Analytic Nondualism:
Why Reality is Objectively Subjective

MSc Thesis *(Afstudeerscriptie)*

written by

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Abstract

Orthodoxly, reality is understood to consist of an objective world which contains beings that have a subjective experience of the world within their minds. Metaphysical theories differ on the ontological status they assign to the world and the mind, but many are based on this conceptual distinction. In this thesis, I start by examining the ontology of objective realism, which takes an objective world as a given and therefrom tries to derive subjective experiences, as well as the difficulties it faces, including the hard problem of consciousness and problems regarding mental causation. After considering a number of recently proposed unorthodox worldviews, I present my own metaphysical theory of analytic nondualism as a true alternative to objective realism. At its core is the observation that your present experience is the only thing of whose existence you can be certain. The proposed ontology tentatively assumes that there are other experiences like the present one, explains how experience can account for itself without the need for an underlying objective world, and offers substitutes for notions of an external world and a shared world.

Contents

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1 Introduction and overview

What is there? This is the question that metaphysics, in particular its subfield of ontology, is fundamentally concerned with and it is the question which constitutes the starting point for the journey through this thesis. According to the prevailing orthodoxy, there is a *world*, which is in some state *objectively* and which contains beings that perceive it. This perception happens in the *minds* of these beings and is experienced *subjectively*. Metaphysics then asks: What exactly is the world? What exactly is the mind? And what exactly is their relationship? (The last question in particular is the one constituting the famous *mind–body problem*.) There is much that has been said about these topics and the answers are diverse, to say the least. Sometimes, only the world is considered to constitute *reality*, while the mind contains mere *appearances* of reality. Because of this, ontology is mainly concerned with what there is *in the world*, while the other two of the questions I posed above are examined under the broader heading of metaphysics in general, within the philosophy of mind, or specifically under the banner of *metaphysics of mind*. I favour the latter term for denominating the field within which this thesis is placed.

This dichotomy between an objective world and subjective minds lies at the heart of many questions in philosophy. That is why I have chosen to present the philosophical background on which this thesis is founded in terms of some of the dichotomies that the world–mind dichotomy spawns (chapter 2). We first discuss the tension between asking what the world is like and asking how and to what degree we can know it (section 2.1), before discussing the dichotomy between world and mind specifically, including an explanation of what exactly we mean by these terms (section 2.2). We then go on to consider concrete answers that have been given to the above questions, discussing whether world and mind are equally real or whether one is more fundamental than the other (section 2.3), if one is fundamental, then which one (section 2.4), and whether we should even take the world to be real at all (section 2.5). Underlying the dichotomy between an objective world and subjective minds, still, is the even more fundamental dichotomy between *objectivity* and *subjectivity* in general; this circumstance has been pointed out by Thomas Nagel [2, 3], whose analysis of this dichotomy we follow in concluding the chapter (section 2.6).

Regardless of the tensions between world and mind, most of the philosophical positions that we discuss – and indeed the intuitive understanding of reality by most people – take there to be an objective world that exists and is a certain way by itself (i.e. irrespective of its being perceived), that can be described objectively, and that fully determines the subjective perceptions of it. This set of basic beliefs constitutes the worldview that I call *objective realism* (chapter 3). We discuss that humans, in trying to understand reality, have been seeking an ever more objective understanding of the world, but why, nevertheless, we should not identify reality with objective reality (section 3.1). Still, even when we grant that reality is more than an objective world, there remain problems with reconciling the objective and subjective aspects of reality as long as we take there to be some kind of objective world that determines subjective experiences; concretely, these problems concern the placement of the mind within an ontology that starts with an objective world (section 3.2). Lastly, we consider the schism between the world as objectively existing and the *idea* of the world within subjective experience, questioning whether we can take the two to correspond, whether there is just one way the world objectively is, and whether there even needs to be an objectively existing world underlying the idea of the world (section 3.3). The conclusion is that, as a matter of experience, the idea of the world is more fundamental than an objectively existing world corresponding to it and that, hence, objective realism, with its problems of being reconciled with the presence of subjective experiences, should be discarded in favour of a worldview that takes subjectivity to be fundamental.

In preparation of presenting such a worldview, we consider a number of other unorthodox worldviews that have been proposed in recent decades (chapter 4), some of which, however, are still committed to objective realism. Nevertheless, these ideas will offer insights and building blocks for the presentation of the novel worldview. Firstly, we consider Bernardo Kastrup's [4] *analytic idealism*, which presents an ontology that is based on mind rather than an objective, material world (section 4.1); the main insight we take from Kastrup is that there is no problem of accounting for matter (the world) within the mind that would be analogous to the reverse problem of accounting for the mind within the material world. Next, we consider Max Tegmark's [5] *mathematical universe hypothesis*, which argues that the objective world is not merely described by but identical to (i.e. it *is*) a mathematical structure (section 4.2); although he takes this structure to be ontologically fundamental, making it a form of objective realism facing the same problems as any form of it, identifying the world to be a structure makes it easy to place the world as a structure *within subjectivity*. Afterwards, we discuss Caspar

Hare's [6] *egocentric presentism*, which, contrary for the popular pursuit of an objective view of reality, takes the (subjectively had) present experience to be 'really' special and central (section 4.3); Hare observes that only your own experience is present, while everyone else's is absent, and presents a metaphysical view recognising this difference as a proper aspect of reality. Lastly, we will see Christian List's [7] *many-worlds theory of consciousness*, which posits that different conscious experiences are associated with different subjective (first-personal) worlds rather than with the same objective (third-personal) world, leading List to suggest that the objective world is 'ontologically supervenient' on these subjective worlds (section 4.4).

With all that in place, I present my own theory/worldview/ontology: analytic nondualism (chapter 5). At its core is the observation that your present experience is the only thing you can know for certain to exist. In the words of Sam Harris, '[c]onsciousness is the one thing [...] that cannot be an illusion' [1, p. 54]. Everything beyond it is mere speculation. Some speculations, though, are more justified than others: knowing your present experience, you are quite justified to believe that there are others like it; you are less justified, however, to posit that there is a non-experiential world that underlies this experience, for all you know is an experienced world. You might say that you are justified to believe in such a world because it is the only way to account for experience and its contents, but I will argue that experience can account for itself. Within the chapter, I mix sections that describe subjective experience and point out observations regarding experience, deriving concepts that are used in formulating the core ontology, and sections that analyse these concepts further and derive higher-level concepts in order to formulate a coherent theory of reality. For now, I will not summarise the theory and the arguments for it any further; the impatient reader may peek ahead to chapter 6, where I give a medium-length summary of analytic nondualism and the argument for it.

Lastly, appendix A contains a quick introduction to quantum mechanics and its interpretations. The relevance to the topic of this thesis is that formal arguments stemming from discussions of interpretations of quantum mechanics provide one of the arguments for why there might not be one objectively describable way that reality is like. We also discuss how analytic nondualism works as (an ontological foundation for) an interpretation of quantum mechanics.

This, now, covers the contents that we discuss in this thesis. I also want to briefly talk about what we will not discuss, viz. a vast part of the literature on the mind–body problem and metaphysics in general, much of which would

have been greatly relevant. Indeed, the topic of this thesis can be approached from many different angles, as it has been a topic of debate for a long time. An extensive overview of the literature, therefore, would have been far beyond the scope of a thesis project. Instead, I approach the topic from the entry point of the above authors and use their insights to form an argument for my own metaphysical stance.

2 Background: philosophical dichotomies

Philosophy is all about answering some of the most foundational questions there are, like 'What is there?' and 'How can we have knowledge of things external to us, if at all?'. Interestingly, amongst the available positions on many philosophical questions, one will often find a dichotomy with most positions placed on either side of it, rather than a spectrum along which positions might be ordered. This is because the underlying question is, in essence, a yes-or-no question (e.g. 'Is there a mind-independent world?'), a one-or-many question (e.g. 'Is there a plurality of substances or does one type of "stuff" make up everything?'), or because the positions approach the question either from a predominantly objective or a predominantly subjective viewpoint.

As is hinted at by the examples of philosophical questions in the last paragraph, the philosophical field this thesis is placed in is the metaphysics of mind with its central *mind–body problem*. Since the problem concerns things that exist – the mind and the body – and how they are related, I take it to be a question of ontology; in section 2.1, we discuss the field of ontology and contrast it with the field of epistemology, the study of knowledge. In the subsequent sections, we discuss the mind–body problem in detail and consider different ontological positions that have been taken by different philosophers with regards to it. Finally, in section 2.6, we discuss two kinds of viewpoints we can adopt when viewing reality – objective and subjective –, which underlie the mind–body problem in that mental experiences are inherently subjective whereas the body and the containing world are often sought to be viewed objectively.

Since the positions discussed in this chapter have been taken up by a great number of philosophers, each defending their own specific form, there is a great deal of variety and complexity within each position. In this chapter, I contend myself with explaining the basic tenets of each position; simplistic formulations ('. . . -ists believe that . . . ') will be used for the sake of comprehensibility. However, the reader should keep in mind that there is likely always a philosopher who would apply to themselves the label of the position under discussion while disagreeing with something that I ascribe to that position.

2.1 Ontology and epistemology

Ontology, roughly speaking, is the study of what there is, and of the properties of and relations amongst those entities. As a branch of metaphysics, it deals with the question of what *stuff*/substance reality is made of [8]. We will see a range of possible replies in subsequent sections, but a popular one states that the world comprises fundamental particles (quarks, electrons, and so on) and the objects they constitute. Other questions in ontology concern the relationship between stuff and *things*/objects (e.g. porcelain is stuff, whereas a porcelain mug is a thing; cf. [9]) or the parthood relationship between things (e.g. asking whether a cup is one entity, the cup, or millions of entities, the particles constituting the cup, or a collection of entities each corresponding to a subset of particles; cf. [10, §3.3]). In this thesis, the first, more fundamental question of what kind of fundamental *substance* makes up reality (which is often pursued under the broader banner of metaphysics) is most relevant, though more narrow questions of ontology will still be addressed at least indirectly. On a terminological note, 'ontology' is sometimes also used as a generic term (rather than referencing the philosophical discipline) to mean the set of entities (and their relations) taken to exist by a philosophical or scientific theory; e.g. the ontology of particle physics encompasses i.a. quarks, leptons, electrons, and so on. Below, we will see that different philosophical positions have differing ontologies, based on what kind of substances they take to exist and how they relate.

An important notion in ontology is *ontological dependence*: usually, only some entities of an ontology are taken to be fundamental, while all other entities depend on the fundamental entities. One might say that the existence of a cup depends on the particles it is made up of, for the cup would not exist if the particles were not there. It is distinct from *causal dependence*: the existence of the cup also depends, causally, on some cup maker having made the cup at some point [11]. A question that we will examine (though not yet attempt to answer) in the next sections is whether the mind (mental perceptions) ontologically depend on the (objective) world or whether it is the other way around. A related notion is that of *supervenience*. We say that some class of properties B supervenes on another class of properties A, if two particular things that share all A-properties necessarily also share all B-properties. For example, on might say that the temperature of some physical substance supervenes on the speed of the particles making up the substance [12]. For the purposes of this thesis, the question about the supervenience relation between physical and mental properties will be central.

Epistemology is the study of knowledge, asking what knowledge even is, how it is possible to have knowledge in the first place, and how it can be justified; the things we know, supposedly, are the entities of reality and facts thereabout [13]. In this sense, ontology and epistemology form a dichotomy, although in a different sense than described in the introductory text of the chapter: not as juxtaposed answers to a philosophical problem, but as two dichotomous lines of inquiry into the nature of reality. While ontology primarily asks what there is in the world, *objectively* and independent of any one observer, epistemology considers how agents interacting with this world come to know it *subjectively*. Since ontology is a pursuit of humans attempting to know the world, it is clear that it cannot be entirely divorced from epistemology. The question about the possibility of knowledge regarding what exists is what motivated Kant to inquire about the possibility of metaphysics in his Critique [14]; a very limited answer to this question will be the basis of the ontology presented in in chapter 5.

In different areas of the literature, one also often reads the adjectives 'ontic' and 'epistemic'. In line with the dichotomy as explained, ontic descriptions of the world are taken to describe the objective world independent of any observer, while epistemic descriptions are relative to some agent observing the world and concerning their knowledge of the world.

2.2 The world and the mind

I am a thinking, conscious being with a body located in the world, and so are you (unless you are a computer program checking this text for plagiarism). I find myself in a world full of objects that I perceive, and I find my body amongst these objects. Why and how is this one object, my body, able to perceive the world around it and to have conscious experiences? This is one formulation of the famous *mind–body problem*, and it is, I believe, the greatest enigma facing anyone who seeks to understand our condition and reality in general.

Underlying the question of how a body in the world can have a conscious experience is a certain distinction, a *conceptual dualism* one might say, between the world and the mind. Subsequent sections will deal with the ontological status of these two sides, i.e. whether and how they are fundamental aspects of reality. In the following paragraphs, I will try to lay out what we even mean by these terms and provide a guide to the terminology of this thesis.

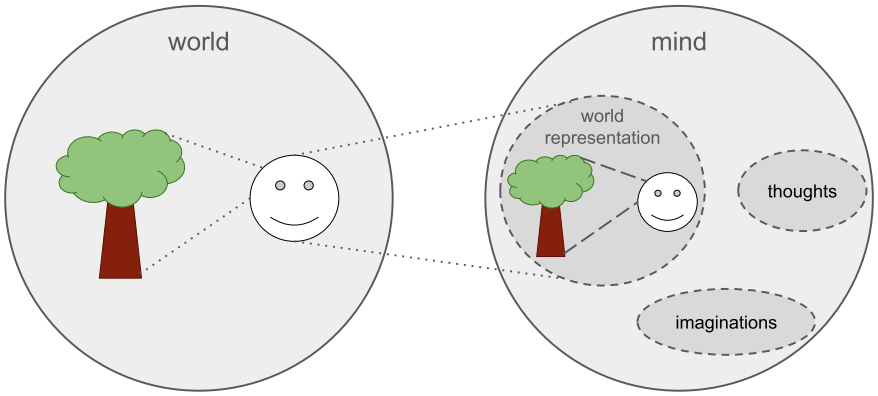

Figure 2.1: In our usual understanding of reality and in talking about it, we distinguish between the world, which contains objects as well as conscious beings, and the mind, which contains those beings' perceptions of these objects alongside thoughts etc.

The world is what is *out there*. It is the place that contains objects which are a certain way objectively, of which our perceptions are *perceptions of*, and with which we interact; it contains our bodies and in particular our brains. Our mind is where subjectively had *experiences* are. It contains perceptions of the objects of the world, as well as thoughts, imaginations, feelings, and so on. This conceptual dualism is illustrated by fig. 2.1. It is *conceptual* because it is a distinction that is, to some degree, implicitly accepted by anyone ever using these words; of course, it builds atop a certain ontological intuition about there actually being such a distinction, but it is not yet a concrete, ontological position by itself. The worldview we discuss in chapter 3 can be seen as the ontological extension of this conceptual dualism.

Sometimes, the world is also referred to as the *real world* or simply as *reality*, with experience dismissed as 'mere appearance' of reality. Since I find it absurd to refuse the mind the designation of *being real*, I will not use this terminology, instead meaning by 'reality' simply the *totality of being*, whatever it is like, and eschewing the term 'real world' altogether.

In the philosophy of mind, there are a number of terms that are used to discuss the mind more discerningly. Consciousness, in the famous and oft-quoted words of Thomas Nagel [15], is 'what it is like to be' something (a particular human, a bat, perhaps a computer running a certain program); al-

ternatively, in the metaphorical words of Sam Harris, 'the difference between [consciousness] and unconsciousness [is that] either the lights are on or they are not' [1, p. 52]. Conscious experiences, then, are simply the contents of this condition. The totality of a momentary experience is sometimes referred to as a *quale in the broad sense*, which is made up of an arrangement of elementary experiences, like redness or roundness, called *qualia in the narrow sense* [16]. Lastly, '(conscious) mind' can mean both the space of consciousness associated with a single conscious being (as in 'your mind contains your experiences') as well as the totality of all mental (i.e. consciously experienced) aspects of reality, as opposed to the (non-mental) world.[1] By consciousness, I do not mean cognition (the information processing carried out by our brains), self-awareness (the awareness of being a conscious creature within the world), or self-consciousness (a sense of awareness that one is perceived by others). All of these are contents of consciousness, but not to be confused with consciousness itself. Consciousness is simply the condition/modality in which these contents exist as experiences.

The distinction between the world and the mind also extends to the kind of facts that can describe a situation. For example, 'there are dinosaur figurines at one end of the room and the author of this thesis is sitting at the other end with his eyes directed to them' is an objective fact about the world (at the time of writing this text), whereas 'I see a dinosaur figurine at the wall I am looking at' is a subjective fact describing my experience. We take the totality of objective facts to describe the *world state* at a point in time, whereas the totality of subjective facts about an experience (had by some particular being) describes a *mental state*. Furthermore, when we describe some creature as having a certain subjective experience, we may say that we are assigning *mental properties* to that creature; I will more broadly speak of *mental aspects* of reality to mean anything that in some way belongs to the mind.

The positions we will discuss in the following sections have different views on the ontological status of the world and the mind, but would also reject some of the ascriptions I have made above. Idealism, for example, rejects that there is a world with objects existing in themselves at all and instead sees the mind as the only aspect of reality. Sceptical positions, on the other hand, would grant the existence of the world, but reject that we can know it to contain anything resembling the objects that we perceive, pointing out that we could

[1] I do not think that 'unconscious experience' or 'unconscious mind' are useful terms (although I certainly think there are unconscious processes happening in the brain); the terms 'conscious experience' and 'conscious mind', then, are not used to distinguish them from the former, but as pleonasms to emphasise the distinction from events in the world.

be entirely deceived by our perceptions as to what the world is like. For both of these examples (and others to be discussed below), the role of physics is not obvious. While in the intuitive dichotomous view described above, it is clear that physics describes the world, this cannot be the case if the world does not exist or is entirely different from how we perceive it to be. This is the reason why I framed this section as a mind–world dichotomy rather than the more traditional mind–matter dichotomy, since we take matter to be something described by physics. Leaving aside sceptical arguments for now, insofar as the world is accepted to exist, I will take it to be the world described by physics and accordingly also call it the *physical world*; furthermore, I will speak of physical properties and physical aspects of reality to mean the properties and aspects of the (non-mental) world.

2.3 Dualism and monism

The discussion of the mind–body problem, as we frame it today, largely goes back to René Descartes [17]. He believed that both the mental (*res cogitans*) and the physical (*res extensa*) exist as separate *substances* and form a dual ontological foundation of reality. According to Descartes, the physical world contains our bodies, which cannot think on their own, but which interact with our *immaterial souls*, which perceive the world through the body, think, and affect the body accordingly [18]. This view is called Cartesian mind–body dualism. Today, we know that thinking/cognition and even perception is facilitated by the brain, as a part of the body located in the physical world. However, this has merely pushed the purview of the mind–body problem, by putting cognition and perceptual processing on the side of the body, leaving open the question of how the activities of the brain within the physical world can lead to conscious experience. Hence, an adapted form and other variants of mind–body dualism remain unaffected.

What all forms of mind–body dualism have in common is that they accept that physical and mental aspects of reality are intrinsically distinct, though closely related. A prominent alternative to Descartes's dualism, which posits two coequal ontological substances, is *property dualism*, which posits the physical world as a single ontological substance, the objects of which, however, have both physical as well as mental properties. Conscious experiences like perceptions or thoughts, then, are taken as mental properties of physical objects, in particular brains. It should be stressed that, while mental properties are properties of a physical substance, they are themselves taken to be

non-physical. In particular, the experience of a thought is different from the corresponding physical process in the brain facilitating that thought.

An alternative to mind–body dualism is monism, where the world is understood to be made up entirely of either a physical or a mental substance, leading to the philosophical positions known as physicalism and idealism, respectively. We will consider them in the next section. Next to physicalism and idealism, there are other forms of monism; e.g. neutral monism posits a neutral substance besides (or rather in-between) mind and matter as the fundamental substance of reality. Famous versions of neutral monism were developed by Bertrand Russell (simply known as Russellian monism) and William James *radical empiricism*. Unfortunately, we will not discuss them further for reasons of time. Another form of monism, which originates in Buddhist philosophy, is nondualism. We discuss it to some extent in chapter 5, where I also present my own version of nondualism.

2.4 Physicalism and idealism

Materialism takes (physical) matter as the sole fundamental substance of reality on which everything else ontologically depends. Physicalism is the modern development of materialism, which expands this ontology to include everything that is physical. In other words, physicalism holds that all aspects of reality are physical and only what is physical (i.e. described by the theories of physics) is real. Concretely, this encompasses matter, but also the spacetime which contains matter itself, energy, fields, etc. The world described by physics is understood as existing objectively and independently from any being observing it. The interactions of matter, e.g. the processes happening within brains, then, are what bring forth conscious experiences. As a form of monism, physicalism is incompatible with dualism and hence has to integrate the mental aspects of reality somehow. How precisely this is done differs per subform of physicalism [19].

