

# INTRODUCTION

## The significance of temporal experience

*Ian Phillips*

Experience is inescapably temporal. Not only is it of a restless world whose rhythms and raptions our perceptual faculties have evolved to discern, it is also an occurrence which itself unfolds in time. These apparent platitudes set the stage for this handbook. For temporal experience is not merely pervasive: it is also puzzling in its own right – indeed many have wondered how it is even possible; probative of wider issues in metaphysics – not least concerning the nature of time itself; and provocative of a wide range of intriguing questions in other areas of philosophy – most notably in mind and aesthetics. It is also, of course, the focus of a great deal of work in the psychological sciences. Together with this introduction, the 27 contributions to this volume – all appearing in print for the first time – offer fresh and expert perspectives on diverse dimensions of temporal experience. Each testifies to the significance of temporal experience. The aim throughout has been not merely to present the contemporary debate but also to enrich it. Thus, for instance, the reader will find treatments of well-established topics and canonical figures intermingled with perspectives on less familiar issues and under-sung theorists. The primary (though far from exclusive) emphasis throughout is on our encounter with time in perception as opposed to memory. Memory deserves a handbook all of its own. It receives one in S. Bernecker and K. Michaelian (eds) *The Routledge Handbook of Philosophy of Memory*, forthcoming 2017. See also Phillips (forthcoming).

### **Part I: ancient and early modern perspectives**

Parts I and II of the handbook explore historical approaches to temporal experience. We begin at the dawn of Western philosophy with early (pre-Platonic) Greek thought about time. Today we standardly think in terms of a single unified time (e.g. for us, “earlier than or simultaneous with” is a transitive and connected relation on the set of events). And whilst we recognize “several qualitatively different kinds of temporal experiences: simultaneity, successiveness, temporal order, duration, and temporal perspective” (Block and Zakay 2001: 59), we take such experiences all to present interrelated aspects of events locatable within this single time. However, as Barbara Sattler’s fascinating chapter explores, for the early Greeks, such a unified conception was absent. Rather, the early Greek conception of time was fractionated, with temporal notions operating essentially in independence – each being “tied to different kinds of experiences”. Arguably, this perspective has important implications for us as contemporary theorists. For it

suggests, as Sattler puts it, that “our notion of time as unified is not something we gain directly from experience”. In other words, however inevitable it may seem, we should be wary of taking our theoretical conception of time as the unadulterated deliverance of experience. This, of course, presses a central question of the handbook: how exactly do we experience time?

In Chapter 2, Geoffrey Gorham begins by charting thought about temporal experience from the Greeks (specifically, Aristotle) through to the Early Moderns. As he discusses, medieval philosophy largely follows the Aristotelian wisdom that time is inextricably tied both to motion and also to the mind. A conclusive break from this tradition does not occur until Descartes (1596–1650), who definitively rejects Aristotle’s yoking of time to motion, and Newton (1643–1727), who famously declares: “Absolute, true, and mathematical time, of itself, and from its own nature, flows equably without relation to anything external” – not least the mind. Descartes and Newton, as well as Newton’s great critic Leibniz, largely neglect our experience of time, however. Interest in temporal experience can be traced instead to the “decisive phenomenological turn . . . taken by the British empiricists Hobbes [1588–1679], Locke [1632–1704] and Berkeley [1685–1753]”. As Gorham discusses in detail, these theorists not only turn our attention to our experiential relation to time, but each struggle to reconcile such experience with their favoured metaphysics: for Hobbes presentism, for Locke Newtonian absolutism and for Berkeley a radical solipsistic phenomenalism. As Part V of this volume explores, such struggles for reconciliation remain very much alive.

Chapters 3 and 4 turn to the more highly systematic treatments of time and temporal experience found in Hume (1711–1776) and Kant (1724–1804). In Chapter 3, Lorne Falkenstein discusses Hume’s attempts to make sense of our experience of time – in particular Locke’s vivid examples of flesh-cleaving cannon-bullets and rotating fiery coals – within his “atomist” framework on which our experience consists in a succession of simple and strictly durationless impressions. Here we find Hume grappling with an issue which runs throughout the volume, namely how successive experience can amount to experience of succession.

Many have thought that, for there to be any experience of succession, the elements experienced as successive would have to be presented *together* and so *simultaneously*. For example, James (1980: 628–629) notoriously declares, “A succession of feelings, in and of itself, is not a feeling of succession”. He continues by quoting Volkman with approval: “we come to this antithesis, that if A and B are to be represented *as occurring in succession* they must be *simultaneously represented*” (Volkman 1875: §87). Following Miller (1984: 109), we can label this assumption the *Principle of Simultaneous Awareness* (PSA). (For recent discussion of the PSA, see Phillips 2010, Rashbrook-Cooper 2013a and Hoerl 2013b.) One familiar proposal is that to satisfy the PSA, the earlier element of the succession, A, must be presented in some form of memory alongside perceptual experience of the later element, B. Insofar as a theorist thinks of the resultant combination as a form of perceptual experience, this proposal is a version of what Dainton (2000, 2010) calls *retentionalism*: the view that our experiences of succession and change are themselves momentary (or extremely brief) but nonetheless have temporally extended contents. To anticipate later discussion, Dainton contrasts retentionalism with *cinematic* views which hold that neither our awareness itself nor its contents have temporal extension – and so sometimes deny that strictly speaking we experience succession at all, and with *extensionalist* views which hold that our experiences of succession and change are themselves extended in time and unfold alongside their contents.

Returning to Hume, Falkenstein discusses how Hume rejects Reid’s distinctive attempt to conform to the PSA by appeal to memory. Instead, Falkenstein argues, Hume exploits his special non-cognitive notion of custom to distinguish between the perceptual situation of two individuals, both of whom are enjoying the same simple perception, but for only one of whom

is that perception a part of a perception of succession. This leads Falkenstein to propose a “Humean” view of temporal experience which eschews James’ “touted unity of consciousness” and holds that an “impression of succession” amounts to no more than our “feeling of confidence in the ability to recite the [relevant] succession of ideas without balking”. (As Falkenstein notes, it is worth comparing and contrasting this perspective with that in Phillips 2010.)

