

The University of Adelaide: School of Humanities, Discipline of Philosophy

Constructing Time:

Temporal Experience and its Future Directed Aspects

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ABSTRACT

This thesis engages with the philosophical problem of accounting for the future directed aspects of our lived experience of time, where modern physics calls the status of these experiences into question. These include: our experience of an extended 'present'; of a distinctly future-oriented temporal direction; of temporal 'becoming'; and the intuition that our future is open to our influence as agents.

It also furthers the project of showing that, despite perceptions to the contrary; work from within the continental tradition can usefully inform analytic philosophy. The contemporary relevance of the theories of continental philosopher Edmund Husserl is demonstrated throughout; however it is emphasised that this thesis is not a work of Husserlian scholarship. The thesis shows that, while analytic views can offer very good accounts of our temporal phenomenology, in combination with aspects of Husserl's view they can offer a richer, more penetrating analysis.

It takes as a background assumption the view that science offers us the best theory of physical time. However, it defends the view that many of what we take to be objective properties of time can be understood to be subjectively constructed and projected onto the world by our perceptual, cognitive, and conceptual systems. The thesis offers a levels-based — but non-reductivist — account of theories and studies that give support to this view, in a discussion organised into personal and sub-personal levels of explanation.

Overall, this thesis offers a modest contribution to the project of understanding the nature of the future-directed aspects of our temporal experience. It remains compatible with modern physics, while offering an account that shows that many of these aspects of our experience need not be understood to be a response to any physical feature of time per se.

DECLARATION

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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Signed:

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INTRODUCTION

It has been apparent for several decades that the initial promise of modern science, particularly physics, to account for our intuitions about time as it is lived and experienced has not been fulfilled. In response, recent work in the philosophy of time has turned to investigating our lived experience of time: with the aim of doing full justice to the phenomenology of temporal experience while remaining consistent with the current state of physics. One of the final frontiers in this enterprise is the study of our future-directed temporal experiences; and the processes, at sub-personal and personal levels, that bring about our future oriented intuitions, thoughts and acts (DeRoo 2009, p. 1; Gallagher & Zahavi 2008, p. 87 note 3; Ismael 2012).

This thesis engages with some significant philosophical problems that arise in the pursuit of a faithful and penetrating account of these features of our temporal experience, while maintaining, as a background assumption, the view that science offers us the best explanation of the physical nature of time. These problems include our seemingly direct experience of things moving, changing and enduring across a perceivable duration which seems to include a definite 'present' or 'now' experience (the so-called 'specious present'); and our intuition that time has a distinct direction and it is open to our influence in the future-wards direction in a way that is not reflected in the past-wards direction.

The ontological status of such experiences may be called into question by theories in the current state of modern physics; nevertheless I argue that they can be explained in terms that remain consistent with these theories. The account developed in the thesis argues that many features of these temporal experiences are not direct responses to any physical property of time itself, but are constructs and projections of the mind. Therefore the view I develop is neutral about nature of time, compatible with modern physics, but perspectival. It incorporates a subjective and intersubjective perspective towards accounting for our temporal experience.

The account developed throughout the thesis is anchored in the work of Edmund Husserl, but while his view binds the elements of the thesis argument together the discussion extends beyond his work, encompassing more recent interpretations of it, and comparing and contrasting his theories with other approaches. While it is not a work of Husserlian scholarship, it aims to add to the body of literature, some of which is discussed in the thesis, which demonstrates the continuing relevance of his work. It is supported by the development of three strategic themes that underpin the account developed in the thesis as a whole.

The first theme acknowledges the contribution of the analytic tradition in philosophy in providing robust and scientifically informed accounts of temporal experience generally, while showing that this kind of account can do justice to the phenomenology of temporal experience. To develop this theme I refer to examples showing that analytic philosophy can share a common purpose with philosophical approaches that are

essentially concerned with a faithful rendition of phenomenological experience, such as that developed by Husserl. These approaches can productively inform each other.

As an example, a comparison of Husserl's work with that of Barry Dainton suggests that, while Husserl's work has the greater depth, detail and explanatory potential, nevertheless Dainton does equal justice to the phenomenology of the 'specious present' in his elegant and streamlined theory.

This theme is further demonstrated by a comparative study of the analytic work associated with Huw Price and the Sydney Centre for Time, and Husserl's theories of time, intentionality¹ and epistemology. To enable this comparison, a study of the body of work on time and temporal experience developed within the analytic and broadly pragmatist tradition by Huw Price, Brad Weslake, and Jenann Ismael is undertaken. I suggest that, in combination, their views about time and temporal experience constitute a distinct philosophical approach, which I call Temporal Pragmatism. The thesis articulates and discusses the features of this approach —its influences and core commitments — and adopts it as a key part of the overall project developed in this thesis. This comparative study of Temporal Pragmatism and Husserl's Phenomenological approach to the study of time furthers the development of a deep explanation of the genesis — in the mind — of some defining features of our future-oriented temporal experiences.

The second strategic theme of the thesis identifies commonalities between the philosophical 'projectivist' view, associated with both Temporal Pragmatism and Husserl, with work in the cognitive sciences. Projectivism, understood broadly, is the view that we 'project' upon the world, as if they are a reality, features that are constructions of our minds. It is usually taken to have its modern genesis in the work of David Hume, whose work can be interpreted as a prompt to investigate how this projection might be possible: that is, how human consciousness constructs our world, and how our minds and brains project that construction onto the external world.² The cognitive sciences, in their explication of the underlying mechanisms and processes that enable our experience, can be understood to have their roots in this Humean insight that the mind/brain and its functions play a significant part in furnishing us with a view of the external world.

Projectivism — and here the focus remains on its Humean characterisation — is also taken to be an expression of commitment to something, for example, to there being a distinct temporal ordering of events from past to present to future, without necessarily meaning that this ordering is part of the objective physical world (See Blackburn, S.

¹ In its most simple formulation, in Husserl's work 'intentionality' refers to the means by which our consciousness is directed towards its object. This definition will be expanded upon as the thesis unfolds.

² Husserl took Hume's projectivism to be raising the question of how our mental construction of our objects of experience is possible, a question that Hume did not pursue, but was taken up by Husserl in his phenomenology (Husserl 1969, pp. 256-257). Indeed, as one commentator notes, Husserl's phenomenology can be understood as a response to Hume's view (Sokolowski 1968, p. 189).

1993, pp. 55-56 for an analogous discussion of causal direction). Husserl, in his analysis of the constitution in consciousness of what Hume termed ‘fictions’ — those things outside the domain bounded by physics — went further, concluding that these ‘fictions’ have their ‘own mode of being’ and have an existence that can be verified by an appropriate ‘mode of evidence’ (Sokolowski 1968, pp. 189-190).³ These responses to Humean projectivism are indicative of the relationships between Husserlian phenomenology, Temporal Pragmatism and the Cognitive Sciences. In combination these views underpin a comprehensive account of how we construct, and project upon the world, the properties and features of our temporal experience that arise at the sub-personal and personal levels of temporal events. They also motivate the development of the inter-theoretical discussion and analysis that comprise the latter chapters of this thesis.

The third theme is motivated by the lingering assumption that there is a divide between the analytic and continental strands of philosophical enquiry. This ‘divide’ arose in the late 1920s and was, arguably, consolidated by Rudolf Carnap’s criticism of the then ascendant Heidegger in the early 1930s (See discussion in Friedman 2000). In his *The Elimination of Metaphysics*,⁴ Carnap complained of Heidegger that ‘...his questions and answers are not consistent with logic and the scientific mode of thinking...’ (Carnap [1932], p. 72; Friedman 2000, p. 12). This complaint captures the nub of the ‘divide’; for Heidegger’s position was that logic and the scientific mode of thinking cannot be central to a philosophical enquiry. The sense that the two traditions talk past each other and have little in common persists.

Recent work in philosophy has sought to cross this assumed analytic/continental divide and bring these philosophical frameworks together (Gallagher & Zahavi 2010; Huemer 2005; Smith, DW & Thomasson 2005), and this thesis shares that aim. Husserl’s body of work can enrich and inform accounts which are situated in other philosophical approaches, such as analytic theories of time, analytic theory of mind and philosophy informed by cognitive science. While my specific focus is on a study of the relation between Husserlian phenomenology and Temporal Pragmatism, this strategy is developed more generally throughout the thesis by means of brief discussions and footnotes.

Together, these three strategic themes provide a rich resource from which to draw upon in this investigation into how we experience time and the world.

The thesis has two parts. The first part, incorporating Chapters 1 and 2, considers different theoretical approaches to explaining our experiences of duration — of a

³ Sokolowski cites the German text: *Formale und transzendente Logik* (1929); the equivalent section in the English translation is: *Formal and Transcendental Logic* (Husserl 1969, p.166). In this thesis, Husserl’s theory of evidence is discussed in the context of the connections he makes between the temporal structure of perceptual experience; our ‘judgment’ or grounds for belief in our perceptual experience; and our self-responsibility in striving to obtain the best possible evidence.

⁴ This paper was originally entitled ‘Overcoming Metaphysics’ and Friedman cites this version in his discussion.

‘specious present’ — and future-oriented temporal directionality. In the process, Husserl’s Phenomenology and Temporal Pragmatism are identified as the best theoretical frameworks from which to address the thesis problem.

Chapter 1 contrasts Husserl’s phenomenological theory of inner time-consciousness against a prominent contemporary analytic account of temporal consciousness developed by Barry Dainton. It initially focuses on the problem of the ‘specious present’, the direct experience of succession, motion and change over a duration (and which contradicts the ‘present’ time of physics, which is an ‘instant’). It extends this discussion by considering how our sense of self is constituted, connecting Husserlian explanations of the specious present that are based on this constituted sense of self with competing accounts. Although other philosophers and their theories are acknowledged, it is primarily Dainton’s and Husserl’s work that is described and analysed in this chapter, with recent arguments for and against both views compared and considered.

There is some convergence in the overall aim and scope of their work; however the discussion in this chapter concludes that while Dainton’s theory is an exemplar of rigorous and streamlined analysis and descriptive phenomenology, Husserl’s more theoretically motivated and more deeply penetrating work has the greater explanatory scope and potential for further insights, and this is particularly true of his analysis of protention, the most basic constituent of the future-orientation of our experience.

Chapter 2 acknowledges that a thorough philosophical account of temporal experience requires an investigation of the ways in which the philosophy of science is informed by modern physics. Focusing on our experience of time as having a definite future-wards direction that appears to be irreversible, it offers explanations of this apparent asymmetry of time and discusses how this asymmetry can be reconciled with the physics of time. Two approaches were discussed and analysed: those that hold that time is of itself temporally asymmetrical, and those that claim that it is physical asymmetrical processes *in* time that give time its apparent direction. Entropy, and quantum asymmetries and indeterminacies, were identified as candidates for the latter kind of physical temporal asymmetry. More research in cosmology and physics is needed to properly defend any one of these views, and accordingly, other approaches to explaining our experience of time’s asymmetries, and time’s future directed-ness are considered.

The explanation of causal and temporal asymmetries based on our subjective, but universally shared experience of the temporal asymmetry inherent in disjunctive deliberation, developed by Price and Weslake (2010) is adopted in the thesis. Husserl’s theory of inner time-consciousness is compatible with this view: while he argues that we can have knowledge of the reality of time and the world, his theory implies that many features of our temporal experience are constructed and projected onto the external world.

A positive account of how we might progress towards a fuller understanding of temporal experience and its future directed aspects: of the ordering of events as future,

present and past; of a future open to our agency and intervention; and of the ‘becoming’ of novel events in the world; is developed in the second part of the thesis, in Chapters 3, 4 and 5.

In Chapter 3, I introduce Temporal Pragmatism and discuss it in the context of its relation to work in the phenomenological tradition developed by Husserl. An exemplar of the Temporal Pragmatist approach, Ismael’s work on temporal experience, is introduced here and discussed further in subsequent chapters. Temporal Pragmatism contrasts the intuition of a future that is ‘unwritten’, a future that we influence and shape, against a past that offers no possibilities that are open to our influence. This ‘intuition’ is, like our awareness of the temporal asymmetry of causation, understood to reside primarily in features of ‘us’, of how humans beings, given our particular (and contingent) situation, cognise and conceptualise the world. Ismael’s account of temporal experience is discussed in the context of how Husserl’s work on inner time consciousness might inform, and give independent support to, her view.

It is suggested that that Husserl’s analyses of the structural features of time consciousness supports the kind of genealogical approach to explaining the role of our temporal concepts she develops in her recent work, but also that his view goes further in some respects. Husserl’s theory of time-consciousness, suitably interpreted, demonstrates the extent to which temporal experience, and in particular future-oriented experience, permeates our life at the sub-personal and personal levels of temporal events. I suggest some ways in which the depth and breadth of Husserl’s phenomenology might usefully complement her analytic view, and how his work could be of interest to the Temporal Pragmatists more generally.

Chapters 4 and 5 make use of the distinction between personal and sub-personal levels of explanation, defining these levels in terms of the temporal duration of the events and processes that comprise them, and using temporal bands to separate out these durations within the levels. Martin Davies’ (2000) schema is adopted, so that the sub-personal level of explanation is divided into theories based on neuroscience, and those based on psychological research — with a further distinction made between these theories, and phenomenological theories.

I acknowledge that the incorporation of the personal/ sub-personal distinction and temporal bands within philosophical work is not uncontroversial. Nevertheless it can be justified on the basis that the organisational framework used here clearly does not entail any kind of reductionist view, or seek to blur the theoretical autonomy of different disciplines. It can add to our understanding of the role and function of tacit ‘sub-personal’ level events in furthering our understanding of our future-oriented mental states.

Chapter 4 takes up Ismael’s discussion of the ‘open future’, introduced at the conclusion of Chapter 3. Using her discussion as a catalyst, I show that some important personal level features of future oriented mental states and intuitions can be understood to be mind-dependent constructs and explicable in terms of evolutionary and adaptive

processes, as well as cognitively and conceptually oriented theories. I take as my starting point Husserl's view that, from our perspective, events in our personal future are neither fully determinate nor indeterminate before the events they are concerned with occur, and so we retain a real basis for our concepts of responsibility, agency and deliberation.

This discussion includes work by philosophers influenced by Husserl's theories since the early decades of the 20th century, and considers Husserl's theories in the context of work done in the cognitive sciences, and in psychology. This chapter offers some reasons why we have the future oriented mental states we do: intuitions about the open-ness of the future; a sense of events now future becoming actual, in part in virtue of our own agency over events; our emotional response to anticipation that is markedly different to our feelings about the past; are examples. Of particular interest is evidence that suggests that where sub-personal predictive mechanisms are disrupted, by injury or disease, at the level of neural and psychological events, there may be an association with disruptions to how we experience time at the level of personal level states. This adds weight to philosophical arguments that our future-orientation is mind-dependent, rather than a response to a fundamentally and objectively asymmetrical time, for it suggests that the orientation has a biological explanation that needs no recourse to an asymmetrical theory of time per se.⁵ It also calls into question philosophical views that argue for temporal neutrality as a strategy for living a happier life.

Chapter 5 draws further upon recent work in the cognitive sciences and psychology that incorporates themes from the Husserlian phenomenological tradition. This reinforces the connection between the cognitive sciences and philosophy, and, in virtue of Husserl's focus on the constituting role of time-consciousness in our experiences, brings out the importance of temporality, in the form of predictive mechanisms, in accounts of sub-personal processes. The incorporation of work from the cognitive sciences is, I suggest, integral to any comprehensive account of the intuitions that underpin our personal-level experiences of the future orientation of our temporal experience: openness; future-directionality and 'becoming'.

The chapter explores the sub-personal level temporal processes and acts that bring about our sense of being dynamic future-oriented agents in a world open to our influence; accordingly a key focus is on agency, and the links between sub-personal level explanations and personal level explanations. I focus on Shaun Gallagher's persuasive Husserlian-based reasons in support of the view that the sub-personal protentional mechanism that enables protentional consciousness is necessary for our sense of agency at the personal level of temporal awareness. His account is discussed at some length and reasons to endorse his view over that of his competitors are discussed and defended. In defending this Husserlian influenced view, the advantages of Husserl's

⁵ If pressed, the view can explain the asymmetry of processes in the physical world as the result of the asymmetry inherent in entropy. This is not, by itself, sufficient to explain the features of our future-oriented experience (see Chapters 2 and 3).

interconnected theories of time-consciousness, perception, intentionality, evidence, and the life-world, become obvious, for his view can readily account for associations between phenomena at different levels, within his cohesive web of theories. Husserl's theories are not, of course, without their inconsistencies and internal contentions, and need to be argued for. Nevertheless, as the literature can attest, his work continues to bring out possible connections and correlations for further investigation, particularly in the cognitive sciences.

Recent work in the cognitive sciences on 'predictive coding' is discussed briefly, and in the context of future directions for my research. This a new and developing theoretical framework which construes the brain as fundamentally geared towards tacitly predicting our immediate perceptual experience, monitoring how well the predicted experience matches the sensory data received and recalibrating predictions in the light of detected errors in these predictions. A brief discussion of predictive coding theories compares and contrasts them with theories of Husserlian protention and self-evidence — and finds interesting similarities.

This thesis overall shows that contemporary analytic work in philosophy; informed by psychology and neuroscience, can combine with Husserlian-influenced phenomenology, in the service of a well-rounded account of our future-oriented temporal experience that remains compatible with the view of time given in physics. It is a study of those aspects of our future-oriented temporal experience that are best understood in subjectivist terms, as 'constructions'.⁶ It acknowledges and embraces our future oriented temporal experience as deeply and indispensably embedded in our life — and acknowledges that our life, in turn, is embedded in time — and develops an account of how and why this is so.

⁶ This account developed from a suggestion, made by one of my supervisors, Greg O'Hair, that the work of Husserl, and Price and Weslake, might be fruitfully combined in an investigation into the constructed and projected aspects of our temporal experience.

1: DURATION AND THE 'SPECIOUS PRESENT'

Where is it, this present? It has melted in our grasp, fled ere we can touch it, gone in the instant of becoming (James 1948, p. 280).

OVERVIEW OF CHAPTER

This chapter develops an account of the experience of duration and temporal direction, that is, an explanation of our experience of succession, motion and change as being present to us while also perceived to be unfolding over time. It is an account that draws from different philosophical traditions, as well as other disciplines. It seeks compatibility and convergence between views while acknowledging there are real and interesting differences in how time is understood across these diverging viewpoints.

The 'specious present' is a rich concept found across these disciplines, but common to all is the problem of reconciling our 'common-sense' experience of duration with theories that seek to understand this experience in physical, psychological or philosophical terms. Although there are differences in how each discipline understands the specious present, the project of reconciling these views is a theme of the thesis: therefore this multidisciplinary approach, this comparing and contrasting of views that seek to understand the 'specious present,' foreshadows the strategy used in the more extensive discussion of the future-directedness of temporal experience that is to follow.

Three concepts or conceptions, of the 'specious present' are discussed below, and together they illustrate the disparity between the conceptualised 'present' instant⁷ of the mainstream physics of time, and the extended 'present' of our perceptual experience. That these concepts differ from each other indicates that the concept of the 'specious present' is theory-laden, it makes sense only in the wider context of a theory and its principles.

The first section of the chapter shows that science (particularly psychology), and philosophy, share some common aims in the project of understanding and explaining the 'specious present'. There are also differences, and these bring out the challenges involved in developing a comprehensive but coherent theory of the perception of duration.

Then, still keeping the theory-laden nature of the 'specious present' in mind, the focus turns towards three philosophical theories that engage with it, Retentionalism, Extensionalism and Cinematic Realism, and considers them in the light of a reductionist

⁷ Where appropriate, 'instants' denote durationless, ideal points of time as posited in physics and logic; and 'moments' denote the tiny instances of perceptual awareness which defenders of philosophical approaches such as Retentionalism and Cinematic Realism, for example, refer to as 'now-moments' and 'frames'. This should avoid some confusion between theoretical accounts of time and experiential accounts of time, by making it clear that moments are a somewhat looser measure of time than the strictly durationless mathematical instants of physics and logic.

approach to the ‘specious present’ developed by Philippe Chuard, and a reductionist approach to consciousness developed by Daniel Dennett.

In the latter section of the chapter, two of these philosophical theories are discussed in more detail. In the first, Extensionalism, the focus is on the work of its most well-known modern exponent, the analytic philosopher Barry Dainton; while in the discussion of Retentionalism, the work of Edmund Husserl, a philosopher and phenomenologist in the continental tradition, is introduced. The relevance of Husserl’s work to contemporary theory in the philosophy of time is a theme developed throughout the thesis. The rudiments of his work on time-consciousness are discussed below, with a more detailed discussion of his work on time and its connection to his theories of intentionality, perception and evidence developed in later chapters.

Extensionalists argue that our experience of duration is a direct experience of non-simultaneous temporally related events, across an objective extended time span. They are realists about our perception of duration (for a clear summary of Extensionalist claims see Chuard 2011, pp. 3-8). Retentionalists, by contrast, understand our experience of duration to be a perception of a reality that has duration but do not take our perceptual experience to be itself extended across objective time.

Interestingly, Barry Dainton, one of the current and more prominent critics of Husserl’s Retentional view of temporal experience, identifies William James as an influence on his own theory of temporal experience, which he characterises as a ‘neo-Jamesian position’ (Dainton 2005). On the other hand, Husserl read James’s work and was aware of the latter’s doctrine of the specious present and the theories he posited to explain our experience of its phenomenal features — and agreed with much of it (Gallagher & Zahavi 2008, p. 2; Grush & Andersen 2009, p. 298). This convergence of otherwise conflicting views is indicative of the scope and the subtleties of the concept of the ‘specious present’ and of James’ exposition of it.

THE CONCEPT OF THE ‘SPECIOUS PRESENT’

William James (1948, p. 280) popularised the term ‘specious present’, using it to describe the duration of a perception of change, motion or persistence of things. However, James did not coin the term, attributing it to William Clay, also known as Robert Kelly. Capturing the enduring philosophical problem of how to account for a distinguishable, phenomenal present when reason and science tells us that time cannot have this property, Kelly says of our experience of a present:

The relation of experience to time has not been profoundly studied. Its objects are given as being of the present, but the part of time referred to by the datum is a very different thing from the conterminus of the past and future which Philosophy denotes by the name Present. The present to which the datum refers is really a part of the past — a recent past — delusively given as being a time that intervenes between the past and the future. Let it be named the specious present...(Clay, cited by James in Grush & Andersen 2009, p. 279).

James himself defines the ‘specious present’ variously as ‘intuited duration; a direct experience of events changing and moving in and across the ‘present’; and an experience which is present and distinct from the retrospective access to past events we enjoy in reproductive memory (James 1948, p. 286).

As he suggests in the epigraph at the beginning of this chapter, the ‘specious present’ eludes easy location, definition or explanation: despite the term being in circulation for well over a hundred years it resists reduction to a single definition or concept. In more recent literature, theorists offering accounts of this aspect of our experience of time have rediscovered it, and it is found in theories of the philosophy of time, and psychology. It is also discussed in the context of theories of physics, where the experienced ‘present’ is seen to contradict the tenets of classical and modern physics, and hence is indeed ‘specious’.

DIFFERENT CONCEPTS OF THE ‘SPECIOUS PRESENT’

Three concepts of the ‘specious present’ that capture the different ways of understanding time in psychology, physics and philosophy are identified and discussed in this section:

(1) The ‘specious present’ is: ‘The duration which is perceived both as present and as extended in time’ (Le Poidevin 2009 following William James). This conceptualisation captures the main focus of the discussion which follows; how to reconcile concepts 2 and 3 below, and incorporate both into an account of temporal experience drawing from work in the analytic and continental traditions in philosophy, while doing justice to our perceptual experience of duration.

(2) The ‘specious present’ is the ability to apprehend successive events as more or less simultaneous, as in short-term memory (Fraisse 1984, p. 9). This psychological approach conceptualises the ‘specious present’ as having definable but flexible temporal limits and exemplified by particular kinds of mental experiences.

(3) The ‘specious present’ (of the kind Fraisse and Le Poidevin discuss above) is a ‘spurious’ present — if we assume that the ‘only true present is a mathematical, durationless instant’ as is taken to be the case in modern physics (Čapek 1961, p. 42). This conceptualisation of the specious present is taken by philosopher of science Milič Čapek to represent a dominant view in modern physics, although it is not one he endorses. The discussion below considers these three concepts of the specious present in turn, with the aim of forming a deeper understanding of our experience of the ‘present’, from a philosophical perspective.

PHILOSOPHICAL CONCEPTS OF THE ‘SPECIOUS PRESENT’

Le Poidevin (2009) notes that James elaborates on his concept of a ‘specious present’ in several ways. For example, the first interpretation of a ‘specious present’ Le Poidevin identifies is the psychological present or span of short-term memory described above as (2). Secondly, it is the duration which is perceived, not as duration, but as

instantaneous, as in the case of a perception of a mosquito's wings beating too fast for our perceptual systems to track, so we see no more than a haze of wing movement. Thirdly, it is the duration which is directly perceived, that is, where we directly see change and motion, a view which Sean Kelly (2005, pp. 224-230) calls 'the problem of pace perceived'. On this view, we experience objects as moving *now* at the moment we experience them, yet it must be the case that movement takes some time to occur, which seems contradictory, as indeed the 'specious present' of physics suggests above, in (3). Le Poidevin's final interpretation of a Jamesian 'specious present' as one which has a duration which is perceived both as present and as extended in time, is described under (1) above, and adopted as the general view found in philosophy here (Le Poidevin 2009).

PSYCHOLOGICAL CONCEPTS OF THE 'SPECIOUS PRESENT'

A contemporary account of time perception from a psychological perspective is developed by Paul Fraisse (1984): a pioneer of French psychological science. He describes a 'specious present', also called a psychological present, as the ability to apprehend successive events as more or less simultaneous; as '...the duration of short-term memory'; and also as 'the perception of things as being a set'. Examples of the latter are a 'short sentence' or 'rhythmic pattern' (Fraisse 1984, p. 10).

Fraisse focuses on the perception of temporal duration (Rosenzweig 1997). In particular, after surveying the psychological literature on the perception and estimation of time in the 1970s, he identifies three orders of duration, measurable and distinct; providing what he refers to as: '...a phenomenological order of knowledge which is placed in relationship to physical time' (Fraisse 1984, p. 29). These orders of duration are:

- (a) less than 100ms, at which the perception is of instantaneity;
- (b) 100 ms – 5 sec, the perception of duration in the perceived present; and
- (c) above 5 sec, an estimation of duration involving memory (Fraisse 1984, p. 29).

The 'specious present' falls under (b), above, and it should be emphasised that although his view privileges experienced time over clocked or measured time (Fraisse 1984, p. 4), his account is still able to posit an objective temporal *boundary* for the duration of a whole present perceptual experience in a human subject, despite there being variations between individuals. He refers to this as the perception of duration 'stricto sensu' or in the strictest sense (Fraisse 1984, p. 30), and this analysis of perceptual content as it is subjectively experienced over time allows Fraisse to determine its limits in physical 'real' time. In this way he links the time of phenomenology to the time of physics. This kind of approach is amenable to reconciliation of physics and experience, keeping subjective experience centre-stage, but using science where it is relevant to a better understanding of that experience.

More recently, Barry Dainton also notes that an estimation of a temporal duration such as a 'specious present' should not be based solely on a subject's estimation or judgment in an experimental context. This is in part due to our normal human fallibility in estimating such a duration (Dainton, 2010a, Supplement: 'The 'Specious Present' further issues'), and also because some subjects who have such experiences cannot make any judgments about them. Presumably Dainton is suggesting a need to explain why such judgments are relevant to the analysis of human perception, when it is not a factor in our understanding of the experiences of other beings that also seem to experience duration (non-human animals are his example). In those subjects who are capable of judgment, he suggests that factors such as mood, or normal interpersonal variations in the processing time of perceptual stimuli, skew subjective estimations (Dainton 2010a, Supplement : 'The 'Specious Present' Further Issues'). It is clear that phenomenological duration is difficult to quantify accurately, suggesting that there is value in bringing different approaches together; perhaps, for example, the psychologist's and the continental philosopher's views about 'phenomenology' might inform each other so as to better understand experienced duration at the level of brain states and consciousness.

Dainton, using recent surveys of philosophers' own estimation of their perception of duration from a purely phenomenal rather than experimental perspective, finds that subjectively introspected experiences of present-ness span a range of above 300 ms and below 1 ½ seconds. By contrast, Fraisse's final estimation of the perception of duration in what he calls the 'strictest sense' (his second order of duration (b), above) at between 100 ms and 5 seconds, has a wider range than Dainton identifies (Dainton 2010a, Supplement: 'The Specious Present: Further Issues', citing Fraisse 1984). Dainton finds Fraisses's upper limit of 5 seconds for a perception of duration in its strictest sense implausible, preferring instead the duration of 750 ms he attributes to another psychologist, Vittorio Benussi.⁸ It should be noted that Dainton's view of temporal duration is concerned with '...the stretch of time which can be apprehended as a unit and is the object of a single act of apprehension'; as opposed to Fraisse's perception of duration in the 'strict sense' which is linked to the span of short-term memory.

Given these varying estimations of a phenomenal experience of duration, and the acknowledged difficulty of objectively quantifying subjective experiences of time, clearly more work is needed in psychophysics and psychology, as well as in philosophy, to make progress on these matters. It seems likely that philosophical concerns with the perception of motion and change will continue to interact and intersect with those of psychology, as Dainton's work does above, and below; and with physics, as in the work of Dainton and Fraisse. In contrast with experienced duration, 'physical' time is easy to count and quantify in terms of measurement according to a chronometer, but may not

⁸ Dainton discusses the work of psychologist Vittorio Benussi briefly (Dainton 2010a Supplement: The Specious Present, some further issues'), and he cites his source as Albertazzi, 1996, 'Comet tails, fleeting objects and temporal inversions', *Axiomanthes*, 1-2, 111-135, p. 118.

have the resources necessary for a comprehensive account of temporal experience. This is discussed below.

CONCEPTS OF THE 'SPECIOUS PRESENT' IN PHYSICS

The term 'specious present' is not generally found in physics. However, the way in which physics usually conceptualises time is relevant to philosophical theories of time that do use the term, particularly those in the analytic tradition, as the proponents of these theories generally aim for consistency with modern physics. In modern physics time is idealised, measured and represented as points or instants, which are generally understood as comprising a continuum. This conception of instants can be problematical for philosophers, because it appears to reduce the experience of 'now' or 'present-ness' to being merely one point in a series of points, with no relation between those points or instants, excepting that of succession. There is an apparent contradiction between the mathematical measurement of time as favoured by physicists — a continuum of points, with each point representing an instantaneous present — and the lived experience of the 'present' as having duration.

Some philosophical views, such as the 'B-theory' of time, to be discussed in Chapter 2, below, have no significant difficulty with conceptualising time as a series of space-time points, all ontologically equivalent, and ordered in relations of earlier, later and simultaneous with each other. However, sharing Milič Čapek's concerns, as noted above (p. 15), this chapter considers some ways in which philosophy can remain consistent with modern physics without agreeing that the concept of the 'specious present' is inherently contradictory.

Interestingly, recent work in physics suggests that a punctal instant may not be the only scientifically valid way of construing a time described as 'now' or the 'present'. An alternative is offered by the theory that time is 'gunky' (Dainton 2010a section 5.5; 2010b, pp. 311-312).

SOME ISSUES CONCERNING GUNKY PARTS

Gunky time, space or matter has parts that do not reduce to points (Arntzenious 2012) so it always has some real (as opposed to experienced) temporal extension. Therefore it seems feasible that gunky time, space and matter could form part of a theory showing how a perceptual experience might be divided into gunky parts.

'Gunk' is a term which can be interpreted in different ways, and Hud Hudson offers a succinct definition of the properties of gunky objects (assuming, here, that gunky objects exist, which is not certain): 'a piece of gunk is an object, each of whose parts has proper parts' (2007, p. 291). Unpacking this a little, Hudson adopts a theory of mereology that suggests the relation of gunky parts to one another is one of 'partial ordering'. This relation is a) transitive, b) reflexive and c) anti-symmetric, that is, if x, y and z are parts then: a) if x is part of y , and y is a part of z , then x is a part of z ; b) x is a part of x ; and c) if x is a part of y , and y is a part of x , then x and y are identical

(Blackburn, S. 2005, p. 262). This ordering of gunky parts allows for a degree of structure and order in the absence of punctal continua, and is useful in theory building.

Finally, Hudson notes that ‘proper’ parts of an object are generally understood to be the parts within that object that are numerically distinct from the object itself. Any object of gunk has gunky parts, which themselves have proper (i.e. distinct) gunky parts (Hudson 2007, p. 291).

The alternative to gunk, atomism, is supported by claim that there is metaphysical necessity for objects, ‘atoms’ which have no parts, also called ‘simples’. Hudson suggests that arguments on both sides focus on whether simples or gunk can be, or are, actually in the world (Hudson 2007, p. 299). If gunk is actual, it has the advantage of providing a physical concept of ‘the present’ that cannot, by definition, be punctal. By definition, gunky time, space or matter has duration and/ or extension. However, as Dainton (2010b, p. 312) notes, reconciling ‘gunk’ with the point-based mathematics of (classical) physics remains a problem, and since points remain virtually indispensable to theories of physics, there is a good case for retaining them as part of our ontology.

Similarly, although he sees interesting possibilities for gunk, Frank Arntzenius (Arntzenius 2012), suggests that ‘every problem associated with the existence of points can be overcome, there appears to be no single devastating argument that space and time have to be gunky’. He thinks there are good reasons though, independent of the utility or otherwise of points, to ‘explore’ gunky space and time (Arntzenius 2012, p. 2), however he identifies a potential problem for this approach. Regions of pointless space (and time) need to be measurable, in some real sense that allows them to be incorporated into the relations and functions which modern physics depends upon. This is a project which Arntzenius endorses for future research (Arntzenius 2012, p. 21), and which may lead to a useful way of understanding time.

These interesting but underdeveloped theories of time (and space) in physics are not yet up to the task of fully explaining the perception of duration, and philosophers are also working towards this aim; sometimes drawing from, and sometimes challenging, theories from physics. Continental philosophy in particular, with its focus on describing and offering theories that explain the foundations of temporal experience, and objective time, from within a subjective perspective, may usefully inform modern physics. Later discussions of Edmund Husserl’s work will develop this theme.

THE MAJOR THEORIES OF THE ‘SPECIOUS PRESENT’ WITHIN PHILOSOPHY

As noted above, the third concept of the ‘specious present’ describes how it appears in the context of physics, and implies that a perceptual experience is both present and extended in time. This seems to be an immediate and obvious logical contradiction. Philosophy takes on the challenge of explaining how to avoid the contradiction. Within philosophy three major kinds of theories aim to explain an experience of duration:

Retentional theories; Extensional theories and Cinematic Realism/ Moving Spotlight theories.

All of these theories should address two well documented objections, which together form a dilemma. The first (D1) is that, if a perceptual experience happens across a duration, then that whole experience has temporal parts with different temporal modalities — some parts are earlier, or later, than others, in the order of succession of those parts. If that is the case, however, how can we have an experience that is extended in time but experienced as present throughout? This is a problem for temporally extended experiences.

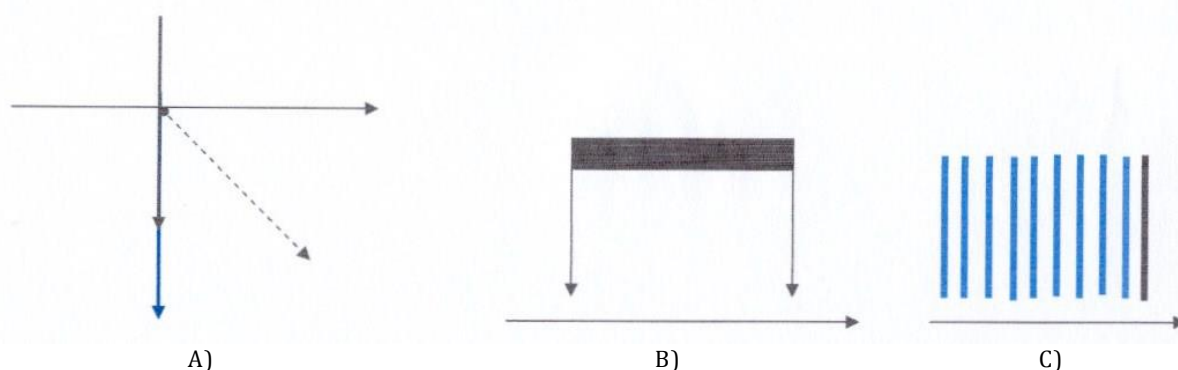
The second objection (D2) begins by accepting there is really a fully present, though momentary, perceptual experience and then asks how events can be experienced as happening in that present moment, without all being experienced at once as being simultaneous? This is a problem for momentary experiences. The theories below address this dilemma from within different philosophical traditions and with different motivations. Incidentally, as noted above, ‘gunk’, if actual, offers a physicalist concept of the present that cannot by definition be punctal and so may be used to avoid this horn of the dilemma.

Given that the concept of the ‘specious present’ is found in theories of temporal experience in psychology and in analytic philosophical theories of time and consciousness, the variation between the concepts in the discussion above makes it apparent that the ‘specious present’ is a ‘theory laden’ concept: it is not something we understand naturally; it can only be made sense of in the context of a set of theoretical principles (Blackburn, S. 2005, p. 364). Therefore the major philosophical theories of the ‘specious present’, the Retentionalist, Extensionalist and the Cinematic or Moving Spotlight theories, will be discussed and contrasted against a reductionist view. This reductionist view is a version of the Cinematic view, but one in which explaining an experience of succession or motion requires nothing more than unconscious perceptual processing, coupled with an innate propensity to believe that what is presented really is succession and motion in the world. In terms of the dilemma described above, this view accepts (D2), that there are no temporally extended experiences, whereas both Extensionalists and Retentionalists argue there really are temporally extended experiences (D1), although they differ over the conditions of possibility for these experiences.

These theories are described and compared in the context of the concepts of the ‘specious present’ outlined above on p. 16. A competing phenomenological theory developed by Sean Kelly and a psychologically informed theory of consciousness developed by Daniel Dennett (1991) broaden the discussion. The aim is to provide a comparison of a range of attempts to make sense of temporal consciousness.

The diagram below offers a simplified model of the three main philosophical theories of the ‘specious present’ discussed in this chapter. A represents the Retentional model; B the Extensional model and figure and C the Cinematic/ Moving Spotlight model.

FIGURE 1: COMPETING MODELS OF THE 'SPECIOUS PRESENT'



This is a representation of a single extended present experience as described in each of the three theories discussed below. The horizontal arrow represents real, objective or clock time in each case. However, in reality, in each of these models there would be many of these 'presents' even over a duration of a few seconds. Fig.1. A) shows the structure underpinning a present experience in the Retentional theory. The present moment of experience is shown as a dot on the horizontal axis. It is accompanied by its retention, depicted below the dot of present-ness on the vertical axis as 'just past' and as becoming more past (represented in blue); and by its protention, enabling an awareness of what is just about to happen in the next moment of experience, shown as extending above the dot of present-ness on the vertical axis. The dotted diagonal line represents the fading, in our consciousness, of the awareness of the 'just past' over time. Fig.1. B) is modelled on Dainton's own depiction of a single Extensional specious present (Dainton 2010a, section 1.1). The shaded area represents duration of purely phenomenal present-ness, an experience of real motion and succession in the world, experienced as fully present throughout this duration and spanning a duration block of real, objective time. Fig.1. C) represents the Cinematic model and Moving Spotlight models and adapts Dainton's representation (2010a section 1.1); the darkest frame, on the far right, depicts the 'present' and represents an experience of everything happening 'now.'

RETENTIONAL THEORIES OF THE 'SPECIOUS PRESENT'

Barry Dainton's very clear overviews of the Retentional theories of the 'specious present' are acknowledged here (Dainton 2008c, 2010a, 2010b). As he puts it succinctly: 'Retentional theorists hold that individual "specious presents" lack temporal duration but have contents which succeed in presenting (or representing) temporally extended phenomena' (Dainton 2010a section 6).

Temporal experience that is directed past-wards is the result of 'retention', which provides access to the phenomenal content of previous moments of experience, and gives the theory its name. Dainton calls this view a two dimensional time; however it is not clear that Retentionalists necessarily must or do accept this. Certainly one Retentionalist, Edmund Husserl, does not endorse the view that there is more than one 'time', although he does think that our immanent, or internal, temporal consciousness of perceptual experiences happens at a different level of time-consciousness from the things in the world that we have those perceptual experiences of (Husserl & Brough 1991, p. xxxi; 74).

CD Broad, an analytic philosopher, developed a Retentional theory of the 'specious present' in the first half of the twentieth century as Dainton notes (2010a section 6.2.1), citing its appearance in Broad's *Examination of McTaggart's Philosophy* in 1938. According to Broad's view, acts of awareness are momentary rather than temporally

extended. A model of a present which is experienced as extended, as it is developed in his theory, is distinguished by each present experience being accompanied by representations of previous content; content which has an increasingly less 'present' phenomenal character in its representations at each new moment (Dainton 2010b, pp. 109-110).

Broad's idea of 'presented-ness' expresses our experience of perceptual content being fully and incontrovertibly present to us, and, he further argues, a direct perceptual presentation is the measure of the maximal degree of presented-ness. However, with each successive moment (each 'specious present') in which that content still occurs, its degree of presented-ness decreases, producing an overall experience of the events which form part of that content becoming less and less present and, of course, more past. Eventually, these past events sink into memory (Dainton 2010b, p. 110). It seems likely that Broad construes presented-ness to be a primitive property, not amenable to further analysis (Dainton 2010a section 6.2.1). This is not unusual in a field of enquiry where so much remains unknown.

In summary, Broad's view is that we have a perception of temporally extended content, experienced as temporally extended in virtue of the retention, or holding of the formerly 'maximally present contents', which are retained and sink further into the past in their order at each successive moment.

Edmund Husserl's Retentional theory of time consciousness addresses the problem of the 'specious present' from within the continental tradition of phenomenology, and his focus is the study of the constitution of experiences in consciousness. 'Constitution' is a somewhat contested technical term in Husserl's work, and here it is meant in the sense of 'bringing about' or enabling our experience of things in a way that imbues these things with meaning for us. On this construal of the term real things exist prior to our constitution of them and independently of our consciousness of them, and so there is no implication that Husserl endorses an idealist view about perceptual knowledge here. Similar interpretations of Husserlian 'constitution' are found in Sokolowski (1964, p. 134) and Moran (2000, p. 165). This usage will be denoted as here as 'constitution_b'. Another relevant sense of 'constitution' is that of 'making up', which will be denoted 'constitution_m'. Husserl shares with Broad the view that the perception of motion and succession is best explained by an extended experience of what has just happened sliding effortlessly into what is now, and onwards to what is about to be.

To enable this kind of temporally extended experience Husserl posits a formal structure of inner time consciousness; a structure incorporating primal impressions or present apprehension of sensual content; backwards oriented retentions and forward oriented protentions. Retention, in Husserl's theory, enables access to just past perceptual experiences. Protention enables our awareness of more sensations about to be

experienced, along with tacit expectations of what these sensations will be.⁹ The result, as in Broad's view, is a 'specious present' that is perceived to have temporal duration and yet to be a real momentary present. If their view survives objections against it, this enables Retentionalists to avoid the dilemma above by endorsing (D2), and showing how a momentary present can also support an experience of duration.

EXTENSIONAL THEORIES OF THE 'SPECIOUS PRESENT'

William James is associated with the view that captures the main feature of the Extensional theory of the 'specious present': the claim that the 'specious present' is a 'duration block' of an extended, whole, present and direct perceptual experience, rather than a point or moment. He famously says:

The unit of composition of our perception of time is a duration block, with a bow and a stern as it were, as it were- a rear-ward and a forward-looking end. It is only as parts of this duration block that the relation of succession of one end to the other is perceived...we seem to feel the interval of time as a whole with its two ends embedded in it (James 1948, p. 280 discussed in Dainton 2010a, section 5.1).

A further feature of Extensionalist views is noted by Dainton; the 'immediacy thesis', which states that: '...change, succession and persistence can feature in our experience with the same vivid immediacy as colour or sound or any other phenomenal feature' (Dainton 2010a section 3). Extensionalism is a realist view, in the sense that the temporal features described above are directly experienced as fully present across a 'specious present', they appear in the world in the same objective time in which they are being perceived.¹⁰

An extended present does away with the need to retain or pretend phases of a perceptual experience as just past, or just about to happen in order to explain the experience of motion succession and change across duration, at a moment of time. This is because it is an experience of duration that tracks movement and successions across a whole perceptual experience, an experience with a real objective duration in clock time. It accepts the first horn (D1) of the dilemma on p. 21, and if the view also stipulates that the whole of the content of an extended specious present is experienced as being phenomenally fully present, it claims to avoid the seeming contradiction that the past is really being experienced in the present.

Extensionalism has a fore-father in the psychologist L W Stern, as cited in Dainton and in Toine Kortooms (who provides the translation used by Dainton and cited below).

⁹ However, in Husserl's later work, in the 'Bernau Manuscripts', his views about the 'primal impression' underwent considerable change. This development is mentioned briefly below, on p. 40 and in note 26, and in more detail in 'Husserl's Later Theory of Inner Time-consciousness', see Chapter 3.

¹⁰ Although the 'clock' time of the event perceived will not *exactly* match that of the perceptual event, due to the time taken for perceptual processing.

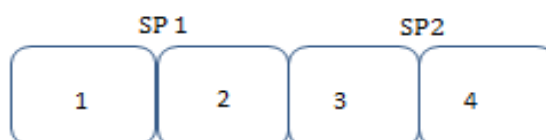
Stern says:

The psychic occurrence that takes place within a certain stretch of time may possibly form a unitary coherent act of consciousness regardless of the non-simultaneity of its constituent parts — The stretch of time over which such a psychic act is capable of being extended I call its presence-time (Dainton 2010a section 2.5 ; Kortooms 2002, p. 43).¹¹

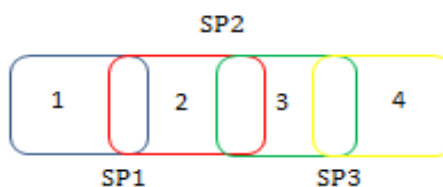
As Dainton notes, Stern is essentially arguing that perceptual experiences are not momentary but temporally extended, which is a prototype Extensionalist view.

There are two main models of Extensionalism in recent literature: those in which ‘specious presents’ are laid out end to end; and those in which they overlap. Figure 2 represents these models, each showing a succession of four auditory tones, in which two tones comprise a ‘present’ experience.

FIGURE 2. END TO END AND OVERLAPPING SPECIOUS PRESENTS.



Two ‘end to end’ Specious Presents incorporating a succession of four tones: there are two distinct present experiences, each with two tones placed end to end, each with no connection between 2 and 3



Three ‘overlapping’ Specious Presents incorporating a succession of four tones: Tones 1 and 2 are connected, Tones 2 and 3 are connected and Tones 3 and 4 are connected, resulting in three overlapping extended ‘present’ experiences, SP 1, SP 2 and SP3. These ‘present’ experiences actually overlap almost completely, but for clarity they are represented as more widely spaced, above.

Dainton points out that the ‘end to end view’ (top, above) is able to account for our perception of succession over the duration of a ‘present’. Here, tones 1 and 2 are part of a single present experience, SP1, allowing for a smooth transition from tone 1 to tone 2 in virtue of diachronic co-consciousness, which, in Dainton’s theory, enables two tones to be experienced in succession but also to be experienced ‘together’ across an

¹¹ The original source of this passage is: L.W. Stern , “Psychische Präsenzzeit” *Zeitschrift für Psychologie and Physiologie der Sinnesorgane*, Band 13 (1897): 325-349, pp. 326-327.

extended 'present'. This is similarly the case for tones 3 and 4, in SP2. However where SP1 meets SP2 there is no co-consciousness binding tones 2 and 3, for they share no 'present' (Dainton 2010a section 5.2).

This drawback is avoided by Extensional theories that posit overlapping tones, as in the second of the models shown above. This latter model has shared content in all the overlapping sectors of a succession of 'specious presents' and this, along with diachronic co-consciousness, enables a continuous whole experience over SP1, SP2 and SP3.

The extended, present experience of motion and change, which directly represents events moving and changing in (almost) the same span of clock time in Extensionalist accounts, is a way of reconciling present experience and extended perceptions of motion of motion and change. It is a relatively simple, one-level account of temporal experience. The strengths of Dainton's version of this theory, and an objection to it, are considered in more detail in the final sections of this chapter.

CINEMATIC/ MOVING SPOTLIGHT THEORIES OF THE 'SPECIOUS PRESENT'

The Cinematic Realist theory and the Moving Spotlight theory are combined in this discussion, as they have relevant similarities. Although the two are distinct, and there are differing formulations of both, all variations share the claim that a present experience has minimal duration, it is momentary: our experience of motion, and of events happening in a smooth succession of 'nows' is constituted_m¹² by rapid presentations of static frames of perceptual experience, or of 'spotlighted' present perceptual experiences.