Supervenience physicalism is the thesis that all properties supervene on the physical, i.e. any two worlds that are identical w.r.t. their physical properties are identical w.r.t. all their properties, or in the context of the present discussion, two physically identical conscious beings in identical environments cannot have differing mental states [20]. This formulation of physicalism is compatible with property dualism, in that it accepts the existence of a distinct class of mental properties, so long as they supervene on the physical. This, however, contradicts the physicalist conviction that everything is physical, since it allows for something non-physical, i.e. mental properties, to

have independent existence. Hence, supervenience physicalism is not accepted as a sufficient definition of physicalism [19]. A stronger version is type identity physicalism, which requires that every mental property is *identical* to a physical property [21]. This form, however, does not allow for mental properties at all, since clearly e.g. felt happiness is not a physical property (or otherwise the word 'physical' becomes so broad that it loses its meaning). Lastly, realisation physicalism holds that every property either is itself or otherwise is *realised* by a physical property, where realisation can be defined e.g. in terms of higher-order properties [22].

There are numerous more ways to spell out physicalism, but the above paragraph shall suffice for now. We see that the main obstacle for physicalism is reconciling the view that everything is physical with the presence of mental (i.e. at least apparently non-physical) properties. There are primarily two ways to make sense of the mind within physicalism, forming yet another dichotomy: reductionism on the one side and emergentism on the other.

Many proponents of physicalism espouse a form of *reductionism* regarding the mind, which is a position that says that the mental is in some sense reducible to the physical [23]. This reduction can be either explanatory or ontological: explanatory reductionism holds that mental phenomena are entirely explainable in physical terms and that there are no mental phenomena that transcend the grasp of physics; ontological (or constitutive) reductionism is the stronger view holding that mental aspects of reality are ontologically constituted by physical properties and nothing wholly above or beyond these physical properties [24, 25]. For the remainder of this thesis, I write 'reductionism' to mean ontological reductionism. Reductionism is related to but distinct from *eliminativism* about the mind (or eliminative materialism), which claims that our common understanding of the mental aspects of reality are so flawed that we should not take them to be existent at all [26]. Dennett [27], for example, criticises the concept of qualia and suggests, in essence, that there are no such things as qualia at all.

On the other end of the spectrum from reductionism is *emergentism*, though the views presented under this banner are diverse. In the study of complex systems, emergence refers to behaviours and properties of systems that result directly from the interaction of its parts/subsystems (e.g. the behaviour of migrating birds forming shapes of 1s or arrow-heads is emergent from the behaviour of each bird trying to be in the slipstream of another bird while still having clear sight ahead), so that the emergent behaviour is hence clearly reducible to the subsystem behaviour [28]. In the philosophy of mind, on the other hand, emergentism is the view that mental states/properties emerge

from physical (in particular neural) processes and are hence ontologically dependent on the physical, but are themselves of a different kind and *not* ontologically reducible to physical world states [21, 29]. Proponents of *weak emergence* view the emergence of mental states as compatible with physicalism, affirming both the existence of the mind as well as the fundamentally physical nature of reality. On the other hand, when these emergent mental states are understood to have causal powers that go beyond behaviours that are determined bottom-up from the underlying physical state, we speak of *strong emergence*, which clearly is not compatible with physicalism [30]. Both weak and strong emergence, though, are compatible with dualism when they take the emerging mental aspects to constitute their own ontological class, either as a mental substance or as mental properties. I will refer to such formulations of emergentism (based either on weak or strong emergence) that include a dualist view as *dualist emergentism* and to formulations that are compatible with physicalism (i.e. only those based on weak emergence) as *physicalist emergentism*. We shall return to justifications and problems with these positions in the next chapter.

Moving on, the traditional rival view to physicalism (or traditionally, to materialism) is idealism. Instead of explaining the mental in terms of the physical, idealism denies the existence of a mind-independent, physical world altogether and views *mind* as the fundamental and sole substance of reality, where the ambiguity of the term 'mind' is reflected by the many forms of idealism that have been put forward throughout the centuries [31]. An early and highly influential defence of idealism was by Bishop Berkeley in the 18th century. The ontological foundation of his *subjective idealism* are the subjective perceptions of individuals, since the existence of those, unlike the existence of the world that is supposedly causing these perceptions, is impossible to doubt [32]. To account for the consistency amongst perceiving individuals, Berkeley invokes the perception of God, thereby effectively creating an idealist analogue of the objective world of physicalism. In the decades following Berkeley, idealism has been developed further in different parts of Europe, leading to the movements known as German idealism and British idealism. Although idealism has seemingly fallen out of favour in modernity, just a few years ago, Bernardo Kastrup has defended his position titled *analytical idealism*, which we discuss in section 4.1.

2.5 Realism and anti-realism

Realism is a broad term that is used in more or less all philosophical disciplines. Relevant for the endeavour of this thesis is *metaphysical realism*, which is the belief that the world that we inhabit and perceive is ontologically independent from the mind [33]. In other word, the world would exist 'just as much' without any conscious being observing it. A crucial aspect of metaphysical realism (and all forms of realism, with few exceptions) is that *being real* is understood as *having mind-independent existence*; the oft-made designation of the world as the *real world* is in line with this.

Concerning the relationship between the world and our perceptions of it, we differentiate between direct and indirect realism. *Direct* (or naïve) *realism* is the view that we directly perceive the world as it is, holding that either our perceptions are accurate representations of the world, or that the objects of our perception actually *are* (identical to) the objects of the world. In the latter form, direct realism may sound like a form of idealism, but differs in that direct realists maintain that objects continue to exist on their own when not perceived. *Indirect realism*, on the other hand, holds that our perceptions are incomplete and inaccurate representations of how the world really is [33].

Important for indirect realism is the distinction between *primary and secondary qualities*, famously expounded by John Locke [34, 35]. The primary qualities of objects in the world are those that the objects are said to have in themselves, independent of anyone perceiving them, whereas secondary qualities are those that objects only possess in virtue of and in relation to being perceived. For example, the primary qualities of some particular sapphire include its location in space, that it consists (mainly) of aluminium oxide molecules, the way those molecules are arranged, and so on; the blueness of the sapphire, which results from some wavelengths of light being reflected and some absorbed upon interacting with its constituent molecules and the reflected light then hitting our retinas, is a secondary quality of the sapphire. Similarly, a primary quality of a piece of candy is that it contains sucrose, whereas its sweetness upon eating it is a secondary quality. Indirect realists would say that the blueness of the sapphire and the sweetness of the candy is only present in our mental representations of the world and not in the objects as they 'really' are in themselves. Direct realists would reject this distinction and say that blueness is just as real a property of the sapphire as its arrangement of molecules, and the sweetness just as real a property of the candy as its containing sucrose.

Note that the form of indirect realism presented here is still quasi-direct, in the sense that the world is understood to be made up of objects corresponding to the objects as we perceive them, just lacking secondary qualities like colour and taste. More radical forms of indirect realism reject that the world can be subdivided into objects corresponding to the objects of our perception in this way. This is the case for the sceptical positions we consider in section 2.5.3 as well as for the theory of *conscious realism* we consider in section 3.2.2.

Physicalism, as we have described it above, entails metaphysical realism, but the converse is not the case, since a dualist could still be a metaphysical realist about the non-mental aspects of the world. Idealism, on the other hand, rejects the mind-independent existence of the world and is hence incompatible with metaphysical realism.[2] Consequently, idealist ideas have historically also been categorised under the headline of anti-realism and the two terms are sometimes used synonymously (e.g. in [36]). Today, however, the term 'anti-realism' is mostly used within the philosophy of science. So before we move over to the other side of the dichotomy of this section, we shall discuss scientific realism.

2.5.1 Scientific realism

Scientific realism is the view that the objects, structures, and laws described by scientific theories are real, broadly speaking. Of particular interest is the status of objects that are not directly perceivable but are central to scientific theories, e.g. protons and electrons in physics. Chakravartty [37] identifies three commitments at the heart of scientific realism. The first one is a commitment to *metaphysical* (ontological) realism. The second commitment requires that scientific statements are understood in a *semantically* literal way, in that the theoretical terms (e.g. 'electron') are taken to refer to real objects in the world and the statements to have definite truth values (i.e. they are either literally true or literally false). For example, considering the statement (regarding some material) 'upon performing some experiment, the atoms constituting the material emitted photons with a wavelength of 450 nm', the scientific realist (strictly speaking, only an entity realist regarding particle physics; see below) takes all the theoretical terms (atoms, photons, photon wavelength) to refer to things actually existing in the world, whereas certain anti-realists would understand the statement to be a mere useful fiction shorthand for 'upon performing some experiment, the material emits blue

[2] This is only true about the classical forms of idealism and realism as introduced in this chapter. Indeed, Kant [14] simultaneously espouses *transcendental idealism* and *empirical realism*.

light, which causes the measurement apparatus of the experimental setup to read "450 nm"'. Lastly, the *epistemological* commitment of scientific realism says that scientific theories grant us (approximate) knowledge of the world, i.e. while theories may turn out to be ultimately false as general theories (like Newtonian physics does not describe the movement of black holes), they are true descriptions of the world (as existing mind-independently and described literally by the theories) at least in some circumstances and to some extent.

An important distinction within scientific realism is between *entity* realism and *structural* realism. An entity realist (e.g. about particle physics) holds that the success of a scientific theory warrants belief in the (mind-independent) existence of the entities of the theory (e.g. atoms). A structural realist, on the other hand, focuses on the structures (i.e. relations between entities) described by theories, though the precise focus differs between the two types of structural realism [37]. *Epistemic structural realism* (ESR) is the view that, while there are unobservable entities in the world, scientific theories do not constitute knowledge of these entities, but only about the structures between them. In other word, ESR accepts the ontological and semantic commitments of scientific realism regarding entities, but reserves the epistemological commitment for structures. *Ontic structural realism* (OSR) goes one step further and rejects the ontological commitment regarding entities in favour of an ontological commitment to the existence of structures. In other words, according to OSR, the world is fundamentally made up of structures; entities/objects, if they are taken to exist at all, are ontologically dependent on these structures [38]. A particularly radical form of OSR is due to Max Tegmark and will be discussed in section 4.2.

2.5.2 Empiricism

Any view that rejects realism, i.e. that denies the existence and/or knowability of a mind-independent world, falls under the heading of anti-realism. Amongst the arguments against realism are those in favour of idealism – which is why one also often finds realism and idealism juxtaposed directly with each other (rather than with anti-realism or materialism, respectively) –, sceptical arguments (which we discuss in the next section), and others. Here, I want to focus on a famous argument against *scientific* realism in particular, viz. the *pessimistic induction*, which goes as follows: in the history of science, there were many theories that were useful in predicting outcomes of experiments, but which ultimately turned out to be false and used terms which did not refer to anything that actually exists in the world. For ex-

ample, the phlogiston theory of the 17th century tried to explain fire as an element called 'phlogiston' that was released during combustion; by today's theories, however, there is nothing in the world that the term 'phlogiston' refers to. Since most theories in the history of science are now deemed equally false (when considering general validity), the pessimistic induction concludes that, most likely, today's theories are wrong as well [37]. (Note that this argument only attacks the semantic and epistemological commitments of scientific realism.)

Accordingly, empiricism is a view that denies that we can know the world and focuses on our empirical observations as the source and subject-matter of knowledge. Scientific theories, according to this view, are seen as true only insofar as they describe and predict empirical observations. Statements talking about unobservables, then, can be neither true nor false when interpreted literally, since the terms for these unobservables do not refer to anything [39, 40]. A famous (but nowadays largely abandoned) form of empiricism is *logical positivism* (or logical empiricism), whose core tenet is that only direct observations and logical proofs can be sources of knowledge; statements about unobservables are interpreted non-literally as in the example about atoms and emitted photons above [41].[3] It is important to note that empiricism, in general, is an epistemological view and does not encompass a position regarding the ontological status of the world (though some empiricists and in particular logical positivists have also rejected metaphysical realism).

2.5.3 Scepticism

Another position that rejects the epistemological commitment of scientific realism is *scepticism* (about the world).[4] While empiricism focuses on empirical observations as a source of knowledge but is at least agnostic about a world underlying these observations, scepticism is committed to metaphysical realism but doubts (or even denies) that we can know the world. In particular, sceptics consider the possibility that the world is entirely unlike we perceive it to be [44]. As Thomas Nagel [3, p. 73] puts it: '[B]y "tree", I don't mean just anything that is causally responsible for my impressions of trees, or [...] anything of the sort that I and others have traditionally called tree. [...] [T]hose things could conceivably not be trees.'

[3] A modern development of empiricism is Bas van Fraassen's *constructive empiricism*, which is not committed to the existence or knowability of unobservable entities, but nonetheless takes a scientific theory to be true as long as it correctly explains observable phenomena (in van Fraassen's words: if it is 'empirically adequate') [42, 43].

[4] Like realism, scepticism is a *type* of view and only becomes a concrete view when one says about what one is a sceptic.

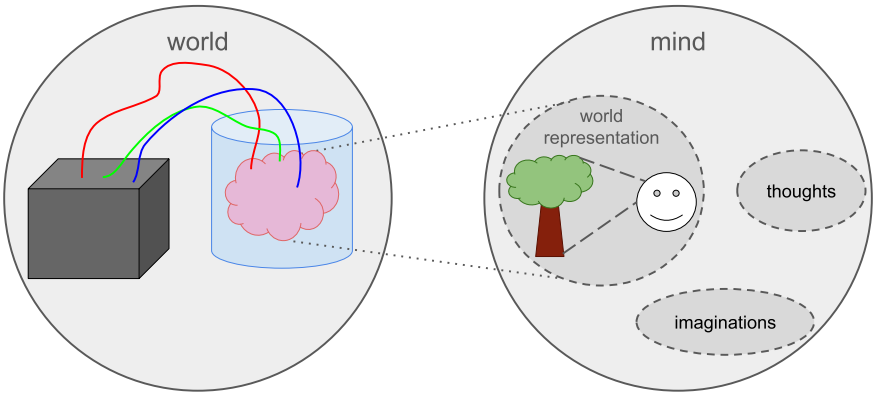

Figure 2.2: In the sceptical thought experiment of the brain-in-a-vat, a free-floating brain is connected to a computer, which, by exchanging signals with the brain, induces in it neural activity that is indistinguishable from the neural activity a brain within a body within a natural world would have, arguably implying that one cannot know whether one's own experience is not actually had by a brain-in-a-vat.

A famous sceptical scenario is the *brain-in-a-vat* thought experiment (cf. e.g. [45]): imagine that somewhere in a laboratory is a vat in which a brain is floating and is connected, via neural implants, to a computer, so that the computer can send sensory input signals to that brain and receive motor signals from it. The computer, then, simulates a world and reacts to the motor signals from the brain, so that the input signals to the brain are identical to those it would receive were it actually located in a body in a world corresponding to the simulated one, sent from its eyes (etc.) instead of the computer; this scenario is illustrated in fig. 2.2. Notice that, *from within the experience had by that brain*, the brain-in-a-vat scenario cannot be distinguished from a scenario where the brain is inside a human located in a world that actually *is* how it is experienced (cf. fig. 2.1 on page 8). By extension, the argument goes, none of us can know whether we are not actually brains-in-a-vat. (This is a modern development of the *evil demon* thought-experiment due to Descartes [17], in which an evil demon, rather than a computer, is simulating a world and thereby deceiving an immaterial soul, rather than a brain. Unlike Descartes's scenario, the modern version does not require substance dualism.)

A similar idea is known under the name *Boltzmann brains* (named after physicist Ludwig Boltzmann; cf. e.g. [46]): according to modern physics (in particular quantum field theory), our universe consists fundamentally of different fields; fluctuations in those fields can cause particles to form spontaneously. In an infinite universe, then, structures of arbitrary complexity could form spontaneously. Hence, it is possible that a brain, identical to your brain in its current state with all its memories, could spontaneously form somewhere in the universe. Assuming that there is a one-to-one correspondence between brain states and (experienced) mental states, it is impossible to tell whether the experience you are having right now is not actually had by such a *Boltzmann brain*.

The *simulation hypothesis*, proposed by Nick Bostrom [47], is a related sceptical scenario. It is similar to the brain-in-a-vat scenario, but does not require physical brains. Instead, it assumes that it might be possible to simulate a universe on a computer and that this simulated universe could actually include (a simulation of) beings that have conscious experiences of this simulated universe. As with the previous scenarios, since the simulated universe is assumed to be indistinguishable – from within that universe – from a 'real' universe (i.e. one that is not simulated and more or less as it is experienced), we ourselves cannot tell with certainty whether we are in a simulated universe or not. Moreover, since beings in a simulated universe could potentially run simulations of their own, the number of (higher-level) simulated universes would be much greater than non-simulated ones, making it more likely that we are living in a simulated universe.

What all the foregoing scenarios have in common is that they assume the existence of a world that is, in essence, like ours (i.e. that can contain brains or computer simulations) and whose inhabitants could, in principle, perceive it 'as it really is' (in the quasi-direct realist sense mentioned previously). Furthermore, we cannot know whether we are in a scenario where we live in a universe that is roughly as we experience it or whether we are in one of the sceptical scenarios. Importantly, though, the sceptic believes that there is a real difference between these scenarios and that, although it is possible for us to know the truth about the scenario we are in, there is such a truth. An idealist, on the other hand, would deny that there is such a truth beyond experience and would dismiss questions about which scenario we are in as meaningless. Idealism, hence, is a form of *anti-scepticism*.

Generally, anti-scepticism is a position that denies the validity of sceptical arguments [3]. One anti-sceptical argument concerns the reference of terms: since by 'vat', one could not mean anything other than the types of things

that one has perceived before and learned to call vats, and since in the brain-in-a-vat scenario, these things would be nothing more than certain patterns of signals the computer sends to the brain – in particular, the word 'vat' could not refer to the vat that the brain is in –, the thought 'I am a brain in a vat', when had by that brain, would be necessarily false [3]. (Note that Nagel [3], after outlining this argument, goes on to argue against it and for the possibility of scepticism, saying, in essence, that while we might lack the access to the world, as it really is, that would be necessary to fully and accurately describe the situation we are in, we can nevertheless be sceptical about whether the world is the way we perceive it, containing us and the physical objects we see, or actually entirely different.)

The sceptical scenarios we have considered up to now concern the objective world and what it is like. There are, of course, sceptical scenarios questioning other aspects of reality as well. For example, the *five-minute hypothesis*, due to Bertrand Russell [48], suggests the possibility that 'the world sprang into being fve minutes ago, exactly as it then was, with a population that "remembered" a wholly unreal past' [48, p. 121]. Indeed, in every moment of experience, we cannot know whether the world was not actually created in just that moment, complete with your memories of the past without there actually having been such a past. Another yet different form of scepticism concerns *other minds*, pointing out that it is impossible for each of us to know with certainty whether the other people around us have minds/conscious experiences of their own [49, 50]. As before, scepticism about other minds assumes that there is a real difference between another person having vs. not having conscious experiences, while it is impossible for each of us to know which is the case. *Epistemological solipsism* combines scepticism about the world and scepticism about other minds, saying that it is impossible for us to know anything that transcends our own immediate experience [49]. Taking this a step further by concluding that one's own experience is the only thing that exist *at all* leads one to the metaphysical position that is usually referred to simply as solipsism, but which I call *ontological solipsism* for clarity. In this radical form, ontological solipsism is not seriously defended as a philosophical position by anyone;[5] rather, one often finds it used as a pejorative within criticisms of philosophical positions (as in 'This view is a form of solipsism, hence it is absurd.').

[5]After all, whom would a solipsist like to convince?

2.6 Objective and subjective

The mind–body problem is perhaps best seen as an instance of the objective–subjective dichotomy. This dichotomy, together with many more instances thereof, has been insightfully examined by Thomas Nagel in his essay *Subjective and objective* [2] and his ensuing book *The view from nowhere* [3].[6] In line with the conceptual dualism outlined above, the objective aspects of reality concern the world and its constituents as they are in themselves, whereas the subjective aspects of reality concern the experiences of this world as had from a particular position by a particular being within it. In his texts, Nagel frames the dichotomy in terms of the *viewpoints* from which we view reality, with each of us being able to adopt both subjective as well as objective viewpoints. While I have been talking of dichotomies, Nagel understands the these viewpoints as lying on a spectrum.

The most subjective viewpoint we can adopt is to simply view (the appearance of) the world as we perceive it from our place and situation within it, complete not only with sounds and colours, but with our attitudes and opinions towards the objects of the world. To adopt a more objective viewpoint, we *abstract* from our subjective viewpoint, acknowledge that our attitudes are due to our constitution and its appearance influenced by the place from which we perceive it. Next, we can abstract from our sensory apparatus, since the world is perceived differently by different creatures (e.g. bats using sonar perception) and an objective viewpoint of the world cannot depend on how it is perceived. The limit to this series of ever more objective viewpoints is 'a conception of the world which as far as possible is not the view from anywhere within it [...], its aim is to regard the world as centerless, with the viewer as just one of its contents' [2, p. 206].[7] It is important to note that objectivity, to Nagel, is not about intersubjective agreement, i.e. finding a description of reality that accommodates as many conceivable and actual subjective viewpoints as possible, but about detachment from any point of view at all, 'under the pressure of an assumption that everything must be something not from any point of view, *but in itself* [emphasis added]' [2, p. 208].

Framing the mind–body problem as an instance of the objective–subjective dichotomy is perhaps the most lucid way to discuss it, since it is not the

[6] Note that this section digresses in style from the previous ones; rather than giving an overview of positions, I lay out the views of one philosopher, Nagel, in particular.

