally extended enduring things and will call them “processes”. That we need more than the ordinary four-dimensionalist resources to account for them has already been recognised by the founder of tense logic:

“There is, however, a genuine difficulty, which I do not know how to solve, about the representation of past-tense facts as the former being-the-case of present-tense ones. Since the present is an instant, the only past-tense facts which we can represent by ‘It was the case that *p*’ or ‘It has been the case that *p*’, where *p* is in the present tense, are facts about what was the case at an instance or at a succession of instants. [...] Whatever *goes on for* a period of time can be fitted into this pattern, since *it is going on at* each instant in the period. But what *takes* time eludes this representation.” (Prior 1968: 7–8 and 2003: 24)

Let us be clear about the difficulty: it does not concern the questions (i) whether spacetime is ‘gunky’ or composed of points (cf. Hawthorne 2007: 271), (ii) whether tense logicians may quantify over extended instants (or help themselves to what Brogaard (2007) calls ‘span operators’), nor (iii) whether instants or intervals are more fundamental. Nor does it concern the issue of (iv) whether some dynamic properties are intrinsic or extrinsic to objects-at-times, though our question will have implications for this debate.¹³ While there is an even tighter link to the issue (v) whether some temporal entities are essentially temporally extended, the question of processes does primarily concern how things persist, not whether they have properties essentially which presuppose temporal extension.¹⁴

What then, is the specifically metaphysical question of processes? Temporally extended, but enduring things like processes are of interest to the metaphysician of time because their conceivability, and even more their metaphysical possibility, shows the conceptual independence of three questions:

1. ontological dependence: whether or not some category of temporally extended thing can exist without its temporal parts;
2. individuating, essential dependence: whether or not some category of temporally extended thing could be what it is without its temporal parts being what they are;
3. ways of taking up time: in virtue of what temporal extension is produced, what the principle is by which some temporally extended thing is so extended;

The first of these questions concerns the nature of time, and of temporal parthood and could be answered, e.g., by an argument for the conceivability, possibility or perhaps even actuality of temporally extended simples. The second

¹¹This is what Sider (2001a: 59) calls “four-dimensionalism” and Sider (2007: 242) calls the “temporal parts theory”. His argument in favour of it (the adaptation of David Lewis’ argument from vagueness for unrestricted composition for the diachronic case) establishes only a weaker claim which has been called “instantaneous plenitude” (Hawthorne 2006: 87), namely that necessarily, for every time that some spatiotemporal objects exist, there is something coincident with it at that time that exists only at that time. Hofweber & Velleman (2010: 4) think that instantaneous plenitude follows from the very notion of temporal extension and express their conviction that the notion of extended simple is conceptually incoherent.

¹²The ‘new’ solution to the problem of temporary intrinsics Brower (2010) offers to endurantists does not solve this problem. He takes Socrates to be a part of Socrates-at-*t* and to be bent at *t* in virtue of Socrates-at-*t* being bent *simpliciter* (2010: 893). Socrates will also be, however, part of Socrates-and-Xanthippe-at-*t*, which is partially annihilated *simpliciter* and so his becoming a widower is as much a non-Cambridge change as is his standing up. Brower will reply that parthood is not enough: to be derivatively bent, Socrates must have the same matter as bent-Socrates-at-*t*. This answer, however, presupposes the theory of accidental unities, which requires a prior distinction between intrinsic and extrinsic properties (for widower-Socrates is *not* an accidental unity).

¹³The standard arguments for taking instantaneous velocity to be extrinsic – the Ockhamist view (Bigelow & Pargetter 1989: 290), the Russellian view (Zimmerman 1998: 268), and the at-at view (Arntzenius 2000: 187–189) – take it to be determined by taking the limit of a sequence of distance-time pairs – that is, by measuring distance over time as the temporal interval approaches zero – and *thus* to be determined by reference to the location of the object at other times. The instantaneous velocity being extrinsic is thus taken to *consist* in its being relational with respect to other temporal parts of the object. This argument, whatever its worth for perduring objects, is much less plausible for enduring objects.

¹⁴Prior’s talk of such entities “taking time” is perhaps in this respect misleading: while processes like giving a lecture (one of Prior’s examples) may plausibly be taken to be of such a nature that they cannot last only an instant, this itself to be explained by their special and sui generis way to persist, i.e. their *taking up* time rather than *lasting for* some time.

question concerns the priority issue that is left open by four-dimensionalism, at least of the Siderian variety. Even of things that are, at any given time, identical to their temporal part existing at that time, we may ask, as we have seen above, whether they are prior or posterior to these temporal part, or rather, to avoid a superficial conflict with the irreflexivity of grounding, whether it is of their nature to stand in the parthood or temporal counterparthood relations that they do.