Cinematic Realist views suggest that our experience of motion is really a series of momentary experiences which provide what Dainton (2010a section 4.1) calls 'momentary snapshots' of an unfolding event, presented sufficiently rapidly to produce the effect of motion and change in the experiencer. In this view, the world is presented in perception in much the same way as the successive presentation of the frames that make up a screening of a video presentation might make up a cohesive seamless presentation of a succession of parts of our own life, for example.

A classic interpretation of the moving spotlight view,¹³ described but not endorsed by CD Broad, evokes the experience we would have on this kind of view:

...we imagine the characteristic of present-ness as moving, somewhat like the spot of light from a police-man's bull's-eye traversing the fronts of the houses in

¹² 'Constitution is 'meant here in the sense of 'making up', see 'Retentional Theories of the Specious Present', above.

¹³ A recent version of the Moving Spotlight theory has been developed by Bradford Skow (2011). It furnishes a substantial view of time (as opposed to a relational view of time), with a 'now' which is present *simpliciter* rather than present-in-relation-to-other-times. He argues that it can be rendered compatible with Einstein's theory of Special Relativity, if a second dimension of time, a Super time, is introduced to account for the changing temporal properties of events within a four-dimensional block universe (See also Skow 2009). Philosophical, metaphysical views of time and their relation to theories of time in physics are discussed further in Chapter 2, below.

a street. What is illuminated is the present, what has been illuminated is the past, and what has not yet been illuminated is the future (Price 2011c, p. 277 citing CD Broad).¹⁴

To achieve this effect both the Moving Spotlight view, above, and Cinematic Realist views utilise the ‘phi phenomenon’. As Daniel Dennett (1991, p. 114) notes, the phi phenomenon has its basis in the work of psychologist Max Wertheimer who found that our visual system can be tricked:

... if two or more small spots separated by as much as 4 degrees of visual angle are briefly lit in rapid succession, a single spot will seem to move back and forth. This experience of motion, generated by rapid visual presentations of static momentary spots, frames or stills was utilised by the film and television industry and is therefore analogous to the experience of motion we see on television and cinema screens. The cinematic and moving spotlight views both use this characteristic of visual processing to explain our direct experience of motion occurring over time, contrary to the received view from physics in which the present is momentary.

Therefore they address the second part of the dilemma, above, since (D2) endorses the view that the present really is momentary. Dainton (2010a section 4.1) and others, question whether it succeeds, doubting that these views can fully capture the phenomenology of the perception of motion and change. However, Philippe Chuard, below, provides some further support for Cinematic Realism and its variations.

A REDUCTIONIST VIEW OF THE ‘SPECIOUS PRESENT’

Chuard (2011) explores the claim that we directly perceive temporal properties and relations, such as change and persistence, in the sense that these properties and relations are temporally extended phenomena, given in really temporally extended experiences (citing Dainton in Chuard 2011, p. 3; Dainton 2000, p. 114). He denies the claim, arguing that we do not really have a direct perception of a temporally extended phenomenon, such as a ball being thrown in an arc, if this entails that the perceptual experience itself is of the whole experience of the ball throw, extended over clock time. On the contrary, our experiences are momentary temporal parts of perceptions.

In some respects, Chuard’s positive view, Temporal Perceptual Atomism, is similar to the classical physicist’s view of the specious present, above, since he argues that all we ever really perceive is a series of momentary experiences. His view is also similar to Cinematic theories of the ‘specious present’ in that Chuard incorporates psychological elements such as the ‘phi phenomenon’ and the various ‘cognitive limitations’ of our perceptual processing, discussed further below, to explain an experience of streamlined

¹⁴ The reference to Broad here is: Broad, CD (1923), *Scientific Thought*, (London: Routledge & Kegan Paul), p. 59.

continuity of perceptual content in a succession of discrete 'present' moments (Chuard 2011, pp. 7-8; 17-18 notes 18, 42).

Temporal Perceptual Atomism suggests that what we take to be experiences seamlessly succeeding one another in a 'stream' of consciousness are actually a series of momentary, non-temporally extended discrete experiences (2011, pp. 2-3).¹⁵ Our experiences of things in the world moving and changing in a succession which appears unified and seamless is due at least in part to the operations of our perceptual and cognitive faculties, which ensure we do not usually perceive any 'gaps', if there are gaps, between successive phases of experience (Chuard 2011, p. 17).

The cognitive and psychological features that Chuard identifies as allowing an experience of motion and change are:

'the successive combination of the phenomenal character of each single experience in the succession; the temporal relations — distance, order, succession — between such experiences; the degree of overlap between the representational contents of adjacent parts in the succession and...cognitive, mnemonic, and introspective limitations...' which mediate against our seeing gaps between discrete experiences and thus produce a perceptual experience of succession (Chuard 2011, p. 17).

Beyond these features of perceptual and cognitive processing, there is no other 'binding' or unifying relation, and we need not and do not directly perceive real relations of change, succession and temporal ordering; all we need is a succession of experiences in the manner outlined above.

If his theory is shown to be true, then an explanation of an experience of succession in a 'specious present' need posit nothing more than a succession of instantaneous experiences, with the kind of features noted above, and this requires no extra relation, to bind these experiences together. However, as will be discussed below in the context of assessing the merits of a dominant Extensionalist view defended by Barry Dainton, there are objections to this theory. If it succeeds, however, it seems a fruitful way of bringing philosophy and psycho-physics together in the project of better understanding temporal experience.

While Chuard's view is more finely nuanced than the Cinematic Realist theory briefly outlined above, it shares some of its characteristics, primarily the claim that perceptual

¹⁵ L.A. Paul (2010, pp. 351-354) offers a similar kind of reductionist account, as noted by Dainton (2011, p. 388), which argues that an experience of 'succession, which she describes as experiences as of 'passage and change', results from neural activity in the brain in response to stimuli of sufficient similarity given in a series of stages. Paul (2010, p. 353) cites well studied illusions such as the 'phi' illusion, discussed above, where the experiences as of one moving shape changing colour over a duration in a way which 'flows' seamlessly from red to green despite being given as a series of static images; and argues a similar brain process 'fills in the gaps' (although she takes care to note this 'filling' is not to be understood literally) between stages of experiences as of passage.

experiences that appear to be extended across time are not extended duration blocks or 'specious presents', but are momentary.

Table 1 summarises a comparison of the compatibility of the three dominant theories of the 'specious present' that I discuss in this chapter (as well as Chuard's view) with the concepts of the specious present outlined above on p.16. Ticks indicate points of congruence, crosses denote points of variance.

TABLE 1

Concepts of the 'specious present'	Retentionalist View	Extensionalist View	Cinematic/ Moving Spotlight View
SP1: The 'specious present' is 'The duration which is perceived both as present and as extended in time' (Le Poidevin 2007).	√Agrees: the present is perceived as punctal, but perceptual experiences are perceived to have duration in immanent time, centred on a present moment, and accompanied by dispositional access to the just past, and to the 'just about to happen'.	√Agrees: We perceive events which are extended in real time over a series of overlapping or end to end duration blocks of 'present' experience'. These form an experience of succession.	√Agrees: This view is compatible with cinematic views, which posit a basic level of perceptual processing of momentary experiences in a succession from which our perceptual system produces pre-reflective pre-conceptual experiences of motion. In this kind of theory our basic perception of motion is fully and momentarily present, but coupled with a higher level of perceptual processing involving concepts, memory and belief. This provides the phenomenology of an extended succession of events, and motion, in the world (Chuard 2006, 2011).
SP 2: The 'specious present' is the ability to apprehend successive events as more or less simultaneous, as is the case in short-term memory (Fraisse 1984, p. 9).	√Agrees that the experienced 'specious present' is perhaps due to a form of dispositional intentionality, dispositional memory, or other form of past perceptual content which there to be actualised in the present. √Agrees with the priority placed on analysing subjective phenomenal experience.	√Agrees with the basic premise that events can be apprehended as successive while being (loosely speaking) simultaneous if this taken to mean fully 'present' but not momentary. X The duration of this 'specious present' (up to 5 sec) is longer than extensionalist theorists such as Dainton allow, but may be compatible with Stern's view.	X Incompatible with versions that posit a succession of discrete experiences where no connections across, or between them, are possible. √ May be compatible with views such as Skow's (Skow 2009, 2011) which allow for four dimensional stages or slices in a Moving Spotlight theory. Arguably, these allow a personal continuity based on reflection of experiences still available to us across times, in a block universe.
SP3: The 'specious present' is a single point, and therefore is in contradiction with our lived 'present' experience which has temporal duration.	X Denies the contradiction. Accepts that the present has minimal duration in objective time, but insists that a spread of temporal content is possible in immanent or subjective time.	√Agrees that the 'specious present' is incompatible with punctal physics, it is extended across real time. Dainton argues (below) that a whole 'specious present' cannot be reduced to moments or physical instants.	X Accepts that the present has minimal duration, and so denies the contradiction.

A FOURTH VIEW

Standing outside all three views discussed above, philosopher Sean Dorrance Kelly (2005, p. 230) defines a specious present as an experience containing ‘...direct perceptual contact not only with what is now occurring but also with what has recently occurred and indeed with what is about to occur as well’.

Kelly frames the problem of how we perceive duration as the problem of ‘pace perceived’ (2005, pp. 224-230). This refers to our experience of objects as moving *now* at the very moment we experience them, although this movement must be occurring over a duration that is longer than a moment. This seems to contradict the possibility of a momentarily present experience, as the second horn of the dilemma referred to above on p. 20, suggests.

He offers a positive argument as a solution, that: ‘...to experience something as past, perhaps, is to experience it as the thing on which you’re now losing your perceptual grip’. He goes on to say that our experience consists largely of gaining and losing ‘perceptual grip’ on things in the world, so that ‘...at every moment it [the experience] is a dynamic process, one that distinguishes sharply between what is imminent and what is receding’ (Kelly 2005, p. 233).¹⁶ For Kelly (2005, p. 232), there is no present moment with definite content, our experience ‘now’ is always about what has just happened or what is about to be, continually changing, moment by moment as perceptual grip is gained or lost. Therefore the past is distinguished from the present in that our experience of past-ness is of a loss of ‘grip’ in the now.

Husserl’s later views about perception and time (see note 9 above, and Chapter 3 below) share some similarities with Kelly’s description of perceptual grip, in that they suggest that Retention and Protention, together, enable experiences that are always of what is about to happen or just happened, with a mere moment of maximal fulfilment or ‘now’, which is immediately retained and anticipates the next moment of experience. This moment at which what is protended is fulfilled and immediately retained seems somewhat analogous to Kelly’s loss of ‘perceptual grip’.

Kelly’s view is incompatible with Extensionalist views (although he does not endorse Retentionalism either, despite these seeming similarities with Husserl’s view, and particularly his later work), since he particularly opposes those accounts of a specious ‘present’ which contain temporally modal parts, all experienced as equally present, such as Dainton’s view (Kelly 2005, pp. 226-227, 230-231). In fact Kelly (2005, p. 226) takes the kind of view Dainton defends to be the defining idea of a ‘specious present’: that past content is experienced in the present, in the mode of being present, which he takes to be ‘specious’ in the sense of being contradictory. Kelly, therefore, would suggest that Dainton does not avoid the first horn of the dilemma on p. 21.

¹⁶ Kelly (2005, p. 233, fn 35) follows the French Phenomenologist Maurice Merleau-Ponty in explaining the temporal aspects of our experience in terms of the idea of ‘perceptual grip’.

COMPARISONS WITH DENNETT'S VIEWS ON PERCEPTION

Daniel Dennett's (1991) project is to explain consciousness and conscious experiences in physicalist terms, although he fully admits the task is not yet complete (Dennett 1991, pp. 454-455). The distinctive methodology he adopts for explaining conscious experience is 'heterophenomenology'. He takes care to emphasise the scientific rigour of this method:

ignoring all tempting shortcuts...[heterophenomenology] is the neutral path leading from objective physical science and its insistence on the third-person point of view, to a method of phenomenal description that can (in principle) do justice to the most private and ineffable subjective experiences, while never abandoning the methodological scruples of science (Dennett 1991, p. 72; also cited in Zahavi 2007a, p. 22).

In response to the objection that this third person point of view cannot capture our experience Dennett responds: 'You [the subject] get to edit, revise and disavow, ad lib, so long as you avoid presumptuous theorizing about causes or the metaphysical status of items you report, whatever you insist upon is granted constitutive authority to determine what happens in your heterophenomenal world' (Dennett 1991, p. 96). However, your interlocutor need not believe your report, for you, as subject, only know about what *seems* to be happening in your experience. Dennett's aim is to discover if the subject's heterophenomenology (how things seem) portrays something real and if does not, then to explain why it seems to the subject to be so.

A relevant point about Dennett's view, in the context of the 'specious present,' is that Dennett is identified by Dainton (2010a section 4.5) as a 'phenomeno-temporal antirealist'. This, in Dainton's terminology, attributes to Dennett the view that: '...change, succession and persistence cannot be directly perceived and apprehended' (Dainton 2010a section 1.2), the heterophenomenology of a perception of motion, for example, is not a direct perception of something moving, presented over a duration. There are 'holes' or gaps in the information we take in from the world, Dennett (1991, pp. 356-357) suggests, but these do not interfere with our seamless experience as of motion, change and persistence, for so long as we do not perceive the temporal edges of any gaps in phenomenal experience, there is nothing to indicate that our experience is gappy at all — our perceptions appear to be smoothly flowing on.¹⁷ Rather than 'filling in' the gaps or holes, our perceptual system simply ignores them. In this respect Chuard's view, discussed above, shares commonalities with Dennett's view, and is similarly opposed to Extensionalism.

¹⁷ Dennett attributes this view, in part, to O. Neumann, 1990, 'Some aspects of phenomenal consciousness and their possible functional correlates' presented at the conference 'The Phenomenal Mind- How is it Possible and Why is it Necessary?', Zentrum für Interdisziplinäre Forschung, Bielefeld, Germany, May 14-17.

Chuard and Dennett provide a philosophical analysis of the constitution of a perception of a temporal relation, which is broadly consistent with physics and psycho-physics, and Chuard (2011, p. 9) argues, as Dennett does, that a perceptual experience consists of atomic, momentary parts (either ‘instantaneous’ or too short-lived to allow for a perception of non-simultaneous events) presented as a gap-free series. He also notes that higher order states such as memory, introspection and belief may have a role in the experience of temporal duration. His incorporation of introspection, memory and belief into his explanation is consistent with Dennett’s view that ‘buffer memories’ (for example echoic memories) may be part of an explanation of how our brains produce coherent, seamless perceptual representations of ‘temporal properties of events in the world’ — in this case, the duration, change and the succession of events. As Dennett notes this seamless representation occurs despite the representing systems in brain and body being asynchronous with the features of the world they represent (Dennett 1991, p. 145 note 2).¹⁸

Husserlian Retentionalism could almost be understood in terms of an ‘atomist’ theory, such as Chuard’s view (Chuard 2011, p. 9), although unlike Chuard, Husserl does not endorse introspection as a methodological tool (Thomasson 2005, p. 116). Chuard also makes it clear that simpler versions of atomism do not posit an extended immanent ‘experience’ of duration, as found in Retentionalism; rather, a series of sensory experiences, coupled with mere judgments and background beliefs, is sufficient for temporal experiences in such a view (Chuard 2011, p. 10).

Dennett, by comparison, notes that with respect to any report I might make about my conscious state:

‘On the one hand there is the truth about how it is with me, and then on the other hand, there is what I eventually say about how it is with me (if I choose to do so). Although I tend to be a highly reliable reporter, there is always room for errors to creep in’ (Dennett 1991, pp. 316-317).

For Dennett, a first person report is always fallible; it may not be an account of something real, and according to the method of heterophenomenology, if it is not real, then Dennett’s project is to uncover a psycho-physical, third-person explanation of why it seems to be so. As Zahavi (2007a, p. 23) notes, Dennett seems to follow the ‘principle of metaphysical minimalism’, that is, ‘we shouldn’t multiply entities beyond necessity’, and this leads him to separate what we believe about experience from what is real about experience. We can know how something ‘seems’ to be to us, but Dennett eliminates any purportedly verifying claims about what my object ‘*really* seems like’. Ultimately, he argues that our conscious experience consists in a series of judgments

¹⁸ Of interest, in the context of this thesis overall, Dennett notes our perception of events and their temporal properties enables our brain to predict and anticipate imminent events — when they will begin and end, or change — and to respond to them in a timely fashion. In Dennett’s evocative way of phrasing it, the brain can ‘produce future’, it can further our survival by anticipating a problem and working to avoid it before it harms us (Dennett 1991, p. 144).

and beliefs that something seems to be a particular way, with nothing further required to explain that belief or judgment (Zahavi 2007a, p. 24). If our beliefs about our experiences cannot be verified by matching their content to investigations of our brain activity, Dennett thinks we have reason to question our reported experience.¹⁹ In response, Zahavi (2007a, p. 25) raises the question of what, in our brain processes, could match our phenomenal experiences. However Dennett (1991, p. 455) makes it clear that heterophenomenology is just the beginning of an explanation of consciousness, a new approach rather than a settled theory, so he may well be confident that Zahavi's question will be answered in the future.

Dennett's heterophenomenology differs significantly from 'phenomenology' as developed in the Retentionalist view of Husserl, and from the Extensionalist view of Dainton. A brief discussion of these differences segues to the final part of the chapter, which focuses on the theories of Husserl and Dainton that address the 'specious present' in the literature.

In contrast with heterophenomenology, Dennett (1991, p. 44) describes Phenomenology²⁰ (capitalized) as a philosophical school centred on Husserl and briefly alludes to the method of *epoche*, further describing it as a way of becoming acquainted with objects without the distorting presuppositions of theory and practice (Dennett 1991, p. 44).

This definition misses some of the force of Husserl's view, for Husserl sees the *epoche* (what we would now call a thought experiment), as a bracketing, or putting to one side, the assumption that the object of investigation is real. The focus of Phenomenological investigation becomes the constitution_b of the object of investigation; what it is that enables this object to be brought to conscious awareness and to have meaning for us as experiencing subjects (Drummond 2008, pp. 67-68). Husserl differs from Dennett in that his focus is on theories of the structure of consciousness, rather than on reducing consciousness to theories from neuroscience and psychophysics.

¹⁹ Zahavi says of Dennett's view here: '... Dennett is basically proposing that the veracity and validity of our personal beliefs [about our phenomenal experiences of pain or colour for example] are to be measured and tested by matching them with sub-personal processes. If it should turn out that there is a mismatch, which is what is to be expected — after all what could possibly count as a match — we would have to conclude that our common-sense self-ascription of mental states is persistently and systematically mistaken' (Zahavi 2007a, p. 25).

²⁰ As Hintikka (1995, p. 84) points out, historically the term 'phenomenological' meant 'directly measurable', as opposed to something which was hypothesised but not observable in reality. It was, and is, a term associated with science, and in physics it refers to the practice of recording experimental observations, independently of there being any underlying theory or fundamental basis for them. The term 'Phenomenology' as it is used in the continental tradition of philosophy, and in particular, by Husserl, encapsulates much of what makes Husserl's view so valuable as a means of understanding what is presupposed about the world and the role of our own perceptual and cognitive structures and capacities, in bringing about that understanding. Husserl's Phenomenology, as a methodology, is closely linked with science: it is a means of explaining how the logical thinking underlying science comes about as a conscious process; and offers a theory of evidence that can justify empirical claims about the physical world. And, as Husserl stresses, adopting the phenomenological attitude is a method for understanding the world and how we come to know it, and it takes '...nothing away from the fully valid being of the reality of the world as the all of realities...' (Husserl & Gibson 1931 section 55).

Dainton (2010b, p. 103), in contrast with Husserl, defines phenomenology as a description of experience; for example, he defines a phenomenological task as ‘trying to formulate a *description* of our short-term experience of time that is clear, accurate and intelligible’. Dainton’s view is relatively simple, at least to the extent that he thinks that basic and fundamental human experiences, such as that of change, are those most likely to reflect reality, and so what we perceive really matches events in the world (Dainton 2010a section 4.5).

THE BASICS OF HUSSERL’S THEORY OF INNER TIME-CONSCIOUSNESS

Edmund Husserl did not engage directly in debates about the ‘specious present’, but his view of how our perceptual consciousness can be extended over time has been defended against recent criticism in this context by followers in his tradition (Gallagher 2003; Zahavi 2007b).

The perception of change and motion and succession is only possible when we have an extended experience of what has just happened sliding effortlessly into what is now, and onwards to what is about to be. Husserl’s theory explains how we have this experience by incorporating into his theory of the structure of consciousness a means of temporally extending present experiences: retentions and protentions. His analysis of our experience of time and the structures which support that experience is deep and penetrating. He developed a rich account of these structures, divided into three levels.

Protention, retention and a ‘primal impression’ of the sensory information we take into consciousness ‘now’ are the elements of the first level, the structural form of inner time consciousness in this theory. We have no direct access to this inner most level, and so can have no phenomenal awareness of it. It can best be understood as our unconscious organising of sense data according to a form, or structure, resulting in a stream of experiences. Although it is the means by which sensory information can be presented as being temporally extended, as having related phases or parts in our conscious experience, the formal structure itself does not have temporal phases (See Gallagher & Zahavi 2008, p. 84).

Husserl’s insight is that this inner-most level of this structure also constitutes our consciousness itself in the process of taking in sensual information from the external world (Husserl & Brough 1991, pp. 392-393). Pre-reflective, tacit, self-awareness and awareness of the world both arise in virtue of the response of the fundamental level of absolute time consciousness to stimuli from the external world. At the most basic level, our concepts of motion and succession reflect a very basic awareness of these phenomena, due to the organising of sensations in ‘association’.²¹ Protention, along with a retention and primal impression, bring about an awareness of our experiences as they unfold. However, this is not a claim that there is a ‘self’ that exists as an object, or as a

²¹ Association is part of the Husserlian structure of intentionality. It organizes sensations, coherently, in a rudimentary way at first, and then more specifically in the light of further experience (Sokolowski 1964, p. 176).

real entity, or as a 'central controller' of consciousness. As Gallagher and Zahavi (2010) note, subjective consciousness — a sense of 'how things are for me' — is a theme found in the phenomenological literature, but is also utilised in analytic philosophy of mind. An explicit, reflective, self-awareness is, arguably, only possible because there is a pre-reflective, tacit, self-consciousness. This is because reflective self-consciousness has access to first-order phenomenal experience *through* pre-reflective consciousness (Gallagher & Zahavi 2010). Our reflections on our experiences take this sense of 'what it is like for-me-ness' for granted.

We experience sensory impressions at this second level of inner time consciousness, where they fill the form of time, and manifest a stream of events in consciousness. This gives rise to a tacit pre-reflective awareness of an experiencing self; coupled with an awareness and experience of other people as 'subjects' in the world, expressed as an innate empathy with them. There is intentionality at this level but it is pre-reflective and implicit (Zahavi 2010, p. 326). It is perhaps best understood as a dispositional intentionality (Findlay 2012, pp. 81-82), towards what is 'just past', and what is just about to happen, which are constituted_b respectively by retention and protention.

Retention always accompanies the primal impression and extends the 'now' experience to incorporate what has just been experienced.²² Protention may not necessarily manifest itself as an experience at all, and may remain unconscious. It is most readily experienced as discordance between what is passively anticipated to happen next, and what is experienced in reality. The discordance makes clear that our anticipation of the next moment of experience was not met. Protention also forms part of the 'horizon' of a perceptual experience, the field of possibilities arising from the content of my 'now' moment, possibilities that are informed by the 'just past' experience (See Zahavi 2003, p. 84).

There is a further level of time-consciousness, consciousness of objective time, which is dependent on inner time-consciousness in Husserl's structure of time consciousness. The everyday time of clocks and dates is constituted_b subjectively and intersubjectively, by its coherence with my own ordering of times, and with the events which occur at those times being co-experienced by others. It follows then, that on this view subjective time is the grounding for, and the means of constitution_b of, objective time.

The time of science, measured in instants, is part of objective time: instants can be considered to be 'illata'²³, in that they exist in the world and our concepts of them are founded on our practical, pre-scientific understanding of time. As will become apparent over the course of this thesis, Husserl embraces science but he also argues that it is grounded in our pragmatic, lived experience of the world.

²² In Husserl's later work his conception of role of the primal impression changes, and this is discussed briefly below, in note 26, and in Chapter 3.

²³ 'Illata', found in the work of Reichenbach, Carnap and Dennett, are usually defined as posited or inferred theoretical entities, which can exist and can be investigated empirically, perhaps with results which explain more about them than the theory in which they are posited (Ross et al. 2000, p. 134).

Although the formal structure of inner time consciousness enables our experience of temporality, it cannot itself be described in temporal language; ‘we have no names for it’ since it constitutes temporality and so is not itself properly described in temporal terms (Husserl & Brough 1991, p. liv; 382; Zahavi 2010, pp. 323-324). It remains ultimately inscrutable, despite Husserl’s detailed theories of time-consciousness; however the kind of structure he proposes has some independent support from recent work in philosophy of mind.²⁴

Discussions of Husserl’s theory of time-consciousness conducted purely in the context of the ‘specious present’ debate, and particularly from within an analytic perspective, may obscure the wider importance of Husserl’s theories of time-consciousness, considered in combination with his theory of perception.

In perception, our next moment of experience is informed by that of earlier moments but not completely pre-delineated by them; this is due to apperception, an awareness inseparable from my experience ‘now’, of the just past and imminent phases of that experience. As Husserl observes, in apperception ‘...even what is already seen is laden with an anticipatory intention. It, what is already seen, is a constant framework that prefigures something new’ (‘Horizons and the genesis of perception’ in Welton 1999, p. 223). Perception, then, for Husserl, has an experience of temporal succession built into its structural foundation: protention, retention and primal impression. In virtue of its constant prefiguring of the new, it is a structure that underpins the orientation towards the future that characterises our experience. This theme, the future-oriented directionality of time, is developed further throughout the thesis.

The ‘what is already seen’ and ‘prefiguring of something new’ of apperception makes up the ‘inner horizon’ of a perception; where an inner horizon can be understood as a field of still open possibilities for future experiences of the object being perceived. In this ‘already seen’ and ‘prefiguring of the new’, apperception and the inner horizon can be understood as the way that the implicit unconscious form of time-consciousness is manifested in our lived, conscious experience. It forms the basis of our experience of a world in which events are organized in a temporally asymmetrical series, which is ‘open’, events that are not yet fully settled, for us, ‘become’ for us in the future-wards direction. In its open-ness, it is the basis of our direct experience of change, motion succession and persistence but also and perhaps more importantly, of our sense of agency and responsibility. These features of Husserl’s work are expanded on in later chapters.

In the set of diagrams below, the formal structure of Husserl’s Retentional model of time-consciousness is depicted at two successive moments, t_1 and t_2 .

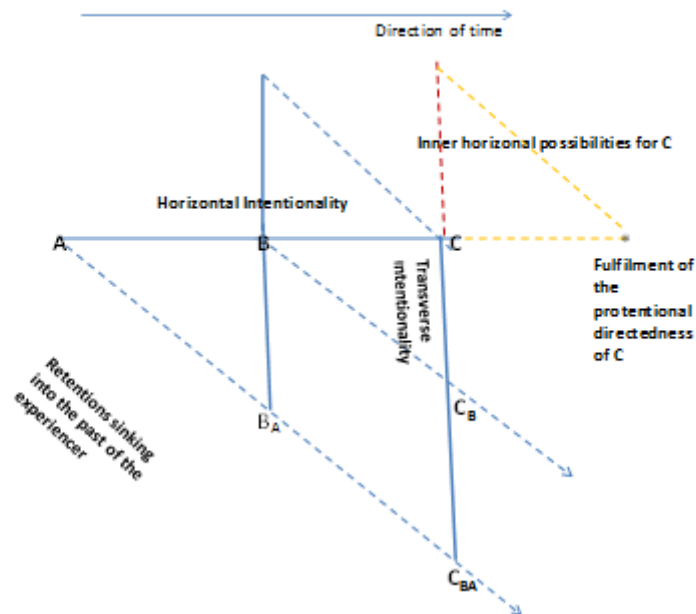
²⁴ For example, in work by Kriegel (2011), and in Thomasson (2005).

FIGURE 3: THE STRUCTURE OF HUSSERL'S THEORY OF INNER TIME-CONSCIOUSNESS

Fig. 3a : t1



Fig. 3b: t2



In Fig 3a. an experience of hearing two musical notes, A followed by B, is depicted along the horizontal axis. The vertical axis represents the extended structure of the experience of B with the primal impression of the note B depicted with its retention and protention. The diagonal dotted line A-B_A represents the sinking back or fading of A and B in our consciousness. The line B-B_A depicts the retention of A in consciousness — it is this retention that secures our experience of B as seamlessly continuous with A. The dotted line above B represents protention, the as yet indeterminate experience, (passively) anticipated, which is part of our experience of B. This anticipation is directed to a field of horizontal possibilities for that experience, represented by the triangle bounded by dotted lines.

Despite being as yet undetermined, the protention of more experience to come, along with the retention of A, contributes to our experience of succession. In Fig. 3b, a further musical note, C, has been experienced, filling the protention that was part of the experience of B. A has sunk further down in our conscious awareness, at C_{BA} . B is retained by C at C_B , and C now protends further experiences to be filled from within its field of inner horizontal possibilities.

Husserl's account of the 'specious present' is integrated into his far reaching investigations into the possibility of human experience at the subjective, intersubjective and objective levels and so its scope extends beyond its capacity for enabling an experience of succession and a stream of consciousness. The following section considers whether a competing account of the 'specious present' raises a good objection, one which might outweigh the advantages offered by scope and explanatory power of Husserl's view.

DAINTON'S OBJECTIONS TO HUSSERL'S RETENTIONAL VIEW AND A POSSIBLE REPLY

Barry Dainton discusses Husserl's Retentional view at some length in his 'Temporal Consciousness' (Dainton 2010a), and elsewhere (Dainton 2010b, 2011). He begins with the observation that as Husserl developed his theory of inner time-consciousness, the nature of retentions and protentions changed, so that instead of being 'real sensory-like contents in consciousness, animated by an act of apprehension', as they were in Husserl's earlier version of internal time consciousness, circa 1904-5, by 1909 they are 'intentional through and through' (Dainton 2010a section 6.23; Husserl & Brough 1991, p. 336).

In construing retentions and protentions as purely intentional in this way, Dainton is emphasising that, unlike the initial primal impression it retains, the retention itself has no 'sensory-like' content. It no longer presents real sensory content in the mode of the just past. Dainton notes that Husserl adopted this view in response to his new conviction that the present or 'now' and the 'not-now' are such fundamentally different temporal properties that the same perceptual content cannot have one property and then the other simply in virtue of the manner in which that content is apprehended. Therefore, Dainton suggests, Husserl changes his view so that retention now becomes purely intentional, a 'modification through and through' (Kortooms 2002, p. 197), as opposed to presentation or representation of the external world founded on a primal impression but experienced in the mode of just past. Past-ness can now be understood to be devoid of 'sensory-like' representational or presentational content, and having only 'reele,' purely intentional content with no real intentional object.²⁵ On this new

²⁵ 'Reele' and 'Real' are technical terms in Husserl's work: what is 'reele' is that which is an immanent or inherent component of an experience or mental act; the taking in of sensual information and the apprehension and intending of an object. It is contrasted with the 'irreal': intentional content or intentional objects which lack an identifying definitive temporal location; they are 'omni-temporal and experienced as the same intentional object at various times. On the other hand 'real' components of mental acts are actual physical or psychological entities or experiences, so for example in an experience of red, 'red' understood as a concept is an 'irreal' component of that real experience of a red thing (Drummond 2008, pp. 115, 176).

view a single musical tone just heard is retended, or intended, as being past but as something immanent rather than transcendent to consciousness.²⁶

On this basis Dainton questions the justification for claiming that a thoroughly intentional entity can be an integral part of a perceptual experience of real change and succession in the world (Dainton 2010a section 6.2, 6.2.3). Specifically he argues it is not clear how a specious present filled with '*purely* intentional entities' can provide us with a '*...properly* perceptual experience of change and succession of the kind that realism demands' (Dainton 2010a section 6.2.3).

However, a purely intentional entity can be veridical or not, depending on whether it has grounding in sensuous information from the external world, and in the cases of perception that Dainton discusses here, retentional content depends on the suffusion of sensuous data into consciousness, which gives rise to the primal impression: an awareness of our intentional object as here, now.

In support of the latter point I note Toine Kortooms' (2002, p. 98) remark that what we have in consciousness, i.e. in our perceptual experiences, is 'already the result of an underlying process of constitution' in the inner most level of absolute inner time consciousness, thus the connection to the external world occurs prior to our pre-reflective experience of it and reflection on it. The protentions, retentions and primal impressions that are the structural components of the innermost, constituting level of time-consciousness are the non-temporal and unconscious facilitators of temporal experience, rather than experiences themselves, but these structural components are dependent on the reality of the physical world.

Providing textual support for this view, Kortooms (2002, p. 281)²⁷ notes that in the *C-manuscripts* Husserl denies there is intentionality towards objects of perception of the kind Dainton refers to above as being in the 'primal stream' or stream of consciousness; experiential consciousness at the level of the 'streaming' is pre-reflective and so it is not an intentional *object* for a self in the sense that Dainton seems to be attributing to Husserl.²⁸ Finally on this point, Zahavi (2010, pp. 321-322), cites Husserl (Husserl & Brough 1991, p. 122) as noting that retention is '*...intentionality...but with a specific*

²⁶ As noted above (note 9) and discussed below in Chapter 3, in his later work, Husserl moved to reduce the structural form of inner time consciousness to a continual series of protentions and retentions. The primal impression that gives rise to the 'now' experience is reconstrued as a 'limit of the positive protentional tendency and the negative retentional tendency', so that this limit is our 'consciousness of the thing that is 'itself there' in person...' (Kortooms 2002, pp. 198-199 citing the 'Bernau Manuscripts', p. 39-40). This cannot be the view which Dainton discusses in his criticism here however, for he refers to work from 1909 and the 'Bernau Manuscripts' are dated between 1917 and 1918. Therefore, while I note this development in Husserl's thinking, I will not speculate on how Dainton's criticisms bear on this later view here.

²⁷ Kortooms is using unpublished sources here; see Kortooms 2002, p. 292.

²⁸ Zahavi notes that Dainton uses 'phenomenal content' and 'phenomenal object' interchangeably to mean what we are phenomenally aware of or experiencing: things like 'melodies, spoken lines of poetry, approaching buses...' (Zahavi 2007b, p. 454), whereas Husserl makes a distinction between 'objects' which are intended and reflected upon, and 'content' or 'what is experienced', including sensual content and affect.

character of its own', which is consistent with the view that it is a dispositional and passive intentionality towards the past and not a feature of our reflective experience.

When we have an experience of things changing and appearing in succession; it is in virtue of pre-reflective self-awareness, which arises from the latent or passive intentionality towards both the thing perceived and towards consciousness as constituting it, and from 'association' (see note 21 above) which orders sensory information into relations such as succession at a very basic level. In answer to Dainton's objection, it seems that retention and protention have a connection to the external world in virtue of their inseparable connection with the primal impression, the bearer of sensual information, and the pre-reflective self-awareness which makes those experiences of the real world ours, over time.

It might also be objected that the suggestion that the primal impression, retention and protention are connected to our experience of the external world cannot be reconciled with the bracketing of claims about the external world that is the starting point for practicing phenomenology. However, in *Formal and Transcendental Logic*, Husserl (1969, p. 275) says of phenomenological reflections that they are 'two-sided', uncovering what is solely the product of my mind, but also that which is real and separate from me, but has meaning for me in virtue of passive associative activity in my mind.

Although Husserl's conception of the primal impression changes in his later works (see note 26 above), it remains integral to our experience of the external world. This interpretation of Husserl's later views has some support from Shaun Gallagher (2013, p. 146-147), who observes that in Husserl's later conception of the primal impression and its relation with protention and retention, the primal impression cannot be understood in isolation and is always modified by retention and protention (2013, p. 146). While I have suggested the structural form of protention-primal impression-retention is not available to us in consciousness, as Gallagher notes it is not independent of our consciousness or the content of our experiences (2013, p. 147). It seems that Husserl's view of temporal consciousness consistently takes the structure of protention and retention and the primal impression (however the latter is construed) to be inseparable from our experience of the external world.

Dainton also raises a concern about the large amount of perceptual content lingering in consciousness that seems to be implied by Retentionalist theories in general, including Husserl's. The concern is that as each moment unfolds, and more retentional content, with the same 'vivacity' as the present experiences it retains is added, the resulting large amount of content clogs consciousness with experiences.

With respect to Dainton's comments on how retention as it is presented in *The Phenomenology of the Consciousness of Internal Time* (Husserl & Brough, 1991) is related to the real world, Husserl's point, as above, is that retention, in the case of musical tones for example, is 'modified consciousness', it is a '...consciousness of past sensation in which no actual [present] tone can be found, only a tone that has been' (Husserl &

Brough 1991, p. 336); it is no longer in our consciousness as present but as just past.²⁹ This is an older view of Husserl's, however, and does seem to imply that retentions remain in consciousness.

However, if retention is understood to be dispositional, as is suggested here, then it is accessible to consciousness in the right set of circumstances, for example it will always be found flanking the primal presentation which gives rise to the experience of 'now' in the manner of a 'present' musical tone. An example of such a suffusion of the past in the present is the smooth experience of a riff of musical notes as one is followed by another in a present experience, but which become more like dispositional memory as they fall away into the past. On this view retention (and protention) provide for an experience of succession; an extended experience in immanent time, in virtue of this access to the just past and to the just about to happen. However, they need not be understood to be permanently in consciousness, clogging our conscious experience.

Dainton (2010a section 6.3) also refers to a view developed by Husserl in his later work on time in the *C manuscripts* (C 17) as discussed by Kortooms (2002, p. 266). Dainton notes that, on this later account, it is the transcendental ego that unifies temporal experiences and so accounts for our sense of the '...unity of simultaneity and succession' (Kortooms 2002, p. 272 citing Husserl's *C manuscript* 7, 9a, Kortooms' transl.). According to this new view, protention, for example, is an 'ego-less striving toward what is to come' (Kortooms 2002, p. 273). This 'ego-less striving' remains compatible with the view that protention and retention are unconscious processes, and protentional and retentional consciousnesses exhibit directedness, an intentionality that is dispositional in nature and which we are not usually aware of at all. There is no danger of regress here for the deepest level of explanation of this new way of understanding the structuring of temporal experience is, as in Husserl's earlier views, unconscious or 'passive', in the sense that there is no active involvement with the 'ego' (the self) in either its natural (psychological) or phenomenological (transcendental) aspects.

Dainton (2008a, p. 631) finds Husserl's view of the specious present, and the stream of consciousness, as discussed above, 'highly complex and interconnected'; and questions whether we can discern anything in our own experience to support this kind of complex structural framework. It is certainly the case that Husserl's work relies on heavy duty theoretical structure, but it is a structure that reflects his detailed examination of how our temporal experience seems to be constituted_b. Husserl, unlike Dainton, eschews the simplicity of a descriptive account of phenomenology that focuses more narrowly on explaining phenomenal content, and extends his investigations to the underpinnings of the phenomenal experience, and particularly, the important role played by time-consciousness in all aspects of conscious experience. The importance of time-consciousness in a practical sense, its importance to how we act in and on the world, is a theme found throughout the chapters to follow.

²⁹ This section of Husserl's work is dated by Brough (1991, p. x) as written between 1907 and 1909. Dainton's discussion focuses on Husserl's post 1909 work.

 DAINTON'S ACCOUNT OF TIME CONSCIOUSNESS AND THE SPECIOUS PRESENT

Barry Dainton brought the term 'specious present' to the foreground in his book, *Stream of Consciousness* (Dainton 2000, p. 116), and much of his later work has been concerned with how '...distinct specious presents combine together to form continuous streams of consciousness' (Dainton 2008c, p. 369). More generally Dainton contends that any good account of temporal experience must satisfy the 'Dynamic Requirement', which is to explain how 'change, persistence, succession and movement' are all experienced over short durations (Dainton 2008c, p. 370), and is relevant to the third concept of the 'specious present' as described above on p. 16..

In Dainton's theory, the Dynamic Requirement is met by a combination of temporally extended 'specious presents' and a relation that 'glues' the contents of these 'specious presents' together: the relation of co-consciousness. A 'specious present' is experienced as being present, at each moment over a duration, a duration which Dainton estimates in his own case as being about half a second. It is overlapped by the next duration block of present experience at some time before it elapses although the rate at which overlap occurs is not specified. However, Dainton notes that 'adjacent specious presents overlap almost completely', which implies that new 'specious presents' come into being at a very rapid rate.

These overlapping 'specious presents' are not like two distinct entities which are superimposed over a duration, like overlapping sheets of coloured glass; rather they are a sharing of common parts (Dainton 2008b, p. 67). Where two 'specious presents' overlap there is a single experience which is part of two 'presents' so that, when we are listening to the sequence of notes *do re mi*: '...we hear *do* flowing into *re* and *re* flowing into *mi* and the *re* which follows *do* is the very same token experience as the *re* which is followed by *mi*' (Dainton 2008b, p. 67)

Further, two successive tones, for example a '*do*' and a '*re*' can be both fully present in a phenomenal sense; for in this account of temporal experiences, phenomenal contents are present just if they have 'their fullest measure of force and vivacity' (Dainton 2008a, p. 632). Importantly, then, in Dainton's view the term 'present' denotes a 'phenomenal characteristic', an 'immediacy and vivacity', a feeling, we might say, as opposed to a temporal location (2008c, p. 371). This might be construed as a way to avoid the objection that there is an incoherency here, that a 'specious present' lasting 500 ms must have parts which are earlier or later than other parts, with all being experienced as being present, but with some parts actually having occurred in my past experience. Dainton's insistence that the current moment of real time, and the particular characteristics or qualities of phenomenal experience, can be understood to be different definitions of the term 'present' addresses this problem, but seems to add an unnecessary ambiguity about what it means to say of an event or a moment that it is 'present', when evaluating his view.

Since the content of individual ‘specious presents’ is fully present to consciousness on this view, and therefore non-modal by definition, the overlapping ‘specious presents’ must contain shared non-modal content and in virtue of this shared content ‘...all the successive brief phases of the stream of consciousness are phenomenally connected to their neighbours’ (Dainton 2008a, p. 634). These overlapping specious presents are unified in virtue of their shared content (see diagram, p. 25 above) and this content in turn, is connected experientially by a relation of diachronic co-consciousness that binds content together as a whole (Dainton 2008a, p. 634-635).

Phillipe Chuard (2011, pp. 17-19) questions what aspects of this experiential connection between temporal parts are not equally well accounted for by a mere gap-less series of short perceptual experiences presented in succession, as his own view suggests can be the case. In support of his claim that there is, in fact, nothing more than a succession of experiences in play here — there is no further property of co-consciousness. Chuard makes two claims:

(a) Extensional ‘specious presents’ or whole phases of experiential awareness are reducible to, or at least entirely supervene upon, a succession of temporal parts (2011, pp. 15-16) and

(b) Dainton’s relation of diachronic co-consciousness is not required to unify experiences within a specious present and so is superfluous, providing no reason to adopt it (2011, pp. 16-21).

If these claims are true, his own explanation of our experience of succession, outlined above need posit nothing more than a succession of experiences, with the kind of features noted above³⁰ and it requires no account of an extra relation binding the series of experiences together.

To defend (a), Chuard (2011, pp. 11-15) outlines a general mereological argument which turns on supervenience relations between a whole experience and its parts. His conclusion is that, if whole experiences do not supervene upon their parts, then there must be a property that the extended whole experience has, and its parts lack. That is:

...[E]xtensionalists claim whole experiences are something over and above successions of their parts: they are irreducible to “mere successions”. This seems

³⁰ See ‘A Reductionist View of the Specious Present’, above. In brief summary these features are combinations of: the content of experiences themselves, particularly where this includes remembered or retained traces of what has gone immediately before; some degree of overlap between the representational contents of adjacent parts in the succession of experiences; and what he calls ‘... cognitive, mnemonic, and introspective limitations...’ the brain’s smoothing out of gaps between discrete experiences and thus furthering a perceptual experience as of succession. In earlier work he describes his view as a (‘second order’) version of Projectivism. This view suggests that the world is actually represented as a succession of temporally tiny experiences, with gaps between them, but we believe we are experiencing a seamless succession of events, with a distinct temporal ordering, and we project this belief onto our perceptual experience of the world. We further believe that our experience of succession represents an objective property of time (Chuard 2006). He refers in passing to these ‘background beliefs’ as contributing to the phenomenology of temporal experiences in his more recent work (2011, p. 10).

to mean that ‘temporally extended whole experiences fail to supervene on mere successions of shorter experiences (their temporal parts), merely replicating the parts may not suffice to replicate the whole experience itself (2011, p. 14).

Chuard argues that his account of why we seem to perceive events as having duration and succession allows that our experience of succession can be explained solely in virtue of these parts and their properties, and features of our perceptual system. If Dainton and other defenders of Extensionalism are to avoid (b): the claim that there is no need for any further property that binds the temporal parts of a ‘total’ experience together, they should show why a ‘total’ Extensionalist ‘experience’ *does* require an experiential property over and above the mere succession of its temporal parts.³¹ This requires showing that his more economical view cannot account for the phenomenology of an Extensional Specious Present.

In Dainton’s version of Extensionalism as cited by Chuard (2011, p. 16), the phenomenology of a whole extended present experience requires diachronic co-consciousness to enable an experience of a cohesive ‘whole’ (Dainton 2000, p. 236; 2008c, p. 370). If Dainton’s claim that the relation of diachronic co-consciousness is a property of the whole experience, but not of the mere succession of its parts is to be defended then he must show that co-consciousness does indeed make possible an experience that is different to that of the sum of the parts alone. If defenders of Extensionalism, and of diachronic co-consciousness, cannot show that this is the case, then Chuard’s claim (b) seems well-founded.

Chuard (2011, pp. 21-26) discusses several mereological arguments that Extensionalists could appeal to in support of their claim that co-consciousness does bring about a whole experience that is distinct from an experience of the sum of its parts. He concludes the discussion with an argument based on modal differences: various possibilities are introduced that could compromise the supervenience claim. Briefly, the premises of the argument are: ‘... (1) a temporally extended experience of succession *could* exist without some of its temporal parts, and (2) a mere succession of temporal parts *couldn’t*’ (Chuard 2011, p. 25). He concludes that ‘...by Leibniz’s Law, [the] different modal properties in (1) and (2) mean that (3) the whole experience, and the succession of its temporal parts, are distinct (Chuard, 2011, p. 25). If the argument succeeds, then it shows that the extended ‘present’ experience, taken as a whole, is distinct from the mere succession of its constituting parts, contrary to Chuard’s claim.

³¹ It is assumed, following Dainton (2013, pp. 9-10), that the smallest unit of duration is a moment in a dense continuum, and these would be the minimal parts of an Extensionalist Specious Present. This does not rule out there also being parts of such a present that are shorter than the whole, but longer than a moment. As far as I can see this point does not affect Chuard’s view, for his concern is with the minimal parts of an Extensionalist ‘experience’, although I note that his Atomist view is committed to temporal parts being sufficiently short to disallow non-simultaneous events being represented. However the point is relevant to a different objection raised by Michael Pelczar (Dainton 2013, pp. 4-14 pre-print numbering), but one which is beyond the scope of the discussion here.

However, he identifies an ambiguity as to whether the modal property that threatens the existence of the series of parts but leaves the whole experience untouched should not be applied to the whole experience as well, for what affects the parts must surely affect the whole — hence both exist, or neither. If the experience as a whole is really distinct from the mere succession of experiences that make up its temporal parts, then what it takes for each to exist, and for the question of whether they could exist without some of their constituent parts to even arise, may differ too. The argument fails to show conclusively that there is a distinction between the succession of experiences and the experience of an Extensionalist ‘whole’. Chuard concludes that Dainton’s view cannot show that:

The mere succession of temporal parts *could not exist-as-the-same-whole-experience* without some of the whole experience’s actual parts; and the whole experience *could exist-as-the-same-succession-of-experiences* without some of the succession’s actual temporal parts (Chuard 2011, p. 26 italics retained).

Therefore the supervenience of the ‘same whole experience’ on its temporal parts has not been shown to fail. Chuard concludes that a mere succession of experiences cannot be shown to be distinct from the whole extended experience and therefore, the addition of diachronic co-consciousness is not required to explain the phenomena. His minimalist account suffices to explain the phenomenal experience of duration, and so this line of objection against Dainton remains open.

Dainton has not responded to Chuard’s paper as of the time of writing. However, in ‘Temporal Consciousness’ (Dainton 2010a section 4.5) he refers to a talk given by Chuard (2006) and notes that in response to the kind of view Chuard develops here, Extensionalists will not accept that a mere belief about a feature of consciousness — the experience of change and continuity — can provide a full explanation of the experience. Introspection, the direct access to our mental states, suggests otherwise, he notes, and where an experience is as embedded in our lives as that of change and continuity, we have good reason to trust our experience.