[7] We might recognise this aim as the (implicit) aim of the natural sciences. Indeed, in the metaphysical instance of the objective–subjective dichotomy, Nagel sees the physical description of the world as the relevant objective viewpoint.

stimulus–response behaviour of living creatures, which may also be referred to as 'mental states' and described in objective terms, but the subjective aspect of mental states, i.e. what it feels like to have them for the being having them, that transgresses any objective description of reality and that makes the mind–body problem so elusive. Concretely, the relation between the objective/physical and the subjective/mental cannot be likened to relations between two objective aspects of reality, since this fails to recognise the subjective nature of experience [2]. We discuss whether and how it is possible to reconcile the objective and the subjective aspects of reality in the next chapter.

3 Objective realism and its challenges

In the previous chapter, I gave a broad overview of the main positions in the metaphysics of mind and tried to present them in an impartial (dare I say objective) way. In this chapter, I will focus on one broad position, as well as some adjacent and compatible ones, and discuss them more critically. The central position to be discussed underlies many of the metaphysical positions we discussed in the previous section. Moreover, I believe that it also constitutes the worldview that is held, at least implicitly, by most (scientifically-minded, secular) people today. I will refer to it as *objective realism* (about the world). At its core, it can be characterised by the following three beliefs.

Metaphysical realism: there exists an *objective world* that is 'out there', external to and independent of any presence of mind. It is that which (mental) perceptions are perceptions *of*.

Objectivism: there is, at all times, one way the world is in itself (as seen from Nagel's [3] most objective viewpoint), i.e. one set of facts that exhaustively describes the state of the world.

Subjective supervenience: the contents of subjective experiences are entirely determined by the objective world. All facts describing a subjective experience are derivable from the set of facts describing the state of the world.

In this basic formulation, objective realism can be understood as the ontological extension of the conceptual dualism discussed in section 2.2. From here on, I will sometimes refer to the world whose existence objective realism is committed to as the *objective world* to distinguish it from other senses in which the word 'world' will be used.

Many of the positions we considered in the previous chapter are committed to objective realism. This is obvious for physicalism, in particular in its reductionistic variety as well as for physicalist emergentism, but also for the weak-emergence form of dualist emergentism. (Cartesian substance dualism and the strong-emergence form of dualist emergentism, on the other hand, ascribe properties to the mental/subjective that cannot be accounted for in physical/objective terms and are hence incompatible with subjective super-

venience.) Less obviously, even Berkeley's idealism implies objective realism, since there 'God's perception of the world' plays the role of the objective world. Hence, in arguing against objective realism in this form and against the particular beliefs, I am arguing against a large number of metaphysical positions that are based on it.

Empiricism, as we saw, is an epistemological position without ontological commitments and hence neither implies nor rejects objective realism. Scepticism, on the other hand, although also a predominantly epistemological thesis, is at least committed to metaphysical realism and compatible with the other two beliefs of objective realism. Adjacent to the previous three beliefs, there is another belief that is often held as an addendum to objective realism. It, however, is incompatible with scepticism, as it concerns the correspondence between the objective state of the world and subjective perceptions thereof. It will be relevant in our discussion of the knowability of the world below.

Quasi-direct realism: the world is 'roughly' as we experience it. Our experience is filled with appearances/images of the objective world, which are different from how the world is *in itself* (e.g. only our appearances contain colour, while the world only contains photons of certain wavelengths), but by abstracting away from secondary qualities like colour, we can know the primary qualities of objects which describe how they are in themselves as part of the world.

NB: while physicalism implies objective realism, the converse is not the case. Nevertheless, practically all prevalent metaphysical positions that belief in an objective world take this world to be described by physics. Therefore, in line with much of the previous chapter, I will use the adjective 'physical' to talk about properties and states that concern the objective world. Analogously, I will use the adjective 'mental' to talk about properties and states of subjective experiences had by beings within the world. With this in place, we can also use terminology introduced in the previous chapter to rephrase the definition of subjective supervenience: mental states are (in principle) derivable from physical states.

In the following sections, we examine difficulties that each of these beliefs and consequently objective realism as a whole face. The focus is placed on the difficulty of accounting for the subjective aspects of reality within the worldview of objective realism. Through our analysis, we are putting bounds on any objective understanding of reality that is based on objective realism.

3.1 The pursuit of objectivity

In trying to understand reality in the name of science, humans have pursued an ever more objective view of the world, to the point where sometimes only what is objective is considered real. Copernicus saw that the Earth only appears to be central, with the Sun rotating around it, when viewed *from* the Earth, but that objectively it is the Sun that is the centre of our solar system, with the planets, of which the Earth is just one, orbiting around it. The Sun itself turned out to be just one of many suns, located somewhere in one of many galaxies [51]. Darwin's theories implied that humans are not the beings created by the creator god of the universe in his picture, but just another animal shaped by evolution [52]. Advances like these changed our understanding of the world from one in which the Earth and we humans are at the centre of the universe to one in which we are just another part. This abstracted our understanding of the universe from our place within it and made it centreless.

Particle physics and our understanding of our perceptual systems tell us that colour and sound are not parts of the world, but contingent on our constitution and only appearing when we perceive the universe by interacting with it. Objectively, the universe contains just matter (or waves and fields) with physical properties. This insight made our understanding of the universe colourless.

Einstein's theory of relativity taught us that the passage of time at a point in the universe is influenced by the gravitational forces at that point, that it passes slower at some points and faster at others, and that hence what looks like two events happening at the same time from one point in the universe looks like a succession of events from another; there is no global sense of simultaneity, let alone a global sense of *now*, that is valid for the universe as a whole [53]. This replaced our understanding of the world as one that evolves through time and that we experience at each point in time by an abstract space-time that is now-less.

In this pursuit of objectivity, says Nagel [3], we are transcending the contingencies of our own place in the world and are learning about how things really are in themselves. But when it comes to the subjective aspects of reality, this move towards objectivity does not provide a deeper insight; by abstracting away from subjective aspects, we are leaving them behind unexplained. In the words of Nagel [15, p. 174]: 'If the subjective character of experience is fully comprehensible only from one point of view, then any shift to greater objectivity [...] does not take us nearer to the real nature of the phenomenon:

it takes us farther away from it.' Hence, a purely objective description of reality is incomplete; 'reality should not be identified with objective reality' [2, p. 211].[1] Rather, both the objective and the subjective have to be accepted as complementing and irreducible aspects of reality.

Another illustration of the circumstance that an objective viewpoint cannot constitute an exhaustive description of reality can be seen in the thought experiment known as 'Mary's room', due to Frank Jackson [54]. Jackson asks us to consider a scientist, Mary, who has been living all her life inside a room which contains only black-and-white objects including a computer with a black-and-white monitor through which she can see black-and-white footage of the world outside the room. With the help of collaborators outside the room, she is able to investigate the world in detail and focuses her studies on the colour perception of humans. Eventually, she learns all there is to know about the visual system and what happens in the brain when humans see particular colours. One day, the door to the world outside the room is opened and Mary can step outside. Jackson then asks us, when Mary steps into the colourful world and sees objects in colour for the first time, does she learn something new? He answers affirmatively: before, she might have known all *objective* facts about human colour perception, but only by stepping outside the room did she learn what seeing in colour is like *subjectively*. Therefore, Jackson concludes, physical (objective) facts do not exhaust all there is to know about reality.

Although the consequences of these arguments are more far-reaching, the main take-away we shall focus on for now is simple: subjective aspects of reality, in particular conscious experiences in *the mind*, exist, as real aspects of reality, wherefore eliminativism about qualia is simply wrong.

3.2 Where to place the mind

With the existence of the mind asserted, the questions arise: What position does it have in an ontology of reality? And how does it interact with the objective world posited by objective realism? In this section, we critically assess the answers to these questions given by the positions that we introduced in the previous chapter and which I briefly summarise again here.

[1] Idealism, which might be seen as the other extreme, only allowing for the subjective aspects of reality, is not acceptable to Nagel either, because he insists that there are some ways which things are like in themselves and denies that this objective aspect of reality can be reduced to the subjective any more than the other way around [2].

Reductionism (regarding the mind) is the view that the mental aspects of reality are in some way reducible to its physical aspects [23]. In its most radical form, it boils down to eliminativism, when it claims that the mental aspects of reality are ontologically reducible to physical aspects and that mental events (like thoughts) are nothing above and beyond the physical events that underlie them (i.e. neural processes). Type identity physicalism, in particular, holds that all properties of reality *are* physical properties and describable in the objective terms of physics. We have rejected this kind of eliminativism in the previous section. Less radical forms of reductionism admit the presence of subjective experiences, but still maintain that they are reducible to physical aspects in an explanatory or semantic way, i.e. that statements about mental experiences can be translated into equivalent statements about physical processes and that hence the mind can be discussed entirely in physical terms.

To see the problem with this, remember that by mental aspects of reality, we mean subjectively experienced mental states. Now, while we might be able to explain in objective terms that two events happen simultaneously as viewed by some being in the universe, that these events cause certain processes in the brain of the observer, and that these processes cause the observer to respond in a certain way, none of this entails any subjective facts about what it feels like to that being to experience the perceptions of the events in a unified now and from a certain viewpoint in the universe. Likewise, no objective description of wavelengths and brain states entails what it feels like to experience the colour red. As I said above, in adopting an objective viewpoint, we are irretrievably leaving behind subjective aspects of reality that are simply not present in an objective viewpoint and that are not entailed by objective descriptions. Therefore, not even a purely explanatory reduction of subjectively experienced mental states is possible.

A possible escape for reductionism involves *bridge laws*. Even though physical theories do not *by themselves* entail facts about subjective experience, they, of course, tell us *something* about our experience; e.g. when a physical calculation predicts that a certain object will emit photons with a wavelength of 450 nm upon having been excited in some way, you learn that you will experience what you know as the colour blue. This is possible because the word ‘blue’ serves as a *bridge* between the objective description of photons with wavelengths on one side and subjective descriptions of colour experience on the other side. More generally, in reductionist theories, bridge laws systematically associate properties of one domain with properties of another domain to which the former is to be reduced; in the context of the mind–body problem, mental properties are associated, through bridge laws, with phys-

ical properties [19]. While this is certainly a pragmatically useful approach that can account for the ability of physics to predict experiences and uncover the systematic links between objective and subjective descriptions of reality, it explains neither the ontological status of the mind nor why the bridge laws are the way they are (i.e. it is entirely conceivable that 450 nm wavelength photons would lead to an experience that you would now subjectively know as red instead of blue, an idea related to the argument known as the *inverted spectrum*). Hence, bridge-law reductionism reduces the mental to the physical neither ontologically nor explanatorily and hence leaves the important metaphysical questions unanswered. Any position that does answer these questions by reducing the mental to the physical, on the other hand, will be unable to account for the subjective nature of experience, as argued in the previous paragraph. Therefore, I conclude that reductionism of this sort is an untenable position in the debate around the mind–body problem.

Physicalist emergentism is an alternative to reductionism, but one that still maintains a commitment to physicalism. It accepts the independent existence of the mind, *emerging* from physical processes in the brain, but maintains that reality is fundamentally physical and that, in particular, the mind is entirely explainable through and accounted for by physics [29, 30]. Before we discuss physicalist emergentism about the mind further, a quick detour to another area of philosophy shall be illustrative, as both reductionism and emergentism are also positions regarding other ontological problems. In the philosophy of science, reductionism about molecules holds that molecules are nothing more than complex assemblies of atoms with certain bonds between them, with all their properties following from the properties of the atoms and the way they are assembled, thereby reducing chemistry to physics; emergentism, on the other hand, holds that molecules are not just assemblies of atoms, but objects in their own right, albeit *emergent* from the assemblies of atoms and hence ontologically dependent on them, thereby still maintaining that everything is *fundamentally* physical [30].

While this kind of emergentism about molecules emerging from atoms seems like a plausible position, it cannot be analogously extended to the mind emerging from the brain. The problem is that physics and chemistry are both understood as describing the objective world, where the idea that something that is emergent is an entirely new thing while still being dependent on its constituent parts – like a figure in a Pointillist painting emerging from an assembly of dots – is intuitive to us. The relation between two types of things seen from within the objective viewpoint (atoms/physics and molecules/chemistry), however, cannot be lifted to directly apply as an analogy

for the relation between the objective and the subjective viewpoints on reality. If by mental states one meant simply objective facts about brains and descriptions of complex behaviour, then indeed, the analogy could be applied to characterise physicalist emergentism about mental states as a coherent position. However, by mental states I mean *subjectively experienced* mental states, which simply and undeniably are so entirely and categorically different from a purely objective description of the world that the analogy could not possibly apply. Note that my point is not that the analogy to emergentism about molecules is just an insufficient definition of physicalist emergentism about the mind. Rather, my point is that emergentism can be a coherent position at all only from within the objective viewpoint, describing the emergence of one objective thing from another (or alternatively from within the subjective viewpoint; but it cannot concern the relation between objective and subjective viewpoints). What would be needed, then, to make physicalist emergentism about the mind a coherent position would be an objective conception of the relationship between objective and subjective viewpoints, but this, again, would necessarily lose the intrinsic character of the subjective viewpoint and hence be unable to fully account for it. Therefore, physicalist emergentism about the mind simply is not even a coherent position.

In sum, the arguments I presented in rejection of eliminativism, reductionism, and physicalist emergentism amount, altogether, to a rejection of physicalist monism, according to which reality is fundamentally just comprised of the objective world as described by physics, with mental phenomena just being special patterns therein and nothing 'extra' on top. Instead, the arguments imply, the mind (and subjective aspects of reality in general) needs to be accepted as an irreducible aspect of reality. However, the arguments do not attack any constituent beliefs of objective realism, so a position based on objective realism that accepts the irreducible existence of subjective aspects (so long as they are supervenient on objective aspects) still seems possible.

Substance dualism is an alternative to physicalist monism and accepts both mind and matter as separate and interacting substances of the universe [55]. Simply positing a mental substance (like immaterial souls in Cartesian dualism) next to the physical substance of the objective world, however, does not defuse the difficulty of accounting for subjective experiences in an objective conception of reality, if the mental substance is assumed to exist as just another objective aspect of reality. (Nagel [2] calls this strategy *annexation* of the subjective to the objective.) It is no easier to answer why a non-physical substance can have a subjective experience than to answer why a physical object can; it is merely easier to axiomatically posit the

former ('Souls simply are the things that have experience!') and be content with an objective theory that fails to explain subjectivity.

Property dualism , which holds that there is only one type of substance with two types (mental and physical) of properties [55], seems like an attractive alternative. Naïve formulations thereof, however, do not fare better if they just posit mental properties alongside physical ones ('This brain currently weighs 1.4 kg, consists of roughly 100 billion neurons, and is experiencing a black mug.'). However, a property dualism that recognises that for certain physical states there is something that it subjectively is like to experience that state, taking this as a mental property of that state and without annexing this subjective experience to an objective description, seems to me to be the last resort for reconciling objective realism with subjective experiences.

Accepting the mind (in the form of mental properties) as an ontologically irreducible aspect of reality, there remains the question of its ontological status, i.e.: is the mind emergent or fundamental? In the first case, we have property-dualist emergentism, either in its weak or strong form (cf. section 2.4). Here, mental properties are accepted as a distinct ontological category, albeit not as an ontological primitive, but as ontologically dependent on and emergent from physical properties. The problem faced by this view is known as the *hard problem of consciousness*. The alternative to property-dualist emergentism is to take mental properties as fundamental and ontologically primitive aspects of reality, as is done in the class of positions known as *panpsychism*. Both of these topics deserve sections on their own.

3.2.1 The hard problem of consciousness

The question that anyone defending a position based on the worldview of objective realism has to answer is this: if the world exists and evolves objectively (as described by physics), then why is there such a thing as subjective, conscious experience in the first place? Why and how do interactions of mind-less, physical matter give rise to subjective, qualitative experience? Answering this question is hard; so hard, in fact, that David Chalmers [56] has dubbed it the *hard problem of consciousness*.[2] He contrasts it with 'easy' problems of consciousness, which are not easy in the sense of being trivially solvable, but in that solving them is in principle possible within the (current)

[2]Joseph Levine, in a paper [57] predating Chalmers's book, has phrased this problems slightly differently in terms of an *explanatory gap* between objective descriptions of the world and the presence and contents of subjective experiences.

framework of science and using methods from the cognitive sciences including. Examples of easy problems include the questions of which brain areas are involved when a subject seems to be conscious (as opposed to dreamlessly asleep), how the brain produces language and allows a person to speak and think, or how the visual system processes inputs from the retinas. One might say that the easy problems concern the structures and processes underlying conscious experience. Crucially, however, it is conceivable that all these processes could happen in the brain without there being a subjective, conscious experience associated with them. In this context, Chalmers [56] asks us to consider what he calls a (philosophical) *zombie*: a creature who, from the outside, acts exactly like a conscious person and is indistinguishable from one, but for whom 'the lights are not on', where there is nothing that it is like to be that creature.[3] The hard problem of consciousness, then, asks why we are not zombies, but conscious beings.

Physical states may causally determine the *structural contents* of mental states, but they do not logically entail the *subjective experience* of mental states. Hence, a fully objective description of reality only captures it up to equivalence with a reality in which everyone is a zombie. This satisfies the requirement of subjective supervenience of objective facts determining subjective facts, but does not account for the presence of these subjective facts in the first place. The challenge faced by property-dualist emergentists, then, is to explain why and how certain physical processes give rise to conscious experiences or, in other words, why certain physical states are accompanied by mental states. Furthermore, there is the question of why these connections are the way they are, i.e. why photons with a wavelength of 450 nm hitting retinal cells and thereby causing specific neural patterns lead to the conscious experience of what we call blue. (This is the same problem as we discussed above in the context of bridge-law reductionism.) Indeed, these connections between physical and mental states seem entirely contingent. This poses an obstacle to (though not directly an argument against) emergentism, since within other instances of emergentism (e.g. chemical properties emerging from physical ones), the connection between the underlying and the emergent properties is taken to be a necessary connection.

In the literature, one finds many proposals about how the mind can be incorporated into the worldview of objective realism, some of which are forms of (or at least in the spirit of) property-dualist emergentism (examples in-

[3]The possibility of such a creature existing has been contentiously debated in the literature. Indeed, few would claim that a zombie is *nomologically* possible in our universe. Within objective realism and with the above conclusion that the mental is irreducible to the physical, however, such a creature is certainly conceivable/logically possible.

clude Donald Davidson's *anomalous monism* [58] and John Searle's *biological naturalism* [59]) and some of which claim to solve the hard problem of consciousness (or deny its problematicity). Unfortunately, for reasons of time, I am unable to examine these positions here. Hence, I have to let them stand as possible solutions rather than being able to conclude that the hard problem disproves emergentism and forces us to accept the mind as a primitive. Nevertheless, the hard problem provides a concise formulation of the main difficulty faced by objective realism of accounting for the presence of subjective experiences. Furthermore, its solution is at the very least non-straight-forward. Together with the other difficulties described in this chapter, it at least serves as an indication that attempting to solve the mind–body problem through a theory based on objective realism might be a misguided endeavour.

3.2.2 Panpsychism

Rather than viewing mental properties as being emergent from physical processes, panpsychism views them as *fundamental* properties of the objective world. There are many variations of this position and related ideas that also go under the name of panpsychism; we will consider two specific theories below. At first, though, the classic form of panpsychism we shall consider is one that is plausibly compatible with physicalism in that it takes consciousness to be a fundamental property of all physical matter; this form of panpsychism has also been called *micropsychism* [60] and *bottom-up panpsychism* [4]. According to this form of panpsychism, there is some set of mental properties associated with every particle in the universe, which combine to form more complex mental properties when these particles interact and form objects. (Note that micropsychism usually still takes human-level experiences to be *emergent* from the processes in the brain and its constituents. In contrast to the emergentism discussed above, the subjective mental state emerges from constituents that are already mental themselves. There is, hence, no emergence of subjective, mental properties from objective, physical properties, but emergence only between subjective, mental properties.)

There are numerous problems associated with this view. *Firstly*, it is contested that an atom could be said to have an experience, i.e. that there is something that it is like to be an atom. This has lead some to propose *protopanpsychism*, which holds that fundamental particles have *proto-mental* properties, that are not themselves associated with experience but constitute mental properties in sufficiently complex clusters of objects with proto-mental properties [60]. However, these proto-mental properties are either

indistinguishable from physical properties (since a physicalist would take physical properties to sufficiently explain the presence of conscious experience) or posed ad-hoc, as just those properties that are sufficient to explain consciousness, and hence of little explanatory use. The *second* problem is known as the *combination problem* and regards the difficulty of explaining under which conditions and how two experiences combine. This problem raises a number of question, which are more easily phrased on a macro-scale: if every neuron in your brain has (proto-)mental properties, how can there be one unified experience associated with your entire brain as experienced by you right now? Are there experiences associated solely with subsets of the neurons in your brain? And is there a unified experience associated with two interacting humans? The latter two questions intuitively seem to be answerable in the negative, which points to an observation leading to the *third* problem: there is only one unified experience you are having right now. While we find that the objects of the world can be broken apart and found to be constituted of smaller parts, the same is not true for experience; you can focus on individual aspects of your experience, like only one object in your visual field, but this simply changes your unified experience and does not make parts of it go away. Hence, while it is natural to divide the world into constitutive parts and see it as made up of fundamental particles, the same is not the case for experience; there is simply no reason for us to see our experience as constituted of individual experiential parts.