In Chapter 4, Katherine Dunlop turns to the towering but obscure figure of Kant, leading us expertly through various interpretative approaches to his views about temporal experience in the *Critique*. Dunlop’s primary focus is on the *Analogies of Experience* in which Kant argues that a necessary condition of cognizing temporal relations is that the events involved are subsumed under the concepts of cause and substance. Kant’s argument here is apparently premised on the murky claim that time cannot be perceived in (or by) itself. As Dunlop discusses, on Guyer’s important interpretation, Kant is here being driven by just the kinds of issues about unity discussed in relation to Hume and James. Thus, for Guyer, the “fundamental premise of Kant’s transcendental theory of experience” (1987: 171) is the thesis that “each representation, insofar as it is contained in a single moment, can be nothing but absolute unity” (A99). Guyer reads this as claiming that each individual representation is completely independent from all others, and, since only one representation is ever present to us at a time, as implying (the apparently anti-realist view) that we are incapable of directly experiencing succession. Dunlop expresses simultaneous admiration and skepticism for this interpretation, noting, for one, the tension between Guyer’s reading of the slogan that time cannot be perceived in (or by) itself, and Kant’s earlier remarks about time in the *Aesthetic*, where Kant declares that time is an a priori intuition, and so apparently representable without concepts. How then to understand Kant’s slogan? A promising possibility, suggests Dunlop, is that Kant is saying that temporal properties cannot be experienced apart from *spatial* properties.

## **Part II: nineteenth and early twentieth-century perspectives**

In Part II we turn to the last heyday of theorizing about temporal experience – the late nineteenth and early twentieth century – and to four of its luminaries: Hodgson, Husserl, Bergson and Stern. (For discussion of debates about time-consciousness in the nineteenth century, see also Andersen and Grush 2009.) We begin in Chapter 5 with the now relatively obscure figure of Shadworth Hodgson (1832–1912). Although lately neglected, as Holly Andersen explains, Hodgson’s work is pioneering and pivotal in the history of the philosophy of temporal experience. Looking backwards, Hodgson can be viewed as a great systematic philosopher in the tradition of Kant and Hume. Looking forward, he can be seen as the instigator of pragmatism, phenomenology and the “process”-oriented philosophies of Bergson and Whitehead. Indeed, as Andersen argues, he also has claim to being the “original neurophenomenologist”.

In the preface to *The Principles of Psychology* (1890: vii), James recognizes Hodgson as due special gratitude for his inspirational writings (alongside Mill, Lotze, Renouvier and Wundt). And, partly channelled through James, Hodgson can be credited as the originator of ideas which remain at the core of modern thinking about temporal experience. James quotes extensively from Hodgson’s *Philosophy of Reflection* in his famous chapter on the perception of time (James 1890: 607–8). And in the passages quoted we find Hodgson anticipating under the label of the “empirical present” the concept of the specious present made famous by James. Moreover, as Andersen brings out, Hodgson also augurs James in conceiving of experience “as a stream of consciousness consisting of many various currents, or a cable consisting of variously coloured strands, variously intertwined” (1898: 41). Andersen goes on to discuss how Hodgson clearly anticipates crucial features of Husserl’s account (on which see Brough’s Chapter 6), albeit with

important differences. There are also striking affinities, I suggest, between Hodgson's insistence on the processive nature of experience, and the consequences for our thinking about the fine-grained structure of experience (see, especially 1898: chapter 2, §§5–6), and very recent work including O'Shaughnessy 2000, Soteriou 2007, Phillips 2011 and Crowther and Soteriou's Chapter 14. Andersen is thus surely right: Hodgson's *oeuvre* offers a "treasure trove of philosophical insights" for contemporary theorists of temporal experience.

In Chapter 6 we turn to Husserl (1859–1938) and his lifetime obsession with time-consciousness. As John Brough brings out, drawing on a profound knowledge of Husserl's corpus, Husserl starts out by seeking to avoid what he sees as two tempting mistakes which, combined, would imperil the very possibility of temporal experience. These mistakes are, on the one hand, the thought that we can *only* consciously experience what is present, and on the other, that we can *never* be consciously aware of the present since the present is an ephemeral instant, lost to the "past before consciousness can catch it". This leads Husserl to the view that we experience an extended, "living" present which contains the punctate now conceived of as the fountainhead of other modes of temporal appearance (varying degrees of just past, or soon to come). This yields Husserl's famous analysis of temporal awareness in terms of three inter-related aspects: primal impression, retention and protention. These ideas have strong affinities with Hodgson and James. They have also strongly influenced contemporary *retentionalist* views of temporal experience which echo not only Husserl's view that (as Brough puts it) "in a given moment of a temporally extended perception I can be presentationally aware of an entire temporally extended object", but also Husserl's intentionalism – his view that experience has an act-object structure, but *contra* the sense-datum theorist or naïve realist, that its objects need not exist in order for them to be the intended objects of experience. (On the connection between retentionalism and intentionalism see Hoerl's Chapter 13.)

Having set out these familiar ideas, Brough turns to an arguably more profound, and certainly more puzzling, dimension of Husserl's views. For Husserl insists that our experience is not only *of* time but is also "a temporal object itself" (1991: 239; cf. Phillips 2014a). Moreover, Husserl holds that in any act of awareness, say of a melody, it is not only the melody that we are aware of (though it is only the melody that we *perceive*). We are also aware of the unfolding experiential act which has the melody as its intentional object, as well as what Husserl calls the "absolute flow" which constitutes this awareness. Arguably, we can see Husserl here as grappling with the way in which experience's own temporal dimension, and our awareness of it, is explanatorily relevant to our experience of time – an idea downplayed by contemporary retentionalists but at the heart of rival extensionalist views. (For an excellent discussion of Husserl in connection with contemporary theorizing, see Hoerl 2013a.) It is at this juncture that Husserl declares time-consciousness to be both the "most important" (1991: 346) but also the "most difficult of all phenomenological problems" (1991: 286).