He makes a similar point (Dainton 2011, p. 388 note 7) in his discussion of Paul’s (2010) view:

Holding that our experience does not really possess the dynamic features it seems to possess, that we merely believe that it does, may make life easier, at least in some respects, but the cost is high, we are being asked to endorse a highly revisionary account of what our experience is like.

Chuard, who does not see that there is any distinction to be made between our temporal experiences in the Extensional, Retentional and Perceptual Atomist views he discusses, can only disagree, to the extent that this criticism also bears upon his own view.

Finally, Dainton has suggested that the Extensional specious present may be ‘gunky’: that is, it may be made up of infinitely divisible but atom-less matter, matter which is

therefore never ultimately reducible to points, as discussed above (Dainton 2010a section 5.5; 2010b, pp. 311-312). If the specious present, thus construed, can be reduced to an infinite number of parts, each distinct, each having duration, and made up of more gunky parts, then this complicates any objection that argues for the possible reducibility of a whole to its punctal parts, including Chuard's objection above.

The Extensional account of temporal experience is a realist view, in the sense that Dainton argues that motion, change and the stream of consciousness really are as they seem, temporally extended experiences of temporally extended phenomena in the world. It is a comprehensive, coherent theory, but the points Chuard makes against it bring out some problems for the view, in that it has not yet been shown that we cannot have a realist account of our experience of succession without a property, such as diachronic co-consciousness, that binds the parts within and across the specious presents that comprise the experience. Interestingly, in a general sense, an Atomist account like Chuard's is broadly compatible with Husserlian Retentionalism (Chuard 2011, p. 9 notes 21 and 22), whereas Dainton's is not, and for the reason that there is an unnecessary complexity in the Extensional account in virtue of synchronic and diachronic co-consciousness.

This brings out the point that complexity is a relative concept, and for some, co-consciousness is seen as an unnecessary posit, just as Husserlian retentions may be for others. This is a field, however, in which different approaches, the theory-based, structural framework of the phenomenological approach; and the empirical, analytical approach are more likely than most to jointly provide insights into the problems of explaining temporal experience which transcends the methodologies of both. Dainton perhaps acknowledges this when he notes that:

[William] James clearly believed that there is an unvarying structure or mechanism underlying our temporal awareness, as did Husserl after him. If this is right, and if (as many believe) consciousness is essentially temporal, then this structure (or mechanism) is an essential component of consciousness itself, in all its forms. Hence the importance of the enterprise of arriving at a clear and accurate understanding of the composition and the functioning of the specious present (Dainton 2010a supplement: 'The Specious Present: Further Issues').

SUMMARY

At the beginning of this chapter William James asked where the 'present' is. While no definitive answer to this question is yet possible, this discussion of the concepts and philosophical theories of the 'specious present' considers a variety of approaches, which are all working towards answering this question. It is suggested that the answer must include acknowledging the varying ways psychologists, physicists and philosophers consider the time of physics, and the time of subjective experience, and how these might be reconciled. All these views add grist to the mill, furthering the debate.

The early part of this chapter focused on a dilemma:

1) If a perceptual experience happens across a duration, then that whole experience has temporal parts with different temporal modalities — some parts are earlier, or later, than others, in the order of succession of those parts. However, if that is the case, how can we have an experience that is extended in time but experienced as present throughout? This is a problem for theories which posit real temporally extended 'present' experiences, such as Extensionalism, and Fraisses's psychological view of the perception of duration.

2) If there really is a fully present, though momentary, perceptual experience, how can events can be experienced as happening in that present moment, without all being experienced at once as being simultaneous? This is a problem for theories that posit momentary 'presents'; such as Retentionalism, Cinematic Atomism and Chuard's Reductionism. This is also an implication of the dominant view received from modern physics.

The chapter considered the ways in which the horns of the dilemma can be avoided, with a focus on philosophical theories. Of these, three main types of theories came to the fore, Extensionalism; Retentionalism; and a reductionist view, a version of Perceptual Atomism. These theories, and other relevant approaches, were compared and contrasted with the aim of bringing out their relative strengths and weaknesses.

Of the views considered here, it is the Retentionalist view, particularly as it is developed by Husserl, which offers the most cohesive and comprehensive account of the 'specious present', embedding the specious present in theories of consciousness, self and the experience of an 'open future'. As the comparison of the concepts of the specious present against the various theories discussed shows (p. 29 above), Husserl's view also has the advantage of being broadly compatible with psychological approaches such as Fraisse's; as well as with some versions of Atomism, such as Chuard's. It is compatible with time as it is conceived in physics, if the time of physics is understood as a useful way of measuring time but one ultimately dependent on our conception of time as it is lived and experienced.

Husserl's view is necessarily complex, but this need not be taken to be a negative feature of the view, given its scope. Dainton's objection to Husserl's characterisation of 'retentions', on the grounds that in Husserl's later work he posited retentions which were insufficiently grounded in the real world to provide a robust, perceptual experience; and a further complaint that retentions are extravagant and 'clog' conscious experience were addressed.

Finally, at the level of conscious experience as well as at a fundamental, unconscious level of mental processing, Husserl's theory can be understood to cohere with recent views about perception from philosophy of mind, psychology, and physics. His theory has both explanatory depth, and relevance to other approaches similarly concerned with understanding the basis of temporal experience. The deep integration of Husserl's

theory of time with his theories of perception and perceptual evidence suggests it could similarly inform and elucidate theories and approaches to understanding perception in different approaches and disciplines, by showing how, analogously, the features of temporal experience influence how we understand our world.

This theme, the relevance of Husserl's theory of time-consciousness to other approaches and disciplines, is broadened and developed further, below.

2: TEMPORAL DIRECTION

OVERVIEW OF CHAPTER

Throughout the twentieth century and into the twenty-first, philosophical accounts of time and temporal experience have been informed by our best theories of time as given by physics: Einstein's Special Theory of Relativity (STR), General Relativity (GR) and quantum physics. This chapter acknowledges these theories and discusses how our experience of temporal asymmetry might be explained within their frameworks. In particular the philosophical question of whether time itself has a property of intrinsic asymmetry is discussed in the context of Einstein's theories of Relativity. To some extent this discussion relies on contested hypotheses in cosmology, which are not resolvable at this time.

The dominant view in physics suggests that the experience of temporal asymmetry is grounded in an asymmetry of processes in time rather than in an asymmetry of time itself. Three candidate theories are discussed; entropic asymmetry, weak nuclear force and the asymmetry of measurement in quantum mechanics. However, the difficulty of finding any clear evidence to favour a particular theory over others in the light of on-going debate invites the consideration of further theories that aim to explain the experience of temporal asymmetry from within a philosophical perspective. These are broadly termed asymmetries of knowledge; they offer explanations of why our knowledge of events in our past is both more comprehensive and of a different phenomenological character when compared with our much sparser knowledge of what is yet to occur.

In particular, and connected with this asymmetry of knowledge, we all share a certainty about the asymmetry which holds between our ability to affect whether some events in our future happen, compared with our ability to retroactively affect events in our past. This asymmetry of agency is the focus of the latter part of this chapter, where a further philosophical approach, a version of Pragmatism developed by Huw Price, is introduced and discussed. The broad approach to understanding time and temporal asymmetry associated primarily with Price's work is studied further and adopted throughout Chapters 3 and 4.

During the early twentieth century Husserl was also developing his phenomenological account of time as it is manifested in human consciousness (Husserl & Brough 1991; Husserl & Landgrebe 1973); as well as developing a critique of modern science as a practice (Husserl 1970a). This period also saw a philosophical divide develop between the analytical approaches and phenomenological philosophical positions (Gordon 2010).

Anglo-American-Australian analytic accounts of temporal experience (Mellor 1998b; Smart 2004) tend to draw heavily from scientific theory, particularly physics.

Where appropriate, throughout this chapter, I indicate where Husserl's work is consistent with, and relevant to, analytic accounts of time and temporal experience. Husserl situates temporal experience contextually; he understands it to be fundamental to how we can gain scientific knowledge about the world as a whole. He aims to show not just how and why we experience time in particular ways but how our temporal experience is connected to our perception of the external physical world. It is a theme of this thesis that valuable work in the analytic tradition would benefit from the inclusion of Husserl's work.

TIME IN MODERN PHYSICS AND PHILOSOPHY

TERMINOLOGICAL CLARIFICATIONS

SUBSTANTIVAL AND RELATIONAL TIME

A historical but still relevant debate about the nature of time in physics was conducted between Gottfried Leibniz and Samuel Clarke; Clarke being a proxy for Isaac Newton (Clarke et al. 1956). Leibniz argued that time is relational; it is comprised of events in the universe standing in relations of being earlier, later or simultaneous with each other. On this view things are not strictly 'in' time, time is manifested in the relation between the events in which things participate. In contrast Clarke argued that time is substantival, it is a substance in itself which can contain other things, and so it makes sense to say that events happen in time and things exist in time (Dainton 2010b, pp. 2-3).

This distinction has consequences for how temporal asymmetries can be constituted. If time just is a series of events or processes and their relations with each other, then time can be no more than the relation between events that gives events the properties of being earlier, later or simultaneous with each other. However, if time is substantival then it could be understood to have an intrinsic directionality that events and processes partake in. Alternatively, time could be intrinsically symmetrical while material and mental processes that are 'in' time have an asymmetry of their own (Dainton 2010b, p. 44).

Huw Price (2011c, p. 292), notes that temporal anisotropies are not sufficient for temporal asymmetries. Time may vary in ways which are irrelevant to any experience we would have of an intrinsic directionality of time: it may be finite in one direction and infinite in the other; or a discrete time could vary as in Price's example, where time becomes more granular in one direction than the other, so that the 'gaps' between 'amounts of time' are closer together in the latter case.

SPACE, TIME AND SPACE-TIME

Space and time were considered to be completely separate entities before Einstein's Theory of Special Relativity (STR) was published in 1905. However, by 1909 the mathematician Hermann Minkowski was convinced that:

...henceforth space by itself and time by itself, are doomed to fade away into mere shadows, and only a kind of union between the two will preserve an independent reality... (cited in Carroll 2010, pp. 385-386 note 11).

The implication of Einstein's theories of Special and General Relativity is that space and time are distinct yet also inextricably connected; in geometric terms every point-event in the universe has four co-ordinates, three spatial and one temporal, and if two points in space-time have different co-ordinates they cannot be in direct contact. DH Mellor (2005, pp. 615-616) explains the practical relevance of this fact for us when he describes a four-dimensional universe in terms of the ways in which two things can or cannot be in contact with each other. For example, there are three ways in which a separated cup and a saucer can avoid being in spatial contact with each other: if the cup is north or south of the saucer; east or west of the saucer; or above or below the saucer. This explains how the three spatial dimensions work to keep things in the world separated, but there remains another way in which the cup can avoid being in contact with the saucer, it can be in the same place as the saucer but at a different time from it, thus exemplifying the temporal dimension of four-dimensional space-time.

This example shows there is a similarity between space and time in how both affect our experience of how things are situated in the world, but there remain obvious experiential and pragmatic differences between what we can do in time and what we can do in space. These differences are at the heart of discussions of why time, and not space, seems to have a direction, a direction which fundamental physics does not consider to be a feature of time per se.

There is also a significant difference between space and time in the context of the Special Theory of Relativity (STR). Minkowski light-cones separate the universe into distinct and inviolable space-like and time-like regions, which are relative to a space-time point situated in the centre of a pair of connected forward and backwards looking light -cones. These light cones define the possible field of events in the causal past and future of the point they are centred on, and are discussed in more detail below, in the context of Milič Čapek's (1961) argument that time is intrinsically asymmetric.

TIME, PHYSICS AND RELATIVITY

Physicist Stephen Hawking (2005, pp. 68-69) argues that we can only meaningfully talk about time as beginning with the event colloquially referred to as the Big Bang. He theorises that initially all the matter in the universe was 'squashed' into a single point with no size or duration, and immediately following this state the Big Bang occurred (Hawking & Mlodinow 2005, p. 69).

Hawking notes that in some respects Einstein's theory of General Relativity (GR) supports the hypothesis that duration — time — began at the Big Bang. However, GR also seems to entail that any predictions about the initial conditions necessary for a universe which began with a Big Bang yield infinite values. According to Einstein's theory, and Hawking's interpretation of its implications, the Big Bang implies a

universe, which, at its beginning, was infinitely dense, and had an infinite curvature of space-time. Unfortunately (GR) suggests that the infinite density of the universe and the infinite curvature of space-time are conditions where our physical theories break down, a crisis point referred to as a ‘singularity’. This singularity indicates that there is an anomaly in the very theory (GR) that which seemed most likely to explain it, hence at this time we cannot account for the beginning of the universe (Hawking & Mlodinow 2005, p. 84).

Since all scientific theories break down at the Big Bang, including theories of predictability, Hawking concludes this means that no hypothesis about conditions prior to the Big Bang can have any scientific foundation — they cannot be tested by modelling or other means available to us at this time (Hawking & Mlodinow 2005, p. 69). For this reason Hawking argues that events before the Big Bang should not be part of a scientific model of science. For all practical and scientific purposes, the Big Bang is the beginning of time and all other moments are taken to be later than it.

The findings of physics are useful and influential in the analytic philosophy of time: scientific facts about the currently posited age of the universe (13.7 billion years according to Hawking and Mlodinow 2005, p. 68) or the possible hidden dimensions of string theory and the entanglements of quantum mechanics are all grist to the mill of analytic philosophy of science.

This first section of this chapter concludes with an outline of how Mc Taggart’s theory of time is related to STR in analytic philosophy; and a discussion of an interpretation of Husserlian phenomenology suggesting that Husserl was sympathetic to attempts to integrate his work with Einstein’s, and that Husserl’s work is compatible with STR in important ways. The discussion also briefly considers McTaggart’s often overlooked C-series, and how Husserl’s theory of time is situated with respect to it.

STR AND PHILOSOPHY: MCTAGGART & HUSSERL

MCTAGGART AND STR

In the philosophy of time, STR is sometimes discussed in the context of McTaggart’s argument for time’s unreality, and his distinction between the A-times and the A-series and B-times and the B-series (Dainton 2010b; Mellor 1998b). Very broadly, A-time refers to times as ‘future’ or ‘past’, relative to the time experienced as ‘present’; while the A-series is the series of events in the world ordered as past, present and future (Mellor 1998b, p. 8). This is contrasted with B-times and the B-series. B times are simply space-time co-ordinates ordered according to whether they are earlier or later than one another; while the B-series is the sequence of all space-time events located at the time they occur (Mellor 1998b, pp. 10-11). The B-times of events do not change their relation to each other, whereas the intrinsic temporal locutions of events in the A-series, their being past or present or future, change continuously (Mellor 1998b, p. 11).

A-times require an objective universal 'present' time against which other times can be determined to be past, present or future relative to it. STR denies there is any particular frame of reference within which a time can be designated the 'universal present'. Since it has no non-perspectival or universally defined present STR is usually associated with the B-series which similarly implies there is no universal present. Further, the A-series is compatible with the thesis that present (and perhaps past) events have a reality which future events do not have. The B-series, on the other hand, explicitly has no ontological distinction between earlier, later or simultaneous events, all are equally real.

It is important here to note that the 'reality' of all space-time events at all times and places, a thesis generally associated with the B-series, is a philosophical interpretation of STR. The interpretation entails that the reality of space-time points is not relativised to particular co-ordinate systems (frames of reference) and it can be argued that STR does not imply any such relativity of reality (Brogaard & Marlow 2013; Smith, Q & Oaklander 1995, pp. 183-184).³²

ALVES' DISCUSSION OF HUSSERL AND STR

Pedro Alves (2008) discusses Husserl's phenomenological work on time consciousness with the aim of showing that it can be interpreted in a way that is broadly consistent with Einstein's STR. Husserl was aware of Einstein's work; Alves (2008, pp. 213-214) refers to correspondence (circa 1923) between Husserl, and the mathematician and theoretical physicist Herman Weyl concerning Oskar Becker's project of synthesising his (Husserl's) work in phenomenology, with that of Weyl, and with 'Einstein's investigations' (STR).

In this context Husserl argues that the domain investigated by physics, the objective time of nature, constitutes³³ itself in consciousness '...through idealisations emanating from the founding ground of the *experience* of time...' (Alves 2008, p. 211). This is consistent with Husserl's wider position concerning the relationship between science and our experience of the world; he argues that that the practice of science is grounded on our experience of a pre-scientific 'world'. This experience is the *a priori* direct and universal awareness we have of the world's underpinning general structures; of the 'being' of the spatio-temporal world, an experience common to all human cultures (Carr 1970, p. 335; Husserl 1970a, pp. xl, 138-139).

Similarly, Alves (2008, pp. 218-221) describes how Husserl develops his explanation of objective time by analysing the intersubjective experience of time, identifying the features of time which are universally experienced by everyone in the world, and then idealising these features. The features he identifies as common to all are our direct immediately apprehended experience of succession and a perspectival orientation

³² Smith and Oaklander (1995, pp. 183-184) also discuss a competing philosophical interpretation of STR where claims about what is 'real' can be understood as being relative to a particular frame of reference. This is an on-going debate, and engagement with it is beyond the scope of this thesis.

³³ 'Constitution' meant in the sense of 'bringing about' or enabling.

centred on a present moment — our experience of events as past or future is relative to this ‘present’ (Alves 2008, pp. 218-219). Idealisation of these shared features of our experience generates an objective, linear time, a series of points in a fixed temporal order, infinite in the future wards direction, but with only one, ‘real’ present moment (Alves 2008, p. 220).

This objective linear time has these features:

- a. Time is continuous; its form is such that another ‘portion’ of time can be inserted between any two other points.
- b. Temporal points within time are ordered in a way which is asymmetrical and non-transitive
- c. Time has a *global asymmetry – it progresses towards the future* (Alves 2008, p. 220 my italics)

Husserl abstracts a further invariant from this infinite array of points, a time in which all events are jointly present.³⁴ Each individual perceiver now takes their own perspective on this ‘always present’ time, and this provides their subjective consciousness of ‘now’ (Alves 2008, p. 221 citing Husserl’s ‘Bernau Manuscripts’, p. 181).³⁵

However, Alves (2008, p. 225) notes that this Husserlian ‘construct’ of objective time is Newtonian, and not yet consistent with STR, for it posits an Absolute time, rather than a Relativistic time. He offers a corrective to this problem. Noting that STR entails that two events that are simultaneous relative to a frame of reference need not be simultaneous relative to another reference system which is in motion relative to the first, he suggests we reinterpret Husserl’s view of objective time, as described above (Alves 2008, p. 225). Then, if two points are simultaneous from the perspective of one observer, this does not entail that they are simultaneous from the perspective of another observer. There is no universal ‘now’ in this new view. Alves’ relativistic reinterpretation of Husserl’s work also incorporates Lorentz equations, which shows that measurements of time vary systematically for two different observers passing each other at high speed (and comparing clocks) — both perceive the other’s clock to be running more slowly than their own, yet both sets of measurements are equally correct. From all of this, Alves draws the conclusion that:

...the measures of time are always relative to an observer, and inter-combine, through Lorentz transformations, not into a universal time that goes beyond and suppresses the observer’s position but a space-time invariant that can only be obtained from and within the multiplicity of observers (2008, p. 225-226).

³⁴ Husserl’s (1960, p. 81) reference in the *Cartesian Meditations* to an objective universe having a ‘fixed’ ontological structure is also suggestive of a block universe view.

³⁵ The constitution of objective time is discussed further in Chapter 3, below.

In this way, the Husserlian phenomenology of objective time and STR both embrace and entail a 'fixation of time on the observer' (Alves 2008, p. 226), a convergence which supports Alves' relativistic interpretation of Husserlian objective time, and his claim that STR can be made consistent with Husserl's phenomenology. Husserl argues there can be no real opposition between time as it is experienced in virtue of our consciousness of it; and time as given in modern science, between 'lived time' and the 'time of the world' (Alves 2008, p. 227), and Alves' re-interpretation remains founded on intersubjective 'lived' experience of time.

An important aspect of Husserl's account of temporal experience is that it is asymmetrical in the sense that events that are in the future from the perspective of an experiencing subject, remaining unsettled until they occur, in contrast with our perspective on past events, which are settled. This might seem to contradict the view of time as it is given modern physics, particularly in STR. However Husserl does not claim that time has this asymmetrical property independently of any human cognition of it. While we do experience objects as being present and before us, here and now, Husserl is not arguing that this experience is correlated with any objective 'becoming' of events in time. The importance, to us, of experiencing an object as 'present' is the evidence it provides for the veridicality or otherwise of our perception of that object. This is the case for our perception of the temporal features of the world.

To make this clearer, according to Husserlian metaphysics our intended object is real and existing when it is given to us with adequate evidence,³⁶ 'intuitively' as being fully here and real, now (Zahavi 2003, pp. 27-33). This is not a claim that our knowledge of the nature of time is infallible however. Husserl's view is that all objects of experience (including the temporal/ spatial world as a whole) are, from our first awareness, there for us. They are understood as 'being,' prior to any reflective cognition about them for '...as long as the further course of experience does not provide occasion for doubt or modalisation of any kind...' (Husserl & Landgrebe 1973, p. 29).³⁷

³⁶ Husserl's theory of evidence, understood as a theory within epistemology, differs significantly from epistemology as practiced in analytic philosophy, which tends to focus on the notion of 'justified true belief'. Analytic epistemology is, therefore, primarily concerned with the conditions of evidence for propositions expressing beliefs, i.e. our reasons for believing that 'P'. The evidence in support of P will generally be assessed in terms of how well P represents features of the actual world with respect to P (see, for example, Bernecker and Pritchard (2011)). Husserl's theory of evidence is more nuanced, with different levels and standards of evidence applying to different areas of enquiry: areas as diverse as our perception of the natural world; our judgments about relations between things in the world; as well as the domains of mathematics; and logic. In Husserl's view optimal or adequate 'evidence' is understood to be direct awareness or apprehension that what we are intentionally directed towards is here before us now, and exactly correlated with the way we judge it to be, or the way we mean it.

³⁷ Husserl's theory of evidence is inductive, and is similar in some respects to Bayes' theorem: in both views it follows that the greater accumulation of evidence for the truth (or falsity of a claim), the greater the chance that the claim is true (or false). In Bayes theorem, as in Husserl's view '...evidence combines with prior probabilities (prior plausibility assessments) to produce posterior probabilities (posterior plausibility values) for hypotheses' (Hawthorne 2012). Husserl's theory of evidence is a systematic, formulaic method for working out probabilities based on past and continuing confirming evidence, or on new evidence that calls earlier evidence into doubt; it yields a direct inference of the likelihood of a modal proposition being true, and will be likely to generate highly objective and intersubjectively agreed values (see Husserl's discussion in *Ideas 1*, section 145, reprinted in Welton 1999, p. 119).

Husserl's theory of evidence likewise suggests that while our perceptual knowledge of the world is ultimately fallible, for all *practical* purposes our awareness of its temporality is as of 'real time'. In his theory of time-consciousness, as discussed in Chapter 1, he argues that our experience of time is a subjective response to a physical time in the world, structured by features of our perceptual system and projected onto the world.

However, while a solipsistic subject can bring about an experience of time and the world, for them, it would be a world which cannot be corroborated by a unity of appearances; it cannot be 'known' with evidence. Evidence requires validation by other observers who corroborate that evidence. That is to know something with evidence:

[the perceiver] must experience the things as the very same things, and he must, if he is to know this identity, stand in a relation of empathy to other cognizing subjects, and for that he must have Corporeality and belong to the same world, etc. (Husserl 1989, p. 87).

As Alves describes above, in Husserlian terms an idealisation of the intersubjective features of our temporal experience is the key to a Husserlian account of objective time of science that is consistent with STR. Therefore, defenders of Husserl's view can consistently argue that the time of objective, natural science is founded on and dependent on, time as it is intersubjectively experienced pre-scientifically and pre-theoretically, a point developed further in Chapter 3, below. Time, for us, is fundamentally asymmetric, events appear, to us, to have an ontological status that is relative to the perspective of an observer, and we have a degree of certainty about this which is irresistible, yet as stressed above, not infallible.

HUSSERL, AND MCTAGGART'S A-SERIES AND B-SERIES

Alves' argument for the consistency of Husserl's work with STR invites the question of how his view is situated with respect to McTaggart's A-series and B-series of time. As Alves has shown above, Husserl's view can be understood to be consistent with STR, which in turn might imply consistency with the B-series. However, Husserl's (1989, p. 205) insistence that future events are not completely settled; that there are 'horizontal possibilities' for future experiences of real (or ideal) objects, that is, a field of possibilities which could or would present themselves in the appropriate circumstances, suggests he could support a version of an A-view of time. Moreover, we are tacitly directed towards an expectation of this next phase of awareness while retaining awareness of the phase that has just elapsed. It is clear that at this fundamental level Husserl views the just past and just about to happen phases of experience differently, the just past phase is settled but the 'just about to happen' phase is unsettled and open. This commitment to an open future seems to be at odds with the implications of modern physics (and the B-view of time), which are usually understood

to entail that the universe is deterministic. Following Alves, I suggest, to the contrary, that Husserl's view is not incompatible with modern physics and the B-series of time.

Husserl's view is that causal relations hold between events in the objective, physical world; and relations of motivation³⁸ hold between the acts of consciousness that give rise to intentional acts directed towards the world. He defends the existence of a universal causal regulation (1970a, p. 31) an *a priori* universal 'belonging together' of everything in the world, but he argues this causal regulation does not '...determine, objectively *all* events in the sphere of the plena...' (Husserl 1970a, p. 37).³⁹ So, while Husserl argues that all the physical things in the world which are available to perception through sense data fall under this universal causality, he also argues that for human beings there is a 'necessary anticipation' of the world which is given sensuously and directly as a set of future possibilities. Therefore, in his view, it is necessary that future outcomes are open, for us, from our perspective, but, again, he makes no claim that they are open in any metaphysically objective sense (Husserl 1970, p. 35). As Alves shows above, Husserl embraces STR as a scientific theory while insisting that it is grounded in our pre-scientific understanding of time, in that, in our experience, there are real and open possibilities for actions and events that can influence our future, but these are not mirrored by symmetrical possibilities for action that could influence our past.

This suggests that Husserl is not straightforwardly either an A-theorist or a B-theorist. This is understandable, for Husserl's view of time is both profound and wide-ranging and not easily constrained within the strict dichotomy of the A-series and B-series. Husserl does not endorse the view found in much of the analytic philosophy of time; which sees subjective and objective perspectives on time, the A-series and B-series respectively, as being incompatible. On the contrary his work suggests the subjective and objective perspectives are related and both are essential aspects of time, for us (see Husserl & Brough 1991, p. 74). This will be discussed further in Chapters 3 and 4, below.

MCTAGGART'S C-SERIES

In addition to the A-series and B series which are now deeply embedded in the literature of time, McTaggart identified a third series (he did not consider it to be time), the C-series. As Jenann Ismael (2007b, p. 138 note 3), notes, for all intents and purposes the C-series is a directionless B-series. It can be understood to be a Block universe without a temporal direction.

³⁸ In Husserl's work 'motivation' is distinguished from 'causation' in that it is less exact, being concerned with our mental life, with reasons based on 'personal understanding' as opposed to straightforwardly physical, causal explanations of events (Moran 2012, p. 213). Motivation can also be passive, a kind of unifying relation between the parts or phases which make up an intentional act, for example an act of perceiving an object. In this context the 'motivation' relation is based on there being a reason, in virtue of the first phase of the act, for a subsequent phase to be the way that it is. The subject then experiences a unified intentional act of awareness, which is based on this 'motivated', inherent reasoning. The underpinning reason can have a varying degree of strength, it can be certain or uncertain (Drummond 2008, pp. 138-139).

³⁹ The 'plena' is 'nature as subjectively experienced' (Russell 2006 p. 194), or 'sensuous reality' (Moran 2012, p. 93).

Matt Farr suggests that ‘...the distinction between the *B* and *C* theories, essentially, whether time has a privileged direction, has a more ‘obvious’ relevance to the philosophy of physics than is the distinction between the *A* and *B* theories’. He goes on to say:

The dispute between the *B* and *C* theories of time is of direct relevance to the philosophy of physics: the *B* theorist’s assumption of the existence of a privileged temporal direction is of explanatory relevance to physics; and a comparison between unidirectional and adirectional explanations in physics can in principle shed light on whether time is *B*- or *C*-theoretic (Farr 2012).

Farr’s insight that despite the focus in the literature on the *A*- and *B*- dichotomy, a clearer understanding of the differences between the *B*-series and *C*-series might shed light on whether explanations of time as it is understood in physics is closer to the unidirectional *B*-series or the adirectional *C*-series, also has significant implications for our understanding of temporal experience. Our experience of time is typically associated with features of the *A*-series. If time is *C*-theoretic, then the implication that time is adirectional (time-symmetric or directionless) motivates the question of whether our experience of temporal direction is to some extent mediated by the features of the ‘directional’ *B*-series of time, or — if time is a-directional — wholly a construct of human minds and brains.

This has interesting implications for philosophical views, including the account developed in this thesis, which claim that our experience of temporal direction can be explained independently of any real direction inherent to time itself. A clearer insight into how the unidirectional and adirectional theories of time in physics are related would also inform the more controversial view that our experience of temporal direction need not be derived from any other physical, temporal asymmetry in the world (such as entropic variation), and can be explained as a feature of human beings’ natural perceptual and cognitive capacities to structure our world asymmetrically, given our particular physical situation. Therefore if the *C*-series represents a real adirectional series then it offers support to constructivist and projectivist philosophical approaches to temporal experience. It may be that we respond directly to the adirectional time of the *C*-series, and project temporal asymmetry onto the world; although a further story remains to be told about how objective temporal asymmetries arise in nature, and subjective temporal asymmetries arise in our mind/brains.

The theory that our experience of temporal directionality has its source in an adirectional time has historical support. There are references to the idea of a directionless series of space-time events underpinning our experience of time, predating McTaggart. JN Findlay (1981) identifies them in Kant’s work, for example. According to Findlay’s discussion of Kant’s view of time, the domain of Noumenal things — the ‘things in themselves’ that cannot be discerned by any kind of empirical investigation — is directionless, but it enables the ‘flowing’ time of experience. This

implies that, for Kant, temporal direction is not inherent to space and time but explained by physical asymmetries in the empirical, 'phenomenal' world.

Reinterpreting Kant's view from the perspective of modern theories of time, there are several contending explanations of temporally asymmetric relations between real things in the Kantian 'phenomenal' or natural world: some of which are discussed in this chapter, below. Two examples are: physical asymmetries of entropic direction; and epistemic asymmetries of what we know, from experience, we can do to affect future events as opposed to those in the past.

Findlay (1981, pp. 104-105) also notes that for Kant, time comprises unchanging [perhaps formal] ordinal properties and 'supersessive' ever changing properties. As Findlay puts it: '... [time's] restless shuttle is always weaving a fabric that endures'. Seemingly paradoxical, it is an enduring unchanging array of events, which is experienced as being always in flux.

The possibility that temporal experience may have a foundational directionless level finds some support in Husserl's phenomenology. In an observation that mirrors Findlay's, Husserl notes that: 'Time is fixed, and yet time flows. In the flow of time, in the continual sinking down into the past, a non-flowing, absolutely fixed, identical objective time becomes constituted. This is the problem' (Husserl & Brough 1991, p. 67). The problem Husserl identifies here is that of reconciling a non-flowing time with our experience of a subjective, flowing time — a flowing time that can ground a non-flowing objective time. While this non-flowing absolutely fixed time is somewhat suggestive of Kant's atemporal Noumenal level of reality, Husserl's view seems to imply that our experience of a fixed, objective (but not necessarily directionless) temporal order is constituted in a flowing time, and that a flowing time is constituted by an unknowable, directionless 'non-flowing' structural form regulating processes in our brain/mind. This structural form enables an 'absolute time-constituting flow', a self-constituting consciousness of a future directed time.

John Brough, in his introduction to *The Phenomenology of the Consciousness of Inner Time* (1991), explains that Husserl accepted that this 'absolute time-constituting flow' is 'difficult', and 'controversial', and not absolute in a metaphysical sense. It is the founding level of time consciousness, but it has no existence independently of the immanent (purely mental) objects it brings about (Husserl & Brough 1991, p. lv). The formal structure of protention and retention,⁴⁰ the means by which the flow is brought about or 'constituted_b', is 'unknown to us', and not itself temporal. Husserl says of it:

Time constituting phenomena, therefore, are evidently objectivities fundamentally different from those constituted in time. They are neither individual objects nor individual processes, and the predicates of such objects or

⁴⁰ Protention and retention are defined in 'The Basics of Husserl's Theory of Inner Time Consciousness' above and discussed in Chapter 1 *passim*.

processes cannot be meaningfully ascribed to them. Hence it can also make no sense to say of them (and to say with the same signification) that they exist in the now and did exist previously, that they succeed one another in time, or are simultaneous with one another, and so on... We can say nothing other than the following: This flow is something we speak of *in conformity with what is constituted* but it is not “something in objective time.” It is absolute subjectivity and has the absolute properties of something to be designated metaphorically as “flow”; of something that originates in a point of actuality, in a primal source point...for all of this, we lack names (Husserl & Brough 1991, p. 79).

However if our consciousness of time arises from something not in itself temporal (which I take here be analogous with having no temporal direction) then, as Nicolas de Warren notes:

...how can a non-temporal consciousness grasp time? How does the process of apprehending time as we understand it — as flowing, and with a distinct direction — ever get started? However, if our consciousness of time arises within time then how can we avoid the conclusion that there is a regress of levels of time-consciousness that apprehends a more basic level, and so on (de Warren 2009, p. 104).

Protention and retention can be interpreted as directionless, as having unchanging ordinal properties, to be a formal structure that is part of brain and mind and that, in part, brings about our consciousness of a future-directed time. It is unclear whether Husserl would think that this formal structure is correlated with an ontological direction-less ‘time’ in the universe, an objective physical series in which there is order but no privileged direction. However, if there is this kind of series it could ground a directionless structure of protention and retention and thus avoid the problem of the regress identified by Husserl. How we might explain how a ‘flowing’ time can be constituted by flow-less structure of time, or related in some way to a directionless physical series, remains unclear, but provisionally, it seems that the function of protention and retention is to enable this kind of relation.

To return to Kant’s view as discussed by Findlay: time and space are phenomenal but not ‘delusive or illusory’ — they are empirically real, in that we have empirical knowledge of them. However they are transcendently ideal, and while they are not forms of things in themselves, they seem *in some way* to ‘translate’ relations between things-in-themselves into appearances for us, as of things in spatial and temporal relations, without our having access to these things and relations in any original way (Findlay 1981, p. 105 my italics).

By contrast, for Husserl, things we apprehend are things in themselves, which suggests he thinks we apprehend temporal and spatial relations directly, but as irreal,⁴¹ as

⁴¹ See note 25, above, for a definition of ‘irreal’.

judgments, concerned with events as being before, or after other events. This supports the view that our apprehension of temporal relations depends on the mediating structure of (non-temporal) protention and retention, which, in theory, ‘structure’ time, in much the same way as Kant’s transcendentially Ideal time does.

For Kant, as Findlay interprets him, temporal direction seems to depend for its reality on something in time and space (Findlay 1981, p. 105). This would allow for interpretations of temporal flow as something that is a content of time, but not part of time per se. The atemporal Noumenal realm would provide the ‘container’ for the spatio-temporal content, the relations of ‘earlier’ and ‘later’ that enable an experience of temporal direction, in the real world. In Husserl’s view we directly apprehend causal, asymmetrical relations between physical things and events in the world, as unlike Kant, Husserl argues we are in direct contact with them.

The possibility of a physical atemporal series of ‘time’ has implications for how we should see the relation between the A-series and the B-series. It remains an open question whether there is a directionless C-series, and if there is such, whether if it is physical and/or phenomenological, but it is a question that has significance for philosophical theories of temporal experience as well as theories in physics. However, the implications of the C-series will not be speculated on further here.

The chapter now considers some specific philosophical theories, which aim to explain the experience of temporal asymmetry in the light of the symmetry of time in modern physics.

PHILOSOPHICAL ARGUMENTS FOR TEMPORAL ASYMMETRY

ASYMMETRIES AND ARROWS

Some philosophers of time, for example Čapek (1961), and Maudlin (2009), defend the view that time, of itself, has an intrinsic directedness, a primitive time order ⁴² and their views are discussed below. However time need not have an inherent, intrinsic directedness for us to experience time as having this property. Philosophers may claim that time is symmetrical, and argue the merits of various asymmetries of what is often called ‘content of time’ in order to explain the apparent asymmetry of time.

Dainton (2010b, p. 44) defines the ‘contents’ of time broadly as ‘...material or mental processes which we know to exist’. Here, I will avoid using the term ‘content’ since it seems to presuppose that time is a substantial ‘container’ and is so is a little ambiguous, however Dainton’s distinction between ‘material’ and ‘mental’ processes is retained, so as to avoid presupposing that mental events are fully explicable in physicalist, material terms. Reference is made to events and processes as asymmetrically ordered, in virtue of which they may be the basis of our experience of

⁴² See Dainton (2008b, p. 392) for a succinct discussion of views concerning time-ordering between space-time points.

temporal directionality. The effects of entropy are the most prominent example of a process of this kind, others are the asymmetries experienced when we observe instances of the causal ordering of events, and our experience of our ability to deliberate about acts in our personal future and sometimes act to affect outcomes, in a way which we cannot do with respect to acts in our personal past.

TERMINOLOGICAL CLARIFICATIONS

In this thesis it is assumed that ‘temporal asymmetries’ and ‘arrows’ of time are interchangeable terms. While I will use the term ‘asymmetry’ in what follows, both terms are used in different ways across the literature and need further clarification. For example, Savitt (1995, p. 7) writes that ‘...the arrow *of* time points in the direction in which time, flows, moves or runs. The other arrows are arrows *in* time...’. Here he is making a distinction between an intrinsic asymmetry of time and an asymmetry of material or mental processes ‘in’ time, but he also seems to assume that an intrinsic asymmetry of time implies an intrinsic passage or ‘movement’ of time rather than just intrinsic directionality.

As alluded to above, the term ‘temporal asymmetry’ should also be distinguished from the term ‘passage’, which implies a definite and objective ‘present’ against which a change from past to present to future is measured, a change which Laurie Paul (2010, p. 335) calls an experience as of ‘flowing or animated change’. Paul (2010, p. 334-5) defines temporal passage with some care. She distinguishes between change defined as a series of changeless events (citing the view defended in Mellor 1998) and change which is a ‘...flow of existing events (and their corresponding property instances) from the future to the present and into the past’ (Paul 2010, p. 334). Passage, she thinks, is understood in the latter way, as ‘animated change’ by those who argue that our experience of time coheres with its reality, and that therefore such ‘passage’ is an integral part of time.

However, ‘passage’ does not necessarily imply a ‘moving’ change or ‘passage’ view of time in the literature. Tim Maudlin, for example, argues that time has the properties of asymmetry and passage but does not claim that events ‘move’ from being future and present then past. His claim seems to be just that time has a real and definite directionality that is independent of any subjective perspective on events (Maudlin 2002, 2009; Paul 2010, p. 336 note 8).

When discussing the view that time is asymmetrical in virtue of its own nature or properties, the asymmetry is referred to as an ‘intrinsic asymmetry’ *of* time. Where asymmetries which are not intrinsic to time are discussed, these will be called asymmetries of material or mental processes *in* time. The term ‘passage’ will be preferred over ‘flow’, except where quoting directly, and is not assumed to involve any ‘movement’ of time unless specified. Claims that there are ontological differences between earlier and later events, or between past and future times or events, are clarified in the context of each view or theory discussed.

 INTRINSIC TEMPORAL ASYMMETRY: MILIČ ČAPEK.

Following Einstein and Hawking it is assumed here that time is one dimension of a four dimensional space-time. However, explanations of temporal asymmetry which argue that time has an intrinsic asymmetry or direction must distinguish between time and space in space-time, if time is to be shown to have an asymmetry not shared by space. Proponents of an intrinsic temporal asymmetry, such as Milič Čapek, can argue that this property of time fully accounts for our *experience* of the asymmetry of time; and that this experience is therefore not an illusion, nor does it need further explanation in terms of asymmetrical material or mental processes in time.

Čapek argues against the tendency of philosophers to spatialise time in response to Einsteinian physics (Čapek 1961, pp. 158-165). He notes that this ‘spatialization’ of time is a construction motivated by H. Minkowski’s ‘fusion’ of space and time, where ‘fusion’ in this context means that ‘the temporal component is absorbed by the spatial’ (Čapek, 1961, p. 158). This absorption means that time is just one co-ordinate of four-dimensional space-time comprising a ‘block’ of space-time point-events which are all ontologically equivalent, effectively denying future events a different temporal modality to those of the present and past, from the perspective of any frame of reference. Čapek resists this view, and interprets STR, when correctly understood, to be compatible with an intrinsically asymmetrical time.⁴³

Discussing the spatialisation of time, Čapek (1961, p. 164) asks, rhetorically:

...if true reality is timeless then where does the illusion of succession come from?
If time has no reality, why does it appear to be real?

‘Succession’, as Čapek uses it here, refers to our conscious experience that events occur in a series, rather than all at once, and in a future-wards direction. His usage further implies that time has an intrinsic asymmetry and events occur in a definite order of

⁴³ Čapek (1961, p. 164) also notes that if STR entails that there is no ontological distinction between space-time events, relative to the time we think about them, then an explanation of why we are conscious of events occurring in a ‘successive unfolding’ is needed. He argues that that any attempt to explain this asymmetry (and temporal ‘becoming’), without also assuming that time is real and that it has the property of asymmetry, cannot succeed. In support of this assertion he notes that thinking about time, even as an ‘illusory succession of events’, is itself a mental process unfolding in time, with stages that are asymmetrically ordered in relations of earlier relative to each other. This implies that temporal ordering is either a real element of consciousness in virtue of the reality of temporal asymmetry or it is a real relation between a consciousness which orders time and a time which is symmetrical (Čapek 1961, p. 164). He sees the second possibility, which entails a relation between a ‘timeless physical world and temporal consciousness’ as an ‘absurd dualism’ where all events are co-existent, even ‘present’ in some sense, while being inaccessible to consciousness. Čapek argues for the former view, that the nature of time is both asymmetrical and relational, and so time just is an asymmetrical ordering of events (1961, pp. 349-350). More controversially, Čapek argues that novelty and a ‘becoming’ of new events are features of the universe and these new events are ‘co-determined’ by the events which preceded them and an accompanying experience of now-ness. Arising from this is a ‘...connection with, and a contrast to, the past...’ a contrast which is part of the present experience (Čapek 1961, p. 339), and it is this connection and contrast together which gives the experience its character of present-ness (Čapek 1961, p. 339). There are interesting similarities here with Husserl’s retention of an awareness of the past, as being past, during a present experience, although Husserl does not necessarily see this contrast between past and present to arise from the features of physical time.

earlier and later in virtue of this asymmetry and further, that there is an ontological distinction between past, present and future (Čapek 1961, p. 164-165). Therefore, if STR entails that there is no ontological distinction between space-time events, relative to the time we think about them, then an explanation of why we are conscious of events occurring in a 'successive unfolding' is warranted. Accordingly, Čapek offers an argument for an intrinsic asymmetry of time in the kind of universe described in STR. If successful it can explain our experience of succession in a Relativistic universe.

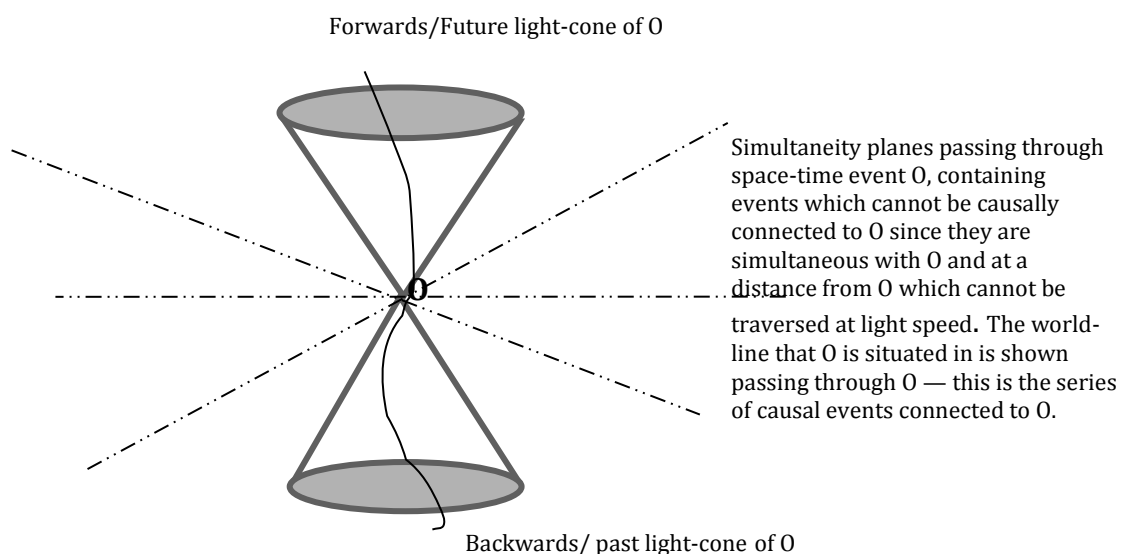
The argument depends on two points:

- a) the uncontroversial view that the finite speed of light is a necessary condition for the possibility of space-time as it is described in STR; and
- b) that the notion of space-time or time-space does not entail that time has no real property of asymmetry.

In support of his view Čapek (1961, p. 160) notes that: 'Einstein himself admitted that the asymmetry of time is preserved even in its relativistic fusion with space when he recognised that "we cannot send messages in to the past"'.

Čapek's argument aims to show that the irreversibility of causal asymmetry is inseparable from and dependent on, an intrinsic temporal asymmetry. This intrinsic temporal asymmetry is demonstrated in Čapek's discussion of the implications of Minkowski's work on 'light cones' (illustrated in fig. 4) below:

FIGURE 4. A MINKOWSKI LIGHT CONE CENTRED ON SPACE-TIME EVENT O.



Čapek observes that given a space-time event *O* located on a world-line⁴⁴, the light-cones through which this world-line passes represent the boundary of all possible events that *O* can be causally related to: those which can be reached by a photon travelling at light speed from *O*. Only events in *O*'s past light cone can be causes of *O*; and *O*'s future light cone is the boundary within which any event *O* causes must fall. This is an irreversible causal relation based on an asymmetry of time itself (Čapek 1961, pp. 166-167). Another way of expressing this point, which also highlights the inseparability of time and causality, is that any pair of causally related events must be time-like connected (that is, they are within the light cones of *O* and so within the boundary within which a photon from one event travels less than or equal to the speed of light). By contrast, events that are not time-like connected cannot be causally related.

It might be objected here that according to STR there is no privileged 'frame of reference':⁴⁵ a pair of events which are simultaneous in one frame of reference are not simultaneous in another which is in motion relative to the first. Further, events which occur in succession in one frame of reference may appear in reverse order in a frame of reference which is in motion relative to the first (Čapek 1961, p. 166). However these scenarios are restricted to pairs of causally unrelated events, that is events that are 'space-like separated'; events that are temporally close but so distant spatially that they cannot be connected by any signal at all which is travelling at light speed or less. It remains the case that all *possible* causal series retain the same temporal ordering for all possible observers (Čapek 1961, p. 167).

Therefore, the finite speed of light preserves the *temporal*, but not the spatial, ordering of events from any possible observer's perspective. It not only distinguishes time from space but also suggests to Čapek that time is the more fundamental and important part of space-time. He says:

Philosophically, while there is no juxtaposition (spatial contiguity as opposed to temporal contiguity) of events, which would be juxtaposition for all observers, there are certain types of succession, which remain the same in all frames of reference. These types of succession are represented by causal series, i.e. world-lines...In other words unlike spatial juxtaposition the *irreversibility* of the world-lines has an absolute significance, possessing genuine and objective reality independent of the conventional choice of the system of reference. Thus it is more accurate to speak of time-space than of space-time...' (Čapek 1961, p. 168).

Lending some indirect support to Čapek's view that there is an inherent asymmetry of temporal ordering in Minkowski space-time, Dainton notes that '...the temporal ordering of the events within the cones is the same in all frames of reference...although

⁴⁴ A world-line represents the motion of an object in and through four dimensional space time. Dainton (2010b, p. 440) remarks, however, that only points are properly referred to as world-lines, spatially extended things occupy volumes rather than lines.

⁴⁵ Defined as: 'a co-ordinate system centred on a particular point *O* in space or space-time and assumed to be at rest' (Dainton 2010b, p. 432).

the temporal distances between them are not...' (Dainton 2010b, p. 325). Further, it coheres with our experience of events in the causal series of our world (represented in the world lines of everything in our world) that causally related events retain the same order of succession, the same direction, in all frames of reference in which they can possibly be experienced (see Brogaard 2000, pp. 92-93).