Conscious realism. A rather novel form of panpsychism is the theory of *conscious realism* (CR) proposed by Donald Hoffman et al. [61, 62]. It is a form of micropsychism, albeit an unconventional one, because it does not claim that fundamental particles are themselves the smallest building blocks of consciousness, but rather that reality is actually composed of *conscious agents*, which are the primitive entities of the theory. The world as we experience it, then, is merely the *interface* to this 'true reality' (cf. section 3.3.1 below). A conscious agent can perceive the world around him, make decisions based on its perceptions, and, in turn, perform actions upon the world around it; this behaviour of conscious agents is called the PDA (perceive-decide-act) loop. The world around agents, in fact the entirety of reality according to CR, consists of a network of conscious agents, whose actions affect the perceptions of other agents. Crucially, the perceptions of agents are posited to be conscious experiences, thereby putting consciousness at the core of the theory. Collections of interacting conscious agents form (higher-level) conscious agents in their own right.

Based on this basic idea of conscious agents, Hoffman et al. have worked out detailed descriptions of the dynamics of conscious agents using sophisticated mathematical formalisms (group theory, dynamical systems theory, probability theory, and more), which they connect to ideas being developed at the (speculative) forefront of research in physics. Furthermore, they worked out mathematical relationships between their model and the world as we experience it. (For example, they 'conjecture an agent–particle correspondence: a particle (in spacetime) is an aspect of a physical projection of the dynamics of a communicating class of conscious agents to a face of an amplituhedron' [62, p. 21].) To the authors, 'the laws of physics and the special sciences are themselves a projection of the dynamics of couscous agents' [62, p. 24].

By taking the building blocks of consciousness to be agents that are *defined to be conscious*, CR does not face the first problem of explaining why atoms should be conscious. However, it still faces the combination problem: if each conscious agent is itself conscious, how can collections of conscious agents be conscious? CR also responds to this question on the basis of the developed mathematical formalism: collections of interacting conscious agents themselves satisfy the definition of a conscious agent and hence are conscious by definition. The implication that subsets of the agents constituting a macro-level agent are themselves conscious is explicitly accepted.[4]

Ultimately, CR is rather speculative in making specific claims about the world beyond our 'interface'. The authors posit elegant mathematical formalisms and connect them to the mathematics of modern physics, but this alone is not enough to corroborate that the entities they take their formalism to describe constitute reality. Furthermore, CR still faces the third problem of panpsychism I pointed out above: the claim that all these posited interacting agents (and all subsets thereof) that constitute an experience are conscious on their own does not have a basis in experience, since each experience is unified and there is no reason to believe, from within that experience, that it is divided into a multitude of consciousnesses, each unified in their own right. In conclusion, the point that the agents posited by this formalism are all conscious and the point that consciousness exists in the form of these agents are two merely speculative points; the connection between consciousness as

[4] 'The theory of conscious agents proposes that a subject, a point of view, is a six-tuple that satisfies the definition of concious agent. [Certain theorems] give constructive proofs of how conscious agents and, therefore, points of view can be combined to create a new conscious agent, and thus a new point of view. The original agents, the original subjects, are not destroyed in the creation of the new agent, the new subject. Instead the original subjects structurally contribute in an understandable, indeed mathematically definable, fashion to the structure and properties of the new agent.' [61, p. 12]

the fundamental substance of reality and the mathematics of conscious agents is not supported by the strength of both these aspects individually.

Cosmopsychism. On the other end of the panpsychist spectrum from micropsychism is *cosmopsychism*, which holds that human-level consciousness is not based on (proto-)mental properties of entities at the micro-scale, but on the *consciousness of the cosmos* [60]. However, as Kastrup [4] points out, this view faces a problem analogous to the combination problem, viz. the *decombination problem* concerning how a unified human-level experience is partitioned from the cosmic consciousness. Kastrup's [4] *analytic idealism* can be seen as a form of (or at least a view based on) cosmopsychism. Since I would like to consider this theory in more detail, I defer a discussion thereof to the next chapter (cf. section 4.1).

3.2.3 Mental causation

So far, we spoke mainly of the ontological status of the mind (reducible vs. irreducible, substance vs. property, fundamental vs. emergent). Another angle from which to view the relationship between the mental and the physical is to consider the problem of mental causation. We focus on mental states and how these are causally related to physical states. As a running example, we consider a scenario in which a person is served a glass of red wine and, upon tasting it, has to indicate whether they like it or not: the wine comes in contact with sensory cells on the tongue and the olfactory system of the person, which send signals to the brain, leading to a physical state p_i of the brain – the taste is experienced as a quale in a mental state m_i and a judgement is made in the mental state m_o – and the brain sends signals to the speech production system to give an opinion in a final state p_o.[5] The problem of mental causation now asks about the causal relationship between these states.

The answer a Cartesian dualist would give is that the states form a causal chain in the order given: state p_i is perceived by the soul of the person, whereupon it is experiencing state m_i and makes a judgement about the taste experiencing state m_o, causing the brain to end up in state p_o. Because the mental states are directly interacting with physical states, this view is known as *interactionism*. Note that subjective supervenience implies that the objective world is *causally closed*, i.e. that events within the objective world only have causes within the objective world (in other words, physical

[5] Of course, making a decision and sending the signals are processes rather than singular states, but for simplicity we take the final states of the processes as the given states.

event only have physical causes), since any apparent cause within a subjective experience could be accounted for within the objective world through an underlying (subvenient) objective/physical cause [21]. Therefore, interactionism is incompatible with subjective supervenience.

Alternatively, some forms of emergentism would hold that p_i results in m_i and additionally *directly* causes p_o, which then causes (or is experienced as) m_o. However, emergentism also takes there to be a causal relationship from m_i to m_o on the mental level of description, as one should intuitively agree: it clearly feels like the experienced taste of the wine is what causes an experienced judgement. Hence, the state m_o has two distinct sufficient causes, viz. p_o and m_i; we say that m_o is *overdetermined* [21]. This overdetermination is problematic, because, as Kim [21, p. 45] puts it, 'it appears to make mental causes dispensable' (since p_o alone is enough to cause m_o) and it '[comes] into conflict with the physical causal closure [for in] a world in which the physical cause [p_i] does not occur and which in other respects is as much like our world as possible [...] the mental cause [m_i] causes a physical event [p_o]' (which would, again, entail a form of interactionism). A possible solution to the problem of overdetermination might be to espouse realisation physicalism and say that p_i and p_o simply *realise* m_i and m_o, respectively; this can be compared to how a chemical reaction might be explained causally in chemical terms as well as in physical terms, with the physical processes *realising* the chemical reaction. However, such a solution faces the same problems as we discussed above in the context of physicalist emergentism, since physical and chemical descriptions are really just two levels from which to view the world objectively and so causal descriptions at the two levels are easily compatible, whereas the physical and the mental are different in a stronger sense, wherefore simply taking physical states to realise mental states does not provide a solution to the overdetermination of the state m_o.

If we want to avoid overdetermination and adhere to objective realism, including a causal closure of the objective world, we are forced to forsake the causal powers of mental states. This leads to the position known as *epiphenomenalism*, which views mental states as causal end-points (or epiphenomena) that are just by-products of physical states and do not cause any other states themselves. In our running example, p_i causes both m_i and p_o, and p_o causes m_o, but m_i and m_o do not cause anything. The problem with this view is that it simply does not fit our experience of mental causation: as I am writing this text about consciousness, I feel that my consciously experienced mental state is integral to my fingers being able to type a text describing this mental state.

If the non-mental, physical state of my brain alone should be a sufficient cause for writing this text, it must contain some physical representation of consciousness and its partially self-referential (i.e. containing thoughts about consciousness and the current conscious experience itself) contents.[6] Indeed, the logical possibility of such a physical representation of consciousness also underlies the thought experiment about philosophical zombies, since a non-experiencing zombie that is indistinguishable from an experiencing being must still be able to talk about experience. Hence, the question remains why, if there is such a representation in the brain, it is experienced at all (at least by non-zombies); recall that this is the hard problem of consciousness. This problem, however, lies outside the concerns of this subsection. Hence, we are left to conclude that, within objective realism, epiphenomenalism, with a physical representation of consciousness in the brain, is the only valid solution to the problem of mental causation.

3.3 Can we know the world as it is?

The acute reader has already noticed that, in talking about (objective and subjective) *viewpoints*, we have been diverting a discussion of *what reality is like* towards a discussion of *how we view the world*. Concretely, both objective and subjective viewpoints are always had by some being within the world. Nagel [2, pp. 208–209] writes: '[T]he same individual is the occupant of both viewpoints. In trying to understand and discount for the distorting influences of his specific nature he must rely on certain aspects of his nature which he deems less prone to such influence. [...] The idea is that if one can still maintain some view when one relies less and less on what is specific to one's position or form, it will be truer to reality/' Through this process of abstraction, says Nagel, we approximate (though never achieve) a view from nowhere, an 'external perspective [whose] satisfactoriness [...] depends on whether it can place the internal perspective within the world in a way that enables one to occupy both of them simultaneously, *with a sense* [emphasis added] that the external perspective gives access to an objective reality one's subjective impressions are impressions of' [3, p. 77]. The emphasised phrase

[6]Note that physicalists would reject that this distinction between what I call the physical representation of consciousness in the brain and consciousness itself is necessary/valid and would instead identify the two. The arguments presented in this chapter so far, however, entail that the distinction is necessary: if the representation is taken to be a neural pattern in the brain as part of the physical world, this does not in itself encompass its being subjectively experienced; the subjective experience is conceptually distinct from the pattern of neural activity.

in the previous quotation is crucial: the process of abstraction *gives the sense* that it gets us closer to the world 'as it really is'. There is no guarantee of this being the case, though. Nagel admits as much himself:

> The limit to which such a development must tend is presumably unreachable: a conception that closes over itself completely, by describing a world that contains a being that has precisely that conception, and explaining how the being was able to reach that conception from its starting point within the world. *Even if we did arrive at such a self-transcendent idea, that wouldn't guarantee its correctness.* [emphasis added] It would recommend itself as a possibility, but the skeptical possibilities would also remain open. The best we can do is to construct a picture that might be correct. [3, p. 74]

3.3.1 The interface theory of perception

A similar but stronger point regarding the knowability of the world is made by Donald Hoffman et al. [63] in their *interface theory of perception* (ITP). Based on simulation experiments of evolutionary processes, the authors argue that evolution does not favour veridical perception (i.e. representing the world in some way as it really is), but in optimising for fitness payoffs will bring about perceptual systems that neglect veridicality, except for when it comes to the preservation of aspects in the world that are relevant for fitness payoffs. Beyond that, however, we cannot trust our evolutionarily evolved perceptual systems to truthfully inform us about what the world is like. Perception merely gives us an *interface* to the objective world. Hence, the ITP is primarily an argument against a belief in quasi-direct realism.

The analogy that Hoffman likes to employ is that of a computer desktop: an icon representing some file is totally different from the file itself (as a series of bits realised as an arrangement of atoms and electrons on the hard-drive) and in no way gives one access to the 'deeper hard-drive reality' of that file, except that dragging it into the trash can icon has consequences on the hard-drive. Similarly, the authors of the ITP argue, the objects of our perception are mere icons for aspects of the underlying objective world; these icons, moreover, are constructed by perception and cease to exist once you stop to perceive them, while whatever the things are they are icons of continue to exist [63].

Since we cannot trust our perception to inform us about the objective world, we have to assume that even spacetime itself is not fundamental, but a con-

struct of perception, so Hoffman et al. [62]. Readers familiar with Kant [14] will notice the semblance to his ideas regarding both space and time as well as perception and objects: the icons of the ITP can be understood as the phenomena, caused by things-in-themselves, of Kant's transcendental idealism. While Kant concludes that we cannot say anything about things-in-themselves, Hoffman et al. use the ITP as a springboard for a theory about the objective world that our perceptual worlds are interfaces to, viz. the theory of *conscious realism* we saw above in section 3.2.2.

The ITP is a powerful argument for why we should be sceptical of the knowability of an objective world and, consequently, of any form of quasi-direct realism. Furthermore, the ITP highlights that our quest of understanding reality is not simply about finding ever-smaller constituents (like looking at the pixels on a desktop screen does not get one closer to the underlying hard-drive reality), but might require us to shift our perspective entirely.

3.3.2 Internal and experiential realism

Whereas the previous subsection questioned whether the world actually is as we see it, we now consider a position that denies that there even is one way the world is, hence opposing a belief in objectivism. In [64, chs. 15–16], George Lakoff presents an account and interpretation of Hillary Putnam's *internal realism* (or internalism). Putnam formally argues against the view that there can be one true description of the way the world is as well as against a model-theoretic conception of meaning, his argument leaning on the assertion that there is no way for us to step outside the world to see and describe it from without; Lakoff summarises Putnam's conclusion saying that 'there can be no objectively correct *description* of reality from a God's eye point of view' [64, p. 259].[7] Lakoff emphasises that this does not entail a rejection of the existence of an objective world, 'only that we have no *privileged access* to it from an external viewpoint' [64, p. 259]. Hence, the arguments against objectivism mainly concern 'reality as we understand it' [64, p. 262], not reality as it is in itself. Yet, since the former is where objects as well as truth are placed by internal realism, it is a metaphysical thesis rather than just a cognitive one.

In particular, internal realism rejects that there is an objectively correct and unique way that the world can be divided into objects. Rather, it puts objects within the *conceptual schemes* of observing beings that live in the

[7] Still, like Nagel, Lakoff emphasises the importance and persistent possibility of objectivity, possible by 'rising above prejudices, [...] the primal prejudice [being] our own conceptual system' [64, p. 264].

world. In other words, objects do no exist in the world, but within the conceptual schemes of observers. To Putnam, only this makes it possible for symbols to correspond to objects, since both are internal to conceptual schemes (unlike in the model-theoretic account of meaning, where symbols, that are internal to beings with a sense of meaning, are said to correspond to objects existing independently in the objective world). Since both Putnam and Lakoff are committed to metaphysical realism, however, they do not deny that there is something that actually exist (in the objective world) which corresponds to these objects. Furthermore, an object can be viewed from within different conceptual schemes, all of which can provide a true view of the state of affairs. Lakoff [64, p. 262] writes: '[W]hether [a] chair is a particular object – a single bounded entity – or a bunch of molecules or a wave form is not a question that has a unique correct answer. All the answers can be correct, but correct within different conceptual schemes.' While those conceptual schemes are compatible and complementary, Lakoff points out that internal realism's 'internal character permits the existence of alternative, incompatible conceptual schemes' [64, p. 264]. Truth itself, then, is not a matter of objectivity, but depends on conceptual schemes. However, 'it is not a total relativism because of the limits placed on it by experience of the real world' [64, p. 264].

Lakoff [64] then goes on to discuss *experiential realism* (introduced as *experientialism* by him and Mark Johnson in [65]) as a more worked-out instance of internal realism; the latter, in its basic formulation, lacks theories of meaning, truth and understanding, according to Lakoff. In experiential realism, meaning is rooted in the structure present in our experience, both on a basic level (our ability to recognise objects through gestalt perception and our ability to move in the world) and on a higher level regarding recurrent types contents of our experience (like containers, paths, and links) and relations between and orientations of those contents (like parthood relations or an up-down orientation); more abstract meanings are derived from this *embodied* foundation of meaning using *metaphorical projection*.[8] This conception of meaning is the foundation for Lakoff's theories of truth, understanding and other related topics, all of which might be classified as epistemological topics. As for the ontological dimension, experiential realism does not differ from the basic formulation of internal realism.

[8]The role that metaphors play in structuring the more abstract aspects of our conceptual systems is the central topic of Lakoff's and Johnson's book *Metaphors We Live By* [65].

This ontological dimension, though, is exactly what remains rather unclear in Lakoff's exegesis of internal realism and experiential realism. In particular, Lakoff focuses on 'reality as we understand it' and as it is structured by our conceptual schemes, but he remains fiercely dedicated to metaphysical realism. Yet, he does not say much about this world, neither whether there is one way it is in itself (even in the absence of a God's eye view from which to see or describe it), nor about its relation to our experiential worlds (beyond saying that the objective world is what limits our experiences). One might read this as an internalisation of the Kantian imperative that we should not attempt to speculate beyond our experience,[9] yet the absence of an explication of this point is indicative of the fact that Lakoff does simply not feel the need to address ontological considerations and is more concerned with epistemology. Nevertheless, the focus on the world as experienced and the examination of the role our conceptual schemes play in understanding the world provide crucial insights for an ontology that takes experience seriously.

3.3.3 The world of quantum mechanics

Another argument against objectivism, i.e. the idea that there is one way the world is and that there can be an objective description of this world, stems from the field of quantum mechanics, specifically from ontological considerations concerning the interpretation of quantum mechanics. A full discussion of quantum mechanics, its interpretations, and how it figures in an argument against objectivism, would derail the flow of this chapter, wherefore I have placed it at the end of this thesis in appendix A. For the present chapter, I will only sketch the arguments in broad strokes, leaving out the relevant references, which can be found within the appendix. (I suggest the reader consult the appendix up to the last section, which builds on ideas presented in chapter 5, after finishing this chapter.)

The formalism of quantum mechanics assigns quantum states to physical systems, based on which predictions about the outcomes of experiments involving these systems can be made. Interpretations of quantum mechanics can roughly be divided by whether they have an *ontic* or an *epistemic* view of quantum states. According to the ontic view, the quantum state assigned to a system by the quantum formalism describes the system as it is by itself irrespective of any observer. The ontic view is, hence, compatible with objective realism where the world and all systems objectively are a certain way at all times. In the appendix, I explain that interpretations with an ontic

[9] In fact, a lot of the ideas about our perception shaping the world of our experience seem to echo Kant [14].

view of quantum states must either invoke non-physical mental causation (contradicting the causal closure of the objective world and hence subjective supervenience), which I (along with many philosophers) find unsatisfactory, or otherwise reject the validity of quantum theory when applied to macroscopic objects, for which I am aware of no justification that is not ad hoc (i.e. just so as to make the interpretation work). Hence, we are left with the alternative: an epistemic view of quantum states, according to which the quantum state assigned to a system necessarily depends on the observer/other system making this assignment. Prima facie, it seems that the epistemic view is still compatible with objective realism and with all systems being a certain way in themselves, just that the way systems are in themselves cannot be captured by quantum states, since these might depend on the assigning observer. However, this possibility of quantum states being epistemic states about some underlying ontic state in this way has been ruled out. The alternative is for quantum states to be *broadly epistemic*, in the sense that they are not about some underlying ontic state, but about something else, e.g. the interaction of the observer with the system or simply the epistemic state of the observer (i.e. their beliefs and knowledge). Of the interpretations with a broadly epistemic view of quantum states, I find the relational interpretation (which is examined in detail in appendix A.4) to be the most convincing. The most important (in the present context) conclusion to be drawn from the relational interpretation is that there can exist no objective viewpoint which is able to describe the world in its entirety, and that the way systems are in themselves is a minute fraction, at best, of the way they 'really are', which encompasses the ways they are relative to other systems; in other words, the way that systems are in themselves does not encompass or imply the way they are to observers/other systems. Therefore, it is not only impossible for beings within the world to see the world *from without*, there simply is no way that the world is 'as seen from without'.

This argument does not follow directly from quantum mechanics, since it relies on a number of assumptions: that non-physical mental causation does not exist, that quantum mechanics is applicable to macroscopic systems, that the relational interpretation is mostly correct, and that the ontological interpretation I favour (see the appendix for details) is valid. If you can go along with these assumptions, then this argument constitutes another justification for abandoning objective realism. If you disagree with one of the assumptions, then the argument involving quantum mechanics will not convince you, though the other arguments not involving quantum mechanics remain unaffected.

3.3.4 The primacy of subjectivity

The arguments that we have seen so far in this section force us to see any notion of an objective view of reality for what it is: an idea within experience. Specifically, it is an idea at which we arrive by abstracting from directly given subjective experiences and that might or might not be veridically descriptive of an objective world. Hence, the objective viewpoint is entirely supervenient and dependent on subjective experience, while the subjective viewpoint is what we have immediate and direct access to: *subjectivity is primary*. We see that there is a divide between the world as it is in itself (if anything) and the idea we have of the world. In objective realism, the world is taken to be subvenient to subjective experience (as per subjective supervenience), while the idea of the world is a content of subjective experience. (This relationship is also illustrated by fig. 5.1 on page 101.) That there is not necessarily a direct correspondence between the two has also been recognised by Kant [14]: the *phenomena* of our subjective experience do not give us access to the *things-in-themselves* (sometimes referred to as *noumena*) of the objective world.

Accepting the divergence, Kant as well as all the authors we have considered in this section are nevertheless committed to metaphysical realism, i.e. to the existence of such an objective world in which things, at least in some respects, are a certain way in themselves and are causally responsible for our phenomenal perceptions. One argument for this commitment is that, from the way we experience the world, it only seems natural to accept that it exists in itself – even unnatural to doubt it – and that there really are things that our perceptions are perceptions *of*. This argument, however, works only in favour of a direct or quasi-direct form of realism, since only the inference from the perception of an object to such an object existing in itself *more or less as we perceive it* can be said to seem natural. The inference from an experience to a world that is a curved spacetime and that contains objects made up of atoms and a huge amount of empty space between atom nuclei, on the other hand, does not seem natural at all. Another argument for metaphysical realism is that we need an objective world underlying our experience to account for the consistencies of our experience. (This requirement was also what lead Bishop Berkeley, in his system of subjective idealism, to posit the *world as experienced by God* as a stand-in for a material reality.) It is one of the main aims of chapter 5 to argue that this is not the case (i.e. that experience can account for its own consistency) and that we can, hence, safely abandon metaphysical realism and objective realism in general.