In Chapters 7 and 8, Barry Dainton explores two other leading lights of turn of the century thinking about temporal experience: Bergson (1859–1941) and Stern (1871–1938). Dainton begins, in Chapter 7, with Bergson, once plausibly the most famous living philosopher yet whose influence has dramatically waned within analytical discourse. At the centre of Bergson's system, and Dainton's discussion, is Bergson's fundamental notion of *durée*. Bergson saw contemporary physics as espousing a cinematic conception of the universe, one on which, as Dainton puts it, "the world ultimately consists of nothing more than a rapid succession of instantaneous momentary slices [or rather three-dimensional volumes]". Readers might here helpfully compare Kripke's *holographic hypothesis* – which clearly has Lewis' doctrine of *Humean Supervenience* in its intended ambit (see Kripke unpublished manuscript; Lewis 1986: xi). In Bergson's view such a conception, and likewise Humean and post-Humean atomism, cannot

possibly accommodate the essential dynamism found in all experience. For Bergson, rather: “there is no feeling, no idea, no volition which is not underlying change every moment: if a mental state ceased to vary, its duration would cease to flow . . . we change without ceasing, and that the state itself is nothing but change” (1926 [1911]: 1–2). Again, readers might helpfully compare O’Shaughnessy’s more focused suggestion that conscious experience is a process which is “occurrent to the core” (2000: 49). Bergson develops this thought by characterizing *durée* in terms of “qualitative multiplicity” or “heterogeneity”: a form of diachronic unity in which each distinct moment of experience fuses with and penetrates the next. Dainton’s discussion of these suggestive but obscure ideas leads him to ask whether Bergson is best understood as espousing a retentional or extensional model of consciousness. Dainton suggests that, in the end, Bergson’s commitment to the seamless continuity of consciousness gives him grounds to adopt an extensionalist account.

Stern’s contribution to the literature on temporal experience is limited to a single article, “Psychische Präsenzzeit” (“Mental Presence-Time”) (2005 [1897]). Nonetheless, the article is important because it arguably offers the first clear articulation of an extensionalist view of temporal experience which (at least since Dainton 2000) stands as one of the major positions in the contemporary debate on temporal experience. Stern’s intellectual predecessors such as Wundt, Brentano, Ward and Meinong took the view already mentioned that, for there to be an experience of succession, the elements experienced as successive would have to be presented together *and so simultaneously*. To accommodate this PSA, most took temporal experience to involve the simultaneous presentation of the present instant alongside “retentional” awareness of the immediate past. Stern rejects this retentionalist view as founded on mere “dogma” (2005: 313), declaring instead, that “mental events that play themselves out within a stretch of time can under circumstances form a unified and complex act of consciousness regardless of the non-simultaneity of individual parts” (2005: 315). Stern calls the stretches of time over which a complex but nonetheless unified act of consciousness can extend, its “presence-time”, a notion closely related to that of the empirical or specious present. As Dainton sees it, discarding this dogma and so embracing an extensionalist view on which conscious experience can unfold alongside its objects, “brings the significant advantage that temporal consciousness need no longer be systematically misleading as to its own nature” (see further Dainton 2000, 2010; also, Phillips 2014a, 2014b).

As Dainton goes on to explore, Stern’s article contains not just an articulation and defence of extensionalism but many other fascinating discussions, for instance of the ways in which anticipatory imagination and episodic memory are present within ordinary temporal experience – something Stern calls “projection”; of the different forms of perceptual memory; and whether and how “presence-times” can be measured empirically. It stands as testament to Stern’s intellectual instincts that these issues have all since received significant attention within both psychology and philosophy.

### **Part III: the structure of temporal experience**

Parts III and IV of the volume turn to the contemporary debate about temporal experience. Part III introduces and explores the central positions at the heart of that debate: cinematic or snapshot views, retentionalism and extensionalism. The reader should be warned, however, that whilst this way of framing the debate due to Dainton (2000, 2010) is both helpful and influential, its precise formulation and ultimate adequacy are much contested.

We begin in Chapter 9 with Philippe Chuard’s vigorous defence of a snapshot view of temporal experience, a conception he regards as in the tradition of Locke, Reid and Hume

(see Chapters 2 and 3). On Chuard's formulation, a snapshot view takes our streams of consciousness to reduce to a succession of very short, if not instantaneous, events none of which represents any temporal relations between non-simultaneous events. Chuard argues that perfunctory dismissals of this view are premature, and that the snapshot view has all the resources required to account for our phenomenology. (Chuard further calls into question the alleged explanatory merits of retentionalism and extensionalism.) The dialectic here is delicate. For many critics, the reason to reject the snapshot view is, as Dainton (2010) puts it, because the view lacks "any plausible account of how change and succession can feature in our immediate experience" and so "cannot be regarded as a promising form of realism". However, by "realism" Dainton means the view that "change, succession and persistence *can* be directly perceived or apprehended" (*ibid*; his emphasis). Yet it is not clear that Chuard wishes to offer a form of realism. As he writes: "the snapshot view isn't trying to explain how we do, in fact, have temporal experiences. We don't . . .". Nonetheless, Chuard does think the snapshot view can "account" for our phenomenology. It is just that it seeks to do so "without liberally assuming that [the phenomenological] appearances must be taken entirely at face value".

In Chapter 10, Oliver Rashbrook-Cooper turns to the debate between retentionalism (or what he calls "atomism") and extensionalism. For Rashbrook-Cooper, the critical distinction between these two positions is that for the atomist the temporal layout of experience itself has no explanatory role to play in accounting for our awareness of temporal features. In consequence, there is no reason why a very brief, or even instantaneous experience should not represent relations between non-simultaneous events which hold over a significantly longer period of time. In contrast, for the extensionalist, the temporal properties of experience *do* have an explanatory role to play in explaining our capacity to perceive temporal features. Thus, on some versions of extensionalism at least, our experience itself must have a temporal structure which corresponds to the temporal structure of its objects (e.g. Phillips 2014a, 2014b). Rashbrook-Cooper sides with extensionalism, arguing that only the extensionalist can simultaneously accommodate two fundamental and arguably intertwined features of temporal perceptual experience. These Rashbrook-Cooper labels (negative) Temporal Transparency and Temporal Presence. Negative Temporal Transparency is "the claim that one cannot distinguish between the temporal location of a perceptual experience and the apparent temporal location of its object" (cf. Soteriou 2013: 89–90). And Temporal Presence is the claim that perceptual experience "renders actions and *now*-judgements immediately appropriate" (cf. discussion in Crowther and Soteriou's Chapter 14, especially endnote 15).