This irreversibility of the world lines as they pass through light cones is significant in Čapek's view: the directionality of time is a 'genuine and objective reality independent of the conventional choice of the system of reference' (Čapek 1961, p. 168). If his view is accepted then the philosophical B- view interpretation of the universe, that all events have their fixed location place in space-time or time-space and concepts of 'now' and 'past' and 'future' are purely subjective and mind-dependent, is not entailed by STR. Berit Brogaard (2000, pp. 92-93) cites Čapek's observation that

..the now of the birth of Plato is included in the causal past of everybody on earth, or more accurately of "all frames of reference which are within the forward light cone whose vertex was on the earth (more accurately in Athens) in 427 B.C.". But the events of [2020] are not contained in the causal past of any present observer. ...[T]he causal lines of the four-dimensional space-time geometry are absolute and the objective status of succession and becoming is maintained.

Čapek argues that temporal asymmetry definitively distinguishes time from space; a view supported by his observation that in Minkowski space-time temporal ordering and direction is not relativised in the way that the spatial analogy, the proximity of things in space (juxtaposition), is (Čapek 1961, p. 168).

However, an objection to this view is noted by Huggett (2010, pp. 175-176) in his discussion of a possible implication of Gödel's model of General Relativity (GR). In Gödel's model the curvature of four-dimensional space-time in GR allows the possibility that light-cones are tipped over at an angle, meaning that that a world line passing through a series of them will follow a curved path- a path that can ultimately result in backwards 'travel' in time and backwards causation. In Fig 4, above, a world-line is shown passing through light cones; in Gödel's theory that world-line threads through a series of cones, each of which is tipped a little further over than the last. The world-line is oriented so as to stay within the light cones but as it follows the orientation of each light-cone it tips further over in each successive threading. Eventually, if it continues to follow the curve of the light-cones as they follow the curvature of space-time, the world-line will form a circle and double back on itself. This means that the world-line now contains point-events which are both earlier and later than other points on that same world-line (Dainton 2010b, pp. 382-383), and backward causal relations are possible.

However, Huggett notes that this scenario does not apply to a local region around a space-time point, for such a region cannot encompass the whole of the curved path a world-line must take through space-time, if it is to realise this backwards causation. Within this 'local' region of space-time, a region smaller than that which is traced out by the path of light-cones, backward causation remains limited by light-speed. Čapek

(1961, p. 159, pp. 185-6 note 5) alludes to Gödel's theory and sees it as the product of the tendency to 'spatialise' time, which Čapek opposes. Neither side of this debate has a clear advantage over the other, and to reiterate the observation made above, the current state of cosmology or physics supports several, sometimes competing, views about the physical nature of time.

A further problem for Čapek's argument is the extent to which causal asymmetry underpins his claims. As noted above, Gödel's discussion of some implications of General Relativity suggests the possibility of backwards causation.

Čapek's argument also depends on the finite speed of light, which he argues ensures that the causal succession of events will remain the same in any possible causal relation from a perspective of any possible observer. That is, 'No causal action can move faster than its electromagnetic disturbances.' Of further concern is Čapek's emphasis on the limiting effect on the temporal ordering of causal relations imposed by light-speed in relativity (Čapek 1961, p. 168). This is vulnerable to the possibility that a particle which can travel faster than light, the theoretical tachyon, could be discovered — a tachyon allows that an effect might precede its cause by backwards 'time travel'. CERN have measured a neutrino exceeding the speed of light, and although more investigation is needed before it can be considered to be a refutation of Čapek's argument, it remains vulnerable to discoveries of this kind ('Particle clocked quicker than light' 2011).

The connection between the experience of temporal asymmetry, causation and the pragmatics of how we can act in the world with respect to our knowledge of (and agency over) events earlier and later than our subjective 'now' are shared concerns of Čapek and Huw Price (Price & Weslake 2010). As Brogaard discusses, Čapek acknowledges the role of our cognitive abilities in determining how we order and make sense of the world; noting that '...our cognitive system grasps only certain features of external reality...' and that our faculties are the result of an adaptive process in response to that reality (Brogaard 2000, p. 79). For Čapek, this reality includes the asymmetries of time and of causal direction. This is interesting in the context of Price's focus on explaining causal directionality in terms of agency. Price argues that explanations of how causation is experienced as being asymmetrical by '...creatures who have the primitive experience of [causally] intervening in the world in pursuit of their ends...' is a relevant factor in any explanation of the phenomenon (Price 2001, p. 108). Both Čapek and Price consider the cognitive abilities and perspectives of agents to be an important part of any explanation of causal and temporal asymmetries.

Čapek is also committed to an epistemology which is informed by physics and is responsive to change and revision in the light of new scientific findings, in the pragmatist tradition of James and Peirce (Brogaard 2000, p. 78). Price (2001, 2011c) privileges a (different) kind of pragmatist account over a realist, physicalist account of causal and temporal asymmetries, but, like Čapek, he acknowledges new scientific findings in his work. These similarities between two otherwise quite diverse philosophers are encouraging in the context of reconciling our experiences of time with

the physics of time. However, Price would not endorse Čapek's confidence in the irreversibility of causal ordering, nor his commitment to the intrinsic asymmetry of time as an external reality — he argues to the contrary that there is no intrinsic passage of time (Price 2011c).

INTRINSIC TIME PASSAGE: TIM MAUDLIN

Price's claim that there is in fact no real inherent directionality in time is denied by Tim Maudlin (2002, 2009), and Maudlin's view broadly supports Čapek's.⁴⁶ Maudlin argues, against Price, that time really passes, not in the sense that time itself moves (or 'flows' to adopt Price's terminology here), but in the sense that things move in time. This distinction needs to be clarified: Maudlin is not arguing that time flows in the sense of moving (Maudlin 2009, p. 110). He notes here that rivers, for example, that truly do flow, can only flow in the direction they do because time passes, but clearly, if rivers flow because time passes this does not imply that the passage of time is the same as a river 'flowing'.

Maudlin illustrates his argument for an inherent directionality in time with an example of an asteroid moving between Earth and Mars. Like any journey, the asteroid's path between Earth and Mars can be described as a series of events in a sequence, as stages of the journey, and the journey in reverse can be similarly described.

In Maudlin's example the spatial locations which make up the stages of the journey match exactly, regardless of whether we consider the journey from Earth to Mars, or from Mars to Earth (e.g. 'a thousand kilometres from Mars' is the same place in both directions). Similarly the topology of the spatial series also remains the same; events keep their place in relation to each other. However, if Maudlin's asteroid is moving closer to the Earth as time passes it is clearly going in one direction; if it is moving further away from Earth as time passes it is moving in the other direction. The *temporal* features or 'locations' of the journey differ depending on whether Earth or Mars is the destination yet the two journeys have identical *spatial* locations. The difference seems to be just in virtue of time 'passing'. So, Maudlin concludes, there is an asymmetry between travelling to Earth, and from Earth; between the event of leaving Earth becoming increasingly past and the event of arriving at Mars becoming less future, and vice-versa, which is not accounted for in the spatial case (Maudlin 2009, p. 108; 116). He argues that this asymmetry is explained by an intrinsic passage of time.

Maudlin supports the distinction he makes between the journeys to, and from, Mars by referring to STR, noting that Minkowski space time with its past-and-future light cones

⁴⁶ Maudlin (2009, p. 116) supports a similar view to Čapek in the context of time 'passage': He says: 'All relativistic models already employ orientable space-times; space times in which the light cones are divided into two classes, such that any continuous time-like vector field contains only vectors that lie in members of one of the classes. In order to account for the direction of flows or other motions all we need do is identify one of these classes as the *future* light cones and the other as the *past* light cones...'

establishes that once we identify which set of light cones is which with respect to the light cones centred on the world-lines of the asteroid moving from Earth to Mars and from Mars to Earth respectively, the direction of travel is clear (Maudlin 2009, p. 116). This coheres with Čapek's observation that the past and future light cones pick out a direction in time.

He also writes that time passage just is '...an intrinsic, objective, distinction between future-directed time-like vectors and past-directed vectors...' (Maudlin 2009, pp. 109, 135), it is an intrinsic directedness which should be incorporated into our representations of space-time. Laurie Paul (2010, p. 336 note 8) suggests that here Maudlin implies an equivalence between an 'intrinsic objective distinction between vectors [the direction in which we are travelling]' and 'intrinsic time passage'. Interpreted in this way Maudlin seems to be arguing for no more than that time has a direction, and Paul interprets Maudlin to mean that he is not defending a literal passage of events 'moving' from future, to present and then past. He seems to mean only that time passage is equivalent to an intrinsic direction of time, yet he also argues for: '...a fundamental objective distinction between the two temporal directions in time: the direction from any event towards its future, and the direction from any event towards its past' (Maudlin 2009, p. 116). It is not clear from Maudlin's discussion of passage what it is that underpins this objective distinction.

Maudlin would not anthropomorphise the example of the journey from Mars to Earth and his discussion of the case is free of any subjective perspective apart from that supplied by the reader. However, it could be suggested that what is distinctive about passage in his example, as opposed to mere directedness, is the experience of a human being travelling from Mars to Earth, which will differ qualitatively from the experience of travelling from Earth to Mars. In his example, for the traveller, arriving at Earth looms in the future when leaving Mars for Earth, and as the trip unfolds the event of leaving Mars becomes more past and settled, while the event of his/her arrival at Earth is less future and less unsettled (more determinate). A travellers' temporal experience is different when travelling in the opposite direction, from Earth to Mars, where his or her arrival at Mars is in the future. The contrast between the 'passage' from future to past relative to any point designated 'now' during each journey, and the experience of passing each of the spatial co-ordinates along the journey, all of which have the same qualities in either direction, remains.

It may be that this different quality of temporal experience in the respective journeys just *is* what is captured by the term 'passage', but Maudlin would deny that passage can be a purely subjective experience (Maudlin 2009, p. 107). However, it seems to be the subjective perspective which makes the temporal difference between any journeys undertaken in one direction, and then in reverse, obvious. Maudlin does not discuss the example in these terms, and would deny that the experience is merely perspectival; rather he would say that this difference in the temporal features of the journey reflects a real asymmetry in time. Yet there does seem to be a question about whether the difference between the temporal and spatial cases can be meaningful if there is no

'experiencer' to discern that arriving at Mars and Earth will be in the future, or the past, on these different journeys. Perhaps the perspectival distinction we make between the earlier and later stages of any process, relative to 'now,' is what we mean by 'passage' of time, and if so, it seems there needs to be an experiencing subject for the notion of passage to be explicable. Maudlin, however, clearly *is* arguing for an objective temporal passage, and Huw Price offers a direct objection to Maudlin's argument.

Price's 'The Flow of Time' (2011c) is a critique of the possibility of an objective, universal temporal passage. Specifically, he discusses Maudlin's example above, of the asymmetry of an asteroid's path as it travels in one direction compared to the same journey in the reverse direction. He objects to Maudlin's conclusion that '...the passage of time [and not any related asymmetry] provides an innate asymmetry to temporal structure' (Maudlin 2009, p. 108).

In developing his objection, Price (2011c) adopts an argument he attributes to Boltzmann, which shows that an intrinsic temporal direction of the kind Maudlin shows in his 'travelling asteroid' example above need not imply that temporal directionality is experienced in the same way across the entire universe. He cites Boltzmann's theory that the entropy gradient is local, not universal. This theory concludes that if our universe has reached thermal equilibrium and is essentially 'dead', there may be local regions [of space] 'about the same size as our galaxy', which differ from the rest of the universe in that they are not in thermal equilibrium during a particular interval of time (Price 2011c, p. 283). During this interval, any beings living in this 'world' [which could be our world] will be able to discern a direction in time and use it to tell the difference between an orientation from past to future, and future to past based on the direction of time 'towards the less probable state from the opposite direction...', that is, in virtue of the asymmetry of entropy. But this will not be an objective universal temporal direction (Price 2011c, p. 283).

If our part of the universe is like this, then the difference between the two journeys, which Maudlin identifies as temporal passage, does not imply that there is an objective universal fact about whether a particular direction is past-future or future-past. More importantly, any explanation of a temporal asymmetry, which allows for time reversed states, can be deployed against any argument for the necessity for a universal temporal direction. Maudlin (2009, pp. 118-135) offers objections to Price's arguments, but here the commentary will be restricted to the observation that the possibility of any definitive physical explanation for an intrinsic temporal asymmetry remains contested and is unlikely to be resolved in the near future by philosophy, cosmology or physics.

More importantly in the context of this thesis, Maudlin (2009, p. 107) agrees that he is positing a physical and objective property of passage to time which, he admits, is not possible to fully define in passage-less terms, for he 'cannot explain time passage in terms which do not already presuppose the notion...'. He suggests that this difficulty may be explained, in part, by the inadequacy of the usual linear and geometric means of representing time in physics, particularly the tendency to spatialise time. A similar

observation is also made by Čapek who writes that representing time in linear form presupposes that this captures the full breadth and extent of time in a spatial analogue and such a view ‘...suggests the wrong idea that...successive moments already coexist and that their past-ness and futurity is not genuine...’ (1961, p. 162-163).

In the context of representing time, it is interesting that phenomenological approaches to explaining temporal experience often use auditory examples. Maudlin (2009, p. 140) suggests using musical tones to represent events may capture the temporal features of events more accurately than visual representations, and address the problems he finds in articulating concepts such as ‘passage’.⁴⁷ This suggests that analytic philosophy more generally could benefit from adopting this kind of approach to representing time. Some analytic philosophers have done so already, Strawson (1959), for example, used the example of ‘sound world’ to examine the relation of consciousness to the world, invoking a world with time but no spatial dimension.

It seems that the nature of time as it is understood in physics is far from settled and therefore a neutral stance on whether asymmetry is a property of time is adopted here, and in what follows.

ASYMMETRIES IN TIME: MATERIAL AND MENTAL EVENTS

ENTROPY AND ASYMMETRY: PHILOSOPHICAL INTERPRETATIONS

The symmetry of time is a tenet of fundamental physics. Therefore the experience of temporal asymmetry is frequently supposed to be accounted for by an asymmetry in the processes and events — material and mental — which occur, rather than as the result of an asymmetry of time itself. Three kinds of asymmetry that are identified in physics: entropic asymmetry; weak nuclear force; and the asymmetry of measurement in quantum mechanics are discussed from a philosophical perspective here. The first, the asymmetry of entropy, is a well-supported explanation for temporal asymmetry in both physics and philosophy of science.

As Paul Horwich (1987, p. 60) discusses, the second law of thermodynamics apparently determines the direction of processes in the world. This is because it is associated with entropy, the measure of the extent to which the energy in a system is available for use, and the second law of thermodynamics states that the entropy of a closed system will always increase over time. This effectively ensures that the system will evolve from a more ordered to a less ordered state and explains why there is a temporal asymmetry between the ‘before and after’ of our common experiences, such as an egg splattering on

⁴⁷ Čapek (1961, pp. 333, 370-372) also endorses the use of auditory examples to illustrate temporal experience, speculating that the ‘dynamic’ nature of auditory sensation, in the continuing addition of ‘new’ tones as a melody unfolds, models a real open-ness in the physical world where future events are not settled. He does not fully elaborate on the arguments for his commitment to an open future in the physical sense here, but his view supports the claim that the nature of temporal *experience* is better captured in auditory examples rather than linear, geometrical representations.

the floor after being dropped, and our extremely uncommon experience of the subsequent reassembling of the mess into an unbroken egg.

Theories of asymmetry based on entropy usually incorporate the 'Past Hypothesis' (PH); a boundary condition on the beginning of the universe. Philosopher Barry Loewer (2007) defends this kind of entropy-based explanation of the experience of temporal asymmetry, as does David Albert (2003, pp. 161-162).

The PH states that the universe had very low entropy at its beginning and throughout its extent, and in Albert's, and Loewer's account it is combined with the claim that there was a 'uniform probability distribution' over the physically possible initial macro-states of the universe which are compatible with the PH (Loewer 2007, pp. 299-304). This 'probability distribution' is the probability that the micro-states (the constituents of macro-states) of a system will be situated on entropy-increasing trajectories rather than on entropy decreasing ones.⁴⁸

In any system which has not yet evolved into a state of maximum entropy, it appears that the probability of any micro-state being on an entropy increasing trajectory is approximately one, whereas the possibility of them being on an entropy decreasing trajectory is approximately zero. This explains why states uniformly exhibit increasing entropy as they evolve in the future-wards temporal direction, however, at any given time there is also an equal probability that the same number of micro-states is on entropy increasing trajectory oriented towards the past. The PH boundary condition is also required, therefore, to explain why the trajectory of micro-states is actually future-directed rather than past-directed (Loewer 2007, p. 301-302). The combination of the PH, the low entropy beginning of the universe, and the almost certain probability that, given this low entropy beginning, micro states evolve on an entropy increasing trajectory in a future-wards direction, explains why states never seem to exhibit increasing entropy towards the past.

While agreeing that all microstates evolve according to deterministic laws, Loewer argues that macro-states, states of things we engage within the world have branching possibilities in the future wards direction (Loewer 2007, pp. 300-304). Therefore Loewer's theory can explain why events which have not yet happened have conditional probabilities, based on the conditions of the world now, whereas events in the past have much fewer (if any) possibilities based on what we know about their future. Loewer's account can also explain why our world history is based on deterministic principles but still 'branches' to the future. His view preserves the experience that in macro-states, the states of agents and the things that agents deliberate about and act upon, the future is open (Loewer 2007, pp. 305-307).

⁴⁸ In more recent work, Albert, and Loewer add the fundamental dynamical laws to the 'Past Hypothesis' and uniform probability distribution, and call the combination of all three 'Mentaculus' (Loewer 2012, p. 16). They argue that Mentaculus offers a more comprehensive explanation of the temporal asymmetry associated with the second law of thermodynamics, when compared with the PH and Uniform Probability Distribution alone. See Weslake (forthcoming) for a critical discussion of Mentaculus.

Price and Weslake (2010, pp. 424-425) argue that Loewer's branching model cannot fully account for the competing thesis that the Past Hypothesis may have a corresponding Future Hypothesis (FH). A FH could imply a low entropy boundary condition on the very distant future, symmetrical with that of the beginning of the universe, which would mean the asymmetry of the 'branching' view is compromised. In the more specific context of the asymmetry which Price and Weslake focus upon, this entails that the field of open possibilities which allows us to affect events in the near future is lost (Price & Weslake 2010, p. 425). They stress that adopting this Future Hypothesis need not imply that we could not act to affect the near future, in the sense that even where the future is determined, we retain the power to deliberate about how we might act so as to ensure a future event happens in the way that a deterministic world entails it will (Price & Weslake 2010, pp. 425-426).⁴⁹

However if they are right to think that the FH is compatible with our ability to affect events in our near future, then by analogy the PH is also compatible with our ability to affect events in our near past, which we know we are normally unable to do. Therefore Price and Weslake suggest that Loewer's hypothesis (and also Albert's, since his view is relevantly similar) cannot explain conclusively why we have the experience of the temporal asymmetry of processes such as deliberation and causation (Price & Weslake 2010, pp. 426-427).

A different way of justifying the Past Hypothesis is offered by Sean Carroll. He addresses the problem of accounting for the low entropy, which seems to be required to explain the present high entropy state of the world, by theorising that there are multiplicities of universes or multi-verses — he admits the theory is 'fearlessly speculative' (Carroll 2010, p. 364). He suggests that quantum fluctuations occur in otherwise high entropy 'de Sitter'⁵⁰ space, fluctuations that could generate new universes that are initially in states of lower entropy. These new 'baby' universes with their low entropy beginning can account for the entropic asymmetry of the newly

⁴⁹ Price and Weslake (2010 p. 425-426) support their argument with an example from Gibbard and Harper (1978), where a future event, my death, is a boundary condition on the future, it will necessarily occur at a particular time at one of two locations. In this thought experiment, regardless of which location I choose to be at, my death will occur there at the appointed time. However they note my choice about which of those locations I am at, will affect the actions of the perpetrator of my death, as s/he must act so as to be at the location I choose. The example suggests that when the occurrence of future events are stipulated in the way a FH entails, rational deliberation about actions which will affect these future events in my life remains possible, and can also affect certain aspects of the future boundary condition itself.

⁵⁰'de Sitter space', as defined by Sean Carroll (2010, p. 309-310), is 'empty space with a positive vacuum energy', and is one of several possible cosmological models of space. 'Vacuum energy' could potentially be explained by the presence (and 'pull') of an enduring 'dark energy' in the universe, and this dark energy, in turn, could be part of the explanation for why our universe seems to be expanding indefinitely, as well as explaining why the curvature of space-time extends to empty space-time (Carroll, 2010 p. 310). Carroll thinks that de Sitter space-time could be the final state of our universe and if it were, it would have '...the highest-entropy state we can think of in the presence of gravity'. This speculative end-point of the universe leads Carroll to question why the universe is not yet at this high entropy state, and he suggests that rather than there being a constant level of dark energy in the universe, there are fluctuations in dark energy of a kind which could lead to variations in entropy across the universe allowing for regions of low entropy conditions in which baby universes form (Carroll, 2010, p. 311).

generated universe as it evolves towards equilibrium. If our own universe began in the same way his theory can potentially explain the low entropy beginning of our universe.

Physicist Paul Davies notes that: '[The] idea of multiple universes or multiple realities has been around in philosophical circles for centuries. The scientific justification for it, however is new' (Davies, P 2003). He also, rather provocatively, suggests that with little chance of empirical verification, the more extreme kinds of multi-verses are so speculative their reality might just as well be taken on faith (Davies, P 2003).

It is important to distinguish multi-verse theories as developed by physicists from 'possible worlds' theories in philosophy. Davies' comment may imply that multi-verses are the same as the entities described in possible world theories in philosophy but this is not the case. Physicists use multi-verses to develop possible solutions to problems such as the genesis of the entropic arrow, as Carroll does above, or explaining the wave function in Quantum Mechanics (QM) as in Everett's many worlds theory of QM (Dainton 2010b, p. 435; Greene 2008, p. 205). Philosopher Barry Dainton defines this kind of multi-verse 'in a broad sense' as a universe within which there are numerous spatio-temporal systems (Dainton 2010b, p. 435). In the context of discussions of temporal asymmetry, some of these systems, he notes, may have different temporal directions to that of our universe.

In contrast, philosophers use 'possible worlds' primarily as a way of exploring modal claims about possibility and necessity, and the truth conditions of such claims. David Lewis posits the reality of possible worlds in a physical, realist sense, but his is an extreme metaphysical position within the philosophical 'possible world' literature. Other philosophers may deny Lewis' modal realism but use possible worlds for similar purposes to Lewis while defining their properties in different ways; for example Alvin Plantinga and D.M. Armstrong develop theories of this type (Crane & Farkas 2004, pp. 309-311).

Lewis also uses his version of modal realism to develop an explanation of causation in terms of counterfactual analysis (Price & Weslake 2010, p. 420). Philosophical possible worlds, such as Lewis' are distinguished from each other in a personal, indexical way, the actual world is ours, it is here and now for us; other worlds are inherently isolated from ours in space and time (Lewis 2004) .

It seems clear that an uncontroversial best explanation for the low entropy conditions that seem to have accompanied the Big Bang is unlikely to be developed without further developments in physics and cosmology, and the case for the asymmetry of entropy as an explanation of temporal asymmetry is still open. Therefore, other physicist theories concerned with asymmetries of the material and mental processes in time are also briefly considered below, along with their philosophical implications.

WEAK NUCLEAR FORCE AND QUANTUM ASYMMETRIES IN PHYSICS AND PHILOSOPHY

Nick Huggett (2010, pp. vii-viii) writes from the perspective of a scientist and a philosopher and embraces the ways in which physics and philosophy can be in 'fruitful dialogue', co-operating to solve problems in both fields. He describes the temporal asymmetry of the weak nuclear force — a law governing sub-atomic particles, and also discussed by Carroll — also referred to in philosopher JJC Smart's *The Space-Time World* (Carroll 2010, pp. 138-139; Huggett 2010, pp. 105-106; Smart 2004, p. 504 note 6). The discovery of this asymmetry resulted from a study of particles, neutral kaons, which repeatedly violated the expectation of symmetry through reflection. When the particles in the experiment bounced backwards off each other after colliding, their motion was not a 'time-reversed' mirror image of the initial motion as would be expected under the transformation of 'parity' (reflection), but was asymmetrical (Carroll 2010, pp. 138-139; Huggett 2010, pp. 105-106), suggesting a fundamental asymmetry at the level of particles.

Huggett (2010, p. 122), however, observes that the everyday experiences of the temporal asymmetry of cause and effect; such as dropped eggs splattering but never re-assembling, or our capacity to act to affect the outcome of future events but not past events, cannot be explained by asymmetries such as the weak nuclear force. This is because the outcomes of dropped eggs and deliberations are 'largely independent of what happens at the sub-atomic level' of particles (Huggett, 2010, p. 122).

A similar caveat applies to Quantum Mechanics (QM). Calculations in QM generate a range of possibilities, a wave function rather than a determinate single result, and once the system is observed these possibilities collapse into a single outcome which depends on all the possibilities, yet eliminates all but one (Greene 2008, pp. 211-212). Moreover, Carroll notes: 'Alone among the well-accepted laws of physics, quantum measurement is a process that defines an asymmetry of time: once you do it you can't undo it' (Carroll 2010, pp. 230-231). The temporal asymmetry in QM entails that acts of observation or measurement seemingly determine a previously indeterminate outcome and this effect is, as far as we can ascertain, irreversible. However, the implication that it is the act of observing which affects outcomes of experiments in quantum mechanics, that the presence or absence of a conscious observer can influence objective physical processes, makes no sense in the context of objective scientific observation and the phenomenon remains unexplained (Carroll 2010, pp. 239-241).

Loewer (1996) discusses this phenomenon in the context of whether quantum indeterminacies are real indeterminacies in the world, which might account for our sense that we deliberate freely in decision making. The view he discusses is developed by Wigner and identifies two relevant kinds of physical indeterminism in the world. One refers to the measurement asymmetry noted by Carroll above: that in a system in QM there are indeterminate possibilities, which 'collapse' when measured. The second is more controversial: that the way a system in QM unfolds '...depends on whether

conscious acts occur' (Loewer 1996, p. 107). Loewer notes that this view implies that conscious acts such as decision making are not physical processes — he does not endorse the view.

He acknowledges that if these indeterminacies are granted then the deliberative outcomes which an agent considers while s/he is deciding what to do can be understood as possibilities, which remain indeterminate until the decision is made by the agent. The making of the decision is in effect the 'measurement' that 'collapses' the possibilities into a determinate and irreversible outcome (Loewer 1996, p. 107). However, Loewer argues against this possibility, and in doing so makes the point that that the best available evidence in QM suggests that all quantum events are subject to physical laws, and there is no evidential basis for suggesting that mental acts of any kind affect quantum events. He concludes, on this and other evidence, that there is '...little reason to believe Wignerian mechanics...' (Loewer 1996, p. 108), and accept the view it posits, and by extension, little justification for the belief that decisions affect wave collapse in QM. Finally, the physicist Brian Greene suggests that the irreversibility of wave collapse is due to entropy (Greene 2008, p. 216) but, as discussed above, the physical basis of the asymmetry of entropy is itself contested by philosophers.

In summary, these asymmetries at the sub-atomic level are interesting, and in the case of 'entanglement' for example, likely to eventually lead to exciting developments in how we understand causal and temporal asymmetries, but the current theories that aim to explain them are subject to significant objections and untangling these is beyond the scope of this thesis.

ASYMMETRIES OF HUMAN KNOWLEDGE AND EXPERIENCE

The theories discussed above consider the ways in which our experience of temporal asymmetry may have a basis in the inherent nature of time, in entropy, or in other physical asymmetries. None of these asymmetries provide an account of temporal experience that is not open to significant objections from a philosophical perspective. Therefore other explanations, based on the lived experience of human beings, and the practical implications of temporal asymmetries for our lives are considered. These are broadly termed temporal asymmetries of knowledge and experience and Dainton (2010b, p. 46) categorises them as '...explanatory asymmetry, knowledge asymmetry, action asymmetry and experience asymmetry'. Horwich adds a fifth: value asymmetry (Horwich 1987, pp. 196-198). Each will be briefly discussed below.

Explanatory asymmetries are concerned with our tendency to explain later events by referring to earlier events but not vice versa. For example, given two events: my printing a thesis chapter and the later event of the ink in the printer running out, I might explain why my printer ran out of ink by referring to my earlier action of printing out a draft of my thesis chapter, but I would not explain my printing a chapter draft by referring to the ink running out.

Knowledge asymmetries concern information which we have available about the past, which is not available, at least not with the same degree of accuracy, about the future. This asymmetry is exhibited in our experience that our judgments about the past are more reliable and accurate than our predictions about the future (Dainton 2010b, p. 46; Horwich 1987, pp. 77-78).

Action asymmetries concern deliberation: our experience of the world is that it makes sense to deliberate about our future because we can often act in ways which affect it, but our experience is that there is no corresponding, symmetrical ability to affect events in our past (Dainton 2010b, p. 46; Price & Weslake 2010, p. 430). So, for example, I can usefully deliberate about whether to replace my toner cartridge now to stop my printer running out of ink in five minutes time; but not about whether to replace the toner cartridge now to stop my printer running out of ink five minutes ago.

Experience asymmetries concern our sense of our lives unfolding, of 'gliding inexorably into the future' as Horwich (1987, p. 33) puts it. They capture the fact that time is experienced as being irreversible. A particular kind of experience asymmetry Horwich discusses is 'value asymmetry'. Horwich (1987, pp. 196-198) notes that in *Reasons and Persons* Derek Parfit argues that we care more about the future than we do about the past, citing as evidence our valuing an enjoyable event that is going to occur in our personal future very highly but subsequently valuing the event much lower once it is in our past.⁵¹ He suggests, following Parfit, that this asymmetrical trait in human nature may be of evolutionary advantage in promoting a tendency to seek out pleasurable activities, although he concedes more research needs to be done to flesh out this theory (Horwich 1987, p. 198). It raises an interesting question about the extent to which some other experiences of temporal asymmetry may have a similar biological basis in human cognitive processing.

These kinds of approach allow that our consciousness of time, and broadly speaking, the 'cognitive apparatus' which supports this consciousness, has an important role in explaining the asymmetries we experience. While not endorsing the view that time itself is asymmetrical, philosopher Huw Price offers an explanation of causal and temporal asymmetries, and a theory of deliberation, which brings out the tacit role of human experience, concept forming and cognitive processing in scientific theory and practice.

Price sees it as the province of philosophers of science to make connections between of the interests of practitioners of the special science such as physicists, and the interests of philosophy generally (2001, p. 103). In seeking a rapprochement, he considers the wider context in which the scientist operates as an ordinary person who uses a scientifically loaded concept such as causation to assist in their practical navigation of the world outside their laboratory.

⁵¹ Parfit's views about 'value asymmetry', as they apply to the future-directedness of mental states such as expectation, hope, and desire, are discussed in more detail in Chapter 4, below.

PRICE AND WESLAKE'S TEMPORAL ASYMMETRY OF DISJUNCTIVE
DELIBERATION

Price (2001) defends a pragmatist view which is consistent with the objectivity and realism of the sciences, while showing that some of the concepts usually associated with the sciences might be better understood by also considering the subjective importance and relevance and role of those concepts in the lives of the beings who use them. Price applies this approach to causation and defines his view of pragmatism as it applies to causation carefully (Price 2001, pp. 105-106). His view is ontologically objective (he argues causal relations are not observer dependent), and with respect to causation his approach is 'practice subjective' on the basis that '...an adequate philosophical account of causation needs to make central reference to the role of the concept in the lives and practice of the creatures who use it'. This philosophical approach is consistent with the practices of physics, so long as there remains an '...informed interplay between the two kinds of restraints [involved], philosophical and scientific' (Price 2001, p. 103). Where the concept of what is to be studied is inseparable from how we live our lives in a practical sense, as is the case with the concept of causation, Price's 'practice subjectivity' allows for a more complete account of the explanandum than one based in physics alone. This kind of philosophical approach is adopted in Price's paper, jointly authored with Brad Weslake: 'The Time Asymmetry of Causation' (2010) discussed below.

Price and Weslake (2010) develop a pragmatist account of the temporal asymmetry of causation which argues that explaining this asymmetry should take into account the *practical* relevance of our ideas about cause and effect. Therefore in developing an explanation of temporal asymmetry, and the asymmetrical relation that holds between cause and effect, they seek a 'third arrow'. This third 'arrow' will be an asymmetry that is related to the temporal and casual arrows and will be consistent with the world as experienced in our normal capacities for action in our environment. They argue that the process of disjunctive deliberation exhibits such an asymmetry.

They make the point that when we deliberate about an act we do so only for the sake of future effects. Normally we *cannot* act now to cause an effect which is now in the past, and this is not merely because we have *defined* pairs of appropriately related events in a way which contradicts the premise that we can retroactively influence events, as in the Humean understanding of 'cause'. Rather it is because the temporal asymmetry of deliberation is a *practical* consideration, a basic and fundamental fact about what we can do in our everyday lives. This fact, that '...we can act for future ends but not past ends (at least in normal circumstances)', is termed the Practical Relevance Constraint (PRC) (Price & Weslake 2010, pp. 415-416). The PRC captures the intuitive sense that an explanation of the temporal asymmetry of causation (and causal action) must be closely connected to the temporal asymmetry of deliberation.

Although fundamental physics claims that time is symmetrical, Price and Weslake (2010, p. 417) note that when it comes to the practical relevance of time and causation,

physicists, as much as anyone else, assume the reality of time asymmetry and refer to events as distinctly past and future in scientific experiments, where results are seen to be caused by earlier procedures in experiments, for example. This is interesting in the context of Husserl's phenomenologically based argument that there are two aspects to scientific practice. The first relates to the 'thinking' undertaken by scientists, their pre-scientific and subjective experiences, their personal expectations of what they aim to do and about what they will discover, and their methodology. The second is the intersubjectively grounded, objective and 'public' or intersubjective results of scientific practices, the application of quantification and distinctly scientific theories and laws (Husserl 1969, pp. 33-38).

In pragmatic terms, Price and Weslake note that while we know it is often in our power to determine whether an event in our future occurs as a result of our deliberative choices; our experience is that we normally have no corresponding retroactive power to affect an event in our past. While cause and effect can be logically and physically conceived of as being reversible from the perspective of creatures on worlds different from our own, for all practical purposes in the world we live in they are not reversible. From our perspective, it seems that our deliberations can give rise to acts which prevent events occurring in the future, but not in the past and this just is the basis of the distinction we make between cause and effect (Price & Weslake 2010, p. 419).

However, Le Poidevin (2009) argues that causation is a stronger relation than the perspectival view Price and Weslake defend allows. He argues that given a series of items Φ - β - κ , where β is a perceptual experience, then, if causation is intrinsically symmetric, β stands in exactly the same causal relation to Φ as it does to κ . Assuming there is no inherent direction of causation, but there is a relation of 'causal betweenness' between the three events, then β is 'causally' between Φ and κ . Le Poidevin argues it is not clear how Price's perspectivalism about causation could explain why the following principle holds: 'If β is a perceptual experience, then it cannot have both Φ and κ as its object'. The problem is that if Φ is experienced at β as occurring before κ , then the two events are not experienced simultaneously at β , i.e. the experience of κ comes after the experience of Φ and so Φ and κ cannot be objects of β at the same time. One event is therefore earlier than the other. This seems an unavoidable asymmetry, and it does seem that the series is not symmetric in the sense that β stands in the same relation to Φ and κ at any given time. Le Poidevin suggests that this means that the explanation for the asymmetry of causation may be deeper than perspectivalists, such as Price, claim.

As Le Poidevin notes, this objection can be avoided by explaining causal and temporal asymmetries in terms of another, non-causal asymmetry, and Price and Weslake adopt this strategy successfully by appealing to the temporal asymmetry exhibited in our deliberative processes. They suggest that the Temporal Asymmetry of Disjunctive Deliberation (TADD) is a 'third arrow' which explains temporal and causal asymmetries by relating them to the asymmetry of our capacity to act so as to ensure a particular outcome occurs which otherwise would not (Price & Weslake 2010, p. 429). The

qualification of 'disjunctive' reflects this claim; schematised as $\sim A \vee O$ the claim is that either I act on my deliberation OR the event I am deliberating about does not occur.

However, since it is intended to successfully explain causal asymmetry TADD cannot itself be explained in purely causal terms without circularity. Price and Weslake, following Dummett (1978, pp. 319-322) argue that we need not and do not always deliberate on causal grounds and so causal considerations are not necessarily employed in deliberation. They show that the temporal asymmetry of deliberative disjunction remains when we deliberate on purely evidential, 'pre-causal' grounds as is the case in the Newcomb problem (see also Horwich 1987, p. 196; Price & Weslake 2010, p. 429).

The Newcomb problem picks out the distinction between the evidential and causal considerations we employ when we deliberate, concerns about whether there are rational reasons to act for an end that we do not cause; for example, or decisions made which are based on an (almost) infallible prediction (Price and Weslake 2010, p. 428-429).⁵² The willingness of people to make decisions based on an almost infallible prediction, rather than on their consideration of causal and counterfactual factors, indicates that the asymmetry of our ability to rationally deliberate about affecting the future but not the past, runs deeper than the asymmetry of causation. It appears that evidential deliberation, though distinct from causal deliberation, is asymmetrical too, for if evidential deliberation was not asymmetrical, then presumably we could reasonably deliberate about changing the past on evidential grounds, but no such ability to do this exists. Deliberation, then, can explain causal asymmetries without circularity, for deliberative asymmetry remains when decisions are made on evidential rather than causal grounds, and deliberation is therefore demonstrably independent of causal asymmetry.

A further argument that explaining causality in terms of TADD would be circular is based on the suggestion that, since deliberation is a biological, mental process, it is also a physical process in the world and therefore subject to the laws of causation. Price and Weslake would not deny that deliberation is a biological and physical process (see 2010, p. 436). However they might appeal to the Past Hypothesis discussed above to explain the existence of such asymmetric deliberators (see note 23 Price & Weslake 2010, p. 434), while insisting this does not reduce their account to the account defended by Loewer and Albert, above. Le Poidevin (2009) anticipates this kind of strategy but provides no definitive response to it.

⁵² The 'Newcomb' problem is set up so that an agent is shown two boxes and can choose one or both. One is opaque-the agent cannot see what is inside. The other is transparent and has \$1000 in it. The agent is told that an infallible predictor has placed \$100000 in the opaque box, if the predictor correctly predicted that the agent will choose the opaque box. If the predictor is wrong, then he has put no money at all in the opaque box. The agent may reason that if there is any money in the opaque box it is there now, cause and effect entails this, and so his/her decision should be to take both boxes. However, the infallible predictor is providing very good evidence, on the strength of his infallible record, that it is rational to decide to take only the opaque box. It seems that both ways of deciding are rational, and hence causal considerations need not be the basis for rational decision making.

Price and Weslake's view will be situated in its wider Pragmatist context, and compared with Husserl's account of the genesis of our experience of the asymmetry of past and future events, in Chapter 3, below.

SUMMARY

The laws of fundamental physics indicate that time is symmetrical. Čapek and Maudlin argue, separately, that modern physics and specifically Einstein's STR can be compatible with an intrinsically asymmetric time, and that our experience of temporal asymmetry is grounded on a real property of time. These theories are contested however, and it seems more work in cosmology and physics is needed to determine whether the best explanation for our experience of an asymmetry of time is that this asymmetry reflects the nature of time itself. In the light of this, I adopt a neutral position with respect to whether asymmetry is a property of time per se.

The chapter also considered explanations of temporal asymmetry that argue that asymmetrical processes in time give time its apparent direction. Entropy is an often cited explanation for our experience of the causal and temporal asymmetries but there remain good objections to the arguments which support it (Frisch 2010; Price & Weslake 2010). Quantum asymmetries and indeterminacies may depend on fundamentally symmetrical processes, but there remains much research still to be done in the field (Price 2011a). Further, even if there are asymmetrical processes at the sub-atomic level it seems unlikely they can explain the large scale causal asymmetries we experience in everyday life. In the light of the need for more research in these areas, a further approach to explaining our experience of temporal asymmetry is considered.

Price and Weslake (2010, p. 440) argue that to explain both temporal and causal asymmetries we should begin with what we know about deliberative processes (which involve both time and causation) and build on these to account for the asymmetry of, temporal orientation of, and deliberative relevance of, causal judgments, in terms of epistemic factors, what we know we are able, as agents to effect. TADD emphasises the importance of our lived experience of what we can and cannot influence by our actions in the world and our lived experience is that we cannot, usually,⁵³ affect a past event by deliberating about, and acting to change, the causal events which are sufficient for it, while there is no such restriction on future directed acts. This is a pragmatist explanation of causal and temporal asymmetries based on our subjective, but universally shared experience of the TADD (Price & Weslake 2010, p. 440).

This kind of explanation is broadly compatible with aspects of phenomenology of the kind Husserl develops, and may be instrumental in bridging the perceived divide between philosophical approaches to time based in the philosophical, analytic

approach, and phenomenology. Importantly, it shows how a subjective approach to describing and analysing the importance and role of a concept such as causation in terms of human experience and action need not imply that the concept refers to something which is not objective and existing in the world. On the contrary, a full account of the concept may require this kind of subjectivity.

In Chapter 3 the broadly Pragmatist — but still analytic — philosophical approach within which the work of Price and Weslake is situated is discussed in more detail, in the context of how it might inform and be informed by, the phenomenology of Husserl. The strategic focus of the thesis narrows onto the future-oriented aspects of temporal experience and a study of the projectivist and constructivist theories and views that add to our understanding of these features of our life.

3: TEMPORAL PRAGMATISM AND TEMPORAL PHENOMENOLOGY

...from the situation when we are deliberating seems to me to arise the general difference of cause and effect (Ramsey 1978, p. 146).

OVERVIEW OF CHAPTER

This chapter discusses a contemporary Pragmatist approach to exploring the relation between time as it is understood in anthropocentric, practical, everyday terms, and time as it is understood in modern physics. In keeping with a key theme of this thesis, I also consider some interesting ways in which Edmund Husserl's work converges with, differs from, and may inform this Pragmatist view.

In Chapter 1 it was noted that William James popularised the term 'specious present', thus sparking a debate about the problem of the perception of duration, change and enduring across a present experience. James, along with John Dewey and Charles Peirce, went on to become a founding father of Pragmatism, a broad philosophical movement which recognises the strengths of empirical science in developing knowledge but does not see it as the only basis for knowledge. In this chapter I discuss how, from within this framework, it is possible to utilise the knowledge of time which can be gained from physics, and incorporate it within an analysis of temporal experience from the perspective of beings like us, situated in the kind of world in which we live (see, for example the views of Price & Weslake 2010, p. 436).

Pragmatism as described by James O'Shea defends the idea that human beings, rather than God or some other external power, have the power within their own cognitive abilities to determine what is true. As William James said, with reference to Leibniz's description of the block of marble whose veins delineate the shape in which it is to be carved, '...we receive... the block of marble but we carve the statue ourselves' (O'Shea 2008, p. 204). In Chapter 2 I concluded that a projectivist and constructivist account of temporal direction is a justifiable choice in the face of the metaphysical uncertainties surrounding accounts of temporal directionality developed within physics. This chapter discusses the importance of our language and practices, and in particular our concepts of time, with the aim of furthering our understanding of how we 'carve the statue ourselves' in response to time's effect on our lives.

It is clear that temporal concepts are deeply woven into the everyday fabric of our lives. This being so, it is initially surprising that — philosophically speaking — we need to justify their role in our language and practices. Temporal terms, like related causal terms, are indispensable, yet explanations of their epistemic role and their ontological status that do justice to their importance in our lives elude representationalist frameworks, where these frameworks break free of language and imply an ontological semantic relation between terms, words and concepts, and objects in the world. A specifically scientific representationalist account of language may further require that the domain of things in the world be restricted to things which are the objects of study

in the sciences. Temporal and causal terms can be problematic in that they do not represent objects of the kind studied in the physical sciences, and therefore, according to some traditional accounts, they seem to have no place in the natural world at all.

In the case of causal terms, Jenann Ismael identifies a ‘quiet revolution’ in ‘philosophical thinking about how we model, understand and learn about the causal structure of the world’; an attitudinal shift she notes is extending to some of the sciences such as psychology and statistics (Ismael forthcoming-a, p. 213). Underpinning this revolution is a realisation that the laws of physics alone are not always sufficient for a good understanding of scientific concepts. In the case of causality, she notes, other considerations are also important. For example, causal relations are involved in human behaviour, exemplified by the role of causal interventions in deliberation.

I suggest that a similar shift in attitude towards temporal terms and concepts is also underway, and deserves to be developed further. This might begin with a better understanding of the relation between our concepts of time, as it is understood in physics; and those concepts of time which capture its practical use, in planning and deliberation for example. This in turn furthers an understanding of the common ground these concepts share, and a more inclusive understanding of the role of time in human life. I suggest that, in a broad sense, the view I discuss in this chapter has the potential to extend the ‘quiet revolution’ to include our concepts of time.

I discuss how Ismael, and Huw Price and Brad Weslake, understand the relation between concepts of time which capture its everyday utility in our lives, and the very different concepts of time developed in modern physics. Their published work on the topics of time, temporal asymmetries and temporal experience suggests they share a commitment to better understanding how these ostensibly competing concepts of time are related, and to a better understanding of the practical, ‘pragmatic’ role played by our temporal concepts.

Price defends a kind of pragmatism, and I call the view I identify with Price, Ismael and Weslake ‘Temporal Pragmatism’. This chapter begins with a review of their respective work on time and temporal experience, and some related work on causal and temporal asymmetries, identifying the aspects that are common to all. I suggest that these common aspects define Temporal Pragmatism as a view.

In this chapter I suggest that Husserl’s phenomenology could inform Temporal Pragmatism, a suggestion initially motivated by Marvin Farber’s assessment that Husserl’s theory of intentionality — the means by which our consciousness is directed towards its object — can be integrated into a non-phenomenological framework.⁵⁴

⁵⁴ Marvin Farber was Husserl’s student and Farber, in turn, taught the American pragmatist Wilfrid Sellars. Sellars identifies Husserl as an early influence on his own work (Huemer 2005, p. 105 note 3; Thomasson 2005, p. 123), and remained receptive to aspects of Husserl’s phenomenological approach. In particular, as Amie Thomasson and Wolfgang Huemer note, Sellars was influenced by Farber’s endorsement of Husserl’s theory of the constitution of consciousness, and by Farber’s belief that Husserl’s work on consciousness could be interpreted in a naturalistic way

However, I extend Farber's insight and suggest Husserl's theory of inner time-consciousness is likewise relevant to the interests of Temporal Pragmatism. This is a justifiable move since the formal structure underpinning Husserl's theory of inner-time consciousness comprises retention and protention and these appear in consciousness as dispositional intentionalities towards the immediate future and past respectively.

The chapter defines Temporal Pragmatism and briefly outline some aspects where Husserl's work on time-consciousness and intentionality may share common purpose with the view, or inform it. Then, it discusses Temporal Pragmatist and Husserlian perspectival views of time, and suggests that while these offer different accounts of what a perspectival view of time amounts to, they converge in their account of how the objectivity of the view of time as given in physics is constrained by its origin in our perceptual, cognitive and conceptual faculties. This theme is illustrated by a discussion of the work of Frank Ramsey on the role of deliberation in bringing about our experience of the temporal asymmetry of causation, and a brief review of a contemporary account which builds upon Ramsey's work, developed by Price and Weslake and discussed above in a different context at the close of chapter 2.

The final section of the chapter stresses the importance of human agency in Temporal Pragmatism, and its connection to our intuition that some future events in our lives are open to our influence, is discussed. This intuition is explored in some detail in Jenann Ismael's 'Decision and the Open Future' (Ismael 2012), and I discuss some features of Husserl's theory of time-consciousness in the context of her work.

TEMPORAL PRAGMATISM

The view I call Temporal Pragmatism has three aspects.

The first is a naturalist epistemology that privileges a scientific investigation of the way our cognitive capacities and conceptual frameworks have developed in an active response to the world (Price 2008a, p. 3). Primarily associated with Price, this is contrasted against the view usually simply called naturalism, which Price calls 'Object naturalism'. He calls his own naturalism 'Subject naturalism' and a similar approach is adopted in aspects of Ismael's and Weslake's work.⁵⁵

Subject naturalism is distinctive in its focus on the role of human cognition, perception, and conceptualisation in constructing much of what we take to be features of our world. Just as the mathematician Leopold Kronecker famously remarked that 'God alone

(Huemer 2005, p. 105 note 3; Thomasson 2005, p. 123). This is an early indication of the affinity of Husserlian phenomenology and pragmatism of the kind Sellars, and Price, Weslake and Ismael, generally endorse. Farber also authored *The Foundation of Phenomenology* (Farber 1943), which discusses Husserl's work.