Before we move on, let us take stock of what we did in this chapter. First, we defined objective realism through a collection of beliefs and identified it to be underlying a large number of prevalent metaphysical positions. Then, in section 3.2, we dealt with the ontological status of the mind and concluded that, if one wants to uphold objective realism, they are forced to adopt an ontology of property dualism that accepts subjective, mental properties of reality alongside objective, non-mental, physical ones, and that these mental properties constitute mental states that are caused by underlying physical states but are themselves merely epiphenomenal. However, neither emergentism nor panpsychism provided satisfactory explanations regarding the connection between mental and physical properties, being faced by the hard problem of consciousness and the combination problem, respectively. Lastly, in this section, we critically assessed the idea of an objective view of the world and its relation to the world itself. We considered arguments questioning whether we can know the way the world is, whether the world is as we see it, whether there even is one way the world objectively is, and concluded the section by questioning the necessity of positing a world underlying our experience in the first place.

In the next chapter, we look at some proposed alternative worldviews and consider the solutions and replies they provide to the problems we considered in this chapter.

4 Some unorthodox worldviews

In the last chapter, I argued that the position that I called objective realism is untenable as a worldview through which to understand reality. In this section, I shall consider some unorthodox worldviews that have been proposed within the recent two decades. The focus on the 21st century is so as to place this thesis within the present debate in philosophy. The worldviews which we consider in this chapter are not necessarily alternatives to objective realism, since some of them remain committed to the beliefs associated with it. Nevertheless, they all attempt to resolve some of the problems I have pointed out in the previous chapter, as we shall see. This chapter is far from being a comprehensive overview of alternative worldviews; rather, it is a *mise-en-place* of ideas that are not entirely satisfactory within their spawning theories (as I will argue in each section) but that will be incorporated into the position defended in the next chapter. The order of the theories as presented in the following sections is ascendingly by their similarity/relevance to this position.

4.1 Analytic idealism

The counterpart to materialism/physicalism, as explained in section 2.4, has classically been idealism. While idealism has historically been associated with continental philosophy and has never quite been accepted as a viable worldview in analytic philosophy circles, Bernardo Kastrup has recently defended a his *analytic idealism* [4], arguing for an ontology based on mind with the argumentative rigour and precision of analytic philosophy.[1] Kastrup sees the juxtaposition of mind and matter, as equal aspects of reality whose relationship needs to be explained, as a false dichotomy. While there is a true hard problem of consciousness when we try to explain mind in terms of matter, there is no analogous 'hard problem of matter', so Kastrup. Hence, an ontology based on mind is able to account for both mind and matter. In particular, matter is nothing more than an appearance in mind. Kastrup [4, p. 21] writes: 'That the notion of physically objective matter – that is, matter outside and independent of mind – is now largely taken for granted suggests cultural acclimatization to what is a mere hypothesis. After all,

[1] Since I aim to do the same for nondualism, I have taken inspiration from Kastrup in naming my position.

physically objective matter is not empirically observable, but a conceptual explanatory device *abstracted from* the patterns and regularities of empirical observations – that is, an explanatory abstraction.'

He recognises the need to account for our living in a shared world that determines our subjective experiences and allows us to interact. Kastrup resolves this by basing his ontology of mind not on the subjective experiences of individuals, but on *cosmic consciousness*, i.e. a universal shared realm of mind. This conception of mind is a form of panpsychism known as *cosmopsychism*, which, as we saw in section 3.2.2, is the counterpart to micropsychism in that, rather than supposing that our conventional level of consciousness is a combination of smaller constituents of consciousness, it takes the cosmic consciousness to be split into individual spheres of consciousness. This splitting happens through a process of *dissociation*, so Kastrup. This term is taken from the analogy he uses to explain this splitting, namely *dissociative identity disorder*, where patients exhibit different identities (called 'alters') at different times, which are experienced by the patients (according to reports) as being wholly different persons with their own memories and personalities.[2] Similarly, says Kastrup, cosmic consciousness is dissociated into different alters at certain boundaries and that '*cosmic dissociation happens precisely at the level of living beings with unitary consciousness, such as you and me.* You and I are alters of cosmic consciousness' [4, p. 48].

Each alter, Kastrup goes on to say, has an inner experience ('a dissociated phenomenal field' [4, p. 53]), but also an 'extrinsic appearance' [4, p. 55], 'what [it] *looks like* from across the dissociative boundary' [4, p. 53] – in our cases, this is our body. Moreover, since all we perceive (within our phenomenal field) are extrinsic appearances of alters of cosmic consciousness, it follows that all objects we perceive in some way have their own phenomenal field (although the dissociative boundaries do not necessarily coincide with our demarcation of the world into objects). Furthermore, there can be no such thing as an unconscious thought (or pattern of brain activity), only thoughts that are beyond the dissociative boundary of our experience, hence had by some other alter *within our brain*. In this context, Kastrup discusses the useful categorisation of mental processes (due to Schooler [67]) into non-conscious, conscious, and meta-conscious. Controlling your heart rate or the

[2] In a particularly interesting case, one alter of one patient not only reported being blind, but EEG scans revealed that the patient's brain actually showed the pattern of neural activity associated with blindness (i.e. little to no activity in the brain areas associated with sight) when the patient exhibited that alter, while they could see normally, showing normal brain activity in the areas associated with sight, when exhibiting other alters [66] (discussed in [4]).

precise movements of your legs when you walk would be classified, by most, as unconscious mental processes. When you dream but are not aware that you are dreaming, you are (arguably) consciously experiencing the dream without being conscious of being conscious, hence it is a merely conscious mental process. This is different for most waking-life experiences, where you are aware of experiencing them (you have a 're-representation' of the experience) and, in particular, able to report on them, making them meta-conscious mental processes. Kastrup now points out that, 'while subjects can report [...] meta-conscious processes, *they fundamentally cannot distinguish between truly unconscious processes and conscious processes that simply aren't meta-conscious*, for *both* types are equally unreportable to self and others' [4, p. 76].[3] Hence, Kastrup argues, we have no reason to believe that there are truly unconscious experiences, which would contradict the fundamental tenet of analytic idealism that *everything is fundamentally experience*.

As with all forms of panpsychism, the problem I see with analytic idealism is that, in the pursuit of ontological parsimony, it makes strong claims about the presence of consciousness in places for which we have no empirical basis. In particular, Kastrup (insightfully) points out that the mind-independent existence of matter is nothing more than a hypothesis lacking justification, yet has no problems claiming that 'liver, kidney and even toe function must all correspond to experiences as well' [4, p. 12]. Furthermore, his locating the dissociative boundary of human subjects, as seen on their extrinsic appearances, exactly at our conventional, bodily boundaries ('The revealed or extrinsic appearance of an alter's boundary is an organism's sense organs. In our case, these are our skin, eyes, ears, nose and tongue.' [4, p. 52]) is easily challenged by thought-experiments. Say you are touching some table, so you experience the contact between your fingers and the table. We can imagine a device that stimulates the nerve tracks somewhere down your arm in just the right way so as to replicate this experience. In practise, your finger is just like this device, stimulating the nerves in your arms and further towards the brain; so the boundary might also reasonably said to be somewhere down your arm. Contrariwise, when you wear a glove, the material effectively 'transmits' the resistance and texture of the table to your fingers,

[3] Paradoxically, after making this point, Kastrup gives examples of conscious but non–meta-conscious mental processes. One is this: notice your breath; you are now meta-conscious of your breath, but just a moment ago, were you unconscious or simply conscious but non–meta-conscious of your breath? Kastrup says that it is the latter, concluding that 'even waking experiences can occur without re-representation' [4, p. 78]. As Kastrup himself pointed out, though, we simply cannot tell whether the experience was unconscious or (merely) conscious. In the epistemically minimal ontology I present in the next chapter, I will consider this distinction again and return to the example of the breath in section 5.5.

just like the nerve tracks transmit the signal further on, so the glove might also be said to constitute the boundary.

This leads us to the next problem with the concept of dissociative boundaries. Kastrup coherently argues that there is no 'hard problem of matter' from within a conscious experience, since, there, matter is just a content of consciousness. However, explaining why and how a dissociative alter of cosmic consciousness having conscious experiences has an extrinsic appearance to *other* alters, rather than not, and how the two are ontologically related is no easier than explaining how physical matter can have mental experiences. Hence, this does pose a problem that is analogous in its insurmountability to the hard problem of consciousness.

Lastly, I want to point out that what Kastrup's analytic idealism is committed to objective realism, since what he calls the 'concealed side of the inanimate cosmos' [4, p. 55] is nothing other than an objective world, except that it is mental in substance rather than physical. While this, in principle, absolves him from having to explain the presence of mind, this approach seems rather ad hoc and sometimes as if the label 'thoughts' has been plastered over what would have read 'material world' in dualist theories of reality. Concretely, in the ontology of analytic idealism, there still is a perception mapping between the 'thoughts of the inanimate cosmos' and individual alters, essentially making it a form of indirect realism. Therefore, the criticism I have levied against metaphysical realism applies to analytic idealism as well. Concretely, the existence of a concealed side of cosmic consciousness is no less hypothetical than the existence of matter and an ontological commitment thereto just as speculative. In conclusion, while Kastrup makes a lot of valuable arguments regarding the relationship between mind and matter and, in particular, the primacy of mind, the ontology he lays out comes with problems of its own and, surprisingly, even retains some of the problems of the materialist ontology it sought to replace.

4.2 Mathematical universe hypothesis

In section 2.5.1, we considered different forms of structural realism. A particularly radical form of OSR is Max Tegmark's *mathematical universe hypothesis* (MUH) [5]. According to Tegmark, a commitment to metaphysical realism (what he calls the *external reality hypothesis*) implies that the world we live in *is* an abstract mathematical structure. His argument, in essence, is that our theories contain (theoretical) objects and relations involving these objects, but that the objects themselves are just convenient constructions

by humans and nothing more than 'human baggage', while the structures themselves describe fundamental aspects of our universe. The objects of one scientific theory can be described by structures of a more fundamental one, like protons are nothing more than structurally arranged quarks, and less fundamental theories can, in principle, be entirely derived from more fundamental ones. The more fundamental a theory is, the less baggage it contains, says Tegmark. The most fundamental theory would be a *theory of everything* (TOE), an all-encompassing theory of our universe from which all other theories are derivable and which, crucially, contains no 'baggage', i.e. is entirely structural/mathematical. Up to this point, the argument seem to imply a form of ESR. Tegmark goes on to say, however, that since our universe would be described entirely by this hypothetical TOE, there is no meaningful way in which it could differ from the structure described by the TOE, wherefore our universe *is* this structure. In other words, if *every* aspect of the world can be mapped to an aspect of a mathematical structure, then it is *isomorphic* to that structure, which, to Tegmark, means that it is not only described by that structure, but identical to it. According to Platonism (to which Tegmark evidently subscribes), mathematical structures are abstract entities that just exist outside of (or prior to) space and time. Hence, all mathematical structures, in particular all those that are (according to the MUH) universes like ours but with different fundamental laws and constants, exist. Reality, in its entirety, is then completely structural.

Conscious beings within a universe are taken to be 'self-aware substructures' of the structure that is the universe, though they are not defined in more detail (beyond a short assertion that it is information processing that produces self-awareness). In this context, Tegmark speaks of two different perspectives on the world, the bird perspective and the frog perspective, which can be understood to be the extremes of Nagel's spectrum of objective and subjective viewpoints as discussed in previous chapters. From the *bird perspective*, one sees the world objectively as the mathematical structure it (supposedly) is, whereas the *frog perspective* is the viewpoint of an observer (a self-aware substructure) from within the world. In particular, since 'a mathematical structure is an abstract, immutable entity existing outside of space and time' [5, p. 3], a 'bird' sees all of spacetime in its entirety, whereas a 'frog' experiences moments of time. When it comes to quantum events, a bird sees frogs branching into different timelines for each outcome of the event, whereas each frog observes only one outcome with apparent randomness.[4]

[4]This is reminiscent of Everett's relative-state interpretation of quantum mechanics (cf. appendix A) and, indeed, Tegmark [5] endorses a many-worlds interpretation of quantum mechanics.

Based on this, now, the question of how, 'given a mathematical structure, [...] do we compute the inside view [frog perspective] from the outside view [bird perspective]', to Tegmark, is the 'most important question facing theoretical physics' [5, p. 5]. In explicitly endorsing the eventual possibility of this derivation of the frog perspective from the bird perspective, he diverges from Nagel, who would deny that subjective viewpoints could be entirely derived from an objective description of the world. Interestingly, Tegmark introduces a third perspective that he calls the *consensus view*, which corresponds to what I called our *idea of the world* in section 3.3.4, i.e. what we imagine the world to be like when we attempt to adopt an objective viewpoint. Tegmark [5, p. 5] writes: 'From your subjectively perceived frog perspective, the world turns upside down when you stand on your head and disappears when you close your eyes, yet you subconsciously interpret your sensory inputs as though there is an external reality that is independent of your orientation, your location and your state of mind.' To Tegmark, deriving an accurate description of this consensus view from a TOE (i.e. a mathematical description from the bird perspective) is sufficient for a fundamental theory of physics while allowing one to bracket the problem of consciousness associated with deriving a frog perspective.

Clearly, the MUH entails objective realism: the world exists mind-independently as a mathematical structure (metaphysical realism), it is objectively describable from the 'bird perspective' (objectivism), and subjective perceptions of the world (the 'frog perspectives') are derivable from the description of the world in itself (subjective supervenience). Tegmark's argument for the MUH and (implicitly) for its commitment to objective realism is based on the assumption that ever more abstract scientific theories can get us closer to an objective description of the world 'from the bird perspective'. However, all scientific theories we have do *not* describe the world from the bird perspective, because we simply cannot view the world from without; rather, they simply describe the consensus view. As Tegmark himself writes, this consensus view stems from a subconscious interpretation of our perception (i.e. it is rooted in subjectivity) and presents a world *as though* there is an objective world. Yet, the existence of this objective world is inferred or rather assumed from this subjective idea of the consensus view. Therefore, trying to find a complete description of the (supposed) objective world and therefrom deriving subjective experiences, had by substructures of this description, is putting the cart in front of the horse. Furthermore, conceptualising conscious beings as self-aware substructures of the universe structure does not tackle the hard problem of consciousness at all. However, if we accept the primacy of subjective experience, the core idea of the MUH can be reintegrated into

an ontology that can make sense of the relation between the world and the mind. Concretely, structures, unlike non-mental matter, are already present in conscious experience. Therefore, identifying the world to be a structure *supervenient* on subjective experience would be an approach that stays true to Tegmark's core arguments while evading the problems of objective realism. We shall explore this approach further in section 5.10.1.

4.3 Egocentric presentism

With all my criticisms of any form of realism, the reader might wonder if I am not backing myself into a corner where I am left with nothing but solipsism as the last standing option. Well, we shall consider this question in the next chapter in detail, but in this section we will see that it might not be the worst option to be left with, because we will consider one of the few seriously defended (and defensible) forms of solipsism, Caspar J. Hare's *egocentric presentism* [6]. Hare's motivational concern are ethical considerations regarding self-interest, asking how we can be justified in preferring something good happening to us over something just as good happening to someone else. He seeks guidance in the metaphysics of time and considers the analogous question of how we can be justified in preferring something bad already having happened to us over it currently happening to us (e.g. a painful surgery). If we take all moments of time (and the events therein) to be equal and only ordered relative to one another (e.g. event A happens before event B and simultaneously with event C) – i.e. if we adopt what is called an *eternalist* view of time (what Hare calls 'four-dimensionalism' with reference to the idea of a block-universe with three spatial and one temporal dimension) – then the preference cannot be justified by the way the world is. The alternative is to believe in '*monadic tensed properties*' [6, p. 16], through which an event can be said to be past, present, or future not relative to some other event but in itself; to believe in monadic tensed properties is to believe 'that tense is built into the way the world is' [6, p. 17]. Hare considers numerous ways to ontologically allow for monadic tensed properties, from the *moving spotlight theory*, which extends the eternalist ontology by the property of *being now* which applies to certain events – though to which changes continuously –, to *presentism*, which takes present events and things as the only ones that really exist. What all have in common is that 'one feature of the maximal state of affairs is that present things are different from past and future things' [6, p. 17]. This, then, provides a justification within the way the world is for having now-centric preferences.

Based on this, Hare seeks an analogous justification for having egocentric preferences. Like events in time are ordered relative to one another, we can speak of relational properties of personal identity, eg. 'being me – relative to CJH' and 'being other – relative to CJH' [6, p. 19]. I, Max Pohlmann, have the property of *being other – relative to CJH* as well as the property of *being me – relative to MP*. Alternatively, or rather additionally, we can introduce monadic properties of personal identity, viz. 'being me' and 'being other'. Crucially, this entails that '[i]n any given maximal state of affairs, one and only one thing has the monadic property of being me. There is a unique *I* at the center (so to speak) of all that exists' [6, p. 20]. While this seems to imply a radical form of solipsism, by which no experiences other than one's own are accepted to exist, the solipsism defended by Hare is more subtle. Notice that a presentist, who beliefs that only the present moment truly exists, is not forced to believe in an extreme variant of the five-minute hypothesis (cf. section 2.5.3) according to which the world would have sprung into existence just in the present moment, but can concede, while believing the past does not exist, that it *existed*, and that this morning I was indeed justified in believing that the sun has not yet risen, while now I can see, clear as day, that it has. Similarly, an egocentric presentist believes that they are the unique thing in the world with the monadic property of *being me*, yet they concede that *to other people* it is a different thing in the world that has this property. In effect, this means that we are living in different worlds, if a world is identified with a 'maximal state of affairs'.

Meditating on his present experience, Hare finds that it contains perceptual objects as well as a subject, in his case himself, that is having this experience. He defines the words 'I' and 'me' as abbreviations for 'the one with present experiences' [6, p. 22]. (Due to this subtlety of these words in the context of egocentric presentism, for the rest of this paragraph, Hare's ideas are reported from the first-person perspective.) I notice that there are other beings in my experience who have experiences of their own, which, however, are not *present*. Nevertheless, I can imagine that these other beings are the one with present experiences, e.g. that *I* am Michael Schumacher (the example used by Hare). In imagining that I am someone else, I am imagining things differently from how they are, since actually *my own* experiences are the ones that are present, not those of Michael Schumacher. Nevertheless, Michael Schumacher has a point of view from which his experiences actually are present. As Hare stresses, though, presence of experiences should not be construed as a relational property ('saying that his perceptual objects are present relative to his point of view, whereas mine are present relative

to my point of view' [6, p. 22]), but as a monadic property had by some experiences/perceptual objects but not by others.

Hare offers a formal-linguistic analysis of propositions regarding other points of view. Concretely, linguistic constructions of the form 'from Casper Hare's point of view ...' are to be understood as *one-place intensional operators*; *one-place* in that they take a single proposition as input and produce another proposition as output, and *intensional* in that the truth of the output proposition does not directly depend on the truth of the input proposition. For example, the truth of the proposition expressed by 'From Casper Hare's point of view, there is a red flower in front of the experiencing subject.' does not depend on the truth of the proposition expressed by 'There is a red flower in front of the experiencing subject.', i.e. whether *I* have a red flower in front of me. A one-place intensional operator that analytic philosophers are familiar with is the necessity operator ('It is necessarily the case that ...'), or its dual the possibility operator, for which the usual formal semantics, viz. Kripke semantics, is built around the concept of possible worlds.

Based on Kripke semantics, Hare provides a similar semantics for a logic of points of view, introducing what he calls *subject worlds*. He [6, p. 23–24] writes: '[A] *subject world* (henceforth an **S**-world) is a world in which some things are present, and all of those things are perceptual objects of one creature. For shorthand say that that creature has *present experiences*. At any such world, a set of *atomic* propositions holds true [...] having to do with the way things are, physically speaking, and propositions having to do with where the property of being present is instantiated. [...] Now, let a *system* of **S**-worlds [is] a set of physically identical **S**-worlds such that for any perceiving creature in an **S**-world in the set, there is an **S**-world in the set in which that very creature has present experiences.' Furthermore, the **S**-worlds of a system are related by an access relation, the **a**-relation. The semantics of point-of-view operators are defined in the obvious way: 'From some point of view, p' is true at the **S**-world $\mathbf{S}_K$ if and only if there is some **S**-world $\mathbf{S}_J$ such that $\mathbf{S}_J$ is **a**-related to $\mathbf{S}_K$ and p is true at $\mathbf{S}_J$; the case is analogous for 'For all points of view, p'; lastly, 'From the point of view of H, p', for some perceiving creature H, is true at $\mathbf{S}_K$ if and only if there is an **S**-world $\mathbf{S}_J$ that is **a**-related to $\mathbf{S}_K$ and where both 'H has present experiences' and p are true.