In Chapter 11, Simon Prosser also grapples with the dispute between cinematic, retentionalist and extensionalist views. His perspective on these issues focuses specifically on the notion of the "specious present". As Prosser introduces it, this is the widely espoused doctrine, that "conscious experiences have temporally extended contents" or, put another way, "that the experienced present consists not of an instant, but of an extended interval of time". Prosser takes this idea to be a common commitment of both extensionalist and retentionalist views. As we have seen, it is a doctrine rejected by Chuard in Chapter 9. Prosser, however, sees no good argument for believing in the specious present so conceived. Instead, he finds in arguments for the specious present a tacit commitment to an "inner picture" model of perception. Prosser grants that, if experiences were like static pictures of a single moment in time, then they could not depict motion or change (an issue explored in detail in Chapter 24). Prosser, however, thinks that we have no good reason to accept any such model of perception and so no reason to think that just because an experience concerns only a single moment in time that it could not attribute motion or change to that point in time (cf. Johnston's discussion of motion perception in Chapter 21). In this way, Prosser develops a *dynamic snapshot theory* which unlike Chuard's

“static” snapshot theory claims to account for the phenomenology of motion and change experience in a genuinely “realist” fashion.

In Chapter 12, Geoffrey Lee turns to another foundational issue concerning the nature of temporal experience, namely whether (and, if so, in what sense) there is such a thing as “subjective time”. Lee approaches this issue by investigating whether there can be inter-subjective phenomenal variation in respect of what Lee terms “rate of temporal flow”, despite there being no illusion. Such a possibility is, as Lee points out, not unintuitive. For example, when we try to imagine how a human being whose neuro-cognitive processes have been uniformly sped up (or a hummingbird or mayfly) might experience various events, there is a strong pull towards thinking that they would experience the events in much the same way that we would experience slower or longer-lived events. However, it is not obvious how to make sense of this intuition consistent with the absence of illusion. Lee discusses various tempting approaches here, including a simple account on which properties such as duration are experienced as relative to the rate of some internal process. As his probing discussion brings out, however, there are serious difficulties with such proposals and so a puzzle remains as to how to understand our experience of duration (and rate of change, etc.) in such a way which allows for inter-subjective phenomenal variation in the absence of illusion.

#### **Part IV: temporal experience and the philosophy of mind**

How do different perspectives on temporal experience interact with other debates in philosophy? One rich source of such interaction is in relation to issues in the philosophy of mind. This provides the unifying theme of Part IV of the handbook which continues many of the foundational discussion of Part III. In Part V, we turn to another rich seam of engagement, namely the relationship between temporal experience and views in metaphysics.

In Chapter 13, Christoph Hoerl argues that there is an intimate relationship between the two rival views which he sees as the most serious contenders for providing an adequate account of temporal experience – retentionalism and extensionalism – and the two rival views which dominate the recent literature in the philosophy of perception – representationalism and relationalism (see Crane and French 2016 for a helpful overview). In particular, Hoerl suggests that retentionalist views can best be understood as the natural application of a more general representational account of perception to temporal experience, whereas extensionalist views are best understood as allied with relational accounts of perception. Hoerl goes on to make the fascinating suggestion that this pairing reveals an asymmetry, for extensionalists he argues are better equipped to meet a “meta-philosophical” constraint on philosophical approaches to temporal experience, viz. that they should explain why the temporal aspect of experience is of special importance when it comes to providing a proper account of our overall conscious perspective on the world. For Hoerl, this is because extensionalism, within the context of a relational approach to perception, uniquely captures the manifestly *occurrent* nature of conscious experience, or as O’Shaughnessy puts it, the fact that “even the unchanging perception of a fixed immobilized world conceals a processive continuity, that of the perceiving itself, which is occurrently renewed in each instant” (2000: 63).

The special relationship between consciousness and time emphasized and explored so vividly in O’Shaughnessy’s work also provides the backdrop for Thomas Crowther and Matthew Soteriou’s contribution in Chapter 14. Crowther and Soteriou’s interest is in the contrasting relationships between temporal awareness in wakeful experience and in other states of consciousness. Their discussion begins with the contrast between temporal awareness in wakeful consciousness and such awareness in dreamless sleep. Drawing on O’Shaughnessy, they propose

that those dreamlessly asleep lack a perspective which provides awareness of the present moment as “now”, and moreover, which provides *successive* awareness of successively present moments as “now”. On the other hand, the wakeful experiencer not only enjoys such a perspective but (at least characteristically) experiences successively present moments *as successive* and further occupies what Crowther and Soteriou call a “tensed temporal perspective” whose origin lies in their experience of the present moment and so which constitutes what they call an “experienced present” (cf. Hodgson’s “empirical present” or James’ “specious present”). What is not clear, however, is whether this privilege of wakeful consciousness is a privilege of conscious experience in general. In pursuit of this question, Crowther and Soteriou examine the temporal properties of experience in dreaming. Ultimately, they suggest that if we think of dreams as acts of conscious imagination, we must think that dreaming involves an experiential relation to time fundamentally different from that found in wakeful consciousness. In particular, they suggest that in dreaming one’s experience cannot provide awareness of, or constitute a temporal perspective on, your actual past, present and future. Dreaming thus severs you from your present.

In Chapter 15, Carlos Montemayor offers an original perspective on traditional debates about temporal experience by drawing on empirical evidence concerning what he sees as two fundamental features of time perception: that it is *amodal* (in that it involves the cross-modal integration of sensorily specific signals, but is not itself dependent on, or associated with, any specific modality or stimulus) and that it is *action-guiding*. Montemayor argues against “atomist” (i.e. snapshot or retentional) models which operate under the simultaneity constraint that “Temporal order and duration must be represented at a moment in time” (essentially the PSA discussed above). Such models, he suggests, are incapable of explaining how an agent’s temporally extended “actions and goals integrate time perception cross-modally” and so “cannot provide an adequate account of temporal experience”. On the other hand, Montemayor does not entirely abandon retentionalism. Instead, he argues for a “Dual Model of temporal experience”, a model that combines the advantages of both extensional and retentionalism. On this dual model, extensionalism is adopted as the correct account of temporal *consciousness*, but retentionalism is adopted as an appropriate account of early, non-conscious perceptual processing.