Even of things that are ontologically dependent on their temporal parts and have them essentially, as part of what they are by their very nature, we may ask *how* they take up time. I will mark two possible answers by the technical terms ‘perdure’ and ‘unfold’. Events, and event-like things (such as wholes, successions or ‘courses’ of events) take up time by perduring, i.e. by existing successfully at different instants, where the property (or property-like feature) of *existence* is intrinsic to their respective temporal parts.

an object *o* *perdures* : \iff *o* persists during interval *I* in virtue of being such that there exists intrinsically, at every instant *t* of *I*, a thing which is, at *t*, a part of *o*.

Perdurance is to be contrasted with another way for temporally extended things to take up time, which I stipulate to be characteristic of processes:

an object *o* *unfolds* : \iff *o* persists during interval *I* in virtue of being such that it a-temporally have parts which extrinsically exist at every instant *t* of *I*.

Perdurance and unfolding, so defined, differ in two crucial respects:

- temporal vs. atemporal having of temporal parts: Temporal parts, as defined by Sider, are short-lived entities which at the time of their existence are part of the temporally extended whole the persistence of which they ground. Their parthood relation being time-indexed allows the perdurantist to have ‘temporary intrinsics’, i.e. allows for the intrinsic exemplification of temporary properties. Suppose object *o* is red at *t*₁, but not red at *t*₂. To give a non-contradictory account of this situation, it is not enough for the perdurantist to postulate two different temporal parts, only one of which is (timelessly) red, but it is furthermore required that these things are not part of the persisting object *o* at the same time. Unfolding things such as processes are different in this respect: they have their temporal parts *simpliciter*, as well as at some given time.
- intrinsic vs. extrinsic temporal existence: To play their rôle in the ‘solution’ (or rather dissolution) of the problem of temporary intrinsics, the temporal parts of the perdurantist are “loose and separate” – their existence at their time does not depend on, nor does it somehow else ‘involve’, the existence of other temporal parts at other times. While it is difficult to cash out this notion of temporal intrinsicness, at least their existence must be intrinsic to perdurantist temporal parts if they are to play their rôle as fundamental bearers of (existence-entailing) temporary properties. Processes, on the other hand, have extrinsically existing, top-down or ‘holistically’ determined temporal parts, which are parts, but also *mere* parts, of their unfolding.

Processes are temporally extended not by happening over time, or by going on for some time, but by taking time or unfolding in time. Let us take grief as an example. According to Goldie (2012), grief is a process where “the unfolding pattern of the emotion over time is explanatorily prior to how/what the emotion is at a time”. The explanatory priority of the pattern implies, but is not exhausted by, grief’s being essentially temporally extended: it also means that the process of grieving does not happen during, or at, its total temporal extent, but rather takes up time in a different way.¹⁵ Goldie (2011: 124) explicitly connects grief’s manner of persisting to Hofweber and Velleman’s example of writing a cheque, the identity of which is only determined by the totality of its temporal extent:

Not only, then, is the process not present in its temporal entirety within the confines of the moment: it is not fully determined by the events of the moment to be the process that it is. (Hofweber & Velleman 2010: 14)

The question of ‘identity-determination’ is orthogonal to the pattern-like character, however: events, arguably, have their identity not determined at any moment of their existence, but are still temporally extended. Stout says that the situation is the reverse, that continuant processes have their identity determined:

...suppose that something interfered with the process so that the later stage never happened [...] This would not affect the identity of the process at the earlier stage before the interference. (Stout 1997: 21)

This, I think, is what the defender of the relational intrinsic should say: that some temporal part is part of a given process is an extrinsic, but non-relational, feature of it, because they make up the process they are parts of, and are nothing else than it; that some process has a given temporal part, on the other hand, is intrinsic but relational: it is part of what it is to have such a temporal part, but still connects it to something of a different ontological category.

¹⁵Goldie goes further to suggest that the characteristic unity of a given process of grief is determined (perhaps even: constituted by) some narrative of the griever. While this strikes me as much too constructivist even for the case of grief (the parts of grief need *already* be coherent in order for them to be coherently narratable), it certainly does not apply to all processes.

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