Hare's ontological considerations regarding **S**-worlds are somewhat perplexing. While he takes the semantics to be helpful in figuring out the truth values of complex sentences involving points of views, he says that the semantics are incorrect, because reality *does not* consist of a system of **a**-related **S**-worlds,

but that there exists only one **S**-world in which only the experiences of one unique person, me, are present. 'What, then, makes it the case that from Henry's point of view Henry's experiences are present? Nothing more or the less [sic] than the fact that from his point of view his experiences are present' [6, p. 27]. Points of view, in Hare's theory, are primitives and the meaning of propositions involving them cannot be reduced to something else being the case. Nevertheless, 'propositions containing the *point of view* operators are true or false of this world *as if* it were part of a system of physically identical **S**-worlds' [6, p. 27]. Hare likens his views to those of a *fictionalist* regarding possible worlds semantics, who does not believe that all possible worlds exist as actual worlds of their own (as a *modal realist* would), but that propositions talking about possibility and necessity are true of our world *as if* it were part of a system of possible worlds described by Kripke semantics. Hare emphasises that the assertion that only one subject world exists should not be interpreted as a statement of '*ontology* in the narrow sense' [6, p. 41], but as describing the simple empirical fact that, as a matter of experience, there is only one sense in which some of the things there are are present and only one being having these things as perceptual objects. Furthermore, the fact that other people's experiences are not present should not be confused with these people not being conscious; in fact, Hare [6, p. 43] provides a definition of consciousness in terms of his semantics: 'A is conscious if and only if from A's point of view, A's experiences are present [notation adapted].' Still, his insistence on differentiating between present and non-present experiences and on there only being one unique subject having the present experience are what make egocentric presentism a mild form of solipsism.

Nevertheless, even though Hare points out that egocentric presentism does not entail a strong form of solipsism, an explication of the precise shape of the ontology that *is* entailed by it is left to be desired. As with fictionalism regarding possible worlds, his position, saying that it is helpful but incorrect to treat the world *as if* it was a system of subject worlds, is pragmatic but ontologically negative (as in: only saying what the world is *not* like). One ontologically positive position regarding possible worlds compatible with fictionalism treats them as mere mental/linguistic constructs (a view known as *linguistic ersatzism, see e.g. [68]*); an analogous position regarding subject worlds (other than the presently experienced one), however, would entail a strong form of solipsism after all. Since that is a conclusion Hare understandably rejects, this position is not available, but an alternative is not offered. Instead, Hare leaves us with a largely linguistic analysis of points of view with an 'incorrect' semantics and the seemingly paradoxical insistence that other points of views exist, yet all *there is* is the presently experienced

subject world. The ontology I offer in the next chapter will provide a more explicit ontological context for speaking about other beings' points of view; I return to Hare's logic of points of view at the end of section 5.4.

While the position of analytic nondualism that will be presented in the next chapter is largely compatible with egocentric presentism, as laid out by Hare, the main point of divergence concerns the analysis of the subject of experience. Concretely, Hare takes it to be an immediate fact of experience that the subject of experience is amongst the perceptual objects and that this subject coincides with some person existing in the world. While this may sound intuitive and even obvious, this identification of the subject of experience – what is *having* the experience – with an object of that experience is not possible in analytic nondualism, as we will see in section 5.2.

4.4 Many-worlds theory of consciousness

The last theory I want to consider in this chapter is Christian List's *many-worlds theory of consciousness* [7]. The theory presented by List is compatible and in some places identical to the position defended in the next chapter, yet the particular details of both theories as well as the aspects emphasised by each differ.

List's analysis begins by explaining, as we have seen in our discussion of Nagel (cf. section 2.6), that objective facts about the world do not entail subjective ones, and that the world, seen objectively, does not encompass subjective, perspectival aspects. For a solution, List posits that it is not this objective world ('the world simpliciter'/'the world as such') where consciousness is instantiated, but that instead 'the "locus" of each subject's conscious experiences is [...] a subject-specific "first-personally centred world"' [7, p. 323]. He defines a *first-personally centred world* (1PCW) as a pair $\langle \omega, \pi \rangle$, where ω is a third-personal world and π is a locus of subjectivity (or perspective) – both of these terms are explored further. He defines a *third-personal world* (3PW) as the 'totality of all facts that hold at that world from a third-personal perspective', where the facts are those that 'would feature in a complete description of the relevant world from the perspective of an omniscient Olympian observer studying the world "objectively" – the "view from nowhere" in Nagel's terms' [7, p. 323]. In order to allow for first-personal facts – i.e. facts about the experience presently had or facts about qualia – something above and beyond a 3PW is needed; List [7, p. 324] writes: 'Even if I knew the totality of third-personal facts [...], my third-personal knowledge by itself would not allow me to infer my own first-person perspective on the

world.' To this end, List introduces a *locus of subjectivity* as an 'additional ontological ingredient' [7, p. 325]. He emphasises that it is more than a mere spatiotemporal location within the 3PW, as a standard definition of centred worlds would have it, since that would still be insufficient to determine facts about a subjective experience. Instead, the locus of subjectivity requires a 'thicker' interpretation and a '[specification] as richly as required in order to ensure that any 1PCW in which the given locus of subjectivity occurs [...] leaves no first-personal facts underspecified' [7, p. 325]. What this specification could look like practically (as practically, at least, as one could hope for in this theoretical context) is not explained by List, unfortunately.

List extends his fact-based characterisation of the 3PW to 1PCWs; each 1PCW, represented by some $\langle \omega, \pi \rangle$, is identified with 'everything that is the case at $\langle \omega, \pi \rangle$' [7, p. 326], including both first-personal facts about the subject's experience as well as all third-personal facts about ω, whether the subject encoded by π knows them/has access to them or not. List further divides these facts holding at some 1PCW $\langle \omega, \pi \rangle$ into *pure third-personal facts*, which are determined by the 3PW alone (i.e. shared by $\langle \omega, \pi' \rangle$ for any compatible perspective π'), *pure first-personal facts*, which are determined by the locus of subjectivity alone (i.e. shared by $\langle \omega', \pi \rangle$ for any compatible ω'), and *mixed facts*, which are determined by the 3PW and the perspective only in conjunction. I will address the problems I see with this subdivision, and with pure first-personal facts in particular, shortly.

Unlike Hare's account, which, while not endorsing a strong form of solipsism, does not allow for a multitude of subject worlds to be said to exist, List takes it to be a reasonable assumption to accept a multitude of 1PCWs, sharing a common 3PW, as existing, while only one such world is *present* for each subject. List [7, p. 327] writes: 'As conscious subjects, we are experientially located in different and parallel [1PCWs]. Of course, our physical organisms and environment exist in a shared [3PW]. The third-personal facts instantiated at each of our [1PCWs] coincide.' This is what makes List's theory a many-worlds theory. To ask whether some being is conscious is to ask whether there is some 1PCW associated with the shared 3PW and that being's perspective; consciousness is an aspect of 1PCWs (a 'mode of being' [7, p. 326] for that 1PCW) and cannot be construed as a property of some object in a 3PW. List suggests that one would be justified to believe that, in a modal realist way, any possible perspective compatible with the 3PW we find ourselves in might instantiate an actually existing 1PCW, though defers the question of whether the same approach of modal realism is justified for other 3PWs. The criterion of *compatibility* is where concrete theories of consciousness come into play, picking out different sets of locations in the world

that are capable of hosting a locus of subjectivity (i.e. pointing out what subset of $\Omega_{3\text{rd}} \times \Pi$, where $\Omega_{3\text{rd}}$ is the set of possible 3PWs and Π is the set of possible loci of subjectivity, corresponds to the set $\Omega_{1\text{st}}$ of *nomologically* possible 1PCWs).

An especially interesting aspect of List's theory concerns the ontological relationship between 1PCWs and 3PWs. Concretely, he suggests that 3PWs are *supervenient* (in a sense that is closer to what I called 'ontological dependence' in section 2.1) on 1PCWs, thereby rejecting subjective supervenience and hence objective realism. This means that 1PCWs exist at an 'ontologically deeper' level than 3PWs and that different 1PCWs are different *realisations* of the 3PW that they share. This entails a rejection of the picture that there is one world at the fundament of reality on which all our experiences depend (ontologically), but that instead it is the world that depends on our experiences. Crucially, this entails that consciousness, as an aspect of 1PCWs, does not supervene on physical properties, as any theory based on the worldview of objective realism with its commitment to subjective supervenience would have it.

How are we to understand the concept of loci of subjectivity as 'thick' centres within the world, which have been characterised only in terms of what they have to achieve, but not constructively? We know that they comprise at least a spatiotemporal location, but this is not enough to derive first-personal facts, as pointed out by List. For an interpretation of loci of subjectivity, by the example of colour perception in humans, we might take the locus to contain a mapping function from wavelengths (or even neural patterns) to colour qualia. Thereby (extended to other perceptual faculties as well), the locus would serve as a bridging entity between the 3PW and subjective experience in a 1PCW. This would also allow to make sense of the idea known as the *inverted spectrum*, where it is imagined that another person might have a subjective experience of colours that is different from one's own (i.e. they have a different wavelength-qualia mapping), yet this is unknowable for you, since you only have access to your 1PCW (including the 3PW that is a part of it), while the other person's qualia is present in their 1PCW, which is not present to you. Similarly, as List points out, it is not impossible that one spatiotemporal location in a 3PW is associated with different loci of subjectivity (and hence 1PCWs), e.g. with inverted spectra relative to another. To me, this seems like a workable understanding of loci of subjectivity.

However, the concept of purely first-personal facts remains problematic. Recall, they are facts about a 1PCW $\langle \omega, \pi \rangle$ that are invariant under substitutions of ω by *compatible* ω'. I will distinguish between two cases, that this

compatibility criterion is either 'weak' or 'strong'. If it is a weak criterion, the conditions that are placed on ω' are either absent (i.e. *any* ω' *will do*) or minimal (i.e. ω' must contain *some* structure, at the spatiotemporal location specified by π, capable of facilitating a conscious experience). Then we can imagine a locus of subjectivity that always has a small red square in the centre of their vision, no matter what 3PW it is paired with. The presence of this red square, then, would qualify as a pure first-personal fact. Is it possible? Only if we give up the causal closure of the physical, for there are 3PWs in which the red square has no physical cause. This would require and imply a form of substance dualism – in particular, a form of *vitalism* – where the locus consists of a mental substance in which the red square is given independently of the 3PW. Furthermore, insofar as we take speaking acts to be necessarily physically caused by processes within the brain, the presence of the red square could not be reported by the subject, which seems paradoxical. Hence, I take this kind of vitalism to be untenable. Now, if the compatibility criterion is instead a strong criterion, i.e. if the set of possible ω' is filtered by some condition based on the first-personal facts of $\langle \omega, \pi \rangle$ (e.g. that any fact about the experience must be somehow mirrored by a third-personal fact about the subject's brain), then purely first-personal facts are effectively turned into a special case of mixed facts after all, hence also leaving no room for purely first-personal facts. (To be fair, note that List does not claim that there are first-personal facts and only introduces them as a theoretical category within his framework.)

Relatedly, another problem I see with List's theory is his identification of 1PCWs with a set of facts. While it is inspired, as List says, by Wittgenstein [69] identifying the world (i.e. the 3PW) with *all that is the case*, which indeed is at least a defensible stance, extending the same dictum to 1PCWs is fallacious. As we saw pointed out by Kastrup in section 4.1, the external/material world is only inferred from experience and, prima facie, only an abstraction in mind. Identifying this abstraction with a set of facts is unproblematic. However, 1PCWs do not consist of abstraction but of qualia, which are qualitatively different from facts. Hence, while we can take a set of facts to exhaustively describe *the structure* of an experience (a 1PCW), an identification of the two is questionable. Nevertheless, a certain synthesis of facts (or rather, the structure they describe) and experience is possible and can be useful, as I will argue in section 5.6.

Lastly, I want to address the relationship between 1PCWs and 3PWs. While List argues that the latter are ontologically supervenient on the former, he nevertheless defines the former in terms of the latter. Furthermore, he states that a 1PCW not only encodes the facts present to the subject, but all the

unknown (and arguably the unknowable) facts about the 3PW as well, with the justification that he seeks an ontic rather than an epistemic account of worlds. In my view, this overspecifies 1PCWs. Concretely, imagine two 3PWs based on our world but with a man-like being on the backside (relative to us) of Mars, spontaneously coming into being on new-year's eve in the year 42 BC, holding up his right arm in ω_1 and his left arm in ω_2, and then vanishing again without leaving any trace. Now take your current perspective π and consider $\langle \omega_1, \pi \rangle$ and $\langle \omega_2, \pi \rangle$. From within these 1PCWs, the fact about the Mars man's hand is not only *epistemically* unknown to you, it has absolutely no implication for your actual or possible experiences, so these 1PCWs truly are *ontically* indistinguishable. Hence, it makes no sense to distinguish between these two worlds. At the end of his paper, List suggests that his formalism could be adapted to consider 1PWs as true primitives of the theory and 3PWs as derived through equivalence classes on these 1PWs (and loci of subjectivity as other equivalence classes as well). Note that this reversal does not lead to the same theory, since ω_1 and ω_2 could not be derived as different 3PWs from the same 1PCW. Similarly, sceptical scenarios like the brain-in-a-vat one, could not be distinguished from the world we find ourselves in. In the next chapter, in particular in section 5.10, I will defend this kind of account of 3PWs (as shared worlds) being derived from primitive 1PCWs in detail.

5 Analytic nondualism

In chapter 2, I discussed a range of philosophical problems and positions, trying to do so as impartially (dare I say objectively) as possible, to show the field within which this work is placed. In chapter 3, I sketched a version of the worldview of objective realism that underlies many concrete metaphysical positions, and expounded on what I see as the problems associated with this worldview and why they are insurmountable problems necessitating an alternative worldview. In chapter 4, I presented some such alternatives, but also explained why, in their current forms, none of them are entirely satisfactory either. The current chapter will constitute a shift in tone, since I will finally be presenting my own ideas, which together form the worldview that is the eponym for this chapter and this thesis.

The name of the position I defend in this chapter, analytic nondualism, is a synthesis of two strands of inspiration. Nondualism is an important concept in various eastern religio-philosophical traditions. What they share is a critical stance towards the distinction between *observer* (mind) and *observed* (world), i.e. what I called the conceptual dualism in section 2.2, as well as a focus on *direct experience* as a way to know and understand reality [70]. In the Hindu-philosophical school of *Advaita Vedanta*, nondualism refers, roughly speaking, to the identity of every individual self, called *atman*, with *brahman*, which is a complex term that one can understand to mean the highest principle of reality [71]. Similarly, in the Buddhist school of Dzogchen, *rigpa* is a state of nondual awareness that does not encompass a distinction between subject and object but instead simply contains contents that arise and fade away [1, 72]. Since these formulations of nondualism come from eastern religio-philosophical traditions, they differ in argumentative style from works in analytic philosophy and sometimes come with religious 'baggage' that can obstruct from the philosophically valid insights. Sam Harris [1] has presented i.a. nondualism in a way that is stripped free of this religious baggage, yet his focus is on personal, spiritual insights rather than metaphysics. What I attempt to do in this chapter is to present a form of nondualism, as a metaphysical position, in a way that lives up to the standard of analytic philosophy (akin to what Kastrup [4] did for idealism), arguing for the position rigorously and from first principles. Given the subject matter, though, these first principles are based in direct, subjective experience, wherefore the language used will differ from what the reader might be used to from texts in analytic philosophy.

The stance on the conceptual dualism taken by analytic nondualism is different from the stances taken by both of the classical monist positions. Materialists/physicalists hold that there is only the physical, objective world and that experiences are just complex, physical processes happening within brains, which are *objects*. Idealists hold that there are only minds (either one mind in a broad sense or many individual minds) which contain experiences and which are *subjects*. Analytic nondualism, on the other hand, posits neither non-experiential objects that are then somehow experienced nor identified subjects that exist 'prior' to experience and then have some experience; rather, experiences consist simply of *objects in subjectivity*. Experiences are neither contained within a world nor within some mind, but they are simply given as they are by themselves. In this sense, analytic nondualism rejects the conceptual dualism between world and mind. There remains something that is referred to as the world within the theory, but it will not be anything like a *counterpart* to mind, because it is simply an occurrence within experience.

Accordingly, analytic nondualism distinguishes itself from many of the previously discussed positions that are committed to metaphysical realism by not requiring an objective world underlying subjective experiences. Instead, it takes the world as we experience it to be 'as real as it gets'. Therefore, analytic nondualism entails anti-realism about an objective world that is *necessarily* responsible for our experience[1] and simultaneously entails direct realism regarding experiences and all their contents, including the world *within* experience.

We are left without a world whose description would serve as the target for a pursuit of objectivity. However, there is a sense in which the notion of objectivity is rescuable: the structures of our experience are, in some sense, orderly, and this order within the structures of experience gives us insight into reality beyond each individual subjective experience. Hence, the only objective aspects of reality are to be found in the structures of subjective experience. On a higher level of description, however, the claim that reality is exhaustively described as consisting of subjective experiences counts as an objective description of reality itself. It is in this sense that *reality is objectively subjective.*

As I said, analytic nondualism entails direct realism regarding experiences. In fact, experiences are the only things of whose existence you can ever be

[1]The word 'necessary' is important, since analytic nondualism entails agnosticism regarding the existence of an objective world that just 'mirrors' subjective experience without causing it.

certain, as your present experience is the totality of that which is *immediately given*. Therefore, conscious experiences are the primitive notion of the theory of analytic nondualism and constitute the core of its ontology. Throughout the subsequent sections, we will explore this ontological core in detail, substantiating and expanding upon the claims that were made in these introductory paragraphs to the chapter, and also consider the hypothetical things that transcend it, from the notion of a subject that is having an experience to a (non-experiential) objective world underlying experience.

5.1 Reality as experienced

> The best day of my life – my rebirthday, so to speak – was when I found I had no head. This is not a literary gambit, a witticism designed to arouse interest at any cost. I mean it in all seriousness: I have no head. It was eighteen years ago, when I was thirty-three, that I made the discovery. Though it certainly came out of the blue, it did so in response to an urgent enquiry; I had for several months been absorbed in the question: what am I? [...]
>
> What actually happened was something absurdly simple and unspectacular: I stopped thinking. A peculiar quiet, an odd kind of alert limpness or numbness, came over me. Reason and imagination and all mental chatter died down. For once, words really failed me. Past and future dropped away. I forgot who and what I was, my name, manhood, animalhood, all that could be called mine. It was as if I had been born that instant, brand new, mindless, innocent of all memories. There existed only the Now, that present moment and what was clearly given in it. To look was enough. And what I found was khaki trouserlegs terminating downwards in a pair of brown shoes, khaki sleeves terminating sideways in a pair of pink hands, and a khaki shirtfront terminating upwards in – absolutely nothing whatever! Certainly not in a head.
>
> It took me no time at all to notice that this nothing, this hole where a head should have been was no ordinary vacancy, no mere nothing. On the contrary, it was very much occupied. It was a vast emptiness vastly filled, a nothing that found room for everything – room for grass, trees, shadowy distant hills, and

> far above them snowpeaks like a row of angular clouds riding the blue sky. I had lost a head and gained a world. [...]
>
> Yet in spite of the magical and uncanny quality of this vision, it was no dream, no esoteric revelation. Quite the reverse: it felt like a sudden waking from the sleep of ordinary life, an end to dreaming. It was self-luminous reality for once swept clean of all obscuring mind.
>
> — Douglas Harding [73][2]

Explore your present experience and look for your head. Neither its reflection in a mirror, nor merely your nose or eyebrows, but that which is behind your face, so to speak. Of course, you will not be able to see your own head, but in attempting it nonetheless, you may be able to experience the insight that Harding describes in the quoted passage. If you succeed, what you will find is the world. Not a world that is external to you, in which you are placed at some given location and which somehow indirectly leads to your current perceptions, but an immediate world filling your experience. You do not have to construct this world from a two-dimensional image on your retina and other sensual stimuli like sounds and tactile sensations; instead, it is simply given in experience the way it is.[3] As a matter of direct experience, this is not an experience of some objective world, it is *a world within experience* (or an *experienced world*) filled with objects and people and everything you know, three-dimensional and in colour. But it is not the only thing that is immediately given; your thoughts, imaginations, and feelings are as well. In total, this is reality as experienced: the entirety of your present conscious experience, as a complex content of consciousness. This experience is your immediate contact with reality, it is *as real as it gets*. This notion of a present experience in totality is close to what List [7] (cf. section 4.4) would call a first-personally centred world – not as a third-personal world together with some centre, but as a true primitive notion.

The contents of your present experience are the only things you have access to and they are the only things of whose existence you can be absolutely certain.

[2]The passage is quoted from an excerpt appearing on https://www.headless.org/harding-books/on-having-no-head (visited on 28.09.2023). I originally came across this passage after reading it quoted in [1].

[3]You might object that our brains do have to construct the three-dimensional world we experience from a two-dimensional image, but this understanding stems from an understanding of science in terms of objective realism; it is not an accurate description of your experience as given. I will re-incorporate scientific insights later on, but for now I ask you to consider only what you experience directly.

If one does not want to leave the ground of certainty, one has to accept *epistemological solipsism*. In section 2.1, I pointed out that epistemology has implications for ontology as a pursuit to *know* reality. Concretely, if we want to place our ontology on the solid ground of certainty, we cannot assume the existence of anything beyond the present experience and instead have to be agnostic about anything else. Therefore, the ontology I propose takes subjective, conscious experiences as foundational and is agnostic about the existence of anything beyond it; in this sense, it is *epistemically minimal*. In other words, conscious experiences form the *core* of the ontology of analytic nondualism. (We will consider to what degree we are justified to include *absent* experiences within this ontological core in section 5.4.)