⁵⁵ There is textual support indicating that Weslake and Ismael generally endorse Price's kind of agent-centred naturalist approach to explaining causal asymmetries and temporal experience (Ismael, 2012, forthcoming-b; Price & Weslake 2010).

created the integers, all else is the work of man'; subject naturalists might adapt his epigram thus: 'Nature alone made the physical things, all else is the work of man'.⁵⁶

In a broad sense the view remains aligned with the American Pragmatist tradition associated with John Dewey and Wilfrid Sellars, and the British tradition known as 'Cambridge Pragmatism'.⁵⁷ It is friendly to scientific accounts of the world as studied in the natural sciences. It is distinguished by its critique of what is often taken to be an implication of a mainstream interpretation of Representationalism, which Price defines as '...the proto-theory [that] says...our statements "represent" aspects of the world and true statements succeed in doing so' (Price 2008c, pp. 1-2). While subject naturalism is a critique of theories of *substantive* semantic world-word relations, it offers a deflationary account of semantic relations per se. Its defenders agree that our words often do correspond to objects in the world, a fact which explains their utility, but insist this says nothing of 'theoretical weight' about truth conditions or about what our words refer to (Price 2008a, p. 9). It is 'naturalism without representationalism' (Price 2008a, p. 2).

The second aspect I identify with Temporal Pragmatism is perspectivalism about time, which attempts to combine two themes. The first theme acknowledges the scientifically endorsed view of the nature of time, which aims to minimise as far as possible the subjective, human perspective in its methodology, and is taken to be superior to any pre-theoretical understanding of time. The second theme embraces our subject-relative, embedded perspective within time, and calls for a study of the language practices, particularly our use of tensed language, which characterise this perspective. Temporal Pragmatism considers how the latter perspective on time is related to the view of time endorsed by modern physics and object naturalism, while retaining a commitment to both.

The third aspect focuses on the role of human beings as agents, whose understanding of the world comes in virtue of our being embedded in time, making things happen in the world, and thereby affecting its history. Our power and our potential with respect to how we can influence and shape future events suggests the need for an account of our sense of 'agency', of what we, as agents, know we can bring about. It is clear that our agency is constrained by the asymmetry of our deliberative practices; we know that we can rationally deliberate about, and act, so as to bring about effects in the future but not our past, and an explanation of this could be developed in terms of the temporal aspects of our perceptual and cognitive processing.

⁵⁶ <http://www-history.mcs.st-andrews.ac.uk/Biographies/Kronecker.html>

⁵⁷ 'Cambridge Pragmatism' encompasses the work of Frank Ramsey, Simon Blackburn and DH Mellor, amongst others, as well as Price himself. See for example 'Cambridge Pragmatism; a research workshop' held at Cambridge in June 2012, <http://prce.hu/w/CambridgePragmatism2012.html>. But see also Ismael's (forthcoming-b) 'Naturalism on the Sydney Plan' where she points to some areas of difference, particularly with respect to 'quietism,' between the 'Naturalism' associated with Price's work as developed within the 'Sydney Plan' and Price's work in the context of Cambridge Pragmatism.

A further question concerns whether we have agency in terms of being 'free'; this is the question of whether there is a real sense in which our beliefs and desires bring about decisions and actions and influence a deterministic causal chain of events. Ismael (Ismael 2007a, forthcoming-a) discusses these and other aspects of agency in some depth, but a full treatment of this issue falls outside the scope of this thesis.

Subject naturalism, perspectivalism and agency are co-located in Temporal Pragmatism, however they can be understood independently. A subject naturalist account need not be agent centred, although by definition it must be a scientific investigation of aspects of human experiences or practices from the human perspective.

Similarly, a perspectivalist account of the relation between time as described in physics and our experience of time can be developed outside of a subject naturalist framework. DH Mellor's *Real Time II* offers a kind of perspectivalist account of the relation between 'real time' which is time as understood in physics and best described in tense-free terms, and our 'tensed', subjective thought and talk about time. His thesis is that many statements we make using tensed language can be understood to contain temporal propositions whose truth-makers are objective (temporal) facts about the world or states of affairs in the world.⁵⁸ Subject naturalism, in contrast, accounts for our tensed statements about the world, our utterances about what events are happening now for example, in terms of the genealogy of the concepts we use to do so; an explanation of their practical utility for us.⁵⁹

Finally, adopting a perspectival view towards reconciling the time of physics with our temporal experience need not require an account of our sense of agency or of being agents. Some medical conditions such as schizophrenia might compromise our sense of being agents, but such experiences will be still described in tensed terms, from a perspective embedded within time, by the person undergoing this kind of delusional experience. On the other hand, an agency based account of our sense that that future is importantly different to the past, in that it is 'open'; need not be a subject naturalist account. Antony Eagle's (2011) work on deterministic chance is an example.

⁵⁸ Mellor emphasizes the practical importance of terms such as 'now' in allowing us, as agents, to act on our beliefs at the right time (Mellor 1998b, p. 4), however he also notes that either facts about the world, or states of affairs in that world, can make tensed propositions true (1998b, p. 26). This might indicate that he defends a more metaphysically realist view of truth than Price's subject naturalism endorses.

⁵⁹ The idea of a genealogy of concepts recalls Nietzsche's 'Genealogy of Morals'. It is interesting to speculate about whether Price intends to evoke Nietzsche's motivations here. According to Brian Leiter's (methodological) naturalist reading of Nietzsche, his genealogies have three different purposes: they prepare the way for a later critique of a concept; they 'force us to think the unthinkable' (they challenge our beliefs); and they are an account of the origin of a concept in naturalistic, mostly psychological terms (Leiter 2002, pp. 179-182). These seem to roughly accord with the purposes of genealogical accounts of concepts as developed in subject naturalism, and might further a critique of 'metaphysical' accounts of truth in the context of theories of semantic word-world relations. Simon Blackburn describes genealogies as 'part historical reconstruction of the way certain concepts have come to have the shape they do, and part a "rational reconstruction" or story about the function they serve, which may or may not correspond to historical evolution (Blackburn, S. 2005, p. 148); Price's genealogies are primarily a 'rational reconstruction' of the function of concepts. In contrast, Husserl offers a genealogical account of concepts in the sense of a 'historical reconstruction' in his *Crisis of the European Sciences*.

When these three aspects are combined they make up a coherent whole, a mutually reinforcing framework which suggests progress can be made on some intractable problems surrounding the relation between time and temporal experience. I look at each in more detail in what follows.

SUBJECT NATURALISM AND THE LANGUAGE OF EXPERIENCE

Subject naturalism, as Huw Price has developed it is, in its broadest sense, the view that philosophy should take as its starting point what science tells us about ourselves, and it tells us that we are natural creatures and therefore part of the domain of scientific study (Price 2008a, p. 3). Understanding ourselves to be subjects of scientific enquiry suggests we should adopt a scientific methodology in pursuit of this enquiry and that the scope of the enquiry should extend to an account of our perceptual experiences and to how we develop concepts about the objects of our experience.

This genealogical account of concepts can be considered to be a deflationary approach to semantic world-word relations, as Price puts it a: ‘...broadly scientific’ hypothesis about what linguistic creatures like us “do” with terms such as “true” and “refers” — what role these terms play in our linguistic lives’ (Price 2008a, p. 9). This approach rejects ‘substantive’ theories of correspondence, but allows for ‘deflated’ correspondence between our mind and its objects (Price 2011f, pp. 23, 26).

FROM SIDEWAYS ON: A GENEALOGICAL ACCOUNT OF THE ROLE OF CONCEPTS

As noted above, Price adopts a deflationary approach to the question of how our words and the world are related in general terms (Price 2008a, p. 6). His positive view is a pragmatic account of language and its role in our lives (Price 2001, pp. 105-106).

It is a ‘sideways on’ view, of the kind also defended by Ismael (forthcoming-b, p. 4).⁶⁰ As Price defines it, a ‘sideways on’ view is an anthropologically based ‘... plausible first order theory about how our brains are linked to their environment’ (Price & McDowell 1997, p. 174); in a sideways-on view the focus is not on debate about whether our concepts describe something ‘real’ in the external world, but on how, given our environment and how we are situated in it, we developed, and continue to develop, those concepts. This is, arguably, a more informative approach than a correspondence theory of semantic relations for it explains what a concept or term does in our lives, not just what it represents. More importantly, it can explain the success of our use of those concepts which do not correspond with any object in the physical world, by accounting for their value for us in terms of their indispensable practical role. I suggest that our use of many temporal concepts can be justified in this way. Their importance to us in a practical sense is exemplified by their role in decision making, where our concern is directed towards desires oriented to the future and beliefs about the past. Temporal

⁶⁰ Further, as Ismael (forthcoming-b, p. 4) notes, a side-on view helps us to separate ‘how things seem from how they are’, a project she sees as advanced by collaboration between physics and the human and cognitive sciences, and one which calls into question the possibility of a ‘pure ontology’.

concepts are more widely embedded in perceptual experience than is often acknowledged, and they are implicated in how we understand and predict the behaviour of other people and so live together in a harmonious society. These themes, and the particular importance of our future-directed experiences of time in perception and our relations with others, will be discussed in more detail in Chapters 4 and 5, below.

SUBJECT NATURALISM AND SCIENCE

Subject naturalism, of the kind adopted in Temporal Pragmatism, takes science to be the arbiter of what there is; however its proponents argue on philosophical grounds that the domain of what can be legitimately studied by science extends further than traditionally thought. On this reading, Price's subject naturalism is modest in that it seeks no more than to broaden the scope of scientific enquiry by incorporating a scientific (and pragmatic) account of our language use and concept formation, within it. It does not imply that the practices of science are in error; while it aims to limit the scope of philosophical views about the natural sciences, by arguing for its own primacy, it poses no threat to scientific practice itself.

However, in a wider sense, the validating role Price gives to subject naturalism with respect to object naturalism could be seen as more radical, as promoting a more robust role for the view. A philosophical endorsement of a wider domain of scientific enquiry based on a scientific, but subject-oriented account of human language and practices could challenge an important tenet of object naturalism — its resistance to the inclusion any subjective, non-physicalistic concepts into science — and in turn, might amount to a challenge to the traditional tenets of scientific practice that object naturalism endorses.

This is because a side-on account of our temporal concepts of 'past' and 'future' — but also, and equally, our moral and normative concepts — uncovers their indispensable, pragmatic role in scientific as well as non-scientific discussion. However, they have no place in any physical theory, and so insisting that these concepts are in fact on the same footing as scientific concepts could be understood as a challenge to science, or as the catalyst for a shift in scientific thinking. It could amount to a vindication of scientific practice in terms of pragmatic justification. In recent work (Price 2011b, 2011d), Price appears to take subject naturalism further in this direction, developing a kind of global pragmatism which incorporates scientific language within an Expressivist framework, normally the province of the moral and modal, although he maintains a kind of 'world' tracking 'external representation' in the view, which can accommodate scientific discussion, practices, and theory building.

It should be emphasized that according to Price this new, deflated kind of representation, the world-tracking e-representation, does not entail that science, particularly physics, has nothing to say about how the world is independently of us. Neither is this view of the role of language in science incompatible with the view that some sentences which track things in the world can also be said to be true of the world

independently of the human perspective. I do not imply here that Ismael and Weslake either endorse or do not endorse Price's global pragmatist view.⁶¹

In his 'Vienna Lecture' (1970, p. 282-283), Husserl, like Price, and to some extent, like Wilfred Sellars,⁶² in his quest to reconcile the 'manifest' and 'scientific' images', argues for a reconciliation of the theoretical attitude adopted in modern science, and what he often refers to as the 'life-world' (that is, the cultural and practical world of everyday life which is not subject to modern scientific theory and enquiry). He argues that we should seek a convergence of both modern science and life-world in a third, 'universal attitude' which could serve as logic of science. This will be an explication and examination of the 'values that guide [us] explicitly and implicitly': an 'attitude' that, while still to be developed and sustained, is nevertheless the subject matter of one of his best-known works, *The Crisis of European Sciences*. However, this view is most comprehensively worked out in his lesser known *Formal and Transcendental Logic* (Husserl 1969).

Husserl's ideal of a universal scientific 'reason' identifies a normative aspect, grounded in logical forms and in logical principles. Put simply, he suggests that all reasonable, thinking beings should judge that certain syllogistic arguments hold true in all cases and to the extent that they do so, they validate our thought and concepts and ultimately our life choices and values.⁶³ This aim of bringing together the descriptive and the normative functions of language is identified by commentators who note the close relations Husserl sees as holding between logic, science and experience (Husserl 1970b, p. 170; Martin 2005, p. 216), and the close relations he identifies as holding between judgments, perceptions and imagination in his genealogy of concepts, for example (Mulligan 1995, p. 219). It seems that Husserl's aim to establish a science that can explain and justify the normative aspects of its language and practice has, in this respect, some common ground with the global pragmatist project. In both there is a need to develop a kind of normative framework within which both our practical

⁶¹ In her 'Naturalism on the Sydney Plan', (Ismael forthcoming-b, p. 15 note 23) Ismael suggests that:

No belief about what is merely the case could play the role that beliefs about laws or chances do in practical and epistemic reasoning. The Sydney Planner [referring to the philosophical approach centered on Huw Price's work at the Sydney Centre for Time] recognizes connections to action in the guise of roles in epistemic and perceptual reasoning, and connections to other concepts in the guise of roles in inference. And he thinks all of these are essential to a full understanding of how beliefs relate to the Absolute structure of the world.

This seems to capture her view, and to the extent Price's later work diverges from this description, it seems likely her view would diverge from his. Interestingly, there is an affinity here between Temporal Pragmatism and Sellars' view that justified knowledge requires both empirical observation, and competencies in language and interpretation, the latter competencies being what Sellars would refer to as the 'logical space of reasons' (Sellars, W. 'Empiricism and the Philosophy of Mind' in deVries & Triplett 2000).

⁶² The manifest and scientific images are rival conceptual frameworks or ways of 'knowing our way around' the world. The 'manifest image' is, loosely, a kind of sophisticated common sense or way of understanding the world as it appears to be; and the 'scientific image' refers to scientific theory and practice in the laboratory (Sellars 2000, pp. 1, 3). Sellars argues these images need to be joined together.

⁶³ It is also interesting to compare this view with MacNamara's work on logical competencies and logical performance (MacNamara 1986, pp. 21-48).

everyday language and practices (life-world) and the practices of modern science, can be understood and validated.

THE PERSPECTIVAL NATURE OF TEMPORAL PRAGMATISM

Temporal Pragmatism acknowledges that our language and practices are perspectival. The idea of ‘local’ perspectives is a familiar one: intuitively we recognise that our own personal perspective is not the only possible perspective on our surroundings. My ‘here’ is your ‘there’, and as Price notes (2007, pp. 250-252), people from Australia are ‘locals’ in Australia and foreigners in Zimbabwe (and vice versa). Numerous other concepts capture the particular local perspectives we take on other places, people and events.⁶⁴

There is also a ‘local’ perspective we all take on the world as human beings embedded in that world, and in time, a shared, intersubjective perspective reflecting our common perceptual and cognitive systems and the constraints they place on how we experience our world. This is ‘local’ in a different sense, and can be understood in two ways: by a comparison with the (hypothetical) perspective of beings with a different kind of biological make-up but still subject to the same laws of physics that we are, or perhaps, from an omniscient ‘God’s eye’ point of view, a perspective outside of time.⁶⁵ Price’s ‘Causal Perspectivalism’ (Price 2007) is a detailed and sustained argument to the conclusion that features of our ‘local’ perspective can account for our experience of the temporal asymmetry of causation.

Identifying this local perspective makes the distinction between it and the perspective-free view often aspired to by modern science clear by comparison, for only by acknowledging our perspectival, human stance does the possibility of a ‘view from no-when’ become apparent (Price 2007, p. 254). The latter stance is an imagined access to things in the world as they are, independently of any human perspective, an example of this is time as it appears in physics, idealised and free of any subjective perspective, as *sub specie aeternitatus* (Ismael 2012, p. 150). Ismael and Price both argue that the local perspective and the ‘perspective-free’ stance are equally valid ways of understanding

⁶⁴ Brian Leiter, in discussing Nietzsche’s ‘perspectivism’, notes that we take epistemic perspectives on the world, and these are formed in terms of our ‘affects’ or ‘interests’, what is salient about the object of interest for us will shape what we come to know about that object — more and different ‘interests’ may well broaden our knowledge of the object (Leiter 2002, pp. 20-21). It remains the case that some epistemic perspectives we can take on an object will distort it and therefore we will be wrong about that object (Leiter, 2002, p. 21). This is often overlooked and deserves more prominence in discussions about perspectivalism; however Husserl’s fallibilist theory of perceptual knowledge acknowledges this kind of perspective.

⁶⁵ Price (2011e slide 15) notes that our ‘generalized location’ or shared situation may obscure the local nature of our perspective. In indexical cases of judgment (for example, with respect to our temporal location), we all share a ‘now’ in the region we are in. In modal cases of judgment, for example with respect our situation as decision makers acting under conditions of uncertainty, we all — as beings with the same temporally oriented consciousness and understanding of our ability to intervene so as to causally affect some near future events, but no past events — experience the same past to future inferential bias. It can be hard to notice that there is an inherent contingency in our particular situation, without a ‘God’s eye’ perspective being available to us as an imaginable possibility that provides a standard for comparison.

time, but by Price's lights particularly, this seems to have implications for science as a practice.

Price (1996, p. 5) likewise argues that the perspective-free standpoint is required for an understanding of time in physics. However, the scientist who attempts to avoid the taint of subjectivity in her practices must adopt a double perspective; her embedded, anthropocentric perspective as a human being, and the objective perspective she adopts as a scientist, so that:

Science's own core categories and activities turn out to be perspectival in a newly recognised way...a way that depends on the peculiar standpoint that science's own practitioners occupy in time...(Price 2008b, pp. 16-17).

To the extent that the causal and temporal asymmetries taken for granted in scientific practice are 'local', contingent and perspectival, this implies some aspects of scientific practice and language are less objective than often assumed (Price 2008b, p. 16). However Temporal Pragmatists do not argue that our (ideally) perspective-free, 'descriptive' language and that of our temporally embedded, perspectival, modal talk, are not equally legitimate ways of talking about time. In subject naturalist terms our scientific languages and practices, the perspectival and the 'non-perspectival', can be validated and vindicated by a genealogical account which brings to the fore the role each plays in our scientific endeavours.⁶⁶

HUSSERLIAN PERSPECTIVES: TEMPORAL PHENOMENOLOGY IN LIFE-WORLD AND SCIENCE-WORLD

It is interesting to compare the Temporal Pragmatist perspectivalist view developed primarily by Price with Husserl's view of the relation between our perspectival, human-centric, cultural stance on the world and the idealised stance adopted by modern science.

In the latter years of his life Edmund Husserl turns his attention to the 'life-world', to the cultural and social aspects of human life as it is lived, and the world as it given in our direct and practical engagement with it. He contrasts this life-world against the rationalised⁶⁷ and idealised view of the world developed in modern science and in much of philosophy; a world-view which he saw as increasingly and inappropriately applied to the cultural and inherently 'human' aspects of life (Husserl 1970a, pp. 269-271). His concern is that rationalisation marginalises the human subjective experience

⁶⁶ Ronald Giere (2003) suggests it is consistent for a Naturalist to claim that there can be a pluralism of scientific theories and legitimate ways to knowledge. Adopting more than one perspective on an area of study, perhaps involving different levels of explanation, can be justified on the grounds that this approach will further the aim of the investigation overall. It is a strategy available to Price, Weslake and Ismael with respect to their non-perspectival accounts of time per se; and their accounts of our perspectival practical experience of time.

⁶⁷ 'Rationalisation' is understood here as the process, adopted as a goal by modern scientists, of deriving a complete account of the world in mathematical, fully determined terms. Human beings and their activities are also rationalised in this process (Husserl 1970a, pp. 65-66).

of the world, and when generalised to incorporate aspects of cultural and social human life such as politics, trade and employment it obscures the true meaning of human life and flourishing. The problem, as he sees it, is that modern science prioritises objective facts over the subjective, and when this is applied to human life it seems that ‘...merely fact-minded sciences make merely fact minded people’, people who become indifferent to the deeper questions about how we should live (Husserl 1970a, p. 6).

Husserl’s discussion of the relation between the ‘life-world’ and what can usefully be termed ‘science-world’,⁶⁸ makes the relation between the personal, cultural and ‘pre-theoretic’⁶⁹ way of living in the world, and the practices of science ‘in the lab,’ explicit. It is a major theme of his later work. However, it is acknowledged that despite its prominence in Husserlian literature the ‘life-world’ is a contested term. It most often denotes a cultural, social world, a world in which the concerns of everyday life such as the times of events, and the meanings of concepts are based on communal agreement, and there is practical quantification and measurement without scientific mathematicisation.

On some accounts (and this view is adopted in what follows) the life-world also encompasses a basic but universal shared human experience of an existing world in space and time — our experience of an asymmetrical time has its origin here — and an awareness of causal connections between events (but of a loose, vague kind), understood to be features of how the human perceptual system responds to external stimuli from the world.⁷⁰

Husserl argues that this human-centred, ‘pre-theoretic’, normative perspective, as adopted within the life-world, must be pre-supposed if the findings of science — of ‘science-world’ — are to have meaning for us. As he notes: ‘...Einstein does not reform the space and time in which our vital life runs its course’, suggesting that the normative perspective of the life-world is always pre-supposed, required in fact, if the findings of science are to have meaning *for us* (1970a, p. 295).

This is because in Husserl’s view science-world does not have the resources to account for how we make sense of the world in ‘pre-predicative’⁷¹ terms, at the level of

⁶⁸ ‘Science-world’ is used to denote the distinction between the world-view or perspective taken by practitioners of science when they go about their scientific practices, and the ‘life-world’ or practical, everyday world of which the science-world and the scientists themselves are a part. Science-world may incorporate mathematics and logic, the special sciences and the human sciences, but excludes phenomenology. The term was coined by Greg O’Hair, who also suggested the catch-phrase ‘Life-world and the Lab’, which captures the essence of the distinction between the two ‘worlds’.

⁶⁹ Meant here in the sense of being prior to the development of theory built on what Husserl describes as the Galilean mathematicisation of nature.

⁷⁰ I have drawn from work by David Carr here: specifically his ‘Translator’s Introduction’ to Husserl’s *The Crisis of European Sciences and Transcendental Phenomenology*, and his paper, ‘Husserl’s problematic concept of the life-world’ (See Carr 1970; Husserl 1970a).

⁷¹ ‘Pre-predicative experience’ or implicit knowing, as defined by Dieter Lohmar is ‘...not knowledge that we can easily actualize at every moment and it is not yet fixed in a propositional manner. But nevertheless it is somehow a [sic] enduring knowledge of qualities of an object or event and sometimes it is even possible to make actual propositional knowledge of it’ (Lohmar 2010, pp. 125-126).

organising and structuring information which gives rise to experiences of the world at a reflective level of consciousness, nor, he thinks, can science-world explain the normative, rational basis on which we make reasoned judgments about how the world is. Such matters, he argues cannot be fully accounted for in empirical studies of humanity in psychology and anthropology. Therefore, he sees the need for a science which will redress this lack. This will be:

...[a]universal responsible science in which a completely new mode of scientific discipline is set in motion where all conceivable questions- questions of being and questions of norm, questions of what is called existence [Existenz]⁷² — find their place (Husserl 1970a, p. 298).

As noted above, this is an investigation that aims to uncover the conditions for the very possibility of thought about the world for human beings. Phenomenology's distinctive role lies in its potential to provide resources for the development of a science of how we negotiate the life-world, providing a more comprehensive account of our relation to the world and our place in it. To this end he advocates a refocusing on the life-world and a more holistic account of what is valuable in human endeavour. This account will be based on intentionality, the structures of conscious experiencing, which Husserl takes to be a legitimate field for a scientific exploration of the practical, cultural, ethical and normative social domains that constitute the life-world (Husserl 1970a, p. 298).

AGENCY AND DELIBERATION

Agency and our role as agents is an important part of the genealogical approach to explaining the functional role of language that plays such a major part in the Temporal Pragmatist view. It seems to be inseparable from the development of a 'plausible' account of our causal [and I will add temporal] concepts, in terms of our cognitive capacities (Price & Weslake 2010, p. 436).

If to be an agent is to act, then the fact that we seem to only be able to act so as to make things happen in one temporal direction might suggest that some physical law entails this, or in keeping with a temporal pragmatist view, it may be there is no such physical law, but there is a subject naturalist account of temporal asymmetry, grounded in our practical experience of the asymmetry of before and after, cause and effect; past and future.

Price, Ismael and Weslake (Ismael 2011b, 2012; Price 1996; Price & Weslake 2010), see deliberation and decision making as the key to understanding why human beings experience this temporal asymmetry. Price and Weslake (2010) discuss, but ultimately discard, competing physics-based explanations of a universal temporal asymmetry which take it to be a property of time itself; and call into question views that take it to

⁷² 'Existence' meant here in the sense of our purpose or our role in the world, as opposed to our 'being' or physical reality.

be the result of asymmetrical processes in time such as entropy. They also argue that a temporal arrow cannot be parasitic on a causal arrow (Price 1996, 2007; Price & Weslake 2010). All argue that the experience of temporal asymmetry can be accounted for in terms of what we know we can achieve as agents, we can rationally deliberate only about actions we plan to take so as to affect our future and not our past (Ismael forthcoming-a; Price & Weslake 2010).

TWO PRAGMATIST ACCOUNTS OF CAUSAL AND TEMPORAL ASYMMETRIES

This section discusses genealogical accounts of temporal and causal asymmetries within a Temporal Pragmatist framework, with a focus on deliberation and agency. It begins with a discussion of Frank Ramsey's work on causation, temporal asymmetry and deliberation, cited by Price and Ismael as an influence on their work. Then I briefly discuss Price and Weslake's (2010) work on causal and temporal asymmetries, which builds on Ramsey's work. I also sketch a Husserlian perspective which shares interesting similarities with Ramsey's account of our experience of temporal and causal asymmetries, and our sense of agency with respect to some future events — as well as some differences.

FRANK RAMSEY

In 1929 Frank Ramsey published a short but insightful paper, 'General Propositions and Causality' (Ramsey 1978). Ramsey's work influenced Ismael (2012) and Price (Price 1992), and he can be understood as a 'pioneer' of Temporal Pragmatism. Price (1992, p. 253) discusses Ramsey's insight that our experience, when we deliberate, of the temporal asymmetry of our agency over some events our in future but not in our past, is a more fundamental explanation of causal asymmetry than a scientific account of entropic asymmetry.

In his introduction to his 'The Direction of Causation: Ramsey's Ultimate Contingency' (1992), Price identifies two kinds of explanation for why the arrow of time seems to be so closely aligned to the arrow of causation, for beings like us. The first, a rigid or *de re* account of the temporal direction of causation, suggests we always experience the causal arrow to be pointing in the same direction as the temporal arrow and offers an explanation of causal asymmetry in terms of a physical temporal asymmetry, such as entropic variation. The second, non-rigid, or *de dicto* account of temporal asymmetry suggests that the temporal asymmetry of causation is not fixed by any physical temporal asymmetry and therefore a further explanation of why beings with our temporal orientation take the temporal ordering of causal relations to go from earlier to later is required.⁷³

⁷³ Price notes that the same distinctions between *de re* (fixed directionality) and *de dicto* (non-fixed directionality) accounts are equally applicable to explanations of the asymmetry of causal relations.

Price argues that Ramsey explains our experience of the temporal asymmetry of causation in the second, *de dicto*, way. It is our experience, as deliberators, of the ubiquity of the past to future directionality of our causal interventions in the world that explains our experience of the temporal directionality of causal relations. This can be understood to be independent of any *de re* account of temporal direction. He explains that in Ramsey's view:

Roughly, the existence of agents appears to depend on the entropy gradient; thus the reason our agent's perspective (and thus our imposed causal arrow) is oriented this way rather than *that*, is that the entropy gradient goes this way, at least in this region of the universe. But whichever way the gradient went we would align the causal arrow with what we *took to be* the past-future arrow; so that in the *de dicto* sense, it seems to be *a priori* that the causal arrow aligns with the past-future arrow- *a priori* not because the connection is analytic, but because of a relationship between what it is *in us* that supports each of the concepts concerned. (This is something like a Kantian synthetic a priori, in other words) (Price 1992, p. 262), referring to Ramsey (1978, pp. 145-146).⁷⁴

So, on Price's reading of Ramsey, a *de re* account of temporal asymmetry based on entropy cannot fully account for our experience of the temporal asymmetry of causation; we need the *de dicto*, synthetic a priori, account of our capacity to deliberate, rationally, only for the sake of future effects. This is the 'what it is in us', that gives rise to the experience of the temporal asymmetry of causation.

Citing the same paper by Ramsey, Ismael (2012, p. 167 footnote 26) notes his observation that the distinction we make between the future and past in deliberation is also connected with volition, with what we know we can will and do. Ramsey says:

What then do we believe about the future that we do not believe about the past; the past we think is settled; if this means more than that it is past, it might mean that it is settled *for us*, that nothing now could change our opinion of it, that any present event is irrelevant to the probability, *for us*, of any past event. But that is plainly untrue. What is true is this, that any possible volition of ours is (for us) irrelevant to any past event. To another (or to ourselves in the future) it can serve as a sign of the past but to us now what we do affects only the possibility of

⁷⁴ Price does not elaborate on his comment that the a priori nature of the alignment of the causal and temporal arrows is somewhat like a synthetic a priori. I think it is illuminating to consider his comment in the light of Norman Kemp Smith's interpretation of Kantian a priori:

The a priori, then is merely relational, without inherent content; it is synthetic and therefore incapable of independent or metaphysical proof; it is relative to an experience which is only capable of yielding appearances. The a priori is as strictly factual as the experience which it conditions. (Smith, NK 1962, p. xxxvi).

This brings out the view's amenity with the deflationary approach to metaphysics generally adopted by Temporal Pragmatism.

the future...from the situation when we are deliberating seems to me to arise the general difference of cause and effect (Ramsey 1978, p. 146).

Ismael (2012, p. 154) acknowledges Ramsey's insight into the unique epistemic access we have to the outcome of our decisions at the moment of their making, when she argues that uttering "I will do" is a validation of belief' and 'trumps any evidence I have by other means', that is, all other information about my deliberation and how it will go is screened off by the deliberative process itself (2012 p. 154). Price likewise interprets the force of Ramsey's account of primacy of the temporal asymmetry of deliberation, above, to be in his assertion that '...our actions are statistically independent of everything except (what we come to call) their effects...' (Price 1992). As Ramsey puts it: 'In a sense my present action is an ultimate and the only ultimate contingency...' (Ramsey 1978, p. 146).

There is some conjecture in the literature as to what Ramsey might mean here when he notes that with respect to our decisions and actions, we cannot change the past [but we can change the future]. Hugh Mellor (1998a) suggests Ramsey might think that it is our belief about the 'settled' nature of the past that entails we cannot change it, which Mellor rightly sees as problematical. Alternatively Ramsey might be offering a metaphysical explanation; the view that the world is such that future times and events are ontologically distinct from past times and events, so that while the future is the realm of possibilities and is open to our influence, past events are settled.

However, it seems that neither of these conjectures represents Ramsey's view here. Rather, Ramsey's view seems to be a version of what would now be called subject naturalism, particularly evident in his focus on what *we can do* when we deliberate so as to affect the world, and in the emphasis Ramsey places on the term 'for us' throughout this passage. This emphasis is on our own lived experiences, how the world is 'for us', suggests that his view turns on what we know to be the case about ourselves in practical and pragmatic terms, rather than on our propositional attitudes about the 'past' and 'future' or metaphysical claims.

Finally, Ramsey's view avoids a concern Price (1992, pp. 255, 261-262) expresses about 'conceptual buck-passing'; a criticism of accounts of causal asymmetry that incorporate as part of their explanation a temporal asymmetry that itself requires further explication. Explaining the temporal asymmetry of causation in terms of our experience of the temporal asymmetry of deliberation allays this concern, it explains our use of causal concepts in terms of features of our 'constitution', i.e. our cognitive and conceptual make-up, rather than a temporal asymmetry in nature, such as entropy (Price 1992, p. 261). Beings like us can deliberate only so as to affect outcomes later than now, and this would remain the case, independently of any objective direction of any physical temporal asymmetry. Therefore, there is no 'buck-passing', no assumption of an underlying physical temporal asymmetry here.

A HUSSERLIAN CONNECTION

The account of our understanding of the asymmetries of causation and temporal ordering developed in the Temporal Pragmatist discussion of Ramsey's view above, shares some similarities with Husserl's view of time and temporal asymmetry. Husserl identifies a pre-theoretical understanding or intelligibility of the natural world of space and time as an inherent aspect of our awareness of the world. Like Ramsey, he argues this arises prior to any investigations of, and theorising of, time and its connection with what we can do and achieve, as discussed by Adam Konopka (2009, p. 328).

Husserl, like Ramsey, focuses on the 'constitutional' features that can explain our use of modal notions or causal concepts, our a priori awareness of temporal and causal asymmetries, and particularly, our intuition that there are 'possibilities' open to us in the future. However in other respects Husserl's view differs from that of Ramsey. In Husserl's work, uncovering the genesis of our a priori knowledge of the world requires an investigation incorporating phenomenological technique of 'bracketing' and 'reduction' (epoche), a kind of thought experiment that is outside the scope of this discussion.

However, nothing in Husserl's account presupposes a physical asymmetry underpinning our experience of the temporal asymmetry of deliberation. For Husserl, all our experiences of the world are possible in virtue of the formal structure of inner time consciousness: and our experience of temporal direction arises from features of this non-temporal formal structure, as discussed above in Chapter 2 (Husserl & Brough 1991, p. 79; Husserl & Landgrebe 1973, p. 254). Temporal asymmetry can be explained independently of any other physical asymmetry, including causal asymmetry in Husserl's view. So, to the extent that Price argues that Ramsey's account of the temporal asymmetry of causation avoids his 'buck-passing' objection, Husserl's account of the a priori nature of our experience of temporal asymmetry should, for consistency, be understood to likewise avoid Price's objection.

DEVELOPING RAMSEY: PRICE & WESLAKE'S 'TIME ASYMMETRY OF CAUSATION'

Following Ramsey, and as discussed in Chapter 2, above, in their 'The Time Asymmetry of Causation' (2010), Price and Weslake develop a comprehensive and contemporary explanation of causal asymmetry based on our experience of the temporal asymmetry of human deliberation. They note that the very concept of causation is seen as problematic because there is no time directed causality at all in fundamental physics, and in response they develop a subject naturalist account, arguing that causal asymmetry is real but perspectival, a product of the conceptual and cognitive apparatus of human beings in response to our experience of our environment (2010, p. 419). It is explained, in part but crucially, by our experience of the temporal constraints on what we, as agents, can rationally deliberate about, given our incontrovertible knowledge that: 'We can act for future ends but not for past ends (at least in normal circumstances)' (Price & Weslake 2010, p. 416).

Although deliberation is inherently temporally asymmetrical, it is not necessarily undertaken on causal grounds, it is possible that we can deliberate rationally for evidential rather than causal reasons, as Newcomb problems show.⁷⁵ Deliberations made on evidential grounds will also be temporally asymmetric, and hence Price and Weslake can claim that the temporal asymmetry of deliberation can explain the temporal asymmetry of causal relations in a non-circular way (Price & Weslake 2010, pp. 428-429).

Nor is the temporal asymmetry of deliberation made explicable by the asymmetry of entropic variation, as noted above in the discussion of Ramsey's view. Price and Weslake footnote a reference to entropic variation, in the context of this being part of the Past Hypothesis, suggesting that the asymmetry of deliberation might be connected to, but not fully explained by, this physical asymmetry of events and processes in time.

As discussed above in Chapter 2, the Past Hypothesis is the theory that the universe began in a low entropy state. If this is so, then entropy — which never decreases — can only increase until it reaches thermodynamic equilibrium. The result is that all systems in the universe become more, and never less, disorderly, and this asymmetry can, but need not be, linked to the asymmetry of time. This asymmetry in nature is offered as a possible explanation for ‘...the existence of ...asymmetric deliberators’ like us (Price & Weslake 2010, p. 434 note 23). It can explain the direction of inference in our deliberations in terms of a response to asymmetries in the natural world, and can account for the temporal asymmetry of our biological systems. Price, though, has consistently argued that there are good reasons to think that how we distinguish the future from the past is a local, perspectival matter (Price 2007).⁷⁶

In summary, Price and Weslake emphasise that: ‘... it is our perspective as deliberators that underpins the distinction between cause and effect’ (Price & Weslake 2010, p. 419). Our deliberations are part of the past of the events that result from them. This is a temporal and causal asymmetry which can only be a feature of beings like us, deliberating agents (Price & Weslake 2010, pp. 433-434). Weslake independently defends this kind of ‘agent-dependent’ aspect to explaining causation in terms of human agency, in terms of what we know we can do and effect in the world (Weslake 2006a, pp. 139-140).

⁷⁵ Price and Weslake refer here to Robert Nozick's (1969) paper ‘Newcomb's Problem and the Two Principles of Choice’, in Nicholas Rescher (ed.), *Essays in honor of Carl G. Hempel*, Dordrecht, Riedel, 114-46.

⁷⁶ In a more speculative vein, Price (2011a, p. 307) cites Boltzmann in canvassing the possibility that, as he puts it ‘...the entropy gradient is a local matter in the universe as a whole, entirely absent in most eras and regions and with no single preferred direction in those rare locations in which it is to be found’. The upshot of this is that the universe could have a symmetrical time with local variations. In turn this could form part of an explanation of the ‘local’ temporal direction of our physical environment. Such an account would be perspectival since it is a local feature of our region of the universe (2011a, p. 307).

TIME AND TEMPORAL PRAGMATISM

I have outlined the elements of Temporal Pragmatism, and discussed a precursor to current work in the field: Frank Ramsey's influential work on causal and temporal asymmetries and their relation to each other. I have also discussed a recent example of Temporal Pragmatism in Price and Weslake's modern update of Ramsey's insight into decision making and its connection to our understanding of causal and temporal asymmetries. My focus now turns solely to the temporal case, beginning with the possibility of a reconciliation between a subject naturalist account of our concepts of time as endorsed by modern physics and an account of our 'everyday' and subjective concepts of time, from within a Temporal Pragmatist framework. Then I briefly recall some salient points from Husserl's theory of inner time-consciousness, and discuss them in the context of some features of Ismael's 'side-on' account of the 'open future' intuition, as presented in her 'Decision and the Open Future' and some of the views she develops in her 'Temporal Experience' (Ismael 2011b, 2012).

HERACLITEAN AND PARMENIDEAN TIME

The Temporal Pragmatists, Price, Ismael and Weslake, endorse Einstein's Theory of Relativity and those philosophical views of time that incorporate well supported theories of physics (Ismael 2012, pp. 150-151, 164-165; Price 1996, pp. 15-16; Weslake 2006b).⁷⁷ Interestingly, they favour a particular terminology in their discussion. The subjective, perspectival view of time is termed 'Heraclitean', and describes times and events using terms such as 'past', 'present', 'future' and 'now'. Events appear to come into being in the present, on this view, and future events are not yet settled or actual, and there may be an implicit assumption of something like a moving 'now', in which we can think and talk about events happening, as changing from being future to being past.⁷⁸

By way of contrast, when discussing a perspective-free conception of time, Price, Weslake and Ismael generally adopt the term 'Parmenidean' to capture the view that time is a manifold of events and times that are ontologically indistinguishable from each other, with no privileged 'now' or distinction between past or future times or events. The term is identified with time as it is described in modern physics, although there are also arguments for the view based on logical principles.⁷⁹ In virtue of this theory of time being endorsed by a well-supported theory in modern physics, Temporal Pragmatists claim it is as the superior account of time per se.

⁷⁷ As does Husserl, see Chapter 2, above.

⁷⁸ An interesting side note: Husserl also refers to our experience of time as Heraclitean, noting that: '...all experiences flow away. Consciousness is an eternal Heraclitean flux...' although translator John Brough notes that retention, the dispositional intending of the 'just past' in Husserl's theory of inner time-consciousness, catches the stream of consciousness, and so the content of the flux is not lost to us (Husserl & Brough 1991, pp. xxiii, 360).

⁷⁹ Developed by Zeno, and McTaggart, for example (Huggett 2010, pp. 17-26; 110-111)

The Heraclitean/Parmenidean distinction in Temporal Pragmatism is broadly equivalent to A-time/ B-time, and to Eternalist/ Temporalist distinctions found in the philosophical literature on time (Ismael 2012, p. 151; Weslake 2006b). While Price, Ismael and Weslake gloss some differences between these distinctions, it is clear that their shared concern is to identify two distinct and overarching ways of describing time, and they identify the literature as being divided along these lines.⁸⁰

TIME AND TEMPORAL EXPERIENCE IN TEMPORAL PRAGMATISM

In 2011 Price and Ismael co-authored an online journal article: ‘Time is but a dream...or is it?’ (Price & Ismael 2011). This article succinctly sets out their mutual position on time as understood in physics, and its relation to our temporal experience, and anticipates the view taken by Ismael in her ‘Decision and the Open Future’ (Ismael 2012) and ‘Temporal Experience’ (Ismael 2011b). It defines a Heraclitean account of time as one taken ‘...from the point of view of a particular moment within time’, that is, it is how time appears to us to be, from our own point of view, at each moment of our lives. A Parmenidean aspect is a description of time: ‘...from no particular point of view, from “outside” time we might say...’ (Price & Ismael 2011). But as they stress, these views ‘...are both right, just different’.

Weslake in his ‘Time’(2006b), notes that the Heraclitean view of time, the view of time that accommodates a movement or ‘passage’ of time, through the future to the present and past, is inconsistent with the Special Theory of Relativity. He suggests, on this basis, that what we think of as the ‘passage of time’ is better understood as ‘... an aspect of our experience of time rather than of the world itself’. There is clearly a convergence of views with those of Price and Ismael here.

However, Ismael delves further into the phenomenological aspects of decision making and agency than either Price or Weslake do in their work on causation or time, using evocative imagery to describe the features of our mental life and experiences which give rise to our sense of agency with respect to events in our future.

In ‘Decision and the Open Future’ (2012), her discussion is structured around the Heraclitean ‘particular [subjective] standpoint’ and contrasted against the Parmenidean ‘view from nowhere’. She describes our practical, agent-centred Heraclitean perspective on time as a series of momentary experiences, memories and anticipations, each ‘implicitly relativised’ to a moment of Parmenidean, or objective, time, with each momentary experience making way for the next (Ismael 2012, p. 151). Ismael refers to

⁸⁰ One reason for privileging the Heraclitean/ Parmenidean distinction over the arguably more widely used ‘A and B’ theory distinction may be that in the time literature the A and B distinctions are made on the basis of metaphysical claims about the nature of time per se; or issues about the truth makers of temporal sentences and propositions (Mellor 1998b for example), whereas Price, Ismael and Weslake take the important differences between the two ways of understanding time to involve pragmatic anthropocentric considerations as well as data from cosmology and physics. The Temporalist/ Eternalist distinction captures the gist of their view equally well, but perhaps lacks the eloquence of the Heraclitean/Parmenidean terminology.

the Heraclitean view as ‘frame-dependent’ and the Parmenidean view as the ‘invariant description of time’ when she claims:

The two views are mutually, inclusive, mutually informing. The latter is a very special sort of extended, evolving, frame-dependent representation of what is represented in a frame independent way in the former. The two go together, as *two sides of the same coin*, each implicitly contained in the other and obtainable from it by a transformation of frame (Ismael, 2012, p. 165, my italics).

Both views can represent the same times and events but from different perspectives, as Price, and Weslake concur (Price 2011c; Weslake 2006b).

I note that we have developed the capacity to theorise that time is not how we conceive it to be from our subjective perspective, when considered from the objective vantage point from which physics, ideally, is conducted. However, it is not clear if these two different vantage points amount to the ‘two sides of the same coin’ Ismael identifies, for this seems to suggest that the Heraclitean and Parmenidean views of time share something significant in common, and it is not clear from Ismael’s account what she takes this commonality to be.

Some insight may be gained in a reading of her forthcoming ‘Causation, Free Will and Naturalism’. Here, Ismael clarifies her view of the relation between scientific investigation and our ‘everyday’ pre-theoretical attitude more generally:

I don’t know what naturalistic metaphysics is if it is not simply to bring everything we learn from science — about the world and about our place in it — to bear on philosophical problems, and to grant the scientific view authority over any pre-theoretic intuitions we might have about how things are (Ismael forthcoming-a, p. 234).

However, our pre-theoretical intuitions about time are genealogically prior to, and presupposed by, our theories of the physics of time, even though scientists cultivate a perspective or stance that is not obscured by subjective elements of human thought and talk. Our everyday, pre-theoretical concepts of time and our concepts of time as developed within modern physics, both stem from the same basic understanding of time and temporal relations that is a contingent feature of how beings with our perceptual and cognitive make-up respond to the natural world.

This is supported by a salient point made by Toulmin and Goodfield about the practices of scientists engaged in the study of time and cosmology in modern physics, in their classic text, *The Discovery of Time*:

It is not always clear how far physical cosmologists see the construction of world models as involving the extension of our intellectual concepts and how far they regard it as an exploration of the truth about Nature (Toulmin & Goodfield 1965, p. 260).

As Toulmin and Goodfield also point out, the available data about time as it is studied in physics is scarce. Therefore our scientific concepts of physical time reflect our capacity to track that data as best we can, pre-theoretically, as well as our capacity to bring our cognitive and conceptual powers to the task of constructing scientific models which add to our understanding of time in the light of the limited data we have.

I suggest Ismael is right to say that the Heraclitean and Parmenidean views of time are two sides of the same coin: however I suggest that the ‘coin’ can’t be time as it ‘really is’, as it might be understood independently of physics and the pre-theoretic attitude, since the Parmenidean view, allied as it is with modern physics here, *is* our best understanding of time per se according to the view endorsed by the Temporal Pragmatists (Ismael, 2012 p. 151). I suggest that the ‘coin’ in question is our own capacity to perceive, cognise and conceptualise time, and the two perspectives reflect the two ways in which this capacity developed.

Just as we construct models representing physical time for theory building in physics, in a very different but still important sense, we also construct our awareness of time as it appears to us, as past and future and present moments and events, although much of this happens at an unconscious or pre-reflective level. Time, as it appears to creatures like us, in our ‘embedded’ situation in time, is manifest in our understanding of temporal and causal asymmetry; in our awareness of the difference between earlier and later and past and future with respect to our capacities for rational deliberation. It is integral to perception, to our sense of agency and responsibility and to our power to influence events and be part of the process of making history. It is also integral to the development and practice of the sciences, including the physical sciences.

I now offer an outline of Husserl’s later work on time-consciousness and discuss Ismael’s account of temporal experience in the context of Husserl’s earlier and later views.

HUSSERL AND THE FUTURE

Husserl’s theory of inner time-consciousness offers rich resources and insights into why creatures like us experience time in the asymmetric and future directed way we do, and in the context of the discussion at hand, how we come to have an experience of a future which is open to our influence. Some salient points from Chapter 1 are briefly recounted below, followed by an analysis how some themes from Husserl’s work offer support to Ismael’s account of the ‘open future’ intuition (2012).

HUSSERL’S LATER THEORY OF INNER TIME-CONSCIOUSNESS

As discussed above in Chapter 1, the foundational level of inner time-consciousness is its ‘form’ or structure, and, in Husserl’s theoretical framework, is a pre-requisite for all human experiences. In Husserl’s earlier work, the elements of this form of time are the ‘primal impression’, which enables an immediate presentation of something in the world; retention, which enables the awareness of what has ‘just happened in

experience; and protention, which enables an awareness of more sensations about to be experienced along with tacit expectations of what these sensations will be. This formal structure is understood as a means by which sensory data can be presented as being temporally extended, as having related phases or parts in our conscious experience, although it is not itself temporal or available to conscious awareness.

However, as noted in Chapter 1, above, in later work Husserl no longer sees the primal impression as a part of the formal structure of time. Toine Kortooms and Shaun Gallagher independently describe Husserl's move to reduce the structural form of inner time consciousness to a continual series of protentions and retentions, with the primal impression now construed as a limit, or 'division' between retention and protention (Gallagher 2013, p. 145; Kortooms 2002, pp. 198-199 citing the Bernau Manuscripts, p. 39-40).⁸¹ This emphasises the importance of future-oriented protention, for our 'now' experience simply is the fulfilment of our protentional consciousness, that is, our immediate lived experience is the fulfilment of our protentional directedness towards the next moment of experience — our immediate future (Gallagher 2013, pp. 144-147; Gallagher & Zahavi in press, pp. 8-9). We might say that our 'now' is simply the resolution of protentional possibilities (Husserl, 'Bernau Manuscripts', 14, cited in de Warren 2009, p. 195).⁸² This can also be understood as the genesis of our experience of temporal becoming, of 'seeing' events once future becoming present and I say more about this below.⁸³ It is also noted that protention and retention, together and inseparably, shape our present experience:

Consciousness is not simply a passive reception of the present: it enacts the present, it constitutes its meaning in the shadow of what has just been experienced and in the light of what it anticipates (Gallagher 2013, p. 147).