It is natural to suppose that, just as we can sometimes perceive the distance between two objects, so we can sometimes perceive the duration separating two events. In Chapter 16, Christopher Peacocke offers a framework which provides a unified understanding of these cases of perception. Peacocke’s framework is founded on a general realism concerning magnitudes (Peacocke 2015). From such a perspective, the fact that two events are separated by a given duration can provide a partial explanation of an observer’s perception of that duration. But what precisely is the nature of such perception? As emphasized by Burge (2010), mere sensitivity to a given magnitude does not suffice for representation of the relevant magnitude as such. A Kantian question thus arises: what are the minimal constitutive conditions for the perceptual representation of temporal magnitudes and relations as such? For Burge, perceptual representation arises through exercise of the perceptual constancies. However, in the case of time, Burge denies that temporal representation requires temporal constancies. Instead, temporal representation requires that our sensitivity to temporal properties is appropriately *coordinated* with perceptual representations which do directly implicate constancies. Peacocke concurs with Burge that a constancy criterion will not work for the temporal case. However, he provides a series of examples which cast doubt on Burge’s alternative proposal. These motivate Peacocke’s own account on which the attribution of temporal representational content is warranted only if such contents contribute non-redundantly to explanations of a creature’s actions. For Peacocke, actions which require such explanations are those which require appeal to how

a subject represents things as having been the case in the past together with identities between presently and previously encountered entities.

Peacocke's chapter ends with a discussion and robust defence of the phenomenal externalism implicit in his account. In particular, Peacocke rejects the suggestion made by Thompson (2010) and Chalmers (2012) that temporal and spatial magnitude terms are "Twin-Earthable", i.e. such as to allow for phenomenal and functional duplicates whose perceptual states represent different temporal and spatial magnitudes (e.g. since located on "Slowed" or "Doubled" Earths).

## **Part V: temporal experience and metaphysics**

Part V turns to connections between our temporal experience and metaphysics. The most obvious and central of these being the relationship between our experience of time and time itself. In Chapter 17, Michael Pelczar discusses and defends a striking conception of this relationship: facts about time can be reductively analysed in terms of facts about conscious experience. Pelczar makes this claim by way of extending the kind of phenomenalist view systematically developed by Mill (1979 [1865]). On a Millian view, the physical world is conceived of as a tendency for the occurrence of specific patterns of conscious experiences, or as Pelczar puts it, as pure, phenomenological potential. Such potential can be expressed using "sensation conditionals". As Pelczar offers by way of illustration: "the fact that a tree has a certain shape and color" can be reduced to the fact that "if experiences with certain qualia were to occur, there would also occur experiences with certain phenomenal shapes and colors". Mill, however, declines to phenomenize time. In Mill's view, time is special in that experiences *themselves* essentially have temporal features such as durations – whereas they do not have colours and shapes. As Mill puts it: "Sensations exist before and after one another. This is as much a primordial fact as sensation itself" (1979 [1865]: 198). Against this ubiquitous view, Pelczar argues that time is not in fact special: phenomenal duration no more entails objective duration than phenomenal shape requires objective shape. The upshot, according to Pelczar is that, *pace* Mill, "when it comes to amenability to phenomenalist reduction, time is in the same boat as shape or color". Pelczar's argument against time's specialness requires him to confront three putatively fundamental aspects of our temporal experience: its manifest phenomenal temporality (e.g. Phillips 2010, 2014a; Soteriou 2010, 2013; Rashbrook-Cooper 2013a, Chapter 10 this volume), its phenomenal continuity (e.g. Dainton 2000; Rashbrook-Cooper 2013b), and the way in which episodic memory involves memories of earlier experiences (e.g. Peacocke 1985; Martin 2001). Pelczar contends that, when properly understood, "none of these phenomena gives us a compelling reason to locate consciousness in time".

Chapters 18 and 19 move to more familiar issues concerning the relationship between temporal experience and the metaphysics of time, and to a familiar type of philosophical issue: an apparent clash between manifest and metaphysical-cum-scientific images. In Chapter 18, Natalja Deng discusses the bearing of temporal experience on what is conventionally known as the A- versus B-theory debate. This terminology comes from McTaggart (1908) and relates to two different ways in which we can describe events (or times). We can either describe them as standing in certain precedence relations to each other, as earlier than, later than or co-occurrent with one another. Events so ordered are ordered in what McTaggart calls the *B-series*. We can also describe events as being (more or less) past, present and (more or less) future. Here we can think of ourselves as ascribing events certain properties (e.g. the property of "pastness"). Or we can think of ourselves as claiming that the events stand in a certain B-series relation to "the present". Events so ordered are ordered in what McTaggart calls the *A-series*. As Deng presents it, the B-theory is the view that (a) all times and/or events exist, and (b) there is a complete

tenseless description of reality – a description which mentions only tenseless facts concerning B-series precedence relations such as successiveness and simultaneity.

There are powerful arguments for endorsing the B-theory (e.g., as Deng notes, the A-theory is notoriously difficult to reconcile with the theory of relativity). Yet for many A-theorists the B-theory is simply incapable of accommodating the manifest fact that time passes. Although this argument need not appeal to experience, it is common for A-theorists to argue that our experience of time passing offers the basis for a powerful inference to the best explanation that time objectively passes. Deng discusses two responses to this argument. The first claims that our experience of passage is illusory and so does not require appeal to objective passage for its explanation (e.g. Paul 2010). The second, which Deng herself defends, denies that our experience is illusory and instead disputes the A-theorist's contention that we actually have experiences as of time passing. Crucially, what Deng denies here is not that we experience succession and change, and so passage in the B-theoretically acceptable sense of there being a succession of times. Rather Deng denies that we experience passage in any more "robust" sense which would serve the A-theorist's purposes. In defending this conclusion, Deng not only rejects the A-theorist's appeal to experience, but further raises a doubt about whether their idea of "robust passage" can even be made sense of.

In Chapter 19, Akiko M. Frischhut turns to a closely related issue, namely the relationship between temporal experience and the metaphysical view known as *presentism*. As Frischhut articulates the view, this is the thesis that all and only present things exist. Such a view might be thought to capture the folk wisdom that the dinosaurs have gone out of existence, and that future Martian outposts are not yet in existence. Frischhut's interest is in whether presentism is ultimately consistent with our perceptual experience of change and duration, and further with our (putative) experiences of time as passing. The answers to these questions of course depend on our preferred theory of perception in general, and of temporal perception in particular. In her systematic discussion, Frischhut first argues that because our experiences of worldly events must, due to light transmission and neural processing delays, lag behind the events themselves, presentists must reject direct realist views of perception according to which worldly objects and events are constituents of our experiences. Frischhut then considers the consistency of presentism and three leading theories of temporal experience: anti-realism (the view that, since our experience is confined to the instant, strictly speaking we do not experience change and passage), retentionalism and extensionalism. Frischhut concludes that the presentist faces severe challenges in combining their metaphysics with any of these theories (although in some cases the tension depends on what the presentist has to say about the independently vexing issue of cross-temporal relations). Frischhut's discussion reminds us of the struggles of Hobbes, Locke and Berkeley (emphasized in Gorham's Chapter 2) as each tried to reconcile their favoured metaphysics with our experience of time.