G. E. Moore [74] has famously offered a proof for the existence of an objective (external) world, going roughly like this: raising both his hands successively, he says 'here is one hand and here is another', which implies that there are at least two objects in the world, wherefore there must be such a world, from which he concludes that metaphysical realism must be true. Crucially, however, both from Moore's own perspective and from that of someone observing him, the only world whose existence follows from this proof is the world *within experience* in which his hands are given as immediately observed objects. This is not the world whose existence a belief in metaphysical realism commits one to, which is an objective world that is responsible for our perceptions of it, but exists entirely independently from them and from any conscious experience at all.

The belief that there exists such an objective world that underlies and is responsible for your present experience is, prima facie, nothing more than a hypothesis. As we saw in section 4.1, this echoes a point made by Kastrup [4, p. 21]: 'physically objective matter is not empirically observable, but a conceptual explanatory device *abstracted from* the patterns and regularities of empirical observations'. Whereas Kastrup uses this as a justification to propose an objective world based on *mind*, I extrapolate the argument to say that *any* conception of an objective world that lies outside of subjective experience is a mere explanatory device.

Based on a belief in the existence of an objective world outside of subjective experience (i.e. on an assumption of metaphysical realism), otherwise perplexing questions – like why our experience is consistent the way it is, that the apple in front of me continues to be there when I have looked away and look again, that I see lightning and a few seconds later hear thunder, that I can interact with other (seemingly) conscious creatures – are answered rather intuitively by taking those experiences to be facilitated by an objective world

governed by laws. This explains why metaphysical realism is such a popular position to take. However, I claim that it is not necessary to assume the existence of an objective world in order to account for your experience. Instead of taking an objective world to be governed by laws, I take the world within experience as well as experience itself to be *directly* governed by laws sufficient to account for the consistencies of your subjective experience. We will discuss how experiences can account for their own orderliness without the need for an objective world in section 5.7.

Notwithstanding the impotency of Moore's 'proof', we might still take there to be something like an objective world beyond experience. But since we do not have access to anything beyond experience, this would constitute an assumption requiring a leap of faith. Since analytic nondualism is an epistemically minimal ontology, i.e. one making no strong assumptions about reality beyond experience, it requires that we do not assume the mind-independent existence of an objective world, as metaphysical realism requires. Note, however, that I am also not suggesting that we assume that there is no objective world whatsoever, since that would also constitute a strong assumption. Instead, analytic nondualism entails agnosticism about the existence of an objective world. Since the ontology aims to be consistent without such a world, though, an objective world can play no direct role in it. (The place of things beyond experience within the ontology will be discussed in section 5.12.) In particular, an objective world cannot be said to be *necessarily* responsible for our experience if we are agnostic about its existence. It is this notion of an objective world – one that is *necessary* to explain our experiences and on which they depend ontologically and causally – regarding which analytic nondualism entails an anti-realist stance. If we manage to show that the world within experience is consistently explainable without the *need* for an objective world, then this anti-realism about a necessary objective world is a theorem rather than an assumption. It is important to note, though, that this anti-realist stance does in no way detract from the reality of your experience in any sense, for there is nothing missing without an objective world underlying. The objects within your experience are not 'less real' because of it; if anything, they are more real, because they are not just images/reflections of objects within some objective world, but they *are* the objects, as they really are, themselves. The world within experience is not mere appearance, *it is the 'real' world.* It is in this sense that I am rejecting the conceptual dualism between world and mind altogether. We will continue to examine the details of this conception of the world as placed within experience further in section 5.8. First, though, we need to examine experience in general in more detail within the following sections.

To sum up this section, my claim is that the world within experience *is the 'real' world*, that it is the only (kind of) world whose existence you can be absolutely certain about, and (as I still have to show) that there is no need to assume anything underlying it.

5.2 Subject and self

> It was all, quite literally, breathtaking. I seemed to stop breathing altogether, absorbed in the Given. Here it was, this superb scene, brightly shining in the clear air, alone and unsupported, mysteriously suspended in the void, and (and this was the real miracle, the wonder and delight) utterly free of 'me', unstained by any observer. Its total presence was my total absence, body and soul. Lighter than air, clearer than glass, altogether released from myself, I was nowhere around.
>
> — Douglas Harding [73][4]

Who are you? Are you some particular creature within the world that is having an experience of the world? Not in analytic nondualism, for this world in which you are just some particular creature is not available. More importantly, it is also incorrect as a matter of direct experience. Are *you* at the centre of your world within experience? Only if you *abstract* from your experience to get an *idea* of a world that is independent of your experiencing it – corresponding to a third-personal world in List's terms (cf. section 4.4) – and then put yourself at the centre of that abstracted idea of the world to arrive back at your experience. Of course, there also is a spatial centre *within* your immediate experience relative to which things are far or close, in-front or behind, left or right. However, as a matter of direct experience, you will not find yourself at this centre. This is the insight that Harding is trying to describe: you might try to find the centre of your experience by looking up your body, your nose, your eyebrows, and locating the centre somewhere behind your eyes within your head; but in trying to look behind your eyes or to find your head, so to speak, if you really try, all you will find is the world. This world does not emanate outward from some centre within your head, there *simply is* the present experience – with a spatial centre, indeed, but without anything at that centre but the experience itself. (This is not a mere claim, but something that I am asking you to experience for yourself.)

[4]Cf. footnote 2 for the online source for this quote.

If you are not at the centre of your experience, who, then, is having the experience, i.e. who or what is the *subject* of the experience? *No-one!* The contents of experience are not experienced *by* anyone, they are *simply experienced.* This is the same point that Hare (cf. section 4.3) is making regarding relative and monadic properties: it is not that your experience is present to you and mine is present to me; rather, only one experience is ever present period. It follows that there is no distinct and unique *subject* of your experience. The only thing that one might call the subject of an experience is consciousness itself, for it is the condition in and through which the experience is had. Then, all experiences share the same subject. (I leave it up to you to decide whether they want to take the subject of experience to be *nothing* or *consciousness*, since both formulations are ultimately equivalent.) In line with this, when I speak of *your experience*, I shall from now on more precisely mean the experience that is presently being had when this text is read and similarly, when I speak of *my experience*, you should take it to mean the experience that was present when this text was written.

So let us return to our question at the beginning of this section: who are you? The answer depends on one's understanding of the word 'you'. Understood as the subject of your experience, *you are consciousness* – as am I. But within your experience, there is also a self, *your self*,[5] As for what this self is and how it comes to be, I find the analysis in Douglas Hofstadter's book *I Am a Strange Loop* [75] hugely elucidating. In the book, Hofstadter introduces the concept of *strange loops* [75, p. 101–102]: 'What I mean by "strange loop" is [...] an abstract loop in which [...] there is a shift from one level of abstraction (or structure) to another, which feels like an upwards movement in a hierarchy, and yet somehow, the successive "upward" shifts turn out to give rise to a closed cycle.' These loops can be found when one turns a video camera onto a screen streaming its own video signal, in Gödel's [76] incompleteness proofs where, through the Gödel encodings, one can formulate statements that are about themselves (e.g. 'This sentence is false.'), as well as in the form of selves. As we read in the quote above, these loops involve levels of abstraction. In video cameras, turning a three-dimensional scene into a matrix of pixels constitutes an abstraction. In Gödel's proofs, the Gödel encoding of a proposition constitutes an abstraction. In the brain, these abstractions, according to Hofstadter [75], are *symbols instantiated by neural patterns.* When these symbols start to reference themselves and, in particular, the symbolic system as a whole, in a self-referential way, a *self* emerges. Hofstadter, a physicalist, then goes on to *identify* the presence of a

[5]NB: by 'your self', I mean the thing in your experience that you call 'self', while 'yourself' is just the reflexive pronoun for 'you' in any sense of the word.

self with consciousness itself. However, the presence of a self-referential symbol within a brain, in the physicalist framework, is not enough to explain the presence of consciousness, as I argued in chapter 3. While Hofstadter's analysis is hence not satisfactory as an account for the presence of consciousness itself, the concept of strange loops nevertheless provides a valuable conceptual tool for understanding selves.

You might ordinarily take this thing that you call your self to be the centre and subject of your experience, but, crucially, it is only an appearance *within* your experience, a content of consciousness. Granted, it is a special content that is ordinarily related to and 'colouring over' all others, since you ordinarily (but incorrectly) take this self to be the thing that is having the experience of all the other contents. But this self is *not prior to* experience. And, as the report by Harding at the top of this section attests, it is not even a necessary ingredient of experience. You can experience this for yourself and probably already have when you were deeply immersed into some activity – in the mental state known as *flow* –, perhaps when you were in a state of deep meditation, or even when, following Harding, looking for your head.

Still, even if you and I were both in a state of deep meditation, our experiences utterly devoid of any notion of self at the centre of experience, there is still a sense in which your experience would be different from mine beyond them comprising non-identical contents. There is a sense in which we have *personal identities*. While the problem of personal identity, which has been discussed influentially by Derek Parfit [77] and also by Hare [6], is of great interest to me and very relevant for the present discussion, an in-depth discussion about my views concerning it would, unfortunately, widen the scope of this thesis beyond what seems feasible, wherefore I postpone it to a later point in time. For now, I will say only that personal identity is founded entirely on temporal coherence between experiences:[6] I have the same identity I had three minutes ago because the two momentary experiences (the one then and the one now) are connected within a coherent sequence of momentary experiences (i.e. a sequence where every two consecutive momentary experiences are coherent, in a sense that will be defined in section 5.3). The previous sentence is problematic because the sense in which the word 'I' is used depends on the very personal identity that it talks about. A more correct but less understandable phrasing reads: there is an absent (i.e. non-present) momentary experience that is connected to the present experience by a coherent sequence of momentary experiences, wherefore both experiences might be said to share a

[6]This understanding of personal identity, I realised some time after first writing this section, is rooted in Derek Parfit's [77] concept of *psychological continuity*.

personal identity. This personal identity is not the subject of experience, for reasons given above, nor the self, since the self need not be present in every experience. Rather, it is an abstract notion, not itself present within any experience, but derived from an analysis of experiences – in particular, including absent experiences. Since the ontology of analytic nondualism, at its core, takes only the present experience as a given, it is not obvious whether this conceptualisation of personal identity is even a valid notion, then. I will explain in section 5.4 under what qualifications it is.

We have seen three senses in which you are you. You are consciousness, as the subject of experience. You are your self, as a content of your conscious experience. And you 'are' a personal identity, in an abstract, indirect, and yet-to-be-explored way. There is another sense in which you are you, viz. as an object of *my* experience. Mind you, I am not trying to dehumanise you, but am using the term 'object' in a technical sense. Since I take the *subject* to be that which is having an experience and identified it to be either absent (i.e. nothing is *having* the experience, it is just being had) or to be consciousness itself, it is only apt to call everything that is being experienced an object. And within my experience, while I have an idea about your experience and believe that you are indeed conscious, your experience is not present, so you are just amongst the things that I am experiencing (in case we ever meet, that is, dear reader), i.e. an object.[7]

While I have mostly talked about you, since it is you to whom I am trying to explain my views, everything I have talked about applies to me as well, mutatis mutandis. I say this to connect back to our discussion of egocentric presentism in section 4.3. There, Hare redefined the word *I* to mean 'the one with present experiences' [6, p. 22]. Since I explained that any experience is had by no-one (or by the always-same condition of consciousness), this same definition does not really work in analytic nondualism. Instead, I take the word 'I' to have the same collection of at least four different meanings, mutatis mutandis, as I laid out for the word 'you': the subject of *my* present experience (still at most consciousness itself), my self, a derived and abstract sense of my personal identity, and an object within other creatures' experiences. Which meaning is meant either follows from context or is spelled out explicitly. For the most part, however, I will use the word 'I' (and its declensions) in a non-technical sense (as in this very sentence), which is closest

[7] Another answer to the question of who or what you are, that one sometimes reads, is that *you are your brain*. I disagree with this statement, because, both within your own as well as within my experience, you are clearly more than that. In section 5.8.1 as well as in section 5.11, I consider the circumstance that might motivate one to suggest this answer, viz. the correlation between your experiences and your brain states.

to its meaning of *my self*, where I feel that my agency resides and my ideas originate, but I would advise you to just read it intuitively, as the intention behind most uses of these words should be clear from context; I will keep uses of the word *I* in technical, non-obvious senses to a minimum.[8]

5.3 The present moment

> *Now*
>
> Time is always now,
> Here, forever,
> Time is always now
> Gone, never,
> God is now
> The ruler of the present
> His son, a lesson,
> Born of a peasant.
> We stay here always,
> As our bodies go
> As far as they can see
> For now is again now,
> Here, forever!
>
> — Serj Tankian[9]

I said that the present experience is the only thing of whose existence you can be absolutely certain. The word 'present' mostly concerns the circumstance that it is the experience *you* are having rather than someone else: my experience is not present to you. However, it also has a temporal aspect, for the experience you were having three minutes ago is not present either. You have a memory, an idea, thereof, which is present, but the only experience that is itself present is the experience of the present moment; to emphasise this temporal aspect, I will speak of *momentary* experiences from now on. How long is a moment? This is a central question in the metaphysics of time, in particular with regards to presentist positions, which take the

[8] The potential for confusion could, of course, have been avoided by employing passive voice in writing this thesis. While passive voice is used at some places throughout this thesis to just this end, the option of using it consistently throughout has been dismissed due to the awkward and unnatural phrasings that would have ensued.

[9] This poem appears on p. 62 of the book *cool gardens* by Serj Tankian, published in 2001 by Pocket Books (Simon & Schuster). See https://www.youtube.com/watch?v=BXMRYS9ZEkE for a musical recitation of the first part of the poem, if you are curious.

present moment to be the only really existent thing (or at least 'more real' than past and future) [78]. While we briefly discussed the metaphysics of time in section 4.3, a detailed survey of the positions defended in the literature is beyond the scope of this thesis, so I confine myself to presenting my own ideas regarding the question and refer the interested reader to [78, 79]. Effectively, the question about the length of a moment asks whether a moment really is a punctual snapshot in time, like the number 1.5 is a snapshot within the real number line, or whether it is extended as a short interval, like the interval $[1.49, 1.51]$ on the real number line.

Posed this way, the question presupposes an objective existence of time onto which an experienced moment can somehow be mapped. It will come as no surprise that I prefer, instead, an approach from subjectivity: what does the present moment feel like? Indeed, when I hear e.g. two drum hits in a very short succession, it does not feel like only the second drum hit is in the present moment while the first one is already a memory; it feels like I am hearing a sequence of two drum hits in this moment. Concretely, when I abstract from my experience to get an idea of a world in which the drum was hit and which evolves with time, I would assign different timestamps to the drum hits; these timestamps constitute an *idea of objective time* as an aspect of my idea of an objective world. Yet, as a matter of direct experience, it subjectively feels like both drum hits happen *now*, even in spite of this present experience containing the aspect of temporal succession (i.e. non-simultaneity) of the drum hits. My *subjective now* – my present, momentary experience – contains events with different timestamps of my idea of objective time. This analysis of my experience, then, goes in favour of an extended moment view.

However, the term *subjective now* is crucial. Let us suppose that, instead of a sequence of two drum hits, there is a continuos drum roll. When I have heard this drum roll for a while, there was also an experience maybe half a second ago, with one drum hit being experienced as *now* both in both momentary experiences (perhaps as the event with the latest timestamp in the former experience and as the event with the earliest timestamp in the present experience). Hence, momentary experiences can have overlapping timestamp intervals. Nevertheless, the two experiences are distinct, for they have different contents (the present one contains the next drum hits that the former one did not contain) and each momentary experience has a definite set of contents that are experienced as *now* within that momentary experience. Therefore, while momentary experiences are extended in objective time (which is only an aspect of the idea of an objective world), as a matter of direct experience of subjective time (i.e. what feels like *now* within an ex-

perience), they are punctual snapshots that are clearly delineated and each one is distinct in itself. In other words, the present moment contains events that you might assign different timestamps, but it is always the unique thing being experienced *now*.

Let me briefly clear up my used terminology. *Momentary experiences* are unified experiences, in that they are experienced as one experience entirely, within which the contents of the experience are experienced as *now*. The *present moment* is the momentary experience being experienced at present, i.e. by you right now; it is what, in a linguistic setting, one would call an indexical, for it continually changes. The present experience is what I have, before this section, used as a broad term to simply refer to your experience as you experience it. The above analysis has now shown that this your experience, the *present experience*, is a momentary experience, in particular, the present moment. Earlier, I have determined subjective experiences, just like the present experience, to constitute the *core* of the ontology of analytic nondualism. In line with this, we can now specify the ontological core more precisely to consist of *momentary* experiences.

Notice that there is no underlying sense in which momentary experiences are ordered temporally: each momentary experience, within itself, just is. (In Russell's [48, p. 121] words: 'There is no logically necessary connection between events at different times.') However, within an experience, I have memories of some experiences but not of others. Therefore, we might define a subjective notion of past-hood through memories: an experience is in the past if I have a memory of it. However, there are mental states or conditions in which one has trouble remembering even just the last moment.[10] Therefore, although I realise it introduces some imprecision, I define an experience e_1 to be *in the past of* e_2 (in symbols: $e_1 \prec e_2$) if there *could possibly be* a memory of e_1 within e_2. The imprecision is due to this *possibility* having to be explained by some other means, perhaps requiring a semantic analysis in terms of possible worlds. Since I do not want to get bogged down on this issue, I will let this imprecise definition stand as it is, based on nothing beyond an intuitive understanding of what it means that you could possibly remember something. However, I believe that you and I share this intuitive understanding and that hence, even if I do not provide a precise definition, there is indeed such an understanding on which the notion of past-hood depends, making the latter a valid (though, as it stands, under-defined) notion.

[10] E.g. after ingesting a cannabis edible with your friends in Amsterdam and realising you should not have trusted the shop clerk saying you will be fine if you only eat half of one.

Clearly, then, this past-hood relation is transitive and antisymmetric (as a matter of intuition). Although there might be something like an idea of the present experience within the present experience, I would not call this a memory, wherefore the relation of past-hood is also irreflexive. In conclusion, this subjective ordering of momentary experiences, based on possible memories and grounded in each experience, is all that time is; there is no *underlying* objective sense in which momentary experiences are ordered temporally.

Note that this also implies that all experiences, within themselves, exist *atemporally*. Pragmatically, it makes sense to say that your past experiences *existed* and your future experiences *will exist*, because you have memories of the former within the present experience and you have memories of the present experience in the latter. Fundamentally, however, all existing experiences (we consider which ones they are in the next section) 'always-already' exist, atemporally and with their own subjective senses of past, present, and future.

Moving on, there is the question of whether time is continuous or discrete. As usual, we approach the question from a subjective angle. Given my present experience e_p and my experience half a second ago e_1 (i.e. $e_1 \prec e_p$), is there an experience e_2 in-between, i.e. with $e_1 \prec e_2$ and $e_2 \prec e_p$? Given that half a second is not that short, there probably is. But can we continue this *ad infinitum*, i.e. is there an infinite chain of experiences $(e_i)_{i\in\mathbb{N}}$ with $e_i \prec e_{i+1}$ and $e_i \prec e_p$ for $i \in \mathbb{N}$?[11] If the answer is yes, (subjective) time is continuous; otherwise, time is discrete and each momentary experience has a unique direct predecessor within the past-hood relation (or none, considering the formation of a new conscious creature). If time is discrete, then the collection of my experiences within the last minute is entirely described by some sequence of momentary experiences $(e_1, e_2, \ldots, e_n)$ with $e_i \prec e_{i+1}$ for all $1 \leq i < n$ (as judged subjectively from within the present experience). Otherwise, if time is continuous, it can be described as a mapping f_e from the real number interval $[0, 1]$ to the infinite set of these experiences, where $f_e(0)$ is my experience exactly a minute ago, $f_e(1)$ is my present experience, and $f_e(i) \prec f_e(j)$ for all $0 \leq i < j \leq 1$ (as judged from the present experience).

Regardless of our understanding of time, then, we can simply define a *coherent sequence of momentary experiences* as a sequence $(e_1, e_2, \ldots, e_n)$ in which $e_i \prec e_{i+1}$ for all $1 \leq i < n$. From this, in turn, a precise notion of personal

[11] Of course, which momentary experience is present, i.e. the referent of e_p, changes throughout your reading this text, but for the purposes of this formal analysis, I take it to be the same throughout.

identity can be derived, as we discussed in the previous section. Just like time, this notion of personal identity is not an objective relation amongst experiences, but a subjective notion based on memories of past momentary experiences. Nevertheless, it allows you to pinpoint the difference between your past experiences and the experiences of others: while both are just ideas of absent momentary experiences, the ideas about your past experiences are not only richer, they also share a personal identity with your present experience. (Therefore, it also makes no sense to ask what it would be like to inhabit the subjectivity of someone else: there is your experience and there is, possibly, the experience from the perspective of the other person, but since the latter could not possibly contain a memory of the former, there is no sense in which *you* could suddenly be *them*.)