In the context of judgment and responsibility in an 'open future' what we protend, or anticipate is 'open' and indeterminate, but determinable (Welton 1999, p. 224). It is determinable in the sense that we protend, or expect, sense impressions which cohere with those just experienced, but indeterminate in that our expectation may be not be met, the next sense impression may be different to what we protend (Lohmar 2002, p. 161). As well, Husserl notes that: '...the further an event has proceeded, the further it presents material for differentiated protentions, which results in a projection of the past

⁸¹ The 'Bernau Manuscripts' are not yet available in English translation. I refer here, therefore, to translations in the secondary literature found in the work of Dieter Lohmar, the Director of the Husserl Institute; and work by Toine Kortooms, Nicolas de Warren and Shaun Gallagher, and I note where a point is supported by more than one source.

⁸² See also notes 9 and 26 above.

⁸³ de Warren (2009, p. 218) goes to remark here that: 1) in the 'Bernau Manuscripts' Husserl pays more attention to protention than is found in his earlier works, and 2) that in the view developed in the Manuscripts an 'original presentation, an experience of the world as it in now, at this moment, is an 'unexpected irruption of novelty'. This phrase captures Husserl's insight into our continuous, but tacit anticipation of the future, and of its resolution in the present; as de Warren notes, '[t]ime consciousness anticipates itself'. Yet, as he goes on to explain, the resolution of this anticipation is always new, always novel to us in some respect, always a newly minted presentation of the world, and never wholly the product of our own consciousness. This emphasises the connection between our 'construction' of features of our temporal experience, and the connection of that experience to the physical world that is independent of us.

on the future' (Lohmar 2002, p. 159, citing the 'Bernau Manuscripts', p. 38). Finally, protention is the enabling condition of our experience of time and its asymmetry; of our sense of the past receding from my personal perspective of my 'now' (Gallagher & Zahavi 2012, p. 85), and along with retention, it is fundamental to our having conscious experience itself — according to Husserl's theory (Husserl & Landgrebe 1973, p. 254).

As noted above (see 'The Basics of Husserl's Theory of Inner Time Consciousness') at the tacit immanent level of inner time-consciousness there is intentionality but of an implicit kind, and following JN Findlay (2012, pp. 81-82), it is suggested it is best understood as a dispositional intentionality towards what has just past and what is just about to happen, constituted^b⁸⁴ respectively by retention and protention. As a dispositional intentionality towards what is about to happen, the content of protentional consciousness can arguably be causally shaped by the intentional content of our experiences. In some cases, where we bring about those experiences by our own actions, it could be that these actions causally influence the sensory information suffusing our brain, which protention and retention operate on. If so, this might shape our tacit anticipation of what will 'fulfil or disappoint' a protention in such cases (Gallagher 1998, pp. 68-69).

Therefore, protentional and retentional consciousness appear to be directly implicated in the construction of the open future. Just as we see events in our past as settled, and the future as having possibilities for us to affect, so too, what is retained in virtue of retention is settled and fixed; while protention tacitly admits possible outcomes.

There is a further level of time-consciousness, objective time. At this level there are pre-reflective experiences, such as perceptual experiences, but there are also reflective acts of consciousness such as recollection and anticipations. This is the level at which intersubjectively verified events and times are represented — it is the time of objects we experience, along with other perceivers, as being 'in the world'; things like cats and clocks. As I discuss below, following a view developed by Lohmar, objective time in this intersubjectively constructed sense also underpins the scientific view of time, as developed in modern physics.

TEMPORALLY EMBEDDED POINTS OF VIEW AND THE COMET TAIL OF RETENTIONS

Jenann Ismael offers a rich and detailed account of our subjective conception of time; a genealogical explanation of how time 'appears' to creatures with the kind of cognitive (and perceptual) equipment we have (Ismael 2011b, 2012).

In 'Decision and the Open Future', her account begins with a reconstruction of the basic level of temporal phenomenology. She notes that:

⁸⁴ 'Constituted' in the sense of being 'brought about'. See also 'Retentional Theories of the Specious Present', above.

The task for someone trying to reconcile temporal phenomenology with physics is to acknowledge all of [its] psychological complexity, and reconstruct the first-personal experience of time without attributing more structure to external time than physics recognises' (Ismael 2012, p. 151).

I will discuss some of the points made in Ismael's response to this desideratum in what follows. In developing her reconstruction of temporal phenomenology, Ismael (2012, pp. 151-152) defines two new entities: 'Temporally Embedded Points of View' (TEmP) and 'Temporally Evolving Views' (TEv).

TEMPORALLY EMBEDDED POINTS OF VIEW

Ismael describes a TEmP as a moment of experienced (first person) time relativized to a moment of objective time and situated in relations of past and future to all other moments of time in that person's personal history (2012, p. 151-152). In this respect it shares some similarities with Husserl's tripartite structure of a moment of time, as described above as flanked by its retentional and protentional consciousness. Husserl's construal of a 'now' experience is sometimes characterised as a 'specious present', i.e. an extended now-experience incorporating a tacit awareness of the just past and just about to happen (see Chapter 1, above).

Ismael (2012, p. 163) also describes the role of TEmPs as capturing our experiences of 'partially known' events in the past, and expectations of the future as they are experienced at each 'now' moment of time. I suggest that understanding a TEmP to be analogous with a Husserlian specious present captures what is essential to the TEmP, but it also offers a formal structure to underpin it: the structure of retention and protention which, in Husserl's view is necessary for mental states such as expectation and memory. In this section I will refer to Husserl's earlier theory of time-consciousness, since Ismael references this view in 'Temporal Experience' (2011b, pp. 462, 475, note 30, 477), while noting that Husserl's later view of retention and protention could be substituted with minimal adaptation.

Underpinning our access to the past, in Husserl's view, is a series of temporally ordered 'now' experiences in a series, each trailing their evocatively named 'comet-tail of retentions' (Husserl & Brough 1991, p. 32). Each of Husserl's comet-tails of retentions brings with it a dispositional intentionality directed towards the past, one tail for each 'now' experience, which is available to consciousness at need. This series of comet-tails are in some respects analogous with Ismael's series of TEmPs although Husserl does not argue that they can bring about an experience of a 'time-line' (of the kind Ismael's Temporally Evolving View describes) by themselves — more is needed.

TEMPORALLY EVOLVING VIEWS

Ismael develops an interesting analogy between a series of momentary TEmPs, strung together in temporal order and joined to form a personal history, the TEv (Temporally Evolving View) and a series of 'snapshots' run through a film projector and forming a dynamic, constantly updating personal history or time-line.

This image of a series of rapidly updating snapshots might imply that Ismael adopts a 'cinematic realist' view of time. This theory of time argues that our experience of events happening in a smooth succession is brought about by rapid presentations of static frames of perceptual experience: Barry Dainton (2010a section 4.1) for example, describes this view of time as analogous to a series of '...momentary snapshots' of an unfolding event, presented sufficiently rapidly to produce the effect of motion and change in the experiencer'. However elsewhere, (Ismael 2011b, p. 470), she seems to imply that her view is somewhat retentional; alternatively she may be defending a combination of the two views. She says:

Each momentary content of consciousness contains, alongside information coming in from observation, a remembered image of the preceding state. And that image of the preceding state contains an image of its predecessor nested in it. And that one likewise, and so on like a string of Chinese boxes, each containing a reproduction of its predecessor (Ismael 2011b, p. 470).

Her view differs from Husserl's 'retentional' account in three ways here. Firstly, Husserl distinguishes between memory and retention, a distinction motivated by his view that these have inherently different natures: memory is best understood as a 'replaying' of retentional consciousness (Russell 2006 p. 135), while retentional consciousness is 'lived through' rather than recalled in the way memories are. This seems to capture an important distinction in the phenomenology of our experience.

Secondly, Husserl's formal structure of time (the structure of retention and protention and, in earlier views, primal impression) is not available to conscious awareness; it constitutes⁸⁵ temporal consciousness at a pre-reflective level of awareness, but is itself mysterious and atemporal, and while it seems likely to be explained by physical mechanisms, the nature of these is unclear (see also pp 59-60 above). The merit of this view is that, in positing an atemporal structure at its core, it avoids the objection that there is a regress of levels of constituting time-consciousness that compromises the theory's explanatory power.⁸⁶

Thirdly, there seems to be no explicit account of how the content of the retained string of Chinese boxes fades from our current consciousness in Ismael's discussion, a problem Husserl can account for, since in his view 'retentional' intentionality towards the past is understood to be dispositional in nature, and content quickly 'sinks back' from our conscious awareness. I suggest, therefore that in these respects, Husserl's view brings out some subtleties in how we might account for features of our temporal phenomenology that might usefully inform Ismael's already comprehensive and phenomenologically compelling view. After this brief digression, the discussion now

⁸⁵ 'Constitution' meant in the sense of 'bringing about' or enabling, see p 23 above.

⁸⁶ This kind of regress may be implied by Ismael's 'string of Chinese boxes', but it is a little unclear if this is so from her discussion. See also 'McTaggart's C-Series', above, for more about the 'regress' from a Husserlian perspective.

returns to the comparison of Ismael's TEv and Husserl's work on the constitution of a personal 'time-line'.

As beings embedded in time, we are also, as Ismael notes, embedded in history (Ismael 2012, p. 164). This is important, for as Ismael notes, our remembering of the past events that our decisions and actions played a part in bringing about that contributes to our sense of agency when we make decisions with respect to our future (Ismael 2012, p. 164). Husserl, as interpreted by Dieter Lohmar, offers an elegant account of how a personal history, an objective time, and more speculatively, an objective scientific time, might be constituted.⁸⁷ Lohmar's (2010) account of the constitution of objective time, draws on unpublished texts from the 'Bernau Manuscripts' as well as from *Experience and Judgment* (Husserl & Landgrebe 1973, pp. 385-389), and he acknowledges that in some respects he exceeds both these texts in his interpretation ('Abstract', Lohmar 2010, p. 115).

Husserl's view, as interpreted by Lohmar (2010, p. 127), is that the establishment of an objective temporal order of events begins with the subjective process of establishing the order of what Husserl calls our 'lines of pasts', but which are more easily understood as 'short narrative stories' in memory: these narratives are by their nature, numerically 'open-ended' (Husserl & Landgrebe 1973, p. 387; Lohmar 2010, p. 115). These 'narrative stories' about our past seem to be analogous with Ismael's series of internally ordered snapshots (2012, p. 152) but depict just one event, and, as a first step, we attempt to order these stories and the events they contain into a personal two dimensional array, a system of past narratives (Lohmar 2010, p. 127). This array of internally ordered short narrative stories are parts of experiences of longer duration, but these longer experiences are not yet ordered externally within a wider ranging, coherent, linear time line.

In the process of subjectively ordering this array of short narrative episodes into a single, internally generated, subjective and personal 'time line' (Lohmar 2010, p. 127), we reflect on what we know about the world: the relations of cause and effect, and the motivations and connections holding between the events we are reflecting on. In this process my recall of an event is verified by its internal coherence with my other remembered events and also against the wider, intersubjectively constituted '...world of commonly shared facts...' (Lohmar 2010, p. 127). This personal time line is in some respects broadly analogous to Ismael's TEv, but it does not yet explain how subjective time is related to objective time. More is needed.

⁸⁷ As noted in Chapter 1, 'Constitution' is a term used in different ways in English translations of Husserl. In the sense Lohmar (2010) uses it here, when he interprets Husserl's view as being that '...objective time is constituted on the ground of subjective time' he is taking Husserl to mean that objective time is 'represented' in subjective time (Lohmar 2010, p. 116). This differs from the two other usages of 'constitution' described in 'Retentional Theories of the Specious Present', above.

Lohmar (2010, pp. 131-132) argues that our own recollection of events in our lives is not sufficient for the claim that these events have an objective temporal location, nor that they occurred in the manner and order we remember. Our recollections may be challenged by other people who also have knowledge of these events, and who differ in their recollection of the temporal ordering of these events. Therefore we need to confirm, defend and perhaps amend our own time line in the light of the recollections of other (competent) perceivers. Eventually, though, consensus will be reached and there will be an 'objective time for all' (Lohmar 2010, p. 128).

Therefore, Lohmar argues, there is a negotiated agreement about what is considered to be true about events and times in a community; a consensus approach, open to renegotiation and revision, which intersubjectively determines an objective order of events (Husserl & Landgrebe 1973, pp. 163-164). This, in his view, is an integral part of the process of constructing an external time, of the kind that allows us to situate our own, past, agentive actions within a history which we can draw upon when recall how our own actions shaped that history.

However Husserl makes it clear that he is distinguishing this kind of intersubjectively constituted 'objective' time order from the sense of 'objectivity' understood in the natural sciences (Husserl & Landgrebe 1973, p. 163 note 1).⁸⁸ This leads to the question of how the objective time of science is related to the intersubjectively negotiated objective time described above. Interestingly, Lohmar suggests that the development of the time of physics has a genealogy based on historical factors: it develops in tandem with the development of physics itself, and he considers it to be simply '...a special development in our everyday understanding of time' (Lohmar 2010, p. 133 note 4). Lohmar's account of scientific, objective, subjective and intersubjective time is therefore broadly consistent with Alves' (2008) argument that Husserl's view can be rendered compatible with STR, in that that the time of physics is an abstraction from the time of everyday experience, as discussed above, in Chapter 2. In his extension of the view to incorporate the time of science, Lohmar acknowledges the perspectival nature of time, for us, while offering some insight into the common origin of the subjective, intersubjective and scientific perspectives on time. This brings us back to a discussion of how the different perspectives on time, primarily the Heraclitean and the Parmenidean, to use Ismael's terminology, are related in the context of the open future intuition.

TEMPORAL BECOMING

A further intuition we share about time is the experience of things and times now in our future 'becoming' actual, and/or present.⁸⁹ 'Becoming' may be understood to be an

⁸⁸ Husserl says here: '...the objective world is, to be sure, equated with the life-world of humanity, the all-embracing community wherein mutual understanding is possible. In our context we can disregard the problem of knowing how the world, taken concretely as the life-world of humanity, stands with regard to the objective world in the strict sense, i.e., to the world as determined in the sense of natural science'.

⁸⁹ It should also be noted that time 'passage' is sometimes conflated with 'becoming' in the literature. Where this occurs, 'passage' is understood to be a change in events from being future, to being present and then past — and

ontological feature of time, or alternatively it may be understood to be perspectival and anthropocentric, a feature we project onto the world. Regardless of how it is understood all the defenders of this intuition agree that the ‘present’ is experientially distinct from the times and things we deem to be past and future, and describe what it is that is integral to that experience as ‘becoming’. Some also claim that ‘becoming’ is associated with a privileged universal ‘now’.

Those who argue that times and things are actual or real in virtue of ‘becoming’ will take becoming to be a universal feature of time itself, and there are several theories arising from this view. One prominent example is the ‘growing block’ theory. This theory posits a progressively increasing universe whose leading edge is the present: this theory can also be combined with a ‘Moving Spotlight view’ (see Chapter 1, above for a discussion of this view). According to the growing block view, things and events become actual — or ‘maximally real’ in the present, having a ‘lesser degree of reality’ after this initial actualisation (Dainton 2011, p. 406). In the Moving Spotlight theory events or things become present because they are ‘lit up’ by some feature of the universe. As Dainton points out, if this view is combined with the growing block theory then future events become fully real or actual in the process of becoming — and then become less real; whereas in a standard growing block view events in the past (but not the future) are as real as present acts, although not experienced as such.⁹⁰ A further, alternative view is the branching time model of the universe (McCall 1994), whereby things and events in the future are real and determinable but not yet determined and actual, prior to one branch and its events ‘becoming’ present and actual in a process of progressive branch attrition of all other contenders.

These Heraclitean theories have in common the view that there is an ontological distinction to be made between present things and future things and also, in some cases, between those things and times that are present and those that are past. In these theories to ‘become’ present will also be to ‘become’ an actual thing in the universe.

Alternatively, those who defend the Parmenidean, traditional ‘block’ view of time and the universe will argue that all times, and all things in time, are on an ontological par and there can be no distinction between times in terms of past, future and present. However, acknowledging the importance of the intuition of ‘becoming’ in practical and epistemic terms, they may understand it to be anthropocentric and perspectival, a feature that human beings project onto the world. On this kind of view, it is plausible that our experience of time is a perceptual and cognitive response to a universe where times, things and events are eternally ordered, and all have an equal degree of actuality, yet are only progressively epistemically accessible to beings like us, in our situation. This kind of view can consistently deny the present is a real feature of time, while

therefore refers to more than just the directionality of time. As noted above, LA Paul provides an excellent clarification of the often conflated (or confused) terms ‘becoming’, ‘passage’ and ‘flow’ (Paul 2010). Here I will refer only to things ‘becoming’.

⁹⁰ Dainton (2011, p. 406) refers to the combination of the growing block view and the moving spotlight view as the ‘Grow-Glow’ theory.

accounting for the experience of ‘becoming,’ and our experience of things becoming actual when we take them to be present to us. This is the strategy adopted by the Temporal Pragmatists, and is broadly consistent with Husserl’s view, particularly his later theory of inner time-consciousness (see above).

The intuition that things in time ‘become’ present is closely connected to the intuition that the future is ‘open’. It is similarly problematic for philosophers whose aim is to provide a faithful account of our temporal experience while remaining consistent with modern physics. Explaining ‘becoming’ in a naturalistic framework requires a reconciliation of our experience of events ‘becoming’ in the world with philosophical views of time that, drawing from perceived implications of STR, claim that there can be no absolute ‘becoming’ in the ‘fixed’ kind of universe STR implies. Ismael summarises the everyday manifestation of this problem thus:

...most people do not think of the future as *out there*, waiting to be experienced, a fixed reality that comes about only in stages. We think of it, rather, as existing only in potential until it has been made available to experience (Ismael 2012, p. 149).

Ismael (2012, pp. 149-150) offers an explanation of ‘becoming’ developed along Temporal Pragmatist lines, taken from the perspective of what it is about our language, thinking and concepts that might give rise to the intuitive experience she describes in the quote above. She also argues that we experience events as ‘becoming’, in part, because we are sometimes participants in the process that resolves the uncertainties and potentialities surrounding future events — we play a role in determining what will become present and actual. When events ‘become’ present to us, particularly when our actions are part of the causal chain that brings them about, this reinforces our sense that a novel event is happening — and that what was previously indeterminate is now determinate, and we make a difference to how events unfold. However this experience need not represent any objective ‘becoming’ in physical time. I endorse this view, and I suggest some aspects of Husserl’s view may be useful additions to Ismael’s view.

Husserl’s view is consistent with the idea that our experience of ‘becoming’ is in part a construction of our cognitive and conceptual systems, which I take to be implied by Ismael’s view, but he also seems to suggest that we project ‘becoming’ onto the world as part of our perceptual experience of that world, and this experience is ultimately grounded in the structure of inner time-consciousness. There are two implications of Husserl’s view with respect to its consistency with Ismael’s’ view.

Firstly, in Husserl’s view, as in Ismael’s, ‘becoming’ is understood as a feature of our experience brought about in consciousness — there is no commitment to ‘becoming’ as a feature of time *per se*.⁹¹ As in Ismael’s view, the notion of ‘becoming’ does not imply a

⁹¹ Husserl says: ‘every concrete lived experience is a unity of becoming and is constituted as an object in internal consciousness in the form of temporality’ (Husserl & Landgrebe 1973, p. 254).

global or universal 'now', our 'now' can be understood as a purely indexical, subject-relative term.

Secondly, Husserl emphasises the connection between the process in which something 'becomes' present to us and our grounds for believing that thing is something actual and concrete. While Ismael and Husserl agree that we can play a role in determining what events happen, and which objects we are intentionally directed towards, the 'becoming' of events and objects seems to need more, it needs these events and objects to be actual, and independent of us, if they are to 'become' part of the fabric of the world. Husserl offers an account of how it is that we apprehend the actuality of events and objects in the process of 'becoming'. It should be noted that, as far as I can see, neither Ismael nor Husserl are committed to more than our perception or apprehension of the reality of the things we take as objects when we experience them as 'becoming.'

Husserl argues that we apprehend an object as 'becoming' present to us as a whole, as the sum of its temporal parts — as having an inner horizon of possibilities,⁹² brought about by protention and retention in a tacit process at the level of pre-reflective awareness. It is our apprehension of the unity of these temporal parts that underpins our experience of objects and events as having an identity over time, to be in time, to have a definite temporal position and so to be physical and actual (Husserl & Landgrebe 1973, pp. 168-169, 184-185). However, it is only in recollection, when temporal objects⁹³ can be 'present to mind' as temporal 'unities of *becoming* and *having become*'; that individual objects/events can be apprehended as having a place in a unique order of becoming, and an objective time can be constituted subjectively and intersubjectively (Husserl & Landgrebe 1973, p. 185). Therefore, it is in virtue of our recollection of events and objects 'becoming' that every actual object or event has its unique position in our time ordering.

I suggest that Husserl's view here supports Ismael's account by offering a deeper level of structure that reinforces her claim that our intuition of events and objects 'becoming' has its genesis in our sense of being participants in history whose actions make a difference to the events that we perceive to be unfolding around us (Ismael 2012, p. 150). The possibility of (veridical) perception is deeply connected with the structure of time-consciousness in his work, and I say more about this in Chapter 4, below. As noted above, his discussion of the implications of the link between becoming and actuality for the constitution of a time order, a time-line, of the kind Ismael describes above as a 'temporally evolving point of view,' likewise offers further support to her view. Finally, as noted above, in Husserl's account this kind of subjectively constituted time-line can form part of an intersubjectively constituted objective time, an objective history, and this also offers a further perspective which I suggest is relevant to Ismael's view.

⁹² See Chapter 1, pp. 36-38 for a description and discussion of Husserl's notion of the 'inner horizon'.

⁹³ Meaning the part of the experience of an object that is inherently temporal — it gives the experience its temporal features — but remains inseparable from the experience of the event/object itself as a whole.

SUMMARY

In this chapter I suggested that the combined work of Huw Price, Brad Weslake and Jenann Ismael on time and temporal experience can be understood to represent a distinct approach that I call Temporal Pragmatism. Woven through the chapter are observations of how various aspects of the work of Edmund Husserl, particularly on inner time consciousness, might inform the work that characterises the Temporal Pragmatist approach. I further suggest that Husserl's investigations and insights into the structural features of time consciousness and intentionality can inform Temporal Pragmatism's favoured genealogical accounts of concepts and practices.

This is borne out by the mutual acknowledgment of Husserl and the Temporal Pragmatists that we need to explain how the normative aspect of human life and language, arguably presupposed in the methodological and epistemological practices of science, can be accounted for. Price and Husserl offer programs — respectively, a subject naturalism (and in Price's later work a global Expressivism), and a universal 'logic of science', that aim to achieve this.

The Temporal Pragmatists and Husserl likewise identify and take as a theme the relationship between two perspectives we can take on science. Temporal Pragmatism understands this to be a contrast between a 'view from no-when' associated with the kind of objective stance on the world usually assumed by metaphysical theories of time (Price 2011e); and the perspective human beings take on the world in virtue of our particular and contingent perceptual, cognitive and conceptual make-up. All seek to broaden the scope of science to incorporate 'problematic' concepts, those which are not usually understood to refer to objects which are part of the domain of modern science, particularly physics. These include temporally modal terms for example; and the normative terms that we employ in validating our use of any and all concepts in terms of the role they play in human life and practice. Similarly, Husserl emphasises that his 'science-world' remains part of the 'life-world'. Showing how science-world can remain part of the life-world is, in part, a motivation for his development of a universal science; his goal being to develop a science of the normative, a science of subjectivity.

Both views acknowledge the wide-ranging pervasive influence of our awareness of time, and our temporal consciousness generally, across the spectrum of human life and practices, and its particular importance for our sense of agency (and responsibility) with respect to future events.

I discussed Frank Ramsey's distinction between our lived experience of the past, now fixed, for us, and a future which we understand offers us possibilities that are open to our deliberation, intervention and action; this is the basis of our experience of the temporal asymmetry of causation, an experience that he argues is the product of something 'in us', in our constitution. The view is a precursor of Temporal Pragmatism and developed further by Price and Weslake in their work on the temporal asymmetry of disjunctive deliberation in 'The Time Asymmetry of Causation' (2010).

Ismael's work on temporal experience shows how the rich textured experience of a future that is 'unwritten', a future that we influence and shape, is contrasted against a past that offers no possibilities open to our influence is, like our awareness of the temporal asymmetry of causation, shown to reside in features of 'us', of how beings like us respond to and cognise the world.

An implication of the perspectival view of time she and the other Temporal Pragmatists adopt is that our 'lived' everyday experience of time, and the time of science, can both be understood as constructions, albeit of different kinds. Both have their beginning in our practical 'pre-theoretical' (as contrasted with the modern scientific sense of 'theoretical') understanding of time, which, on the view developed here, is best understood as a product of the workings of our perceptual, cognitive and conceptual systems.

I argue that Husserl's view broadly coheres with the Temporal Pragmatists' understanding of the basis of our temporal experience. I compare and contrast relevant aspects of Husserl's work on inner time consciousness against Ismael's account of temporal experience, and show that Husserl's analyses of the structural features of time consciousness might inform the kind of genealogical approach to explaining the role of our temporal concepts she develops in her recent work.

Husserl's theory of inner time-consciousness brings out the deep structure of our temporal experience, it explains why, at the pre-reflective and reflective levels of awareness our experiences are temporally asymmetrical, inherently 'open', though still determinable, in the future-wards direction. Protention is foreshadowed as particularly important here. Husserl's theory of time-consciousness does not posit a temporal asymmetry in the external world, although the view is not incompatible with accounts of physical asymmetries in time, such as entropic directionality.

Temporal Pragmatism and Husserl's Temporal Phenomenology share some important similarities, as well as some enlightening differences, and there are significant ways in which the latter might offer support, and perhaps insights, to the former. I develop this theme in Chapter 4.

4: CONSTRUCTING THE OPEN FUTURE: PERSONAL TIME

...if at certain moments we revive the past in our memories or relive the past, this is precisely a matter of reliving or “living in”, while we live the future in a much more immediate manner, in the sense that our complete attention is primarily directed toward it (Minkowski 1970, p. 80).

OVERVIEW OF CHAPTER

There is, on the face of it, no obvious reason why human beings should experience the future as having possibilities we can shape, rather than experiencing events as simply unfolding passively, before us. The physics of time, as currently understood, is silent on this question, therefore a philosophical account that does justice to this intuition about future times and events must look beyond the resources offered by the physical sciences. However, the view to be developed in this chapter remains compatible with physics, and with those philosophical views of time (conventionally termed ‘Eternalist’ or B-theories of time) that argue that there is no inherent asymmetry of time; and that there is, in the nature of time itself, no basis for distinguishing between past, present or future times.

Having said this, it is acknowledged that the intuition that future times and events are open to our influence is more readily accounted for within a metaphysical theory of time that argues that time is by its nature asymmetrical; that future events and times are not yet actual and therefore there is no puzzle about why we have agency over future events, but not over fixed events in the past.⁹⁴ However there remain serious problems associated with this kind of view, as discussed in Chapter 2, and in keeping with the overall aims of this thesis an ‘Eternalist’ theory of time is assumed here.

This chapter and the next consider explanations of the asymmetry inherent in how we think and feel about past times and future times that are based in arguments that this asymmetry is a construct of the human mind rather than a feature of time itself. The discussion is structured in two parts considering, respectively, the personal and sub-personal levels of explanation, following the distinction made between the personal and sub-personal states in the philosophy of mind and the cognitive sciences.⁹⁵ This chapter discusses the personal level of our temporal experience.

I adopt Martin Davies’ (2000) levels based schema here and in Chapter 5. Davies (2000, p. 94), clarifies the relationship between the personal and sub-personal levels of description, noting that, in his view, an investigation of the mutual interaction between these levels does not imply the further goal of reducing theories at the personal level to

⁹⁴ Stephen Torre’s ‘The Open Future’ (2011) provides a comprehensive account of Presentist or A-theory approaches to explaining the Open Future intuition.

⁹⁵ Examples of the personal/ sub-personal distinction are found, for example: in Dennett’s ‘Content and Consciousness’ (1969), where the distinction is first introduced; in Varela’s ‘Present Time Consciousness’ (1999); and Gallagher & Zahavi’s *The Phenomenological Mind* (2012).

those at the sub-personal. This mutually informing, but non-reductionist, relationship within and between levels identified by Davis has a broad application to problems in both analytic philosophy of mind and phenomenology.

It is acknowledged that there are many ways of developing accounts of the relations between levels, with differing levels of ‘grain’ — Carl Craver, for example, has developed a detailed taxonomy of levels and their relations — however this level of detail is not necessary for the purposes of this chapter and the chapter that follows.⁹⁶ Further, it is acknowledged that while levels based accounts are commonplace in the literature of psychology and cognitive science they are not always considered appropriate to discussions in philosophy or phenomenology. I respect this view by distinguishing clearly between theories from cognitive science and psychology; and theories from philosophy and phenomenology, where appropriate. I posit no more than the possibility of theoretical interaction between disciplines where this appears beneficial.

The levels based account I develop here also makes use of ‘temporal bands’ which categorises events or phenomena according to their duration, organises the resulting categories and their contents into ascending or descending order, and represents them as distinct duration-spans or ‘bands’.

Temporal bands, like levels, can be used in different contexts, in different disciplines and for different purposes; and need not be part of levels-based accounts, although they can be. They are found in psychology: for example in Fraisse’s (1984, p. 29) characterisation of the relation between physical time and experienced, phenomenological time as discussed above in Chapter 1. Other examples of the use of temporal bands, without levels, are cognitive scientist Allen Newell’s ‘Time Scale of Human Action’ (Newell 1990, p. 122), and Craig Callender’s (2008) account of the integration of data from perceptual systems across varying temporal durations; the latter is a philosophical account that incorporates work in psychology and cognitive science within its discussion.

In what follows, a ‘personal level’ explanation is understood to be comprised of those mental and physical events that, broadly speaking, endure long enough for us to be consciously aware of them. The sub-personal level, comprising neural events and mechanisms, and information processing events in our brains of such brief duration we are not aware of them, is the topic of Chapter 5.⁹⁷

The generic, level based approach adopted here as a means of structuring the discussion, where each level is characterised in terms of the duration of events within it,

⁹⁶ See for example ‘Craver: A field guide to levels’ <http://folk.uio.no/anderstr/Craver.pdf> (accessed 12/03/2013).

⁹⁷ These categories are borrowed from Varela (Gallagher & Varela 2001; 1999) and from Gallagher’s (2013, p. 143) more recent discussion of them. There are three categories: the first ‘elementary’ level includes events that span a 10-100ms duration (and are sub-personal); the second, ‘integration’ level comprises events at 0.5 to 3 seconds that are experienced as present and ‘personal,’ and construct our lived experiences; the third level, the ‘narrative’ level is straightforwardly personal and involves memory, reflection and anticipations.

allows the terminology and concepts found in analytic philosophy of mind, psychology and cognitive science, and those of phenomenology, to be discussed within a common framework. This makes their similarities and differences more apparent. It furthers a key theme of this thesis: it demonstrates the relevance of phenomenological accounts of the mind — for example, discussions of sub-personal level protention and retention — to other philosophical approaches and disciplines (a relevance also identified by Gallagher & Zahavi 2012, pp. 2-6, 89-91).

In this chapter this levels based analysis is applied to the ‘open future’ intuition, and broadened to include the temporal asymmetries of value and, in particular, agency. Jenann Ismael’s (2012) reconstruction of the genealogy of the open future intuition, as discussed above in Chapter 3, is the catalyst for the personal level account of this intuition and the temporal asymmetries associated with it, developed below.

Ismael argues that our experience that the future is open to our influence can be explained in part by our awareness of our capacity, as agents situated in time, to make decisions and act in ways that can shape how future events will go. It is suggested below that a further aspect of this genealogical account of the open future intuition is self-responsibility in decision making. As a recent interpretation of Edmund Husserl’s work, undertaken by John Drummond (2010) suggests, self-responsibility reinforces our experience of being reasoning, valuing, decision making agents, who can, and do, responsibly influence future events. This furthers our intuition that the future is ‘open’ and can be shaped by our choices and actions.

Derek Parfit, in *Reasons and Persons* (1984), offers a defence of ‘Temporal Neutrality’, the view that our future bias denies us the happiest possible life and so we ought not to have it. In this chapter I discuss the reasons why he holds this view, and argue in response that this inherent bias towards the future in our thinking and concepts seems to be integral to our mental health and emotional well-being. Before this is embarked upon, I briefly discuss the constructed nature of personal time.

CONSTRUCTING PERSONAL TIME

As noted above, in the Temporal Pragmatist view, the constructed aspects of our experience of time are investigated and clarified by means of a genealogical analysis of the practical relevance and utility of the language and concepts we use in our talk and thought about time and features of our temporal experience.

Husserl’s reconstruction of temporal experience in his theory of time-consciousness spans both the personal and sub-personal levels and it is embedded in his theories of perception and epistemology. Nicolas de Warren notes that, for Husserl, our experience of time is:

Neither active, nor passive, neither received nor created, time consciousness is a medial form of self-constitution that cuts across — by undercutting and rendering at all possible — the distinction between “receptivity” [the taking in of

sensory information] and “spontaneity” [understanding] (de Warren 2009, p. 218).

As discussed above in Chapter 1 (‘The Basics of Husserl’s Theory of Time-Consciousness’), this sensory data becomes real for us, and knowable, only because of the temporal structuring of the data in the mind/brain, and the structures of intentionality that enable an understanding of this sensory data.

Husserl’s view as outlined here may seem similar to Kant’s ‘constructed’ mind-dependent view of the world, in that that to have Kantian personal level intuitions (direct knowledge of the world), we must intuit that what appears to us is in time [and space], i.e. we must see directly that what is experienced as being in the world necessarily has a spatio-temporal form which constructs our experience (Kant 1965, pp. 74, 83).

Norman Kemp Smith notes this is a problematic claim for Kant, for it is not clear if our experience of time does presuppose that a series of appearances necessarily represents something as being in time and space, and therefore as existing. As he further observes, a different but equally viable explanation is that a series of appearances presupposes an objectively real time, in which the thing that those appearances represent exists (Smith, NK 1962, pp. 123-125). As Husserl (1970a, pp. 103-105) also notes, Kant presupposes the existence of a spatio-temporal ‘surrounding world of life’, a world which exists as a unified and persisting world that underpins all our subjective experiences, as well being the source of the cultural, meaning-making aspects of life.

Husserl’s view avoids this presupposition by positing that our tacit awareness that we are experiencing a real and existing world is constituted in part by our directly taking in data from that external world, and in part by the (temporally structured) processing undertaken by cognition in response to that data (1970a, p. 98). Our experience of the world is structured by time-consciousness, and built into that structure is the means of attaining evidence for the veridicality of our perceptual experiences, in virtue of the capacity for ‘understanding’ noted by de Warren, above.

Kant assumes the existence of a pre-given existing world, whereas Husserl develops a theory of evidence that shows how we can know that the ‘thing in itself’ in the external world exists independently of us, although the evidence that supports this knowledge is inherently revisable and hence our knowledge is fallible and defeasible. Husserl’s theory of evidence — which is entwined with his theory of time-consciousness — is discussed in more detail in later sections of this chapter, below.

Our personal level experiences of time are the cultural and social fabric within which we live and weave our life, and their ubiquity invites a philosophical investigation of the extent to which our lives and well-being are influenced by the temporal directionality of our thinking and our reflections on, and thoughts about, time itself.

Derek Parfit addresses these issues in his *Reasons and Persons* (1984), an important text in the fields of ethics and the metaphysics of the self.

PARFIT'S 'TEMPORAL NEUTRALITY'

In *Reasons and Persons*, Derek Parfit (1984, pp. 170-177) argues we would be better off if our attitude towards events in our lives was one of 'temporal neutrality'. That is, while we are aware of the distinctly salient and imperative character of the feelings associated with thinking about future events when compared to our thoughts about events now in our past, in Parfit's view this temporal bias is bad for us. If we could, we ought to view events in our near future with the relative insouciance we feel towards events that are now in our near past, for our bias towards the future robs us of the happiest possible life (1984, pp. 176-177). For Parfit, it is our different emotional response to events at different temporal locations, and not merely how we value these events,⁹⁸ which is important in the development of his argument.

While the view developed in this chapter, and the thesis overall, does not endorse Parfit's temporal neutrality, it is acknowledged that this strategy may have benefits in some particular situations. Parfit's view is cited by psychologist Daniel Gilbert and his colleagues (Gilbert, Caruso & Wilson 2008, p. 800), who note that in decision making about events now in the past:

...the value of past events...decreases with their temporal distance from the present but ... it decreases more sharply than does the value of future events, thus creating a fundamental asymmetry — a "wrinkle in time", so to speak — such that future events are valued more than equivalent events in the equidistant past (Gilbert, Caruso & Wilson 2008, p. 796).

Unless this temporal bias is overtly identified and compensated for, it seems that these kinds of value judgments are likely to be less impartial than we take them to be. Gilbert, et al. (2008) call for research into understanding the psychological basis of this temporal asymmetry in decision making, and their discussion suggests that Parfit's view can be adopted as a strategy for fairer, more impartial decision making in these particular kinds of situations. However, Parfit argues that temporal neutrality is a strategy for achieving happiness and well-being in our lives overall, rather than merely a strategy for use in specific decision making situations.

The extent to which Parfit thinks that we can achieve temporal neutrality in practice is not completely clear. He suggests that some of us ('more passive types') already exhibit a temporal bias towards the future to a lesser extent than others (Parfit 1984, p. 176), and that it is at least coherent to think that a person could lack a bias towards the future (Parfit 1984, p. 174). He notes that it is plausible to claim that: '...in our concern about our own interest, we should be temporally neutral' (Parfit 1984, p. 194).

⁹⁸ See also the discussion of Horwich's view in Chapter 2, 'Asymmetries of Human Knowledge and Experience', above.

On the other hand, he also says that:

On any plausible moral view it would be better if we were all happier. This is the sense in which, *if we could*, we ought not to be biased towards the future...(Parfit 1984, pp. 177, my italics).

This might suggest he thinks we cannot overcome our future-bias, particularly to the extent that it is a feature we have in virtue of Evolution, as he goes on to remark that: 'In giving us this bias Evolution denies us the best attitude to death' (Parfit 1984, p. 177). However, this quote might also be interpreted as suggesting we *could* overcome the bias, perhaps where it is more susceptible to rational criticism, such as in our concepts and thinking, and if we could, we ought to. In any event, his claim that our lives would be happier overall if we did not have the future bias, and therefore we ought not to have it is unambiguous, and it is this claim that is the main focus of the discussion that follows.

Parfit's argument that our future bias is bad for us, and his defence of temporal neutrality, does not amount to a rejection or refutation of the 'open future' intuition. However it is representative of a kind of argument, reminiscent of that developed by the Stoics, that can be interpreted as an objection to any overt defence of the positive role that the mental states associated with the 'open future' intuition — expectation, desire, and hope, for example — play in our lives. The Stoics argue that our lives will go better if we seek to curb our 'passions', that is, our emotions; and of particular relevance here, our 'appetites' — our future oriented cravings and yearnings (Long & Sedley 1987, p. 412 citing Stobaeus).⁹⁹ Parfit's argument against our 'future bias' seems in some respects to be a modern version of this Stoic argument.

His positive argument for temporal neutrality can be understood as a challenge to the view developed in this chapter: that the future oriented feelings, emotions, valuings and motivations that are broadly associated with our future-directed attitudes and mental states, and the 'open future' intuition, are not only pragmatically explicable and in some respects biologically indispensable, but also positively beneficial to our mental well-being.

Parfit's view of our temporal asymmetry of value and our future bias more generally is discussed in work by Paul Horwich (1987, pp. 196-198). Horwich's discussion of value asymmetries in his *Asymmetries in Time* (1987) is brief, but he draws out of his discussion of Parfit's work the point that the most interesting aspect of the temporal asymmetry of value is consistent with a biological explanation, as opposed to an explanation in terms of a response to asymmetric properties of, or in, time itself. That is, the asymmetry of value — our future bias — can, in part, be explained by reference to

⁹⁹ However even the Stoics viewed the future-directed states of wishing and desiring in a positive light, deeming them 'well-reasoned' (Long & Sedley 1987, p. 412 citing Diogenes Laertius). They would also have counselled against excessive past-directed emotional responses.

the asymmetry of the mental processing that motivates us to strive to achieve what we need to survive and flourish.

This processing always begins with desire, passes through deliberation and actions and (hopefully) ends up with fulfilment, and is never reversed (Horwich 1987, p. 197). At the most fundamental level, it enables us to want, and to get, feeding and mating opportunities and allows us to foretell and forestall events that might prove detrimental to our survival. Desire and its fulfilment are thereby deeply entwined with our survival and our well-being and flourishing: as well as deeply connected to our future bias.

Suhler and Callender (2012, pp. 2,4, 11-12) also refer directly, if briefly, to Parfit's discussion of in their comprehensive account of the value asymmetry. Like Horwich, they conclude that the future-oriented emotions and attitudes that characterise this asymmetry are best accounted for in theories from evolutionary psychology and in work from cognitive science.

They note the capacity of 'contextually appropriate' future-directed emotions to motivate an organism towards, or away from, desirable or undesirable action as posited in psychological studies (2012, pp. 11-12). They explain that since the causal asymmetry ('so far as we know, causation operates forward in time but not backward' (2012, p. 12)), means that present actions can affect the future but not the past, there would be little reason for Nature to provide an organism with a disposition to feel a stronger emotional response, positive or negative, when thinking about events now past and done with, when compared with the valency of appropriate emotional responses to imagined future events. A strong emotional response accompanying thoughts about an imagined or recollected event now in the past would have no practical effect on what the organism could do to affect that past event. However, the situation with respect to future events is markedly different; here a heightened emotional response accompanying an imagined future event can motivate the organism to act in a particular way so as to influence the outcome of that event. Therefore it makes sense that Evolution would, in the appropriate contexts, promote stronger feelings about imagined future events, than about those in an imagined past. Suhler and Callender suggest, therefore, that the causal asymmetry, in part, explains the temporal asymmetry of emotional valency, and the temporal asymmetry of emotional valency explains the value asymmetry (2012, p. 12).¹⁰⁰

Suhler and Callender also cite a paper by Maclaurin and Dyke (2002) which introduces the useful notion of 'tensed emotions' to describe those emotions that are specifically directed to past, present or future events or states of affairs (2002, p. 278). Like Horwich, and Suhler and Callender, Maclaurin and Dyke also take evolutionary biology

¹⁰⁰ Suhler and Callender (2012, p. 13) emphasise that: '...we do not believe the value asymmetry is the result of a dedicated suite of affective and evaluative mechanisms that evolved solely for dealing with past-future choice'. They see the representational capacities that characterise the asymmetry as developing gradually in human beings, with 'pre-existing mechanisms for valuation and choice' applied to these new capacities as their development progressed.

to be a likely source of insight into the genesis of tensed emotions, and the value asymmetry they associate with those emotions in their paper.

Parfit (1984, pp. 169-170, 177) acknowledges the evolutionary, biological basis of the temporal asymmetries of valuing and its associated feelings in his discussion, and his view does not present a problem for the accounts developed by authors discussed above. However, I suggest that the focus of their views on the evolutionary advantage conferred by value asymmetry and tensed emotions leads them to overlook the further, important claim that Parfit is making here. This is the claim that we would be happier if we were not biased towards the future, and hence we ought not to be so (Parfit 1984, p. 177). In the discussion to follow it is this claim that comes into focus, and it is argued that this aspect of Parfit's view is problematic, and we should embrace the temporal asymmetries of value and of the affective responses that accompany thoughts about past and future events.

To develop the discussion I draw from a series of empirical studies described and discussed by Eugene Minkowski, suggesting that some of our future-oriented, evaluative and anticipatory mental states and emotional responses are positively associated with our psychological well-being. Moreover, Minkowski's work also gives reasons to think that the inhibition of future oriented feelings may be associated with pathological mental states.

These studies add weight to positive explanations of why we experience an asymmetry of value and emotional valency that privileges the future, and extends and expands the biological and psychological account of this asymmetry developed by Suhler and Callender, and Maclaurin and Dyke. The studies also suggest this asymmetry is associated with human mental health and flourishing, and could be so independently of any physical directionality of time. Hence these views also support the view that temporal asymmetries are mind-dependent.

Parfit's discussion is primarily concerned with the personal level, affective, cognitive and conceptual aspects of the future bias, and considers a possible objection to temporal neutrality, based on the claim that our future bias is necessary as a spur to action. He begins with the observation that an important feature of anticipation, hope and desire is their capacity to motivate us, to be the impetus that drives us to achieve things, a capacity also noted by Horwich, above. Parfit employs a conceptual analysis of 'desire' in developing his response to this objection.

Parfit notes that while it seems right to say that our conception of an 'act' is necessary but not sufficient for the concept of desire,¹⁰¹ he further suggests that desire, and anticipation, mental states which we normally take to be inherently future directed, can, under some conditions, be equally rationally directed towards events in the past (Parfit 1984, pp. 170-174), and on this basis they can be understood to be temporally neutral.

¹⁰¹ In the context of desire as a 'motivation to act' we would expect the act in question to be in the future, however.

In support of this claim, he argues that we experience a kind of backwards directed desire or anticipation [or hope] when we desire that an event happened in a certain way, in circumstances where we do not know if the actions we took to achieve our desire were successful (Parfit 1984, pp. 171-172). In Parfit's view, then, we can desire that an event happens in a certain way irrespective of whether the event is in our past or our future, and irrespective of whether we can know the outcome. However, this seems to overlook an important element of desiring and hoping. This is the fact that in cases where we can know if the event we desire has happened or will happen in the way we hope it will, then knowledge of the satisfaction or fulfilment of our desire (or its thwarting) is of importance to us.

His argument that we can understand desire to be a temporally neutral mental state is illustrated by an example. He describes his desire that an already posted letter arrives before its recipient (who is terminally ill) dies, in circumstances where he does not know if it will be, or has been, delivered in time for her to read it. He argues that what is most important to him, as the sender, is that the letter is received before the death of its recipient. He says:

If desires are essentially forward-looking, I must be held to be in two states of mind: a conditional desire, and a conditional hope. I must be said to want my friend, if she is alive, to get the letter before she dies and to hope, if she is dead, that she got the letter before she died. But this description, even if linguistically required, is misleading. My 'hope' is in its strength and nature just like my 'desire'. What I want is that my friend's getting the letter precedes her death. Provided that these events occur in that order, I am indifferent to whether they are in the past or future (Parfit 1984, p. 171).

He argues that his indifference about whether his desired event is in his past or his future indicates that desires (and hopes) need not be understood to be inherently future-directed.

A contrasting view of 'desire' is suggested by Eugene Minkowski.¹⁰² Minkowski argues that a desire about a past event, an event whose outcome we do not as yet know (and may never know) can be equally well understood as a desire directed towards something in our future — a desire for knowledge that the event went the way we intended — knowledge that we hope to receive. Although our desire may be about an event in our past, any knowledge about the outcome, and any knowledge of the fulfilment or thwarting of our desire can only occur in the future — and this knowledge matters to us. The point is demonstrated by this example:

In everyday life desire and hope can seem to be concerned with the past. I hope that my friend has not perished in the railroad catastrophe that the newspapers

¹⁰² Eugene Minkowski was a psychiatrist and philosopher who argued that relevant philosophical methods and theory, suitably altered to reflect their different context, can inform studies in psychopathology (Minkowski 1970, pp. xxxviii-xxxix).

announced this morning and is not on the list of victims that is still to be published, that I will receive later. It is easy to account for this by saying that it is a question of a past which we do not know and which thus resembles a future more than a past. Further, the news of the catastrophe makes me hope for news concerning my friend that I expect from one moment to the next; there is thus future in my hope (Minkowski 1970, p. 93).¹⁰³

Parfit and Minkowski's examples are sufficiently similar to enable a comparison to be made — and this comparison suggests that the mental state that we are in when we desire that an event happens in a particular way is as Minkowski describes above: it matters greatly to us whether our desired outcome eventuates or not. In Parfit's case, where his 'strongest desire' is that his friend receives the letter before she died, it seems it should be of great importance for him to try to ascertain if his desire was satisfied or not, yet he does not discuss this aspect (Parfit, 1984, p. 171).

As noted above, Parfit does not appear to take the question of whether we know, or seek to know if our desire is satisfied to be a relevant factor in understanding 'desire' as a concept. However Minkowski's example, above, suggests that wanting to know if our desires are satisfied is an important feature of what we understand having 'desires' and 'hopes' to mean.

It would almost certainly be possible to determine whether the letter was received, and his desire satisfied, in Parfit's scenario. There are several sources of information he could use: the letter was sent by express mail, and so the post office would be able to track its date of receipt; newspaper notices, or mutual friends, could provide the date of his friend's death. Even if Parfit was unable, in the end, to ascertain if his friend did receive the letter it seems reasonable to think it should have been a matter of great importance to him to attempt to find out if the letter was received, given the professed strength of this desire.