In Chapter 20, L. A. Paul turns to a different point of contact between temporal experience and metaphysics: the metaphysics of the self. Paul approaches these issues by way of an investigation of what she calls "subjective reality" and therein of our "subjective self". Paul thus sets aside questions of the nature and structure of objective reality, considered from an impersonal perspective, and focuses instead on the way in which reality and the self appear from the inside, from each self's own subjective perspective. Of critical interest here is the way in which the subjective self persists through time. As Gorham notes in Chapter 2, Descartes takes his own existence over time to be "so evident that [he] can see no way of making it any clearer" (1983, vol. 7: 29). But can we hope to say more about our grasp of our self-persistence? In Paul's view, we grasp our own persistence through time by mentally projecting ourselves into the past and future. This can be achieved both first- and third-personally. Drawing on empirical studies

(e.g. Pronin and Ross 2006), Paul proposes that first-personal forms of such projection – projection of one’s first-personal point of view *from* one’s first-personal point of view – typically occur within temporally delimited windows. For Paul, such temporal projection provides for a distinctive understanding of oneself as an enduring entity. Paul here connects her discussion with theorizing about the nature of the specious present, proposing that the specious present should be thought of as the most basic “subjective temporal unit of agential experience for a self”. She also suggests that temporal projection is what allows us to *empathize* with our future (and past) selves. However, as Paul develops this thought, it can only do this so long as the way in which I represent myself remains relatively unaltered. This means that at large distances as well as in cases which Paul has elsewhere theorized as involving transformative preference change (Paul 2014), it can cease to be possible to put oneself into the shoes of one’s future (or past) self. In such contexts, there is a sense in which you are alienated from your future self: you fail to know who you will be.

## **Part VI: empirical perspectives**

Temporal experience is, of course, not merely a philosophical preoccupation. Psychologists and neuroscientists have long been interested in the nature of our temporal awareness and its underlying mechanisms. Such work imposes important constraints on philosophical reflection. It also provides insights which philosophers might hope to exploit. For both these reasons, this handbook includes three chapters in which leading experts on the psychology of time perception survey different aspects of the field.

In Chapter 21, Alan Johnston examines how the brain encodes the timing of external events. As James (1890: 627f) argues against Helmholtz, whilst it may be tempting to suppose that the perceived time of events simply mirrors the timing of their neural representations, such a view is both conceptually and empirically problematic. In Johnston’s view, to make progress we need instead to appeal to the critical concept of a neural channel or filter: a set of neurones specifically tuned (or differentially sensitive) to a class of stimuli, e.g. stimuli flickering at a given rate. Johnston reviews the state of the art concerning the nature and functioning of such filters. In doing so, he notes a wide range of potential implications for philosophical and theoretical issues about temporal experience. For example, Johnston notes that one consequence of the operation of temporal filters is that they integrate information over a period of time meaning that “the neural representation . . . of the external world is delayed by around 80ms relative to external events”. As a result, Johnston concludes, we lack “direct access to the present in the external world” (cf. Frischhut’s Chapter 19 in this volume). Johnston also notes that on one successful model of motion perception (Johnston *et al.* 1992, 1999), “motion is represented at a point and at an instant from a calculation made over a spatial region and an extended period of time”. The attribution here of motion to a single point in space and time bears on debates about the specious present, arguably supporting Prosser’s dynamic snapshot theory discussed in Chapter 11. Johnston also shines a light on a number of other important theoretical issues, for example, whether visual experience is continuous or comprised of a series of instants, and whether duration is encoded by a global, amodal cognitive clock (as in the classical models of Creelman 1962 and Treisman 1963 – see Wearden 2016 for an introduction and overview) or, as Johnston argues, rather by various content-sensitive and domain (e.g. modality or task) specific timing mechanisms.

In Chapter 22, Mari Riess Jones argues that human perception is fundamentally concerned with tracking events such as a baby’s crying or a predator’s approach as opposed to time *per se*. However, in contrast to Gibson’s notorious paper, “Events Are Perceivable But Time Is Not”

(1975), Jones denies that an ecological emphasis on event perception implies that humans do not perceive time. Non-instantaneous events have temporal structures and rhythms, and, as Jones explores, such temporal features are richly exploited in service of event perception. In particular, perceivers are able to attune themselves to external temporal features via a process called *entrainment*. Entrainment – a term coined by Huygens in the seventeenth century following his observation of the mutual stabilization of the rhythms of two pendula – is a process whereby one process (e.g. internal cortical oscillations) is brought into synchrony with another (e.g. an external driving rhythm). Entrainment provides the basis for a model of timing which can be contrasted with traditional cognitive pacemaker models. In particular, Jones argues that traditional pacemaker models are too rigid to account for our adaptive, predictive and consequently fallible timing behaviours (cf. Johnston’s critique of global clock models in Chapter 21). Jones goes on to discuss how the internal oscillations involved in the perception of complex events can be thought of as realizing a process of dynamic attending. Thus, a musical performance or speech act can act as a driving rhythm which voluntarily or involuntarily engages (via entrainment) an ongoing dynamic process of attending. In this way, event perception, time perception and attention (properly conceived of as an unfolding activity) are inextricably linked.