Minkowski's view suggests that desires and hopes, even those ostensibly about past events, retain a future orientation with respect to knowledge of the fulfilment, or otherwise, of those desires. The most salient temporal factor in the examples discussed above is not the temporal location of the event that the desire or hope is about, which can indeed be in the past, but the temporal location of the event that will satisfy the desires and hopes themselves, that is, the event of receiving news of the desired outcome. This will always be in our future.¹⁰⁴

¹⁰³ Minkowski's *Lived Time*, cited here, is a deep and penetrating account of future directed experience: he also has an interesting view of the role the past plays in our lives. He takes the past, primarily, to provide us with an impetus towards future action: a motivation to surpass all we have achieved in our lives to date (Minkowski 1970, p. 157).

¹⁰⁴ It seems that there are actually two objects of desire in this scenario: that the letter is received by his friend before she dies; and the knowledge that his desire is satisfied, or not (thanks to Garrett Cullity for this remark). The first, if Parfit's view is granted, can be a back-wards-directed desire or a future-directed desire and so, is temporally neutral; the second is always future-directed. But this suggests that if the concept of desire includes the possibility of back-wards desires, as Parfit argues, and if Minkowski's view that knowing our desire is satisfied is an important aspect of

Moreover Minkowski suggests, evocatively, that desire and hope are: ‘...continually contributing to [the future’s] creation and recreation before us’ (1970, p. 17), suggesting these states play an important role in how we understand — and construct — our experience of time. This supports the view that aspects of how we conceptualise time, particularly the definitive aspects of ‘the future,’ can be explained in part by the workings of our cognitive and conceptual systems; by our human perspective on the world. It also presents a challenge to Parfit’s view that we can think and talk in temporally neutral terms for these concepts seem to be bound up with how we perceive and understand time and the world and are unlikely to be easily changed.

On this basis I suggest Parfit’s argument overlooks an important feature of desire and hope, and the emotions they evoke, a feature that is not temporally neutral. It calls into question Parfit’s suggestion that our language can be rendered temporally neutral without loss of meaning.

Parfit’s second argument in support of temporal neutrality addresses his more specific claim: ‘...if we lacked the bias towards the future, this would be better for us’ (1984, p. 177). He begins by asking us to imagine that we can adopt an attitude of feeling the same way about things in our past as we do about those in our future, so that ‘...looking backward could be equally pleasant as looking forwards, or in the case of pains, equally distressing...’ (1984, p. 175). Then, we selectively forget most of our bad memories, while rehearsing and focusing on the good memories, to the extent that the balance of good memories comes to outweigh the now ‘neutralised’ feelings we have about the future (which we still need to keep in mind, good or bad, so we can react to them and forestall harmful events). The result would be that focusing on the past would be more enjoyable overall than thinking about the future (1984, pp. 174-175). In effect, Parfit’s view suggests we will construct a happier future for ourselves if we adopt this strategy, even if we no longer think and feel about the future in the way we are accustomed to.

A stark example Parfit (1984, pp. 174-177) uses to develop this point and to bring out the implications of this strategy for our overall happiness, asks us to consider how we feel about our own ageing and death. To help us to do this Parfit suggests we imagine that we have just begun to exist, and, at this stage of our lives, we might regret having nothing to look backwards on, although we have our whole life to look forwards to. Adopting the temporally neutral perspective allows us to see that this situation is mirrored by our experiences as we draw towards the end of our existence: we have little to look forward to, but everything (and mostly good things, since we have forgotten most of the bad) in our lives to look backwards on. Parfit argues that there is

the concept of desire is right, then we need both these ‘objects of desire’ in this kind of scenario, if we are to make sense of it as a case of desire at all. If so, there remains an inherently future oriented object of desire, the second, in this scenario. Therefore the scenario is not, as a whole, an example of a temporally neutral desire — unless Minkowski’s concept of desire is wrong. Minkowski’s concept of desire coheres well with our experience, however, arguably more so than Parfit’s. This problem does not arise in straightforwardly future-directed desires which are always satisfied by events in the future.

in fact no rational reason to feel differently about the latter case than the former (1984, pp. 176-177), and if we *were* like this, and it led to us no longer dreading our death, our lives would be happier than if we were temporally biased.

He acknowledges that for some people there is a particular pleasure in planning and anticipation, a future-directed pleasure that any benefit from not having the future-bias cannot capture nor compensate us for (Parfit 1984, p. 176). Notwithstanding this, he maintains we would be happier overall if we lacked this bias towards the future.

Like Parfit, Minkowski takes a wide ranging approach to understanding how the way we think about the future might influence our quality of life. However, Minkowski does not endorse temporal neutrality. On the contrary, in his discussion of a case study of a young woman with depression, he observes:

...our life as we already know...is oriented toward the future, and this orientation is accompanied by a feeling of blooming; our personality advances parallel to the progression of ambient becoming (Minkowski 1970, p. 302).¹⁰⁵

His research is focused on better understanding the causes of severe mental disorders, and his conclusions suggest that some of these disorders are associated with disruptions to the normal functioning of mental processes, something awry in the structuring mechanisms that normally bring about the future-oriented-ness of our thought. Why this might be so requires more investigation. However it suggests, at least indirectly, that we should be cautious about agreeing with Parfit that our future bias is bad for us — and we should undertake further research to better understand the role future oriented thoughts and feelings play in our mental life, and to better understand the underlying mechanisms and structures that support them.

Minkowski's view is informed by psychopathological case studies rather than 'armchair' examples, hence his methodology and scope differs from Parfit's, although, like Parfit, he takes the study of temporal experience to be a means of advancing our wider understanding of human life, action and thinking. However, his work suggests that even if we could adopt temporal neutrality in the manner Parfit suggests, above (Parfit 1984, p. 174), adopting this approach would not make our lives happier. In particular, Minkowski suggests that our future tensed emotions, and future directed mental states play a role in constructing much of what we understand as defining 'the future'; including its characteristic sense of openness and possibilities (Minkowski 1970, p. 102).¹⁰⁶ Therefore we may compromise our sense of agency over our future; our sense

¹⁰⁵ 'Ambient becoming' captures our subjective awareness of events in the world unfolding around us and connotes a sense of on-going renewal and change. It reflects Minkowski's admiration of the work of Bergson, who coined the term (see Urfer 2001, p. 280). It need not, in the context of my discussion, evoke Bergson's wider theoretical commitments.

¹⁰⁶ This view coheres with Suhler and Callender's (2012, p. 2) explanation of the temporal value asymmetry, and tensed emotions, in that it emphasises the importance of psychological and evolutionary mechanisms in bringing about some of the subjective features of our lived experience of time. Minkowski's view, like Suhler and Callender's, offers support to the view that much of our temporal experience can be explained in mind-dependent terms, rather

of free will and our sense of responsibility if we choose to compromise our future-wards orientation. This suggests that, if Minkowski is right, then Parfit is wrong to think that our lives would be better without the bias towards the future.

In more recent work, philosopher Shaun Gallagher has interpreted Minkowski's discussions of psychopathological case studies within the framework of Edmund Husserl's philosophy of time consciousness. I return to Minkowski's work in the context of Gallagher's discussion of how sub-personal, future oriented, 'protentional' mechanisms normally play a positive role in enabling our sense of agency for action and thought; while their curtailment is associated with psychopathological symptoms, below, in Chapter 5.

Gilbert et al. (Gilbert, Caruso & Wilson 2008, p. 800)¹⁰⁷ observe that Parfit's temporal neutrality has yet to be adopted in our practical life. We recognise implicitly and explicitly that temporal asymmetry permeates human life in many of its dimensions, and in many positive ways. In what follows, I offer reasons to think that our bias towards the future, and the related intuition that our future is 'open' to influence by our agentive actions, are essential to human life and flourishing. Parfit's view, while interesting, cannot convincingly show that our temporal bias towards the future is bad for us, while Minkowski's work suggests temporal asymmetries play a positive role in our well-being.

This discussion also gives support to the view that there are good biological, adaptive and personal (conceptual) reasons that can explain our experiences of future oriented temporal asymmetries, reasons that need not appeal to features of physical time.

THEMES FROM ISMAEL'S 'DECISION AND THE OPEN FUTURE'

In her 'Decision and the Open Future' (2012), Jenann Ismael weaves a tapestry of interconnecting strands or themes that underpin our intuition that the future, but not the past, is open to our influence. These themes are:

1. We have an embedded perspective in time. We look backwards to our experience of what we have achieved, how we have shaped events, and forwards to what we can do in the future. When we deliberate and decide how to act we make reasoned assessments of our capacities, in terms of what we already know about causes and possible interventions we effect in the world, we form volitions to act according to rational assessment of our capacities in the situation, and then we act. We see ourselves as 'participants' in the events we see around us because we see the results of our deliberations and decisions (2012, p. 152-153).

than as a response to any physical property of time. See also Jenann Ismael's 'Decision and the Open Future' (2012) for a recent view developed broadly along these lines.

Parfit's view is also broadly compatible with this mind-dependent view although I do not suggest he endorses it.

¹⁰⁷ Gilbert et al (Gilbert, Caruso & Wilson 2008, p. 800) cite Seneca (transl 1932), and Parfit's notion of 'Temporal Neutrality' (*Reasons and Persons* 1984, pp.170-174) when they note that: "'temporal neutrality" has fallen on generations of deaf ears because, whether it is rational or not, people do care more about the future than the past'.

2. Our beliefs about our own future actions are of a different nature to the beliefs of other people about our future actions, and of a different nature to our beliefs about the future actions of other people. Unlike the evidence other people may use to predict the outcome of our deliberations, any evidence we might use to predict the outcomes of our own deliberations is irrelevant, for any evidence about what we might do is trumped by what we actually do. Our actions in this sense are performative, and immune to evidential concerns (2012 p. 154-157).
3. Our reasoning about the future is reasoning about events that our decision will to some extent bring about, and hence this reasoning is based on a different, privileged assessment of probabilities, compared to that of a detached observer (2012, pp. 158-159).
4. Finally, as Ismael puts it, 'For the will, to be, really is to choose' (Ismael 2012, p. 160). However ambivalent we may be about the possibilities open to us, there is no ambivalence about the fact that only *we* can ultimately decide between competing choices — and to exercise our will in doing so. While others may follow us, we have to clear our own path (Ismael 2012, p. 160).

While there are more themes underpinning the open future intuition than Ismael discusses here, she makes her case more than adequately: all of the themes noted above work towards creating our experience of our own volitions and actions shaping future events in a process we influence but cannot avoid. In part, then, it is in virtue of our deciding and acting that we construct for ourselves the appearance of an open future. In what follows I consider a further aspect of this construct, taking Ismael's description of 'deciding' as my starting point:

[In deciding] an agent takes stock of her situation in the world, considers the actions that are available to her, explores the potential downstream consequences of potential actions and makes a choice on her assessment of those consequences (Ismael 2012, p. 152).

She goes on to say that in the process of deliberation it is our exercising of volition which is crucial to our sense that our deliberations result in actions that can change or affect the future: '...an agent regards as available to her only actions that are under volitional control, that is to say, actions that can be brought about by willing them so' (Ismael 2012, p. 153).

The resulting actions: those we observe to have effects in the world; to be under our own control and enacted by our mind and body, produce the sense of agency we feel we have over future events, but also, a corresponding sense of responsibility for them. Drawing from Husserl's work as interpreted and discussed by John Drummond, I discuss the affective and normative elements, as well as the pragmatic elements, in decision making, agency and action, and suggest that these elements also contribute to our intuition that the future is open with respect to those decisions and acts. In addition to the practical realisation that we can affect how future events will go, we feel satisfied

that we have made a responsible decision and acted well, or perhaps, we feel regret that we have not. This sense of responsibility and the emotions experienced as we reflect upon our decision, the resulting action, and its outcome, serve to reinforce the sense that the action was the result of our own volition, and hence ‘freely’ made in a future open to our influence. Otherwise, in normal, non-pathological cases of deliberation and action, there would be no reason for us to experience a sense of responsibility for our decision and its outcome, and no cause for reflective feelings of satisfaction or regret directed towards them.¹⁰⁸

The discussion to follow also furthers the project of demonstrating how Husserl’s work may complement analytic views, including Temporal Pragmatism, for I suggest self-responsible judging and decision making can be consistently incorporated within Ismael’s (2012) view, and the Temporal Pragmatist approach more generally.

SELF-RESPONSIBLE DECISION MAKING

To be a ‘self-responsible’ decision maker is to be self-responsible for the evidence on which we make decisions, according to John Drummond’s interpretation of Husserl’s theories of evidence and judgment (Drummond 2010, p. 445). Drummond describes the notion of self-responsibility as one that is realised in our everyday experience, in virtue of:

...the transition from passively accepting beliefs that are handed down in tradition or communicated by others to the active taking over of a judgmental content as my own conviction, one for which I have intuitive evidence (Drummond 2010, p. 445).

However this critical attitude towards the justification of our own judgments shares the same basic structure, the same ‘seeing that’ a thing or a state of affairs is actually, presently, fulfilling my ‘meaning’ or my ‘judgment’ that something is so, that is at the heart of all levels of Husserl’s theory of evidence (Drummond 2010, pp. 442-443; Russell 2006 p. 119). Therefore I begin with an overview of the basic features of Husserl’s theory of evidence, before discussing Drummond’s work on self-responsible judging and decision making in more detail.

EVIDENCE AND JUDGMENT

Husserl develops a sophisticated and nuanced account of evidence in his *Formal and Transcendental Logic* (1969). It is distinguished from evidence, as generally understood in analytic philosophy, by three features:

- a) It is not only concerned with logical relations between propositions;

¹⁰⁸ This acknowledgment of the importance of responsibility as a constituent part of the open future intuition converges in some respects with debate in the literature about free will and determinism and the implications of various theories discussed within that debate for the possibility, and nature, of human responsibility. A full engagement with this debate is beyond the scope of this thesis. However, the discussion of responsibility below offers independent, if indirect, support to compatibilist and subject-naturalist accounts of these phenomena.

- b) Husserl incorporates retention and protention into his account of perceptual knowledge, so that every perceptual experience comprises a tacit anticipation, and a tacit retaining, of sensory data. This structure distinguishes Husserl's account of perceptual evidence quite markedly from other views;
- c) It is a fallibilist theory of knowledge.¹⁰⁹

In Husserl's theory of perception, we are intentionally directed to our object, and the intention is fulfilled by a direct presentation of the thing we intend in just the way we intended it. 'Evidence' refers, at the most basic level, to this kind of intuitively 'seeing that' the way we 'judge' an object in the world to be is correlated with a direct and present sensuous experience of the thing, that confirms our object *is* as we take it to be (Husserl 1969, pp. 158-160).¹¹⁰ In its combination of direct sensory experience with tacit reasoning ('judging') processes, Husserl's theory of self-evidence is reminiscent of Wilfrid Sellars' theory of perceptual knowledge as presented in *Empiricism and Philosophy of Mind* (Sellars 1956).¹¹¹ Husserl's theory of evidence also utilises the same framework, suitably modified, to explain our evidence for 'categorical' objects:¹¹² these involve our experiences of combinations of things and the relations between them and can be quite complex, our 'seeing that' the clock is telling the wrong time, for example.

This intuitive 'seeing that' something is so — often called self-evidence¹¹³ in Husserl's work — that characterises fulfilled perceptions and judgments should not be confused with a feeling of 'rightness', for in the immediate awareness of the coherence of our thought and the world there is no emotion or affective component. Self-evidence in a Husserlian context is, emphatically: '...not a feeling, it is a rational and objective "experience of truth"...' (Husserl 1970b, pp. 194-195 cited and discussed in Russell 2006, p. 99). However while our feelings are *not* part of our original evidence for the

¹⁰⁹ See also note 36 for a brief discussion of how Husserl's theory of evidence differs from theories of evidence developed in analytic philosophy, and note 113 below.

¹¹⁰ 'Intuitively seeing that' something is the case, in this context, should be understood to be a 'passive' experience in the context of Husserl's theories of intentionality, where 'passivity' refers to something brought about below the level of reflective awareness. In this case it is a passive directionality, a structuring and organising that enables an object of our consciousness to be experienced as 'already there' for us' (Drummond 2008, p. 154; Moran & Cohen 2012, pp. 236, 265-266). At the more fundamental level of inner time-consciousness, the structuring and organising of sensory information is called 'passive *synthesis*', and this is a tacit 'bringing together' of information in the service of a coherent sensory perception of the world (Moran & Cohen 2012, p. 236).

¹¹¹ See Gail Soffer's (2003, pp. 309-310) comparison of the views of Sellars and Husserl, where she observes that: 'Husserl's analysis [of perceptual evidence] makes much the same point generally associated with Sellars: even seemingly very simple perceptions involve quite complex implicit judgments, which in turn generally require learning, concepts, and language'.

¹¹² Although it must be noted while the structure is fundamental it applies to many different kinds of objects and the ways in which different objects present or 'show' themselves in evidence will differ significantly (Husserl 1969, p. 161).

¹¹³ The concept of 'self-evidence' as used historically, to describe Euclid's axioms as 'self-evidently true' for example (Dainton 2010b, pp. 219-220), differs significantly from Husserl's usage, for Euclid's axioms are thought to be apriori and indefeasible, whereas Husserl's 'self-evidence' is defeasible in the face of any new and stronger evidence that cancels out, or calls into question, existing evidence.

veridicality of a direct ‘seeing’ or presentation, they can track, or respond to, this intuitive ‘seeing that’ something is actual, or is the case (Drummond 2009).

Husserl’s theory of evidence is ‘related to the whole life of consciousness’, it is a passive yet still directed intentionality towards the world that has an inherent order, it has a ‘pointedness towards “reason” and even a pervasive directedness towards it...’ (Husserl 1969, p. 160). This tendency to strive towards a better understanding of the world, even as we perceive it, can be understood as an implicit striving towards correctness.¹¹⁴ However, Husserl observes that in everyday life a person often “merely looks and sees” if something is actually thus’ and is satisfied with his first ‘seeing’, seeking no further verification (Husserl 1969, p. 125). When we judge that a state of affairs is a certain way, we are inherently aiming for the best possible evidence in support of our judgment but in practice we often settle for less. This is made more apparent by a comparison of these kinds of everyday judgments, and scientific judgments.

The scientist — as an exemplary critical thinker — understands that evidence has degrees of clarity and may be vague or confused at first. A scientist will seek verification of an initial judgment by continuing to strive for the best evidence possible, and will ‘zig zag’ between seeing the intuitive given-ness of something ‘itself’ and then going back — with a critical attitude — over previous results, reassessing his judgments in the light of new evidence and repeating the process as required (Husserl 1969, p. 125). In Husserl’s view, in this process of striving for further verification, the scientist is guided by the *idea* of evidence that is perfect, ‘or perfectible by systematic stages’ (Bachelard 1968, p. 69; Husserl 1969, p. 125).¹¹⁵

In his discussion of this theory of self-responsible evidence, John Drummond acknowledges that this level of verification of evidence is not usually considered to be part of our everyday judgments — that, in contrast with the critical thinker, or scientist, when we judge in our everyday life that something is so, our focus is normally on what we are judging, that is, on the ‘objective state of affairs’ before us, rather than on the logical proposition that articulates the judging (2010, p. 444). However, he notes that in cases where we have reason to doubt an ‘everyday’ judgment then we do critically assess our attitude towards the judging; we question its truth and our grounds for believing it (Drummond 2010, p. 444).

¹¹⁴ Interestingly, recent work in predictive coding theories, to be discussed briefly in Chapter 5, below, provides independent support from the cognitive sciences for this view, suggesting that our brains have an inherent directedness towards securing ever more accurate predictions of imminent sensory experiences, with the aim of generating optimally accurate representations of the world.

¹¹⁵ John MacNamara (1986, p. 28) notes that we have intuitions that certain forms of inference cannot under any circumstances lead from true premises to false conclusions. What he refers to, along broadly Chomskian lines, as ‘logical competence’ is ‘error free’, and, importantly: ‘...we have an intuition that the principle of non-contradiction could never under any circumstances prove false. There is a sense in which logical intuition prompts us to seek an ideal in our logical thinking, an ideal of absolute clarity and rigor’ (MacNamara 1986, p. 28). It may be this kind of ideal in our logical thinking that Husserl has in mind here.

Then — as is the case with the scientist — our attention is directed both to the state of affairs we are judging, and to the ‘judging’ itself, to the proposition that expresses that they are so (Drummond 2010, p. 444). In Drummond’s view, based on his reading of Husserl (1969, pp. 142-143), our becoming aware of the logical aspect of our judgments — of a judgment’s propositional content — comes about in virtue of our questioning the truth of our own judging, in the same manner adopted by the scientist (Drummond 2010, p. 444).

In everyday life this critical assessment of our judgments may be prompted by reasons that are normative, evaluative and which arise as ‘feelings’ or emotional responses. It is in virtue of these normative, evaluative reasons we have in support of our judgments that we are oriented towards what is ‘genuinely valuable’ and right (Drummond, 2010, p. 450); we see that the thing or states of affairs is given with intuitive fulfilment, and then, sometimes, have an affective response to it. We may and often do make a value judgment about the thing or situation on the basis of reflection on this tacit affective response or feeling.¹¹⁶ Thus, the value attribution, the affective response to stimuli, may in turn itself be justified by self-assessing emotions, when we check that our emotional response is appropriate to the situation at hand (Drummond 2010, pp. 446-450). Just as the scientist routinely calls his judging into question in his work, so too, over time, this critical attitude towards the justification of our everyday judgments that something is right or wrong becomes ‘habituated’, passive, and routine — informing our ordinary everyday judgments as well as those we make with particular care (Drummond 2010, p. 445).¹¹⁷ This suggests that Drummond is correct in his suggestion that even everyday judging is in fact a kind of self-responsible judging (Drummond 2010, p. 445), involving a reassessment and justification of the evaluative and normative aspects of our judgments. This furthers self-responsible decision making.

SELF-RESPONSIBILITY

Self-responsible decision making requires that we take responsibility for determining and verifying the truths that ground our beliefs and actions, as opposed to relying on other people’s views, or on local tradition, for example. As self-responsible agents we

¹¹⁶ It is useful to contrast ‘intuitive seeing’ with other experiences where feelings are attached to perceptual experiences. For example, there is the feeling of unfamiliarity, or discordance: a sense of something not being quite right or out of place, which we experience when revisiting an area once well known to us, but not seen for some time. Another example is ‘deja vue’, a feeling that a scene is familiar when one hasn’t in fact been there before. In the Husserlian ‘intuitively seeing that’ something is so; when we have good (though revisable) evidence for our veridicality of our perceptual experience, there will be no such feeling of discordancy, although we may have feelings of different kinds in response to this perceptual experience (thanks to Greg O’Hair for suggesting this comparison).

¹¹⁷ This view also has some indirect support from Antonio Damasio’s (1994) research, for Damasio suggests that an injury or other disruption to the areas of the brain subserving our emotional and ‘feeling’ responses to stimuli affects decision making and future planning. Giving support to Drummond’s interpretation of Husserl’s work, with respect to the role of affective responses to possible scenarios and choices when decision making, Damasio’s research points towards a link between a deficit in emotional responses and feelings, and the lack of a motivation to take social norms and behavior into account when making the kinds of life decisions that are generally made in the light of these norms. People suffering injuries or illnesses which lead to this kind of deficit may make socially inept, erratic or inappropriate decisions which in turn make their lives more difficult when the decision, and the behavior that follows, is deemed anti-social and condemned (Damasio 1994, pp. 34-38; 45-51; 245-247).

strive to know, to the best of our ability and with the resources of reason as well as our feelings that the things and states of affairs that we make decisions about are in fact as we take them to be. Where we find things or states of affairs are not as we originally took them to be, we reassess and revise our judgments. As Drummond puts it:

A rational being strives towards fulfilling her empty and passively acquired judgements, beliefs and emotional attitudes. When she gains the evidence that allows her to adopt or to revise these judgments, beliefs or attitudes she adopts them as convictions and thereby takes responsibility for them, realizing herself as a person having a particular set of beliefs for which the appropriate evidence has been secured and which define her character. These convictions inform her subsequent judgments, values and volitions (Drummond 2011, pp. 13-14).

There is also an intersubjective, verifying process in judgment and deliberation embedded in Husserl's account. Drummond notes that our own self-responsible thinking depends on our subjecting our beliefs to testing against those of other self-responsible agents in our community, thus ensuring our on-going beliefs are well-founded.¹¹⁸ This also means that in our deliberations we cannot rationally choose an action that would render others unable to think about (and judge) *our* actions self-responsibly, for this would compromise their ability to criticise our beliefs and therefore also compromise the basis on which *we* can refine and revise our beliefs in a self-responsible way (Drummond 2011, p. 15). There may appear to be some tension here between our initially 'not relying on other peoples' views' to ground our beliefs, and then, once we have made our judgments, testing our beliefs against those of others. However, what is important, if we are to be self-responsible agents, is that our evidence arises from intuitively seeing, for ourselves, that a thing or a state of affairs is so, and thus securing good evidence for our beliefs and judgments, the kind of evidence that reliance on hearsay falls short of. By contrast, the intersubjective 'testing' of our belief or judgment about an object or state of affairs, once formed, involves others who are likewise self-responsible agents, and who, like us, have good evidence for their beliefs and judgments and so can critically evaluate our claims.

It is in the concept of 'self-responsibility' that our inherent striving towards having the best possible level of evidence for our judgments, as described above, comes together with our values (Drummond 2010, pp. 442-443). It is in this respect that self-responsibility is an important element in decision making and, I suggest, a constituent

¹¹⁸ There are similarities between 'intersubjective verification' in Husserl's view, as interpreted by Drummond: and Price's 'game' of challenging the assertions and judgments of others where we disagree with them, as developed in his 'Truth as Convenient Friction' (Price 2011g) Price notes that this process of testing our views against those of others seems to disclose an underlying norm of truth in our discourse, although he notes too that the importance of this norm lies in our belief in it, there need not 'actually' be this kind of norm of truth for it to be effective in this context (Price 2011g, p. 180). There is an analogy here, too, with Wilfrid Sellars' example of 'John' who learns the norms applying to judgments about the colour of ties in the different light inside, and outside, of his tie shop from his co-workers, in 'Empiricism and Philosophy of Mind' (Sellars 1956).

of the open future intuition: an addition to the cognitive, conceptual and practical aspects of decision making that Ismael describes above.

In her discussion Ismael identifies volition as integral to action and, therefore integral to the decisions that bring about the actions that might determine how our future will go (Ismael 2012, p. 154).¹¹⁹ Drummond (2010, p. 449) notes that volition depends on our evaluations which in turn depend on our responses to the fulfilling intuition, the evidence that informs the judging.

I suggest that this kind of self-responsible judging, in furthering our rational and well-founded decision making, contributes to our sense of agency for our actions, and to our sense that the future is open to our influence, particularly when we reflect upon these deliberations and decisions and the evidence underpinning them. The self-responsibility associated with judging well presupposes and also reinforces our sense that sometimes we can shape and change future events, and that when we do we are responsible for the results. It is part of how we construct an experience of a future that we can actively influence.

Self-responsibility in judging and deciding also has a temporally extended aspect, incorporating elements of the past and future. Past experience and judgements shape or 'habituate' what we should do in the present, while the present is understood in relation to our future aims and goals. Drummond puts it this way: 'The temporality of deliberation and choice is ecstatic¹²⁰ precisely in so far as the present in which I choose and act encompasses the past and future at once' (Drummond 2011, p. 19). This inherent temporality in self-responsibility is suggestive of a further link between self-responsibility and the construction of the intuition that the future is 'open'.

Moreover, our decisions, our lives and events in our future may go better when we cultivate this sense of self-responsibility: the combination of responsibility for our beliefs, transparency about the evidence that underpins them, and a willingness to test those beliefs against the beliefs of others. When we do so, Drummond (2010, p. 452) suggests, '...we realise the goods of thinking well, and acting well — what we might call the goods of rational agency'. As he succinctly puts it:

It is the self-responsible life that is the flourishing life for rational agents (Drummond 2010, p. 452).

¹¹⁹ Ismael says of volition: 'The volition is the product of deliberative reasoning, and is the mental fiat that initiates action. The action is the bodily movement it executes' (Ismael 2012, p. 153).

¹²⁰ I am assuming Drummond is using 'ecstatic' in a way that is similar to Heidegger's usage. Heidegger uses the term to describe how Dasein, i.e. our 'being' or existence, is 'thrown out' of — affected by and influenced by — our past, and projected into the future '...by way of the present' (Heidegger & Krell 1977, p. 204). Heidegger's view that we are 'thrown into' a world that is always 'already' there for us coheres with the Husserlian idea that our lived 'present' encompasses a directedness towards future possibilities as well as the influence of past experiences and judgments which inform and influence our 'present'. This is, perhaps, an indication of lingering similarities between Husserl's view and that of his former student, Heidegger.

SUMMARY

This chapter further develops the Temporal Pragmatist account of the ‘open future’ intuition discussed in Chapter 3 and continues the theme, developed throughout the thesis, that Husserl’s work can inform and support this approach. The chapter focuses on explaining how our future oriented mental states, our emotions, our sense of agency and our sense of self-responsibility construct our experience of a future that is markedly different to our experience of the past. Bringing together theories and themes from analytic, phenomenological and pragmatist philosophies, it combines these views in a comprehensive account of the open future intuition that remains broadly compatible with Temporal Pragmatist subject naturalism, and consistent with theories of time endorsed by modern physics.

The discussion furthers the argument, introduced in Chapter 3, that many aspects of our future-wards orientation can be explained in terms of features of ‘us’ — as, in part, a construct of human beings situated in time, rather than anything integral to the physical nature of time — a view endorsed by Ismael (2012); by Callender and Suhler (2012); and Maclaurin and Dyke (2002). The account developed here shows that our experience of the open future and the temporal asymmetries that support the open future intuition, can be understood as mind-dependent, rather than a response to an intrinsically asymmetric physical time.

The question of whether we ought to think that the future is importantly different from the past, notwithstanding that we do, inherently, think of future times and events in this asymmetrical way, was raised. Derek Parfit argues that our bias toward the future denies us the happiest possible life and so we ought not to have it.

A counter-argument was offered in response, based on psychological case studies discussed by Minkowski and Gallagher, suggesting that in general Parfit is wrong to claim that we ought not to have a ‘future bias’. There is evidence that the symptoms of some psychopathological conditions are associated with feeling and thinking in a temporally neutral way about our personal future, and, perhaps, also associated with disorders in the sub-personal structures that Husserl’s theories suggest temporally order our conscious experience. Therefore, if it were possible to adopt this temporally neutral stance, it is unlikely to prove beneficial to our sense of purpose, achievement and fulfilment — and our happiness.

Jenann Ismael’s perspectival and agent-centred account of the open future intuition was acknowledged and summarised. It was suggested that a further element might usefully be incorporated within her account: self-responsible decision making. As we reflect upon our decisions and their outcomes we are also acknowledging that they leave a footprint on the world and on history. As self-responsible deliberators, decision makers and agents, we contribute to the construction of the open future intuition in our tacit striving for the best possible evidence for our beliefs and judgments.

This discussion is one part of a two part discussion, developed further in Chapter 5, which brings together two levels of explanation: personal time and sub-personal time, with a view to showing how these levels construct and project the features that underpin the open future intuition, and our future oriented mental states more generally.

5: PROJECTING THE OPEN FUTURE: THE SUB-PERSONAL LEVEL AND TEMPORAL EXPERIENCE

Time is not given to the mind completely made (Minkowski, 1970, p. 34).

OVERVIEW OF CHAPTER

As noted above, personal time, the time of experiences — perceptions, decisions, deliberations and agentic action — is distinguished from the sub-personal level — the brain mechanisms and events and processes occurring below the level of our awareness; supporting and, it will be suggested below, necessary in some cases, for these personal level experiences. This chapter focuses on theories from psychology and philosophy that draw upon work from neuroscience and information processing theories, and considers the contribution these theories make to a comprehensive account of our intuition that the future is ‘open’.

The discussion of sub-personal mechanisms and events developed in this chapter aims to make the connections between sub-personal and personal levels of explanation clearer: these connections are apparent in explanations of our sense of agency, of freedom; the ownership of our thoughts and actions. It offers a different perspective on some traditional philosophical problems centred on responsible deliberation, freedom, and personal identity over time, usefully augmenting accounts of the open future intuition and other personal level aspects of our temporal experience.

As noted in Chapter 4, theories at the personal and sub-personal levels of events offer different kinds of explanations. Personal level reflections on a decision and its ramifications might explain our sense of responsibility and agency for that decision; but at the most fundamental sub-personal level, the neuronal activity associated with the decision holds no sense at all of what it means, for us, and how it affects our lives. Nevertheless, in general, there can be useful insights to be gained from studies of sub-personal level processes with respect to personal level events, and vice-versa. As will be demonstrated in this chapter, these studies can add weight to theories of temporal experience which suggest that many future-wards oriented features of that experience are mind dependent rather than resulting from an asymmetry in time itself.

Martin Davies (2000) distinguishes between two theoretical domains within the sub-personal level of description: information processing (the theoretical domain of psychology) and neurobiology (the theoretical domain of neuroscience). It should be noted that there can be interaction between the theories of the sub-personal level of information processing and those of the neuro-biological level, in his view, without any implication that the former need be or should be ‘inter-theoretically’ reducible to the latter (Davies, M 2000, p. 103). Davies suggests that the relationship between explanations of sub-personal level information-processing mechanisms and personal level events can be understood to be one of theoretical interaction, with ‘downward inferences and upwards explanatory gaps’ (Davies, M 2000, p. 96). Likewise there is no

entailment that explanations of personal level events and processes be reducible to explanations of information processing mechanisms or neurobiology.

With respect to theories informed by neurobiology and neurosciences more generally, I note here that Husserl's work has inspired a number of competing, neuroscientifically informed theories within the cognitive sciences. However, this is a relatively new and evolving field of investigation and it would be premature to endorse one of these views over the others. While I make use of one particular theory of this kind in this chapter, Francisco Varela's work on time consciousness, and refer to his view in the particular context of its relation to Shaun Gallagher's work on protention and agency, I do not engage in a wider critical discussion of the theory's merits or assess the claims of competing theories, beyond this immediate context.

Charting a moderate course between the complete independence of levels, and reductionism, Davies' view offers support to the discussion developed in this chapter and Chapter 4 above, which considers how and to what extent explanations of events and processes at the sub-personal level are related to explanations of events and processes in human life and experience at the personal level, and vice versa.

Daniel Dennett's work on the personal and sub-personal levels of explanation informs Martin Davies' levels based view (Davies, M 2000, pp. 87-92), and while it is Davies' view that is adopted in this chapter, a brief discussion of Dennett's account of personal and sub-personal levels will situate Davies' view. Dennett's account of levels based explanations is also of interest here in its own right, in virtue of its focus on prediction, which is discussed briefly below.

The focus of this chapter is the development of a sub-personal level account of agency and of our orientation towards the future more generally. It suggests that predictive mechanisms at the sub-personal level of analysis are necessary but not sufficient for our sense of agency. In particular, Gallagher's discussion of Husserl's theory of time-consciousness as interpreted in a neuro-phenomenological context emphasises the important role of our intentional directedness towards the future, protentional consciousness, in bringing about our sense of agency at the tacit or pre-reflective level of awareness. His defence of his own, 'protentional' view is contrasted with competing, non-Husserlian views from psychology and philosophy of mind, but it will be argued that, overall, his view offers advantages that competitor views cannot.

The view that there can be interaction between personal and sub-personal level descriptions and explanations of events, without entailing reduction, is endorsed by Davies, Dennett (for the most part), Gallagher, and, David Thompson suggests, by Husserl (Thompson, D 2000, p. 215). Likewise I suggest that the views of the Temporal Pragmatists are broadly compatible with the kind of levels based explanation Martin Davies describes. From within Temporal Pragmatism, Ismael advocates a side-on approach to understanding how we are situated, perspectively, within the natural world, an approach based on collaboration whereby: '...physics partners with the cognitive and human sciences' (Ismael forthcoming-b, p. 4). As she includes a brief

discussion of studies informed by neuroscience and information processing systems in her ‘Temporal Experience’ (2011b, p. 465-467) it seems she could endorse the kind of non-reductionist levels based account I discuss here.¹²¹

The chapter begins with an overview of themes from Dennett’s work and then turns to a discussion of the sub-personal predictive mechanisms that appear to play a role in constructing our sense of agency and our intuition of the open future, and in projecting features of our future-oriented temporal experience onto our world.

DENNETT’S LEVELS BASED ACCOUNT

Dennett identifies ‘ways of knowing’ or ‘stances’ that can be adopted within his levels-based, explanatory framework. These stances need not only be taken towards human beings, however for the purposes of this discussion human persons will be used as an example.

According to Dennett’s discussion of the intentional stance, as it could be used to explain our interpretation and prediction of other people in folk psychology, at the personal level of description we ‘approach each other as *intentional systems*’ (Dennett 1987, pp. 15, 48-49), concerned with predicting the behaviour of other intentional systems — other people. We do this by assuming that, like us, other people are rational beings who act so as to realise their desires, and in making this assumption we are adopting an ‘intentional stance’ towards them (Dennett 1987, pp. 48-50).¹²²

At the sub-personal level we adopt the ‘design’ and ‘physical’ stances. At the sub-personal, level, the ‘design stance’ describes systems in terms of their function; applied to human beings it is a means of understanding and predicting what our physiological systems will do on the assumption that they will behave as they are ‘designed’ to do — they will fulfil their functional role — in various contexts. Similarly, when applied to human beings, the ‘physical stance’ describes human bodies — systems — in biological terms, so that given knowledge of a systems’ physical makeup and the relevant physical laws that apply to it in a particular situation, we can predict how that system will behave in that situation (Dennett 1987, pp. 16-17). These predictive stances can be applied to ourselves in the service of better understanding our own behaviour, as well as offering a way of better understanding the external world and in particular, other people in that world.

¹²¹ The views I endorse below also remain consistent with her suggestion that the domain of the human sciences should not be ‘absorbed’ into or ‘replaced’ by the ‘hard sciences’; and her view, in the context of her discussion of self-organising and self-governing systems that: ‘...science has to make room both for order that emerges from the intrinsic dynamics of self-less systems and the order imposed from the top by the governing influence of self-representational loops’ (Ismael 2011a, pp. 343-344). I also note that Price’s ‘Perfect Match’ (2011b, pp. 104-106), a genealogical fable that accounts for our concept of ‘representation,’ incorporates a discussion of e[xternal]-representations, that is, representations of the biological level of the natural world.

¹²² Dennett’s use of the term ‘intentional’ here should not be confused with Husserl’s use of ‘intentional’ and ‘intentionality’, see note 1, above.

Our brains produce the patterns of behaviour that allow us to effectively deploy the Intentional stance. The intentional stance allows us to identify these patterns in how personal-level relations between ourselves, others and the world usually unfold because these patterns allow us to predict, usually reliably, the motivations and actions of other people (Dennett 1987, p. 27).¹²³ At the sub-personal level, the ‘internal machinery’ (Dennett 1987, p. 64) that supports this personal level activity, makes use of what Dennett refers to as ‘fortuitous correspondences’ between the internal states of the brain, incoming data about the structure of the external world, and the meanings we have already in place (Dennett 1987, p. 61).

This is a sophisticated multi-level account of the importance of prediction in our life, and as such it supports the account of our future-oriented thought developed in the preceding section of this chapter, and below. I return to Dennett’s views about prediction in the context of theories of predictive coding, in a later section of this chapter.

It is not completely clear whether Dennett endorses or rejects any kind of reduction of the personal level to the sub-personal. He suggests that a reduction of descriptions in ‘intentional terms’ (such as beliefs and desires) to ‘design’ level, physiological terms, could only be achieved by redescribing the physiological system in terms of the intentional stance, so that the physiological system would therefore ‘...warrant an interpretation as a realized intentional system’ (Dennett 1987, p. 68).

This could be interpreted to mean that, for Dennett, a reduction of intentional level theories to design level theories could only succeed if the predictive success we find in theories developed at the personal, intentional level of description is retained in descriptions of phenomena at the sub-personal design theory level. It seems that Dennett does not deny the possibility of the reduction of the personal to the sub-personal in theoretical terms but sets the bar so high that such a reduction, in the case of human beings, is unlikely to be practically realisable.

As the broker of the ‘divorce’ between theoretical, ‘idealised’ notions of Intentional systems and the psychological systems that realise them in human life, Dennett (1987, pp. 57-68) seems to view the intentional and design stances as interrelated levels that should remain theoretically distinct; with descriptions of the former not practically reducible to descriptions of the latter, in the case of human persons. This reading of Dennett’s view coheres with David Thompson’s (2000, p. 201) analysis of Dennett’s position on the spectrum of theoretical views in the philosophy of mind, a position that: ‘...aims at a delicate mean between reductionism and eliminativism, on the one side, and dualism and mysterianism on the other’.

¹²³ Dennett argues that this kind of ‘pattern’ is ‘in the world’ and ‘real’; and, in the case of human beings: ‘...produced by another pattern roughly isomorphic to it within [our brains]’ (Dennett 1987, pp. 27, 34). Hence, Dennett does not appear to rule out a reduction of a pattern we find in the world to the pattern that produces it, but as I note, neither does he argue for a reductive account of the personal to the sub-personal.

Davies (2000, p. 95) adopts a clear position on the question of reductionism, observing that attempts to fully explain personal level experience in terms of sub-personal information processing mechanisms will always come up against an upwards explanatory gap — not least with respect to explaining consciousness. On this basis it is Davies' anti-reductive, but theoretically interactive levels based account that is endorsed below.

PROJECTING TIME

It is possible that the thesis that temporal directionality is mind dependent may be proved wrong, either by new evidence to the contrary from cosmology or new developments in physics more generally. At this point, however, there is sufficient doubt about these possibilities to justify taking seriously the claim that some aspects of our temporal experiences are mind dependent and therefore need not appeal to asymmetric features of physical time, or physical processes in time to explain the phenomena. Theories that offer support to the mind dependency thesis are found, in the case of causality and temporal direction, in Price (2010) and see Chapter 2 and 3 above; and in Callender (2008), who develops an account of a 'present' experience — a common now — in mind-dependent and constructed terms which draws from recent research in psychology and the cognitive sciences (Callender 2008, pp. 350-360).¹²⁴

Mind dependent explanations are frequently associated with projectivist views in the literature. Dennett, for example, describes the 'projection' of mind dependent qualities onto the world as 'Hume's Strange Inversion' (Dennett 2013, pp. 209-210), referring initially to our propensity to take causation to be a feature of the world, a feature we think we see because causation is a mind-independent feature of the world, when in fact we are misrepresenting a 'feeling' of causation in our mind as a feature of the external world. We 'project' causation on the world — or in Hume's terms, our mind is exercising its '...great propensity to spread itself on external objects...' (Dennett 2013, p. 210 citing Hume's 'Treatise of Human Nature' I, p. xiv ; Hume 1978). Similarly, in the temporal case, this same propensity to project what is mind-dependent and contingent onto the external world contributes to an explanation of our experience that future events 'become' present; that the time has a future-wards orientation, and we have agency over some events in our future, in a way that is not possible with respect to past events.

PREDICTIVE MECHANISMS AND AGENCY

An account of the sub-personal mechanisms and processes necessary for a sense of agency might be usefully incorporated into a genealogical study of 'the open future', of

¹²⁴ This account is based on the brain's capacity to resynchronise and integrate incoming data so that our experience is of a 'present', reconstructed from apparently, but not actually, simultaneous sensory events. Our experience of this 'now' coheres well enough with other people's experiences to seem to be a shared or common 'now'. It does not claim to be an exhaustive account but it does offer a mind-dependent starting point, one that might be built upon so as to explain more about the features of our 'now' experience, within a scientific framework, and without necessarily appealing to any physical features of time itself.

the kind Jenann Ismael develops (see Chapters 3, and 4, above). Her view focuses on agency as it is manifested in experiences at the personal level. However consideration of the deeper, sub-personal level temporal structure that Husserl's work (and recent work in predictive coding theories) suggests may be necessary for these experiences, particularly with respect to agency, adds a further dimension to the view.

The existence of neuro-physical mechanisms for agency for action is well supported by models and theories in neuroscience and psychology. Chris Frith's (1987, 2004) efference copy/comparator model is an example of such a study, as is the modified version of his view developed by John Campbell (1999), and in the discussion below the efference copy model is compared with Shaun Gallagher's 'protentional' model of agency. The latter draws from neuroscience and psychology but is also informed by Husserl's phenomenological theory of inner time consciousness.¹²⁵ Gallagher (2000, pp. 203-204), identifies a basis for our sense of agency in the sub-personal predictive mechanisms and processes which seem to be necessary for our sense of agency at all levels of consciousness. He contrasts views from neuro-psychology and analytic philosophy of mind (those of Frith and Campbell, respectively) with his own broadly Husserlian account, and this is discussed in more detail below.

Recent developments in cognitive science suggest that an important function of the brain as a whole is to generate predictions of expected sensory data: the brain is essentially a 'prediction machine' (Clark 2013, p. 181). According to 'predictive coding' theories, the brain responds to anomalies between its predictions and its models of how the world is, and uses these anomalies to adjust the models so they more closely match the prediction, that is, the models more closely represent what the world is actually like as evidenced by the congruence between expected sensory data and actual perpetual data. This should mean, in turn, that subsequent predictions informed by these models are closer to the actual world — and therefore the accuracy of our perceptual system's representation of the external world improves (Clark 2013, p. 182; Hohwy 2012, pp. 6-7). This view has implications for our how we understand the genesis of our sense of agency, and it also appears to have relevant similarities to aspects of Husserl's work. 'Predictive coding' is briefly discussed in the context of how Husserlian theories might inform it, later in this chapter.

The 'open future' intuition and our sense of agency over the future, is a matter of phenomenology, not of psychology or neuroscience. Nevertheless the multidisciplinary discussion developed below offers a balanced view of how a key feature of the phenomenology underpinning the intuition — our sense of agency — might come about at the sub-personal level of explanation, and suggests that Gallagher's Husserlian influenced model offers better resources for accounting for it when compared with the Efference Copy Model.

¹²⁵ As noted above, while I discuss neuroscience and psychology separately here, the two disciplines interact, for as Davies (2000, pp. 93-94) observes, '...information processing psychology and neuroscience are mutually constraining disciplines...' within the sub-personal domain.

FRITH'S EFFERENCE COPY MODEL

NEURAL ASPECTS

In simple terms, according to Frith's efference copy model of agency, when our brain instigates an action, it generates a motor command, and sends off an efference copy of that command to a comparator; a kind of 'central monitor' in the central nervous system. The efference copy permits the brain to make a prediction about what the experience of the action will be like (Campbell 1999; Frith 1987; Gallagher 2000, pp. 208-212). When the action is performed, sensory feedback from the movement is sent to the comparator. The comparator verifies that the predictive information it has stored from the efference copy of the initial motor command to act matches feedback from the visual experience of the action. If it does match then the action is identified as our own, as being caused by us. If there is no efference copy of the initial motor command to act at the comparator, then there is no prediction of the movement to verify that we instigated it. So in cases where no efference copy has been sent or received, the comparator assumes the movement is not 'one of ours' and, therefore, that it has a cause external to us (Campbell 1999, pp. 611-612 ; 2011).

Our sense of agency, according to the efference copy model, depends on this match of the feedback from the action with the predictive information resulting from the efference copy of the motor command to act. If an action is passive; for example, if our arm moves because someone jostles us, there is no efference copy of the motor command predicting the action and no sense of agency. Or, alternatively, if there is a failure of the efference copy mechanism, then, even if we actively move our arm, there is no sense of agency for the act.

Frith applies this model to our sense of agency for our thoughts as well as our actions; however, while the efference copy model has considerable support as an account of agency for bodily action, it is more controversial when applied to agency for thought. Frith, however, uses the efference copy model as applied to thought in developing his account of schizophrenic phenomena (Frith 2004).

PHENOMENOLOGICAL ASPECTS

Some implications of Frith's efference copy model as applied to our sense of agency for thought seem phenomenologically problematic. Gallagher notes that the model incorporates a 'meta-representational' level of reflection (Gallagher 2004, p. 11), the intention to think is consciously rather than unconsciously monitored. So, in Frith's model there is the intention to think, and there is reflection on the intention to think and both are required to provide a sense of agency for thought.¹²⁶ But this does not

¹²⁶ It is further noted that Frith's (2004, p. 21) view that the efferent copy of a motor instruction to think, or an intention to think, is conscious and required for our sense of agency, follows Irwin Feinberg's view as described in the latter's paper 'Efference Copy and Corollary Discharge: Implications for Thinking and its Disorders', *Schizophrenia Bulletin*, 1978, no. 4, pp. 636-640. Frith says:

seem to fit the phenomenology of thinking, even in a broadly descriptive sense of the term 'phenomenology', for as Gallagher puts it '...most cases of thinking are neither prefaced by conscious intentions to think, nor followed by an introspective awareness of that intention' (Gallagher 2004, p. 12).