The relation between attention and time perception brings us to the final chapter of Part VI, in which Scott Brown considers cognitive influences on time perception, and in particular the role of executive attention in shaping temporal experience. Brown reviews studies by cognitive psychologists (including many from his own lab) which seek to systematize and understand phenomena enshrined in folk wisdom: how time drags when bored or waiting, or how it flies when distracted or having fun. Psychologists use a wide range of techniques to investigate the effects of expectancy and attention on temporal experience. One, already encountered in Jones’ Chapter 22, exploits rhythmical and other musical structures to manipulate subjects’ expectations. Another is the so-called oddball paradigm (Tse *et al.* 2004) in which a series of identical stimuli are presented successively, with an oddball (e.g. differently coloured) stimulus appearing at random points and thus capturing attention. Still another technique simply involves explicitly directing subjects to attend to the passage of time – even though it is not entirely clear what this involves (see Phillips 2012). These varied paradigms all support the notion that increased attention lengthens perceived duration. Conversely, evidence from dual-task paradigms in which a timing-task is combined with a distractor (e.g. visual search) task indicates that timing is disrupted when attention is withdrawn. Brown relates such findings to different models of timing – in particular, to traditional pacemaker-accumulator models combined with an attentional-gate (as in Zakay and Block 1996) – and to different theories of attention. Brown concludes his review of the evidence by suggesting that timing depends critically upon specific attentional resources, namely those associated with *executive* functions such as task-switching, memory updating and reasoning.

## Part VII: temporal experience and aesthetics

Part VII of the volume turns to aesthetics, exploring some of the rich connections between traditional aesthetic theorizing and work on temporal experience. In Chapter 24, Robin Le Poidevin looks to the striking example of the Italian Futurists and their aspiration to capture the “dynamic sensation” on canvas in order to explore the question: can a static medium such as painting ever successfully depict our experience of motion? Le Poidevin’s rich discussion carefully considers this issue from the perspective of different accounts of motion (on the one hand) and motion experience (on the other). Ultimately, he argues that by developing a suitably non-realist conception of depiction, the Futurists’ ambition may be less hopeless than it might seem at first sight.

In Chapter 25, Enrico Terrone turns from painting to the paradigmatically temporal art of cinematography, or as Terrone suggests it might be better named, “chronography”: the writing or recording of time. Drawing on a wealth of examples, Terrone subtly probes various tempting claims about cinematic depiction. For example: Does cinema conform to the “real-time principle” that, at least within scenes, the order and duration of depicted events are identical with the order and duration of their depiction? Or: Do spectators experience the events depicted in a film as occurring right now (as arguably we perceive worldly events, on which see Chapter 10)?

From cinema we turn, in Chapter 26, to dance, an art form relatively neglected by philosophy yet plausibly one of the earliest and most widespread expressions of human creativity – indeed arguably an art whose origins “lie deep in the evolutionary history of the animal kingdom” (Morris-Kay 2010: 158). Drawing in part on her own experience as a professional-level ballet dancer, Aili Bresnahan offers us a rich analysis of a dancer’s own embodied and inextricably spatio-temporal experience of dancing. She then begins the task of connecting this phenomenological analysis to extant theorizing about temporal experience, taking as her starting point James’ celebrated discussion in *The Principles of Psychology* (1890), and in particular his articulation of the notion of the specious present. Drawing further on work by Damasio (1999) and Wittmann (2014), Bresnahan ultimately argues that an adequate account of a dancer’s experience will have to involve elements of a retentional approach to temporal experience.

Finally, in Chapter 27, Andrew Kania offers us a lively survey of some of the many questions we can ask about music and temporal experience. For example: How, if at all, is temporal experience, and perhaps more specifically rhythmic experience, essential to, or paradigmatic of, musical works and their performances? In listening to recorded music, do we hear the original performance (now perhaps many years in the past), or perhaps only the sounds that were originally produced, or neither of these? What about purely electronically created works for playback? How are we able to appreciate “formal” musical features which lie beyond the “specious present” and so, one might argue, outside our hearing? Finally, how does music’s temporality contribute to its aesthetic value?

Throughout this final section, we find extensive interplay between traditional, broad-brush theorizing about temporal experience and the fine-grained aesthetic projects of providing proper theoretical accounts of particular art forms with all their many intricacies and idiosyncrasies. As Le Poidevin, Terrone, Bresnahan and Kania each bring out, philosophers – be they primarily aestheticians or philosophers of temporal experience – have much to gain from such interplay. Thus, in Le Poidevin’s discussion thinking about the difficulties the Futurists face in depicting motion in light of standard views of motion of experience, spurs the development of an enriched conception of depiction. Or in the other direction, theorists endorsing or criticizing cinematic models of temporal experience would do well, I suggest, to think carefully about the issues Terrone discusses regarding how cinematic depiction actually functions. The extensive interplay just mentioned also reminds us of the way in which temporal experience suffuses our lives, once again underscoring its significance.

## References

- Andersen, H. and Grush, R. (2009) “A brief history of time-consciousness: Historical precursors to James and Husserl”, *Journal of the History of Philosophy* 47(2): 277–307.
- Bergson, H. (1926 [1911]) *Creative Evolution*, A. Mitchell (trans.), New York: Henry Holt.
- Block, R. and Zakay, D. (2001) “Retrospective and prospective timing: Memory, attention, and consciousness”, in C. Hoerl and T. McCormack (eds), *Time and Memory: Issues in Philosophy and Psychology*, Oxford, UK: Oxford University Press, pp. 59–76
- Burge, T. (2010) *Origins of Objectivity*, Oxford, UK: Oxford University Press.