An 'intention to think', while accounting for the sense of agency for thought, only seems to make sense if it is sub-personal, for otherwise the phenomenology of thinking would always involve a conscious 'preparation' to begin thinking, as we might do when beginning to study a paper, for example, or alternatively, it might suggest an experience analogous with inner speech or internal monologues (Gallagher 2004, p. 11). However, these kinds of experience are not always associated with thinking.¹²⁷ Interestingly, in a paper addressing Gallagher's criticisms of his view, Frith (2004, pp. 20-22) comments that he is 'extremely sympathetic' to Gallagher's 'phenomenological' approach, in the context of Gallagher's explanation of the symptoms of schizophrenia, where the sense of agency for action and for thought is compromised. While seeking clarification of what he sees as some shortcomings in the detail of Gallagher's view, Frith acknowledges that Gallagher raises reasonable concerns about his own model.

Building upon Frith's account, Campbell (1999, p. 618) suggests that the efference copy of the 'intention' to think — or better, of the 'effort' to think — is sub-personal and so not available to consciousness. His view addresses the objections that arise when a conscious intention to think is posited as involved in this process (see Gallagher 2004, p. 12). In Campbell's account, as a thought arises (and Gallagher notes this might happen in many ways at the level of sub-personal mechanisms), an efference copy of the 'effort' to think is sent to the comparator and, where these mechanisms function properly, this efference copy is compared against the introspected actual thought. This is intended to be a neuro-scientific account as opposed to a phenomenological account; however, as it does not posit a conscious intention to think it appears to be more faithful to the phenomenology of thinking than Frith's account (Gallagher 2004, p. 12). Campbell (1999, p. 613) also argues that his view has the virtue of parsimony, but as Gallagher notes, the basic efference copy mechanism still requires some further augmentation — a conscious introspection of the content of thoughts — if it is to play the role he asks of it, which compromises its simplicity (Gallagher 2004, p. 12).

Gallagher identifies a more general problem with the views of both Frith and Campbell. In the case of bodily motor processes the main function of the efference copy is not to generate a sense of agency, but to act as an 'executive co-ordinator' of the visual system

In an early version of the model I followed Feinberg...in proposing that the same self-monitoring mechanism could be applied to thoughts as well as to motor movements. ...Shaun Gallagher makes a very thorough and convincing case that such models cannot be applied to thoughts. The problem is even greater for the latest version of the model (Frith 2004, p. 21).

¹²⁷ Frith's view also raises the spectre of an infinite regress, as the meta-representational level seems to itself require an 'intention to think', which also requires an intention to think, and so on, with each intention generating an efference copy mechanism (Gallagher 2001).

and vestibular systems; it is in virtue of these mechanisms that the visual and vestibular systems are 'aware' that we, and not the world, are in motion (Gallagher 2004, p. 12). These systems also have the function of keeping us physically balanced (Campbell 2011). Gallagher's concern is that there seems to be no analogous main function for the efference copy model as applied to thought. Campbell suggests that in the context of thinking, the efference copy may retain the regulative role it plays in motor action, and keep our *thoughts* on track and coherent (Gallagher 2004, pp. 12-13 citing Campbell 1999).

Gallagher (2004, pp. 12-13) suggests, in response, that the semantic and logical tasks of keeping our thoughts coherent are already incorporated within normal conscious thought. However, Campbell (1999, p. 619) denies this, noting that our ordinary ability to keep our discourse relevant and in context during normal conversation is not a process we have consciously available to us at this level. He suggests that the efference copy model, as applied to thinking, has the role of enabling a consecutive narrative or set of thoughts and coherency of thought and speech, and this operates below the level of conscious awareness. This is a good response. However, there are further problems with Campbell's view that are more apparent in pathological cases where the efference copy/comparator system goes wrong, and arguably, the regulative role of the efference copy in keeping our thoughts ordered is compromised.

PATHOLOGICAL ASPECTS

It can be implied from the discussion above that, as Campbell suggests, disruptions to the efference copy mechanism could potentially explain the symptoms of Formal Thought Disorder, as associated with schizophrenic episodes (Campbell 1999, pp. 617-619; 2011).¹²⁸ The idea of 'keeping our thoughts on track' implies a mechanism is involved in feeding back information about our thinking, allowing us to keep our thoughts ordered (Campbell 1999, p. 612; 2011). The efference copy model could account for the predictive aspect of this process. Where the 'prediction' of our next thought is disrupted, the result could explain the incoherence of thought characteristic of some schizophrenic episodes.

Gallagher's (2004, pp. 12- 13) response, as noted above, is that unlike the case of motor systems where a sense of agency does seem to require a predictive mechanism involving efference copies, in 'thinking' we do not require a further means, beyond conscious reflection, for keeping our thoughts on track. He is, however, presupposing that the operations of protention and retention at the sub-personal level tacitly enable our conscious reflection on the continuing coherency of our thought, and this could be analogous to the role Campbell attributes to the mechanisms within the efference copy model.

¹²⁸ He in turn attributes the view to Irwin Feinberg, see Feinberg, Irwin (1978) "Efference copy and corollary discharge: implications for thinking and its disorders" in *Schizophrenia Bulletin*, 4, pp. 636-640.

At this juncture it is useful to have an example of the symptoms of schizophrenic thought disorder to assist in assessing the relative merits of these views. Minkowski (1970, pp. 286-287) quotes from and discusses a schizophrenic patient's description of their experience:

In the morning when I wake up, yes, how can I say it, the "disappearable" is there again; this torments me terribly. Do I know where I am? As far as that's concerned yes. But the "disappearable" of time is not there, and how can you take hold of time, when it was yesterday! There it goes on inside of me, always farther behind, but where? Time breaks.

The bizarre nature of this report might seem to add weight to Campbell's suggestion, above, that the cause of such an experience may run deeper than the patient's inability to order his thoughts according to a conscious deployment of semantics and logic. Perhaps, as Campbell suggests it involves a failure of 'intermediate' mechanisms and processes normally deployed in the course of conversation, but not (usually) consciously available to us (Campbell 1999, p. 619). There are further problems with Campbell's view however.

Gallagher (2004, p. 14) observes that other symptoms of schizophrenia such as a loss of sense of agency for thought or an experience of a thought being 'inserted' are also linked to the failure of the efference copy mechanism in Campbell's and Frith's views. For consistency, therefore, when the efference copy mechanism fails, these symptoms should be also expected to occur in tandem with the Formal Thought Disorder Campbell associates with this failure, and this seems not to be the case.

In fact, the positive symptoms of schizophrenia are characteristically episodic and so not likely to occur simultaneously in all cases (Gallagher 2004, p. 14). For example, in the case of 'thought insertion' episodes, some, but not all thoughts may appear to the patient to not only be not caused by her but to be inserted inside her head by another person. A degree of normal functioning remains, however; this enables the patient to report her experiences. In terms of Campbell's account this would entail that the efference copy mechanism would fail in such cases, but in an ad hoc manner; and to the extent that thought disorder and a loss of a sense of agency for the thought are to be attributed to failure of the efference copy mechanism, it is not clear how this could be explained.

In Gallagher's view the phenomenology of an experience needs to 'constrain' the cognitive explanation of it, and the efference copy mechanism seems too rigid to account for these variations among schizophrenic symptoms (2004, p. 14). His account has a problem of its own (see p. 148, below), nevertheless it offers a more flexible and responsive approach, and one which does justice to the phenomenology.

Frith and Campbell argue that the same sub-personal level mechanism, or perhaps two very similar mechanisms, can account for our sense of agency for movement and for thought (although it should be noted that while in Frith's view the 'intention to think' is

generated at the level of conscious awareness this does not entail or suggest that a body movement is likewise always generated by a conscious intention to act).¹²⁹ In contrast, Gallagher and co-author Francisco Varela suggest that the sense of agency for thought is likely to arise from widespread, dynamical and distributed neural processes, rather than from just one kind of mechanism (Gallagher & Varela 2001, p. 38).¹³⁰ The broad spectrum of schizophrenic disorders seems to favour Gallagher and Varela's approach, in that the myriad of schizophrenic symptoms is better understood as linked to a wide-ranging disruption of different neurological mechanisms and processes (Gallagher & Varela 2001, p. 38), rather than to the disruption or failure of individual efference copies.

Gallagher's view, to be discussed in more detail in what follows, accounts for a link between disruptions to mechanisms at the sub-personal level of awareness and a loss of agency in schizophrenia within a Husserlian theory of protentional and retentive consciousness. His view takes a broad and integrative perspective on the potential of the study of psychopathologies to illuminate our understanding of the importance of the temporal aspects of consciousness in normal mental functioning, situating this understanding within a broader account of the role that temporal thought, especially future-oriented thought, plays in our life.

THE PROTENTIONAL ACCOUNT OF OUR SENSE OF AGENCY

NEUROLOGICAL AND PATHOLOGICAL ASPECTS

Gallagher assumes that protentional and retentive operations, which can be described in both neuro-psychological and in phenomenological terms, will 'ultimately need to be cashed out in terms of neurological processes' (Gallagher 2000, p. 222); he describes them as 'sub-personal operations which generate the flow structure of consciousness. There could be some convergence here with Frith's and Campbell's views, in that efference copies, understood as predictive mechanisms, may be involved in protention, and could in part, be included in a neurological, protentional account of our sense of agency for our actions, although Gallagher does not suggest this.

¹²⁹ Campbell (1999, p. 612) notes that the efference copy model as applied to thinking does not entail that the location of the 'comparator' or monitor (i.e., where the efference copy is sent to) is '...the locus of all consciousness in the brain...', rather, he suggests there may well be many 'regional monitors' to which efference copies are sent. However, this does not address Varela and Gallagher's suggestion that there are likely to be many different kinds of mechanisms involved in the prediction and verification of our actions and thoughts, distributed throughout the brain.

¹³⁰ Barry Dainton (see his 'Husserl, the Brain and Cognitive Science' in Dainton 2010a) notes that Evan Thompson (2007 Chapter 11) offers a sympathetic reading of this 'neuro-phenomenological' approach, developed by Varela and taken up by Gallagher, although Dainton himself has reservations about the view. Rick Grush (2006, pp. 11-15), is also critical of Varela's view. However, Gallagher (2013, pp. 142-144), and Northoff (2014, pp. 554-556) make positive references to Varela's project in their recent discussions of it, which suggests that the view retains support in contemporary contexts. For those who endorse this view, these mechanisms and processes (which may include efference copies) could be considered to be part of a dynamical and distributed self-organising system at the neural level.

Psycho-physiological studies of schizophrenic thought insertion cases suggest such cases involve a failure of the mechanisms necessary for agency, although many other factors are also involved (Ford & Mathalon 2012). For my purposes here, the important differences between the efference copy model and Gallagher's protention-based psycho-phenomenological model concern how each accounts for why, in rare cases, our sense of agency for thought is lost. These differences are found at the level of explanation of the neural mechanisms and processes involved; but also in how well each account matches the phenomenology, how faithfully it describes our experiences.

Gallagher's positive account of agency for thought (2000, 2004, 2005; Gallagher & Varela 2001) begins by distinguishing between a sense of agency for thoughts, and ownership of thoughts — a distinction he notes is not always made. Employing this distinction, he argues that the lack of a sense of agency for thought, in thought insertion cases, results in part from a failure of neural mechanisms to bring about protentional consciousness, leading, in turn, to a failure of a sense of agency (Gallagher & Varela 2001, p. 34). A sense of ownership of thoughts, of the thoughts being in *my* head, by contrast, is linked to retentional mechanisms and processes, and remains intact in thought insertion cases.

The outcome of protentional failure can be understood to be similar in some respects to a normal experience of having an unexpected, random thought or memory arising in our stream of consciousness, for which we normally have no sense of agency. However, when protentional mechanisms fail, not only is there no tacit sense of anticipation for the thought, there is also no sense of our 'making' that thought as it unfolds, of a protentional fulfilment, for it is experienced only passively, in the train of retentions of that thought (Gallagher & Varela 2001, p. 33). The thought appears in our mind as fully formed, and it seems to happen before we 'think' it.

This scenario suggests that there must be a protentional consciousness of a thought *about* the on-going thought insertion experience, a second order protentional awareness of it. Perhaps protention is modified or compromised, but not completely missing in such cases; but this seems to be an ad hoc solution. There is a problem with the view to be resolved here. It may be that a better understanding of thought insertion cases requires a more integrated explanation of how processes at the different levels interact (see for example Gallagher and Varela 2001, p. 39) and below.

Keeping within the protentional approach, the question of whether some neural mechanisms are protentional because they sub-serve protentional consciousness, or is it rather that some neuronal mechanisms sub-serve protentional consciousness because they are protentional might also be raised in this context. As briefly alluded to above, Gallagher and Zahavi (2012, p. 90) suggest that at the neural level of analysis '...the sort of mechanism that underlies protention is more appropriately thought of in terms of widely distributed and dynamical processes than in terms of localised functions'. This suggests that the neural processes sub-serving protention do not exclusively or primarily bring about protentional consciousness but also have other roles, and

predictive mechanisms more generally may be more widespread and versatile than the Efference Copy model implies.

PHENOMENOLOGICAL ASPECTS

Gallagher notes that phenomenological studies have mutually and productively informed the neurosciences, cognitive sciences, psychology and psychiatry, and may provide useful insights (or perhaps debating points) for work in the analytic philosophy of mind. He cites, as examples, work on intersubjectivity and agency, as well as on the nature of the mind more generally (Gallagher 2012b). This ecumenical approach is endorsed here and elsewhere in this thesis.

His phenomenological account of agency begins with the observation that willed action involves, intrinsically, a sense of ownership of the action, and a sense of agency for it. In this view, it is the sub-personal mechanisms sub-serving protentional and retentional consciousness, and the pre-reflective self-awareness they bring about, that explains, in part, how we come to have the sense of ownership and agency for our actions.

As discussed in more depth above (Chapters 1 and 3), in phenomenological terms, protention and retention can be understood to be dispositional intentionalities towards the immediate future and the ‘just past’, which are accessible at the conscious levels of experience. They are features of Husserl’s theory of inner time-consciousness but while Gallagher endorses and follows Husserl’s theory in spirit, however, he acknowledges that he goes beyond Husserl’s work in practice (2000, p. 222).

According to Husserl, and endorsed by Gallagher, retention brings about our sense of self-awareness at the pre-reflective level.¹³¹ It holds the experience of an object as just past in our present and in doing so it explains why our experience is of a seamless retention of a series of experiences of that object, a series of just past experiences that remains available to us, despite the time in which they occurred no longer being our present.

Husserl observes that in retention ‘...what the flow of time takes away...the consciousness of time restores’ (Husserl & Brough 1991, p. xxiii). However, Husserl realises that we not only need an explanation of why an object is presented to us in a seamless on-going experience over a duration of time, he also needs to explain why we

¹³¹ Pre-reflective self-awareness — a phenomenological term — refers to my knowing that an experience is ‘mine’. It is distinguished in Husserlian literature from pre-reflective self-consciousness which is a distinct form of self-awareness and defined by John Drummond as ‘...the awareness of self that accompanies any consciousness of an object’ (Drummond 2008, p. 167). Dan Zahavi describes pre-reflective self-consciousness as a ‘minimal form of self-awareness.’ He sees it as somewhat similar to the ‘subjective or first person givenness of [an] experience,’ or the subjective ‘feel’ of an experience, identified by philosophers of mind such as John Searle and Thomas Nagel (Zahavi 2003, p. 88). Pre-reflective self-awareness is difficult to classify in the structure I am using here, for it is always there for us upon reflection, and although we are not directly aware of it; it is not something that is as yet intelligible solely in terms of neural processes or mechanisms. It seems to be neither properly personal nor sub-personal. This a challenge for the personal/sub-personal distinction and the framework it supports, but I suggest the challenge reflects the difficulties inherent in describing and ‘understanding’ consciousness, rather than a fatal flaw in the framework.

are conscious not only of the object but also of our own persisting experience of perceiving and being conscious, something we are aware of upon reflection. Husserl's concept of 'double intentionality' explains the relation between our perceptions and our consciousness — and our sense of 'self', using the example of an experience of a series of musical tones:

There is one, unique flow of consciousness in which both the unity of the tone in immanent time and the unity of the flow of consciousness itself become constituted at once. As shocking (when not initially even absurd) as it may seem to say that the flow of consciousness constitutes its own unity nevertheless it is the case that it does. And this can be made intelligible on the basis of the flow's initial constitution. Our regard can be directed, in the one case, through the phases that 'coincide' in the continuous progression of the flow and that function as intentionalities of the tone. But our regard can also be aimed at the flow, at a section of the flow, at the passage of the flowing consciousness from the beginning of the tone to its end (Husserl & Brough 1991, pp. 84-85).

Husserl refers to two ways of directing our 'regard' towards time here, by way of two inseparable 'intentionalities' — the 'transverse' and the 'horizontal' (see Fig 3, Chapter 1, above). Transverse intentionality is the bringing to consciousness of the just experienced tone, retention, and just about to be experienced tone, protention, in a primal impression: it is our awareness of the object as it appears in subjective time (Husserl & Brough 1991, pp. 86-87 see also note 11, p. 86). Transverse intentionality relates our consciousness to its object and it is essential to the process of constituting an objective time. It can constitute objective time because each phase of our experience of the tone is retained in consciousness and keeps its temporal place, and we can return to the experience in recollection, even as we are also aware that it is 'sinking' back from the moment which is currently present for us.

'Horizontal intentionality'¹³² is directed towards the passage or flowing of our consciousness. At each moment of our experience a primal impression of sensory data is displaced in time and retained, and in turn, this retention will become a 'retention of a further retention', which we can likewise direct our attention to. We are conscious, then, not only of the initial retention but of the on-going series of 'retentions of retentions' each trailing what was once a primal impression, and all gradually sinking back and fading in their vibrancy (Husserl & Brough 1991, pp. 86-87). Husserl does not explicitly discuss horizontal intentionality as it applies to the future-oriented correlate of retention, that is, protention; however Nicolas de Warren (2009, pp. 197-198) provides textual support for the claim that protention tacitly 'anticipates' that our perceiving and

¹³² I am following Brough's translation of *Längsintentionalität* as 'Horizontal Intentionality' here (Husserl & Brough 1991, p. 85 note 9).

experiencing is continuing on, and ‘projects’ more perceptual experience as coming (although the content of the experience is as yet indeterminate).¹³³

This consciousness of the flowing series of retentions [and protentions], the horizontal intentionality, is described by John Brough (Husserl & Brough 1991, p. 85 note 9) as ‘...the flow’s intending of itself in the flowing’. It entails that our experience of the world is constituted in and of inner time consciousness, that we are at the same time directed to the world as well as directed towards *our* experiences of the world (Husserl & Brough 1991, p. 88). The flow brings about a pre-reflective sense of self-awareness that in turn provides us with a sense of ownership of the acts and thoughts we reflect upon and understand to be ‘content already there’, in pre-reflective consciousness (Husserl 1989, pp. 263-264). And further, as Zahavi (2003, p. 93) notes, citing Husserl’s later theory of time-consciousness as it developed in the ‘Bernau Manuscripts’, p. 277-278, when we reflect on these experiences we are aware of ourselves as agents, as ...functioning, as apprehending, valuing etc...’.¹³⁴

While this sense of ownership of our thoughts and actions is important, and retention and pre-reflective self-awareness appear to be implicated in ‘keeping our thoughts on track’, in the context of the discussion in this thesis it is the future-directed intentionality, protention, that is the most important element of inner time-consciousness. In the case of willed action, protentional consciousness will include our sense of instigating or ‘making’ those actions; there will be an implicit sense of agency for the action. So, when the protended action is fulfilled, the sense of agency is already there, it is already a part of our pre-reflective awareness of the act. Gallagher’s claim is that:

...the dynamics of protention underlie the sense of agency for thought, or more precisely...protentional registration is a necessary but not sufficient condition for the sense of agency (Gallagher 2000, p. 225).

As also discussed in Chapter 3, protention and retention may be implicated in our sense of an open future. Just as we see events in our past as settled, and the future as having possibilities for us to affect, so too, what is retained in retention is settled and fixed;

¹³³ de Warren cites Husserl’s ‘Bernau Manuscript’ no. 10 here (Husserl 2001).

¹³⁴ There is a body of contemporary work in Philosophy of Mind that offers some support to the notion of Husserlian pre-reflective states, positing mental states that are somewhat analogous with them. Uriah Kriegel (2011) argues that our mental states or mental content can have a qualitative character which persists even when we are not intentionally sensing something or having an experience such as feeling an emotion. This ‘cognitive phenomenology’, a feeling attached to our thought, is suggestive of a neuroscientific or psychological basis for an underlying, pre-intentional awareness that is distinguishable from our intentional directedness to an object. Another view, David Rosenthal’s (1986) theory of ‘higher order thought’ argues that a mental state can be intentional, and / or sensory, but to be a conscious state, a mental state must cause a higher order thought about it to occur — in Rosenthal’s view, all conscious states are accompanied by a higher order thought about that state (Rosenthal 1986, pp. 332-336). In this context Husserlian pre-reflective self-awareness, a mental state which appears to have intentional properties as well phenomenal sensual qualities, would need to be accompanied by a higher order thought. It would be considered to be conscious only when it is represented by a thought about its content; in judgments of evidence or reliability, or in recollections.

while protention tacitly admits of possible outcomes. To the extent that it seems possible that our experiences shape the content of protentional and retentional operations it seems likely that personal level events can shape what protention 'protends' (Gallagher 1998, pp. 68-69).

Understood in terms of mechanisms, as a neurological and psychological account, the Protentional account of agency accommodates elements of Frith's and Campbell's views, but it also goes beyond them in its scope. As a phenomenological account it does full justice to our sense of agency for thought, and integrates it within a wider ranging theory of the temporal structure of consciousness and its connections with intentionality, perception, deliberation, and other aspects of human life such as emotions and mental well-being.

The latter point is important. As this discussion suggests, the sub-personal level of explanation alone cannot account for the episodic nature of symptoms such as loss of a sense of agency and thought insertion: these are likely to originate at the level of intentional experiences, in perceptual and emotional experience. It may be that situational, affective, experiential factors disrupt protention, which in turn reinforces the negative experience of loss of agency in a feedback loop. There is interaction between levels of explanation in Gallagher and Varela's model (2001, p. 39), and this is an important advantage of the view.

PREDICTIVE CODING

'Predictive coding' theories of the relation between the mind/brain and the world are a relatively recent development in philosophy and the cognitive sciences: proponents of this view include Andy Clark (2013), Jakob Hohwy (Hohwy 2008, 2012) and Karl Friston (2012) These theories argue that a key function of the brain is to predict what incoming sensory data will be like, and assess how well this prediction matches the actual sensory data received, with a view to improving the congruence of these predictions and, thereby improving the accuracy of our perceptions of the world. The optimal result is the minimisation of prediction errors (Clark 2013, p. 181; Hohwy 2012, p. 2).

A comprehensive account of predictive coding theories that does justice to their range and complexity is beyond the scope of this thesis. However, this brief overview will suffice to show that aspects of Husserl's theories of inner time consciousness; intentionality and self-evidence are relevant to predictive coding theories, and point the way to further research into how Husserl's work can further Clark's aim to couple this theory to other theories and in so doing, further an account that seamlessly unites predictive coding based explanations of perception with explanations of our higher cognitive states, including beliefs (Clark 2013, p. 201).

One example of Husserl's relevance is suggested by the discussion of the efference copy model, and the Husserlian alternative to this model, developed by Shaun Gallagher (2000, p. 222), and discussed in the preceding sub-section of this chapter. The efference

copy model is incorporated into some predictive coding theories (See diagram and commentary on the role of efference copy in predictive coding theories in Seth & Critchley 2013, pp. 227-228).

Further, in predictive coding theories more generally, in situations where sensory data received is at odds with what is predicted, the resulting discordance is termed 'surprisal' rather than the more familiar 'surprise', a distinction reflecting the former's sub-personal status (Clark 2013, p. 183 citing Tribus 1961). These discrepancies between predicted data, and actual sensory information received, are fed back to higher levels in the hierarchy of perceptual processing, allowing for top-down input into the system; informing new predictions and improving future accuracy (Clark 2013, p. 183 citing Rao and Ballard, 1999). The role played by 'surprisal' is strikingly analogous to the role played by protention in Husserl's view, in that we only notice protentional consciousness when our experience is markedly different from that which is 'protended', and we become aware of the resulting discordancy. That is, just as in predictive coding, there is awareness that our perceptual experience did not unfold as we (tacitly) expected, and, analogously with predictive coding processes, the discordance between protention and the data that resolves the protentional possibilities into actuality, and is retained in retention, will shape the content of further protentions.

Husserl's work on 'self-evidence' also shares relevant similarities with some predictive coding theories. Jakob Hohwy (2008, pp. 688-689) suggests that in predictive coding our predictions of incoming sensory data develop along Bayesian lines. As noted above in Chapter 2, p. 55, note 37, Husserlian 'evidence' for the veridicality of perceptual experience shares similarities with Bayesian reasoning in that it factors past experience, as well as current evidence, into current protentional predictions.¹³⁵

Predictive coding theories focus on assessing the accuracy of the predictions generated against sensory data received at the level of neural processing. However, Clark argues they might be 'partnered' with theories of embodied and embedded cognition, thereby incorporating features of our physical environment, even our social situation (Clark 2013, p. 195), into one explanatory framework encompassing perception, action and attention (Clark 2013, pp. 199-201).¹³⁶ He observes that: 'We strive to make the world conform to our expectation as well as to accurately predict how the world will be (Clark 2013, p. 201). However, he also cautions that

...a full account of human cognition cannot hope to jump directly from the basic organising principles of action oriented predictive processing to an account of the full (and in some ways idiosyncratic) shape of human thought and reason. (Clark 2013, p. 201).

¹³⁵ I note however that Clark expresses reservations about how far the Bayesian approach can be applied to predictive coding (Clark 2013, p. 201).

¹³⁶ Gallagher and Zahavi (in press) endorse this kind of 'enactivist' view, and see Husserl's work, notably in his *Ideas II* (Husserl 1989), as relevant to it.

Clark (2013, p. 201) advocates a ‘multiply hybrid’ approach to solving this problem, incorporating: ‘...neuroscience, computational theorising, philosophy, rational decision theory and embodied cognitive science’.

Husserl’s work is notable for its scope and I suggest, on this basis, that his view is relevant to the development of predictive coding theories within the wide-ranging explanatory framework Clark suggests, above. Husserl’s theories of time-consciousness and perception inform our understanding of the practical concerns of human life (the ‘material and socio-cultural’), at the personal level of experience, just as Clark (2013, p. 201) foreshadows that predictive coding, once further developed, and in combination with other theoretical approaches, may do.

DENNETT AND THE ‘PROJECTING’ BRAIN

Daniel Dennett discusses the view that we project upon the world ‘expectations of our own expectations’ (Dennett 2013), in his response to Clark’s (2013) influential paper on predictive coding: ‘Whatever Next?’ discussed briefly above. Here, Dennett develops the idea, made famous by Hume, that causal relations are feelings or *expectations* we project upon the world (Dennett 2013), arguing that predictive coding is ‘expecting to expect’; that is, there are certain ways we need to feel about the world — expectations we need to have — if we are to make sense of the world in everyday life.

Dennett’s interpretation of predictive coding theories brings out the idea that there is a ‘world’ of things that matter (in biological terms) to us, when we perceive them (Dennett 2013, p. 210). At the most primitive level this is true of most if not all creatures, but our concern is necessarily primarily directed towards our own environment (our life-world) which is rich in emotions and feelings as well as more fundamental biological imperatives.

This is where Dennett suggests that tacit ‘expectation’, the sub-personal prediction of what will happen next, becomes important. We habituate the way we feel about the things that matter to us so that over time we come to ‘expect’ to feel that way about them and do so without (usually) being aware that our brains are, at this tacit sub-personal level of processing, ‘predicting’ that we will have this response. Nor are we ‘aware’ that the response is not sourced in the world, but in biologically triggered expectations (Dennett 2013, p. 210).

Dennett makes an analogy between this view and Hume’s view of causation (Dennett 2013, p. 210).¹³⁷ Firstly, as Hume noted, we have a disposition to feel that, when something in the world is constantly conjoined with another thing in the world, this is a causal fact about how things in the world are related to each other. Second, we feel

¹³⁷ Dennett does not refer to other Humean influenced views of causation here, but it is interesting to note Price’s (2011b, pp. 88-89) Expressivist view of ‘causation’ in this context. Price argues that ‘causation’ should not be understood as a descriptive term: it does not purport to describe something real in the world, but is better understood by means of an analysis of its practical role in the language and life of beings like us.

there is further causal fact about how these things are related to us, in that we take these things in the world to ‘cause’ this particular response in us. The ‘sense of causation’ that arises in us as a response to these experiences of constant conjunction is habituated and strengthened to the point where we automatically expect to have this ‘inner feeling’ in response to any reliable conjunction of events. The result is that it *seems to us* that what we observe to be in the world, that is, the things themselves and not our habituated to response to those things, is the source of our feeling that causal relations are in the world. It also *seems to us* that our seeing such events in the world is what *causes us* to see them as causally related events in the world (Dennett 2013, pp. 210, my italics).

Having grounded our ‘experience of “causation”’ in the mind, Dennett notes that predictive coding theories have the resources, once developed, to extend this idea to perception more generally, in that it explains why we ‘expect to expect’ to feel a certain way about something in the world, to behave a certain way in response to things that matter to us. People, emotions and feelings are important to us, they matter to us in an everyday, personal, sense.¹³⁸ The projecting brain, at the sub-personal level, can be understood to enable, in part, the experiences that characterise this personal, social, emotional dimension of the world. Dennett (2013, p. 210) illustrates his point with an evocative example: our emotional response towards babies. We have a biological disposition, he argues, to respond in a certain way to babies. When we see a baby we tacitly experience a suite of feelings and emotions: the feeling that the baby is ‘cute’ and an urge to nurture her, to feel protective, to coo; to find her and her needs compelling. Dennett’s point is that part of our perception of a baby includes a prediction of just this sort of feeling — a feeling we expect to expect whenever we are in the proximity of a baby, and which verifies our experience, and moves us to behave appropriately towards the baby.

In the context of predictive coding theories, when we experience this emotional response in the proximity of a baby the processes in our brain that are concerned with this tacit prediction and its fulfilment do not register an error signal for the perceptual information received about the baby, since the ‘right’ feelings — the feelings we ‘expect’ to have when we see a baby — accompany the sensory data (Dennett 2013, p. 210).

In his response to Dennett’s discussion, Andy Clark (2013, p. 240) approves of Dennett’s identification of ‘we ourselves’ — our own feelings and responses to the events and things we encounter, and those of other people — as being among the many and varied things we ‘predict’ as we perceive the world.

¹³⁸ Dennett suggests that the Bayesian inferences associated with Predictive Coding give us a tacit understanding of these things in terms of affordances (what we can do with them) but also in terms of predicting what we will do with them, and think and expect of them, next (Dennett 2013, p. 210). As discussed above in ‘Dennett’s Levels Based Account’, our expectation of how things in the world behave (an expectation he argues is furthered by our adopting ‘stances’ so that we expect things to do what they are ‘designed’ to do). This enables us to predict what something, or someone, will do next with a reasonable degree of confidence.

A similar view, falls easily out of Husserl's theories of perception, intentionality, evidence and inner time-consciousness. Just as Dennett notes that we 'expect to expect', in Husserlian terms protention 'protends' further experience (Lohmar 2002).

Protention, our expectation of the next moment of our lived experience arises at the level of sub-personal processes, but it is presupposed by our experiences at the personal level: as it is presupposed — a condition of possibility — of all our lived experience (Husserl & Landgrebe 1973, p. 254).

As discussed above (in *Phenomenological Aspects*) Husserl's notion of double intentionality, on some interpretations, offers a way of understanding the relation between the temporal structuring, ordering and associative 'organising' of sensory data in consciousness, and a tacit awareness that it is *me* who is experiencing, an awareness which is available to me when I reflect upon the experience. Protention, arguably, has its own double intentionality, being directed on the one hand to the protention of the next moment of perception, and on the other hand to our own 'continuing on' into our future (de Warren 2009, p. 197).¹³⁹ Given de Warren's interpretation of protention it seems plausible to think that what is protended in this protentional consciousness of our own 'continuing on' includes a tacit anticipation of the 'right' feelings, which may be fulfilled, just as we expect to expect a feeling of 'cuteness' in Dennett's example.

This brief discussion is offered in support of the view that Husserl's theory of time-consciousness and predictive coding theories have features in common and, given the considerable explanatory potential of both theories, it seems likely that they can mutually inform each other in virtue of these similarities.

One possible practical application of a more general Husserlian influenced, inter-level and interdisciplinary investigation of a problem of considerable 'personal level' social concern is suggested below.

PROTENTION, DEPRESSION AND EMOTIONS

In his recent paper 'Time, Emotion and Depression,' Shaun Gallagher (2012c), discusses case studies of depressed patients from the perspective of how to better understand the effect depression may have on the temporal aspects of emotional experiences. He considers whether emotions have a different temporal phenomenology in depressed patients when compared with the reports of non-depressed subjects, referring to clinical studies in psychopathology as recounted by Eugene Minkowski (see Chapter 4, above) throughout.

His study of temporal phenomenology and depression considers the lived experience of time as it is reported by the patient, rather than 'objective' time as measured by clocks.

¹³⁹ Gallagher (2000, p. 225) likewise suggests that protention may have its own kind of double intentionality, giving rise to a 'projective sense of what I am about to do or experience'.

The indications are that, generally, time is experienced as slowing down, or as seeming to stop altogether in some sense, for depressed patients (Gallagher 2012c, p. 128; Minkowski 1970, p. 298). This notion of time seeming to slow or ‘stop’ is important, for Minkowski’s view, and his important insight; is that our normal lived experience of time is of its orientation towards the future, and this seems to be curtailed here. Minkowski argues that time’s future-wards orientation provides the impetus that gives our life its meaning, and ‘...when this orientation is missing, everything seems to amount to the same thing...without rhyme and reason’ (Gallagher 2012c, p. 129 citing Minkowski 1970, p. 303). There is a loss of what we call a direction in life, a sense of purpose. Minkowski explains that: ‘...we build our future, so to speak, at each instant of our life by our activity, expectations, desires, hopes, projects, and finally, by our tendency towards the better’(Minkowski 1970, p. 343).

Our normal future-wards orientation appears to signify a healthy disposition towards action, which in turn furthers our flourishing, whereas its inhibition appears to be associated with and influenced by, the symptoms of mental disorders and, in particular, with a depletion in emotional response. Gallagher puts the point in terms of emotional valency: ‘...without an orientation towards the future, the depressed subject has difficulty experiencing the valency of things and loses a degree of emotional valency’ (Gallagher 2012c, p. 130). In the context of Husserl’s theory of time consciousness this sense of the slowing of time and depletion of our normal impetus towards the future, associated with depression, is suggestive of a disruption of protention.¹⁴⁰ This is an example of how disruptions to sub-personal structures that appear to order our experiences, and which, in Husserl’s theory incorporate protention, could manifest in symptoms at the personal level.

This is also interesting in the light of Parfit’s view that we ought not to have the temporal bias inherent in our emotional responses to events in our future — which amounts to a defence of an attitude of neutral emotional valency, an ambivalence, towards events in our future, as discussed in Chapter 4. Gallagher’s discussion suggests this may arise without any effort on our part, when the deep structures that order our temporal experience are compromised by a psychopathological disorder. This suggests a need for caution, and more research, prior to any endorsement of Parfit’s strategy.

Gallagher does not extend his discussion of time, emotion and depression to encompass a possible link between protentional and retentional disturbance and suicidal feelings,

¹⁴⁰ Gallagher made this point during his presentation at the Graduate Workshop on Cognitive Science at Macquarie University on December 5th 2012. As far as I am aware at the time of writing, he has not discussed the possibility of a connection between a disruption of protention and symptoms associated with depression in his published work but I have his permission to attribute this view to him (personal communication 2nd June 2013).Protention is sub-personal, whereas emotional responses and our sense of time slowing or of meaningless-ness are personal — hence this is a further example of possible associations between sub-personal and personal levels of time.

although the source of many of his examples, Minkowski, does discuss a case study of a young woman suffering from depression,¹⁴¹ who says:

I am not afraid of death, death seems beautiful to me, but the idea that everything passes and life becomes shorter makes me afraid. Thus when I knit, the accent does not fall on what the work accomplishes but on the fact that, as the work progresses, life simultaneously becomes shorter and shorter and it is terrible. This is why I want to kill myself to get rid of this way of thinking and yet I love life...Everything seems stupid in these circumstances...and this meaninglessness causes suffering (Minkowski 1970, p. 301).

The disregard for her 'accomplishment', the apparent meaninglessness and stupidity of life as she sees it and her 'anguish' and 'pain', might seem to provide grounds for suicide. When the patient reports having 'suicidal thoughts' she describes time as a causal factor in her distress, as something she has to be aware of, to quantify and calculate, incessantly — she sees no way of escaping it, and thinking of time in this way is 'terrifying' and 'intolerable' (Minkowski 1970, p. 301). However Minkowski cautions against attributing such motivations to a suicidal patient on the grounds that such an attribution assumes a normality and rationality in her responses which is in fact compromised by her condition, and, as he notes, the patient is ambiguous in her suicidal thoughts, confusedly expecting suicide to cure her disease (the pain or suffering) while wanting to live (Minkowski 1970, pp. 304-305).¹⁴²

Minkowski's caution must be respected, however work by Erwin Shneidman (1993) in the field of suicide prevention suggests that suicide occurs in response to a patient's 'unbearable psychological pain' which he calls 'psycheache', defined as an emotional state causing pain — suffering — experienced to an intensity that, for the patient, is too great to continue living through. This 'psycheache' seems to capture the 'intolerable' nature of the suffering that the patient Minkowski discusses, above, is describing.

The potential for success in preventing suicide, according to Shneidman, lies in finding ways of intervening to reduce this psychic pain before a successful attempt at suicide occurs, and this in turn requires some understanding of the emotion which is so debilitating, and of how to reduce its intensity to manageable proportions for the sufferer. To that end, he notes that studies of the prevention of suicide, and suicide itself, are:

...multidimensional, multifaceted and multidisciplinary, containing, as they do, concomitant biological, sociological, psychological...epidemiological and philosophical elements (Shneidman 1993, p. 147).

¹⁴¹ Gallagher (2012, p. 131 note 3) notes that Minkowski's view was that '...in practice it is difficult to draw clear distinctions between depression and other conditions, such as schizophrenia...', and he did not order his studies under the common heading of depression. Therefore Gallagher advocates caution in drawing conclusions about these case studies, and depression, from Minkowski's work.

¹⁴² The patient was eventually cured of her depression.

The case study of this self-reported suicidal patient, cited and discussed by Minkowski (1970, pp. 301, 305), clearly has temporal features: ‘...the march of time is profoundly modified: it is inverted; time can only pass, only flee irremediably’ (1970, p. 302). Time, for this patient, is not associated with a sense of progression or a sense of accomplishment — it brings only an encroaching sense of, and focus on, the inevitable ending of her life (Minkowski 1970, p. 302).

More work needs to be done, but it seems there are relations between disruptions to sub-personal mechanisms — notably protention — but also the accompanying retentions, and adverse effects on our personal level mental health and well-being. This is a very broad characterisation but it captures what seems to be at stake: disruptions to protentional functioning at the sub-personal level seem to be associated, at the personal level, with a loss of a sense of agency; a loss of a sense of a meaning and purpose in life, and with the sense that our future as something to endure until death rather than as an impetus that motivates us and gives life meaning and hope.

This suggests that further research on the relation between time and emotions, along the lines of Gallagher’s ‘Time, Emotion and Depression’ (Gallagher 2012c) and his wider studies of temporal aspects of psychopathologies (Gallagher 2000, 2004, 2005, 2012a; Gallagher & Varela 2001), could offer support to a multi-disciplinary approach to better understanding suicide and its prevention.

SUMMARY

This chapter considers the sub-personal and projected features that underpin our experiences of future oriented temporal asymmetry, and the open future intuition. The two foci of this chapter are predictive mechanisms and the genesis of our sense of agency, and how these bring about our sense of future orientation, and then open-ness of the future to our agentive action, at the deep, sub-personal level of predictive mechanisms. Examples of predictive mechanisms were discussed in this chapter, including Husserlian protention and efference copy/ comparator model developed in psychology and discussed in analytic philosophy of mind and cognitive science.

Shaun Gallagher’s discussion of Husserl’s theory of time-consciousness, interpreted in a neuro-phenomenological context, emphasises the important role played by our intentional directedness towards the future, ‘protention,’ in bringing about our sense of agency at the pre-reflective level of awareness. His defence of his own, ‘protentional’ view is contrasted against competing views from psychology and philosophy of mind. Gallagher develops a relatively economical account of the genesis of our sense of agency, a view that might further our understanding of how predictive mechanisms and our sense of agency are integrated with other aspects of our mental life, within the framework of Husserl’s wide-ranging theories of intentionality and time-consciousness. I gave reasons to endorse his view over that of his competitors. It was noted, however, that there remain problems to be resolved in both kinds of views.

In the later parts of this chapter the scope of the discussion widens to encompass the importance of predictive mechanisms more generally, with a brief overview of recent work in predictive coding which motivates the suggestion that Husserl's theories, particularly of inner time-consciousness and evidence, may inform and be informed by this new direction in cognitive science and psychology.

Predictive coding theories add weight to the suggestion, developed in this chapter, that our inherent future-wards orientation may, in part, arise from deep sub-personal processes that inform not only how we perceive the world, and thus enable us to act more efficiently and effectively within that world, but might also inform our theories of personal level psychology. Indirectly, the view may contribute to a fuller explanation of why human beings have an inherently predictive, future-wards orientation when — as Chapters 2 and 3 suggest above — it seems likely that physical time has no such orientation.

The discussion of sub-personal mechanisms and events makes the connections between sub-personal and personal levels of explanation clearer: these connections are apparent in explanations of our sense of agency, of freedom; the responsibility we take for our actions. The chapter aimed, in a modest way, to suggest how Husserl's work might add to our understanding of how personal level experiences of future open-ness, responsibility and agency, and sub-personal perceptual systems and predictive mechanisms (including protention), are linked. This could add to a wider more encompassing account of how temporal experience at the personal level is constructed and projected by the sub-personal mechanisms and processes underpinning protentional and retentive consciousnesses. It offers a different, Husserlian perspective on some traditional philosophical problems, usefully augmenting existing accounts of the open future intuition.

Gallagher's recent work on the links between disruptions to protentional mechanisms and mental health is discussed briefly, and suicide prevention is suggested as a possible direction for future research along these lines.

This chapter develops two key themes of this thesis. Firstly, it adds to the body of evidence that suggests that our future-oriented mental states are largely constructed, mind-dependent, and need not require any physical asymmetry of time to explain them. It also highlights the continuing relevance of Husserl's theories of time-consciousness (and self-evidence) to current work in analytic philosophy of mind, and cognitive science.

CONCLUSION

This thesis developed an account of the salient features of our future-oriented temporal experience while remaining consistent with modern physics. Having said this, the account showed that while our best theories of physical time are integral to a full understanding of time, they can offer only partial explanations of it. As the thesis unfolded it showed that a full understanding of time must also take into account how and why time is subjectively experienced in the manner that it is.

The account is situated within the analytic tradition of philosophy. However it demonstrates that incorporating work from the continental tradition of philosophy — here, from Edmund Husserl — into analytic approaches can further the aim of doing full justice to explaining the features that characterise our lived experience of time.

This capacity of Husserl's work to inform analytic philosophy was first brought out in Chapter 1 in the context of my discussion of an analytical approach to explaining our experience of a 'specious' present, developed by Barry Dainton — an approach compared with aspects of Husserl's theory of time-consciousness in the literature. It became clear from this discussion that both approaches faithfully describe the phenomenology of our temporal experiences. I endorsed Husserl's view, while suggesting that a combination of both approaches: the structural and phenomenological with the empirical and analytic; is likely to produce a comprehensive account of the 'specious present' that exceeds that developed in both views considered individually.

A motivation for endorsing Husserl's view over Dainton's in this thesis was the greater explanatory depth inherent in Husserl's theory; and its more obvious compatibility and coherence with recent work in psychology and cognitive science, which allowed me to encompass the insights of numerous relevant approaches within my account.

The problem of explaining our experience of time's future-wards direction was considered in Chapter 2. After discussing theories that posit the future-wards orientation of time to be feature of time itself, and those that take it to be a feature of physical processes in time; I concluded that there are significant problems to be resolved in all the views canvassed. Therefore I turned from the philosophical theories which aim to explain this feature of temporal experience in terms of physics, towards a philosophical theory which takes as its starting point the contribution made by our own perceptual, cognitive and conceptual processing systems. A broadly projectivist view, developed by Price and Weslake, was adopted to address this aspect of the thesis problem. At the same time, it became apparent that Jenann Ismael's work on time and temporal experience shared significant philosophical and theoretical commitments with Price and Weslake's views, and that taken together they constitute a view that would further the project of developing a comprehensive account of how our experience of time is constructed.

This motivated the study of their combined work that culminated in my construal of Temporal Pragmatism as a distinct philosophical approach. In Chapter 3 I brought

Temporal Pragmatism together with Husserl's work on time consciousness in support of my claim that our experience of time as having a distinct future-wards direction is for the most part explicable in terms of constructed features of human perceptual, cognitive and conceptual systems and processes that are projected onto the world.

Husserl's body of work can be interpreted, in a modern context, as seamlessly relating theories at the sub-personal and personal levels of explanation to each other. Chapters 4 and 5 used this interpretation of his work to deepen my account of why we experience time in the future-directed way we do.

Early in Chapter 4 I forestalled a potential problem for my view: a theory supporting temporal neutrality developed by Derek Parfit. I argued, against Parfit that our emotional well-being, our mental health and flourishing, appears to be related to our future-wards temporal orientation — and more research into this relation is required before we endorse temporal neutrality, if indeed we could do so in practice.

Chapter 4 also emphasised the important role played by agency in constructing our intuition that the future is open, at the personal level of experience. John Drummond's multi-level interpretation of Husserlian theories of evidence and self-responsibility offered a means of extending and deepening the connection Ismael makes between agency, and decision making, and our intuition that the future is open. Drummond's account of self-responsible judging brought out the importance of feeling, valuing and emotions as a part of our (often tacit) striving for the best evidence on which to base our deliberations and decision making; allowing for a deeper analysis of the basis upon which we decide and act. It adds a further dimension to the construction of our sense of acting so as to influence the future — in perception, as well as in judging and deciding, we inherently strive towards achieving the best evidence and best outcome. Husserl's theory of evidence incorporates protention and retention, and shows that our perception of the world and the tacit 'reasoning' that underpins the evidence we have for the veridicality of our perceptions, are inherently future oriented processes.

Self-responsibility can also be understood as a mind-dependent aspect of our intuition that we have free will: while developing this point is beyond the scope of the thesis it remains an avenue to be pursued as a means of furthering compatibilist approaches to this pervasive philosophical problem.

Chapter 5 reinforces the important role of agency in our construction of the open future intuition, by reference to a Husserlian informed theory of sub-personal level processes. I concur with Gallagher's view that the Husserlian 'predictive mechanism', protention, is an important aspect of the most convincing account of how our sense of agency is brought about at the sub-personal level of awareness. This account reinforces the important role of protention in bringing about the tacit sense of agency that is necessary for our deliberations, volitions and decisions, as well as our intuition that the future is open.

This discussion of protention and its connection with our sense of agency and our experience of temporal directionality segues into an account of psychopathological disorders, including schizophrenia and depression, which appear to be associated with disruptions to sub-personal protentional mechanisms. The clinical case studies cited here suggest that psychopathological symptoms arise when our capacity to construct time in the normal, future-focused way is compromised by disease or injury, and add to our understanding of how our normal experience of time is related to our mental health and flourishing — to features of our biology. This association between disruption to the sub-personal mechanisms that temporally order our experience, and mental disorders whose symptoms involve disruption to our personal level temporal experience, can be taken as offering further support to the philosophical view that many of the features that characterise our future-orientation — how we normally conceive of time — are constructed and projected by our mind rather than a response to properties of an objective time. I suggested this association warrants further investigation, and I plan to research the viability of a study into the possible link between mental health disorders and disruptions to protentional mechanisms, with a focus on suicide prevention.

I also briefly discussed predictive coding, a theoretical framework situated within cognitive science. This body of work is still in its early stages of development, but as I noted in Chapter 5, there appear to be interesting and relevant similarities between the workings of protentional mechanisms and some features of predictive coding models. I suggested that a comparative study be undertaken to determine how deep these similarities run, and the extent to which these two theoretical approaches can mutually inform each other.

Overall, I have developed an account that offers a modest contribution to the project of furthering a more comprehensive understanding of the constructed and projected nature of the future-directed features of our temporal experience. I also considered some implications of my view for human life, well-being and flourishing. The significant contribution Husserl's work has made to my account reflects the relevance of his work to analytic philosophy, and more particularly, it demonstrates the capacity of his profound phenomenological analysis of time-consciousness to inform analytic views of temporal experience.

Eugene Minkowski told us that time's future-wards orientation provides the impetus that gives our life its meaning. This thesis adds to our understanding of how and why this is so.

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