- Chalmers, D. (2012) *Constructing the World*, Oxford, UK: Oxford University Press.
- Crane, T. and French, C. (2016) “The problem of perception”, in E. N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2016 ed.). Accessed 30 December 2016.
- Creelman, C. (1962) “Human discrimination of auditory duration”, *Journal of the Acoustical Society of America* 34(5): 582–593.
- Dainton, B. (2000) (2nd edition 2006). *Stream of Consciousness: Unity and Continuity in Conscious Experience*, New York: Routledge.
- Dainton, B. (2010) “Temporal consciousness”, in E. N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy*, available at <http://plato.stanford.edu/entries/consciousness-temporal/>. Accessed 30 December 2016.
- Damasio, A. (1999) *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, San Diego, CA: Harcourt, Inc.
- Descartes, R. (1983) *Oeuvres De Descartes*, 11 vols. C. Adam and P. Tannery (eds), Paris: J. Vrin.
- Gibson, J. J. (1975) “Events are perceivable but time is not”, in J. T. Fraser and N. Lawrence (eds), *The Study of Time II*, Berlin and Heidelberg, Germany: Springer, pp. 295–301.
- Guyer, P. (1987) *Kant and the Claims of Knowledge*, Cambridge, UK: Cambridge University Press.
- Hodgson, S. H. (1898) *The Metaphysic of Experience* (4 vols.), London: Longmans, Green and Co.
- Hoerl, C. (2013a) “Husserl, the absolute flow, and temporal experience”, *Philosophy and Phenomenological Research* 86(2): 376–411.
- Hoerl, C. (2013b) “A succession of feelings, in and of itself, is not a feeling of succession”, *Mind* 122(486): 373–417.
- Husserl, E. (1991) *On the Phenomenology of Consciousness of Internal Time (1893–1917)*, (trans.) J. B. Brough, Dordrecht, The Netherlands: Kluwer Academic Publishers.
- James, W. (1890) *The Principles of Psychology*, New York: Henry Holt.
- Johnston, A., McOwan, P. and Benton, C. P. (1999) “Robust velocity computation from a biologically motivated model of motion perception”, *Proceedings of the Royal Society of London B: Biological Sciences* 266(1418): 509–518.
- Johnston, A., McOwan, P. and Buxton, H. (1992) “A computational model of the analysis of some first-order and second-order motion patterns by simple and complex cells”, *Proceedings of the Royal Society of London B: Biological Sciences* 250(1329): 297–306.
- Kripke, S. (1978) Time and identity, unpublished typescript.
- Lewis, D. (1986) *Philosophical Papers Volume 2*, Oxford, UK: Oxford University Press.
- Martin, M. G. F. (2001) “Out of the past: Episodic memory as retained acquaintance”, in C. Hoerl and T. McCormack (eds), *Time and Memory*, Oxford, UK: Oxford University Press, pp. 257–284.
- McTaggart, J. E. (1908) “The unreality of time”, *Mind* 17(68): 457–474.
- Mill, J. S. (1979 [1865]) *An Examination of Sir William Hamilton’s Philosophy, and of the Principal Philosophical Questions Discussed in His Writings*, Toronto, ON: University of Toronto Press.
- Miller, I. (1984) *Husserl, Perception and Temporal Awareness*, Cambridge, MA: MIT Press.
- Morriss-Kay, G. M. (2010) “The evolution of human artistic creativity”, *Journal of Anatomy* 216(2): 158–176.
- O’Shaughnessy, B. (2000) *Consciousness and the World*, Oxford, UK: Clarendon Press.
- Paul, L. A. (2010) “Temporal experience”, *Journal of Philosophy* 107(7): 333–359.
- Paul, L. A. (2014) *Transformative Experience*, Oxford, UK: Oxford University Press.
- Peacocke, C. (1985) “Imagination, experience, and possibility”, in J. Foster and H. Robinson (eds), *Essays on Berkeley: A Tercentennial Celebration*, Oxford, UK: Oxford University Press.
- Peacocke, C. (2015) “Magnitudes: Metaphysics, explanation, and perception”, in D. Moyal-Sharrock, V. Munz and A. Coliva (eds), *Mind, Language and Action: Proceedings of the 36th International Wittgenstein Symposium*, Berlin: de Gruyter.
- Phillips, I. (2010) “Perceiving temporal properties”, *European Journal of Philosophy* 18(2): 176–202.
- Phillips, I. (2011) “Indiscriminability and experience of change”, *The Philosophical Quarterly* 61(245): 808–827.
- Phillips, I. (2012) “Attention to the passage of time”, *Philosophical Perspectives* 26(1): 277–308.
- Phillips, I. (2014a) “The temporal structure of experience”, in V. Arstila and D. Lloyd (eds), *Subjective Time: The Philosophy, Psychology, and Neuroscience of Temporality*, Cambridge, MA: MIT Press.
- Phillips, I. (2014b) “Experience of and in time”, *Philosophy Compass* 9(2): 131–144.
- Phillips, I. (forthcoming) “Time, consciousness and memory”, in R. J. Gennaro (ed.), *The Routledge Handbook of Consciousness*, New York: Routledge.
- Pronin, E. and Ross, L. (2006) “Temporal differences in trait self-ascription: When the self is seen as an other”, *Journal of Personality and Social Psychology* 90(2): 197–209.

### *The significance of temporal experience*

- Rashbrook-Cooper, O. (2013a) “An appearance of succession requires a succession of appearances”, *Philosophy and Phenomenological Research* 87(3): 584–610. Originally published under the name “Oliver Rashbrook”.
- Rashbrook-Cooper, O. (2013b) “Diachronic and synchronic unity”, *Philosophical Studies* 164(2): 465–484. Originally published under the name “Oliver Rashbrook”.
- Soteriou, M. (2007) “Content and the stream of consciousness”, *Philosophical Perspectives* 21(1): 543–568.
- Soteriou, M. (2010) “Perceiving events”, *Philosophical Explorations: An International Journal for the Philosophy of Mind and Action* 13(3): 223–241.
- Soteriou, M. (2013) *The Mind's Construction*, Oxford, UK: Oxford University Press.
- Stern, L. (2005 [1897]) “Mental presence-time”, N. De Warren (trans.) in C. Wolfe (ed.), *The New Yearbook for Phenomenology and Phenomenological Research*, London: College Publications, pp. 205–216.
- Thompson, B. (2010) “The spatial content of experience”, *Philosophy and Phenomenological Research* 81(1): 146–194.
- Treisman, M. (1963) “Temporal discrimination and the indifference interval: Implications for a model of the ‘internal clock’”, *Psychological Monographs: General and Applied* 77(13): 1–31.
- Tse, P. U., Intriligator, J., Rivest, J. and Cavanagh, P. (2004) “Attention and the subjective expansion of time”, *Perception and Psychophysics* 66(7): 1171–1189.
- Volkman, W. (1875) *Lehrbuch der Psychologie vom Standpunkte des Realismus und nach genetischer Methode*, Cöthen, Germany: Verlag von Otto Schulze.
- Wearden, J. (2016) *The Psychology of Time Perception*, Basingstoke, UK: Palgrave Macmillan.
- Wittmann, M. (2014) “Embodied time: The experience of time, the body, and the self”, in V. Arstila and D. Lloyd (eds), *Subjective Time: The Philosophy, Psychology, and Neuroscience of Temporality*, Cambridge, MA: MIT Press, pp. 507–524.
- Zakay, D. and Block, R. A. (1996) “The role of attention in time estimation processes”, in M. A. Pastor and J. Artieda (eds), *Time, Internal Clocks and Movement*, Amsterdam: Elsevier, pp. 143–164.