5.4 Absent experiences

We now return to the central observation motivating analytic nondualism: that the present experience is the only thing of whose existence you can be certain. How, then, can I talk of momentary experiences that are not present, as I did repeatedly in the previous section? This problem has two aspects: the monadicity of presence and the uncertainty about things beyond the present experience. Regarding the first aspect, in line with Hare [6], I understand the *presence* of a momentary experience to be a monadic property: the present experience is not simply present *to you right now*, since both you (as in: your self) and the sense of now are *within* this experience; rather, it *just is* present, as a property of this momentary experience itself. Furthermore, presence is not a property of momentary experiences other than the present experience: while you can form an idea of other experiences, they are not present – *as judged from the present experience*. Nevertheless, presence is a necessary property of any experience, for an experience that is not present *as judged from within itself* is not an experience at all.

Does this not imply an understanding of presence as a relational property, after all? Not really, for I am not saying that some experience is present to some creature within the world, but that an experience is present as judged from within itself; a relation that only contains reflexive pairs can be considered a monadic property without loss. However, I also said that any experience is necessarily present as judged from within itself; so what is the point of such a property if it just the identity relation? And, relatedly, is it still true, for this reflexive understanding of presence, that only one experience is ever present? The answers depend on the viewpoint from which you

judge experiences to have the property of presence. Ultimately, your present experience is the only viewpoint you have from which to judge, and from there, only it itself is present. All other experiences are just ideas within your present experience; you can assume (as I will discuss in more detail shortly) that there exist things that are the referents of these ideas, viz. experiences that are present as judged from within themselves, but you cannot get closer to them than assuming that they exist; they will remain absent as judged from within your experience. In order to say that each momentary experience is present as judged from within itself, you need to adopt an objective viewpoint. Indeed, doing metaphysics requires adopting an objective viewpoint, but it is crucial to note that it is still firmly embedded within your present experience, i.e. within your subjective viewpoint (cf. section 3.3.4). Hence, the objective viewpoint, prima facie, only concerns ideas (within the present experience) of other, absent momentary experiences. The objective viewpoint allows you to ascend to a plane of hypotheticality (where you assume that these ideas have referents) to speak of absent experiences as if you had access to them, judging them to be present as judged from within themselves. Nevertheless, the referents of these ideas must remain hypotheticals, since you one cannot transcend the confines of subjectivity, so the present experience remains the sole one that is truly present.

So let us now discuss, in detail, the second aspect of the problem of absent experiences: the uncertainty about their existence. In section 2.5.3, we discussed the problem of other minds, pointing out that you cannot know whether the people around you are conscious, i.e. whether there exist momentary experiences had from their perspectives. Moreover, we discussed the five-minute hypothesis, asking you to consider that the universe was created just five minutes ago with your brain created just so as to have exactly the memories it has without the events of those memories ever really having happened. Hence, you cannot even know whether there exist (existed) momentary experiences corresponding to your own memories. Of course, the five-minute hypothesis just points out that you cannot be *certain* that any memory actually refers to an actually existing experience, but there is no good argument that it does not do so, either. This is different when we talk about *dream experiences*. In particular, Daniel Dennett's [80] *cassette theory of dreams* argues that most dreams are not actually experienced, but that the dreaming brain is just generating 'cassettes' that are transformed into a coherent narrative and 'inserted' into consciousness upon waking. In the terminology of analytic nondualism, we would say that the memory of the experience of having a dream does not refer to an actually existing experience. One of Dennett's arguments for accepting this view are dreams involving

anticipation (or what Rosen [81] calls *suspense dreams*), where the narrative of a dream coherently leads up to an event that is induced by (or at least correlated with) a stimulus from the waking world. (Dennett [80, p. 157] writes: 'In a recent dream of mine I searched long and far for a neighbor's goat; when at last I found her she bleated *baa-a-a* – and I awoke to find her bleat merging perfectly with the buzz of an electric alarm clock I had not used or heard for months.') So we see that there are valid arguments being made for why *some* remembered experiences might not have been experiences at all. Ultimately, though, one can never be certain either way about *any* remembered experience; within the present experience, each memory is just a memory, the referenced experience itself entirely beyond it. (In Russell's [48, p. 121] words: '[T]he occurrences which are *called* knowledge of the past are logically independent of the past; they are wholly analysable into present contents, which might, theoretically, be just what they are even if no past had existed.') The same is true for your imagining any experience had by some other creature; the experience had from the perspective of some other being is entirely beyond your present experience and unknowable to you.

5.4.1 Solipsism

If you now were to assume that only the present experience exists, you would espouse the most radical form of ontological solipsism imaginable. However, there is no reason for you to assume this. You know that one momentary experience, the present one, exists. It is a very careful step, then, to assume that others *like it* exist as well. After all, why out of all the momentary experiences that could possibly exist should the present experience be the only one that does? The natural candidates for experiences that you are justified to believe in are, firstly, those of which you have a direct memory (i.e. your own past experiences), and, secondly, experiences had from the perspectives of beings around you that *seem* conscious. Exactly which beings seem conscious – whether you are inclined to believe that there is some simple conscious experience associated with mosquitoes, artificial intelligence systems, or even rocks – is not of importance right now. (We will consider this question in section 5.11.) The point is that you are justified to believe in experiences other than the present one and that you have a rough idea of what they are. (NB: when I say that you are *justified* to believe in some proposition p, e.g. that experiences other than the present one exist, this does not imply that you can be *certain* of p, but only that the reasons to believe p outweigh the reasons to disbelieve p.) This alone is enough to reject ontological solipsism, so analytic nondualism clearly does not imply

it. Nevertheless, assumptions about the existence of remembered/imagined experiences are still assumptions. While I obviously make them in everyday life, analytic nondualism remains agnostic about the existence of anything beyond the present experience. Even if you do make assumptions, it is unclear which ones are valid. Therefore, the ontological core of analytic nondualism is simply *all momentary experiences that exist*, at least the present one.

It would be fair to ask, if the ontological core is so hypothetical anyway, why are non-experiential things, like an objective world, not included as well, with the same delimiter of only including those that actually exist. Indeed, we will allow for non-experiential things to be part of the ontology in just this way, as I explain below in section 5.12. However, they remain mere possibilia and are uninteresting in themselves. This is because, as I said above, experience is your direct contact to reality and the point of analytic nondualism is to argue that experience does not require anything beyond it. Furthermore, since you know one experience (the present one), you are much more justified to assume that others like it exist than to assume that there exists a non-experiential, objective world beyond your experience, which is unlike anything that you do know (since the only world you know is the world *within* experience). Therefore, since experiences are what we care about and the only kind of things with which we are always familiar, they are our focus and hence form the *core* of our ontology.

While analytic nondualism does not imply ontological solipsism, its commitment to agnosticism about anything beyond the present experience means that it does work as a theory of ontological solipsism: since each momentary experience has an independent existence by itself, the present experience, as the sole one existing, would be enough to account for itself. Still, analytic nondualism also works as a theory of a fuller reality if you make some careful assumptions about the existence of absent experiences. These assumptions are never inherent to the theory; rather, the theory allows you to draw conclusions from explicit assumptions, i.e. as implications. For example, it is *not* a theorem of analytic nondualism that other people are conscious, but the implication 'if the people around me are conscious, then there exists a shared reality[12] amongst my and their experiences' is a theorem. Similarly, the implication 'if my present idea about my experience three minutes ago refers to an actually existing momentary experience, then there is a notion of personal identity derivable from this and the present experience' is a theorem.

[12]The concept of a shared reality will be properly introduced below in section 5.10.

5.4.2 Perspectives

At this point, it is important to clear up what we mean when we say that other beings are conscious. In your experience, as I mentioned above, other beings are, prima facie, simply *objects*. As that, they cannot *directly* have their own subjectivity, for these objects occur in *your* subjectivity. Rather, what we should mean when we say that another being is conscious is that *there exists* a subjective, momentary experience that corresponds to what we take to be its perspective. If you imagine the experience had from the perspective of another being, you are forming an idea of an absent experience. In fact, you can imagine pretty much arbitrary experiences (e.g. of just the auditory perception of your favourite song without any other contents next to it), but in order to connect this 'free-floating' idea of an experience to some object (being) in your present experience, we require a precise concept of *perspectives*. To elaborate, let us take a step back.

Imagining the experience had by another human is straightforward, as it is, very likely, similar to our own. Given how important it is for us, as a social species, to see things from someone else's point of view, i.e. to develop a *theory of mind* for other people, it is something we learn to do at an early age. We can extend this ability to form a theory of mind of other creatures as well and are able to recognise that it is different from our own; e.g. while most people nowadays would agree that a dog likely has a conscious experience, we can be quite sure that it does not involve language thoughts (like 'Yes, I am indeed a good boy.'), as dogs lack the brain areas necessary for actually understanding language and, in any case, do not exhibit behaviour that would hint at them having an actual understanding of language.[13] Nevertheless, when some people are confronted with the concept of panpsychism (i.e. the idea that every object in the world has a conscious experience on their own), they retort: 'So stones think?'

This, now is where the concept of *perspectives* comes into play. A perspective connects some object in the world (within the present experience) with an (absent, imagined) experience, requiring at least a specified location in the world. In this sense, it is close to what List [7] calls *loci of subjectivity* (cf. section 4.4). Beyond a specified location, a perspective also requires a *facilitation* of the experience within the object that is supposed to hold the perspective, i.e. there must be some (dynamic) representation of all aspects

[13] Of course, dogs can learn to associate certain word sounds with different concepts, but this is different from the discursive language thoughts and the language understanding that we as humans have and which I am referring to.

and parts of the imagined experience within the object.[14] For example, I can imagine there to be an experience as would be had by a human if they were in the spatial location where, in actuality, I see some rock lying around; this experience has visual sensations of the world from that location as well as discursive thoughts etc. But this experience is not from the perspective of the rock, because the rock cannot *facilitate* an experience including sights or thoughts, since there is, arguably, no representation thereof within the rock. Likewise, we can imagine the experience had from the perspective of some dog and additively imagine this experience as containing discursive language thoughts, but this is not an experience from the perspective of the dog any longer, because its brain does not facilitate these thoughts.

The point is that, while the range of experiences we can conceive of is vast, in order for them to be said to be from the *perspective* of some object in the world (within experience), they need to be connected to the object through a facilitation of that experience with all its parts. Note, however, that while this facilitation is a *necessary* ingredient of a perspective, we cannot know for certain what counts as a *sufficient* facilitation: while an artificial intelligence system, e.g. a language model, that contains no representation of emotions cannot constitute a perspective from which an experience involving, say, anger is had, it might or might not be the case that the system's encoding of language constitutes actual *meaning* that is experienced in some (primitive) form. (As we will explore in section 5.11, this is where theories and models of consciousness come into play, as they could give us justifications, short of certainty, for either believing or disbelieving in the system constituting a perspective from which an experience involving certain contents is had.)

With the concept of perspectives cleared up, we can also place Hare's [6] subject world semantics, which we saw in section 4.3, within analytic nondualism. When a sentence involves the *point-of-view* operator, its truth depends on whether the named point of view refers to an actual perspective and what the experience from this perspective is like. For example, the sentence 'From the point of view of the mosquito buzzing around me, I seem to be a tasty source of food.' is true if and only if there exists a momentary experience whose contents are perfectly correlated with some facilitation within the mosquito (i.e. its brain) as an object within my experience, and in which I, the author of this text, occur as an object which is experienced as a tasty source of food. So far, this is broadly compatible with Hare's semantics, leaving aside the differences due to my phrasing in terms of *momentary* experiences, where Hare speaks simply of experiences. However, there is a difference regarding

[14] In section 5.8.1, we consider the facilitation of the present experience.

the semantic framework. Specifically, Hare introduces subject worlds, which are collections of propositions, as formal tools, pointing out that reality is *as if* it were a collection of subject worlds, but is not actually a collection of subject worlds. While reality is obviously not identical to a collection of collections of propositions, we can do better than this blanket appeal to fictionalism. Concretely, in section 5.6.2, I introduce semantic descriptions of momentary experiences, which are collections of propositions that hold true within a given momentary experience and are hence akin to subject worlds in Hare's system. However, these semantic descriptions are simply formal tools, each of which might or might not describe reality. The questions of which momentary experiences exist and what they are like, though, are actual questions of reality. Reality is not *as if* it was constituted of a collection of semantic descriptions, reality *is* constituted of momentary experiences, which semantic descriptions seek to describe.

5.5 Being aware of being aware

So far, I have mostly taken experiences, in an holistic sense (as *qualia in the broad sense*, cf. section 2.2), as a given. Let us look at them more closely: your current experience contains this text, whether on paper or on screen, whatever is around it visually, likely some sounds, perhaps an inner voice that is reading the text, some adjacent thoughts, and more; they are parts of your experience, particular contents of consciousness, or *qualia in the narrow sense* – they are the things that you are *aware* of. On top of them, in some sense, for all of these parts of your experience, there is also the awareness of you being aware of them. In the words of Schooler [67] (cf. section 4.1), these parts of your experience are meta-conscious,[15] and in common parlance, one might say that they are the parts of which you are *consciously aware*, as in: conscious of being aware of them. Now, I take the terms 'being "aware of" something' and 'being "conscious of" something' to be synonymous. However, to avoid confusion, I will reserve the word 'conscious' to talk about other beings having an experience, as discussed in the previous section, and use the word 'aware' to point out the things that are *parts* of an experience. In line with this, I will use the term 'meta-aware' to mean what Schooler calls 'meta-conscious', i.e. you are *meta-aware* of some part of your experience if you are aware of being aware of it.

[15]To be precise, Schooler speaks of brain processes, but since his distinction regards the way that these are experienced and because I do not wish to address the relationship between experiences and brain processes just yet, I adapt his terminology to subjective experiences.

Let us consider the parts of your experience of which you are not meta-aware. Notice your breath. I suppose you were not meta-aware of it before you read the previous sentence, so was it already a part of your experience a split second ago? In the present experience, you only have an incomplete memory of this experience a split second ago, so you cannot tell with certainty whether the sensations of your breath were a part of it or not. Take a moment to closely observe your present experience, as it continually changes, and note its parts. — Now, was the subtle tingling of your left small toe, that you might experience now after reading this, part of this (now past) experience? Was the sight of the object in the periphery of your vision? What about the feeling of your tongue within your mouth? I would wager that at least one of these things was not a part of that experience on which you reflected, where you became aware of what you are aware of. Are you justified, then, in ever assuming that your present experience contains any parts that you are not *aware of being aware of*, i.e. that you are not meta-aware of? You are not: you can only be certain of your experience containing the parts that you are aware of being part of it. As Kastrup [4] points out (cf. section 4.1), within an experience, there is no way to differentiate between being unconscious/unaware of something and being aware-but-not-meta-aware of something. Therefore, if you are not meta-aware of some part of your experience, you have no justification to believe that you are aware of it at all, i.e. that it is a part of your experience in the first place.[16]

Now, the meta-awareness of some particular part of your experience is not actually an extra part on top of the base awareness of the part, as I phrased it above. Meta-awareness is not the thought 'I am aware that I see this text', which *is* an extra part on top, but which is not necessary to be meta-aware of something. Rather, as I have argued above, if you are not meta-aware of something, you have no justification to believe that you are aware of it at all. As a consequence, the present experience, as the thing of whose existence you can be certain, has to be limited to contain only meta-aware parts; this extends to all momentary experiences *like* the present experience. Non-meta-aware awareness, then, is a purely hypothetical concept (just like the concept of an objective, non-experiential world underlying experience). Hence, the only thing that you can even *know* as awareness *is* meta-awareness; whenever

[16]Based on an argument by Kastrup, we have reached a conclusion drastically opposed to the one he reached. This is because Kastrup assumed that you can be aware of something without being meta-aware of it, which furthermore lead him to conclude that *everything is conscious* in some sense. While I agree with him that experience does not need a non-experiential (i.e. unconscious) world to account for it, I do not think we need to pose that 'liver, kidney and even toe function must all correspond to experiences as well' [4, p. 12] to make up for it, as I will explain in section 5.9.

you notice that you are aware of something, you are only really becoming aware of it at that moment of becoming meta-aware of it. In line with this, we can rephrase meta-awareness (of some part) to be simply *the sense that a certain part is experienced*, which encompasses the awareness of that part itself, which in turn cannot be removed from this sense of being experienced. Therefore, momentary experiences, as they form the core of the ontology of analytic nondualism, are understood to contain only meta-aware parts, which are, each, simply the *sense* that some part is experienced.

What is it, then, that you are becoming aware of when you pay attention to what you are aware of? Noticing the contents of your experience is not instantaneous: when I ask you to examine your experience and you become aware of things you were not aware of before, your experience changes; the experience you are reflecting on is already a mere memory, an idea of an experience itself no longer present. Hence, when you become meta-aware of your breath, it is easy to think that you become aware *now* of some non-meta-aware awareness of your breath *then*. However, as a matter of experience, this apparent non-meta-aware awareness is only present within the memory of the experience *then*. As I argued above, you are not justified to assume that it was actually present within the experience itself. The moment you became meta-aware of the breath is the first moment at which you are justified to take it to be a part of this momentary experience. Therefore, when you become meta-aware of some part of your experience, you are not becoming aware of anything outside of that experience; it simply becomes a part of the experience without referencing anything other than itself, no objective world and no other experience. Experiences are not experiences *of something else*, but simply the experiences that they are.

Compare the arguments of this section to the following passage from a conference talk given by Joscha Bach:

> It's like an orchestra: each brain area [...] is like an instrument, each of them playing a specialised part of the music of your mind [...]. This orchestra has a conductor, this conductor is not some kind of magical homunculus, it's a brain area like the others [...]. And this conductor is doing executive function, it's resolving conflicts between the different instruments and tells some to tune up or to tune down [...]. And to do all these things, it maintains a protocol of what it attended to. And this protocol is basically a story that the system tells itself about itself. [...] And this protocol is the only part where our experience gets integrated. [...] And when you access this protocol, you remember what happened

> there [...]. And at some point you'll also be able to replay the fact that you accessed your protocol, so you put into your protocol the fact that you accessed your protocol. [...] So, now, your system is able to remember that it attended to itself a moment ago, that it perceived itself as being conscious a moment ago. And I think this is necessary and sufficient for consciousness. [82, 33:43]

It is evident that Bach is a metaphysical realist and takes brain processes to cause conscious experience. Despite this, the last two sentences from the quotation point to an understanding of consciousness similar to mine; according to Bach, your present conscious experience contains what you *remember* yourself to be conscious of a moment ago, but you really are only conscious of it in virtue of this reflection on your memory. This idea of a necessary self-awareness of consciousness can also be found in the writings of Douglas Hofstadter, in particular in [75], as we briefly saw in section 5.2. So, if consciousness requires some kind of self-referential perception/representation, these thinkers should agree that everything that can truly be said to be a part of a conscious experience must encompass an awareness of its being a part of a conscious experience.

Before we move on, I want to summarise the ontology of analytic nondualism and repeat why I say that it is an *epistemically minimal* ontology. As I have pointed out repeatedly, your present experience is the only thing of whose existence you can be certain and, as we saw in this section, you can only know it to contain as parts that which you are meta-aware of. The most careful assumption you can make, then, is that there exist other momentary experiences just like the present one, i.e. with different contents, but identical in kind as being a conscious experience containing meta-aware parts. Now, analytic nondualism, at its core, does not make this assumption, but it allows you to make these kinds of explicit assumptions and derive consequences. Nevertheless, my claim is that a belief in other momentary experiences is much more justified than a belief in an entirely non-experiential, objective world, because such a world would be unlike anything that you know (since the world you are experiencing, by virtue of that, *is experiential*). Therefore, *all momentary experiences that exist* form the ontological core of analytic nondualism. In section 5.12, we will consider the place in the ontology for non-experiential things, whose existence we have no reason to believe in, but also no justification to exclude.

5.6 The structure of experience

As we began to discuss in the previous section, each momentary experience consists of parts. Nevertheless, each momentary experience is a unified whole: the parts of an experience are not experiences in their own right, for they can only be known to exist as parts of a unified momentary experience from within that experience. These parts include *qualia in a narrow sense* (cf. section 2.2), e.g. the sight of each of these words and letters, the sounds you hear, the feeling of your breath. These parts can themselves consist of parts: the sight of each word may be composed of the sight of its letters, which may be composed of the sight of individual lines and dots, and so on. Nevertheless, smaller parts have no more privileged status than bigger parts, for they equally are parts of your experience that stand in a certain relationship (in this case: parthood) to one another. Moreover, in line with the arguments of the previous section, the constituents of a part of your experience are only themselves part of your experience if you are meta-aware of them, i.e. when you read a word, you rarely are meta-aware of the individual letters, wherefore the sight of the letters, individually, cannot be said to be a part of your experience in itself. Your experience is not *only* a field of sensory information, but it contains what you call the world. Therefore, the objects of the world (and not just the sights, sounds, tactile feelings, etc. of them) directly are parts of your experience; in particular, they are complex parts that themselves are constituted of possibly multimodal parts (e.g. a train is a part of your experience that has visual parts – what it looks like – as well as auditory parts – what is sounds like – and so on). The decomposition of the world (of experience) into objects is not fixed, but it is given in each experience: as Lakoff [64] (echoing Putnam) points out (cf. section 3.3.2), what you take to be an object depends on the conceptual scheme you employ at that moment, e.g. whether you take a chair to be a single object or take it to be a collection of atoms. This conceptual scheme, however, is not something you impose on an unstructured field of sensory information; instead, experience is directly given as having parts: in a momentary experience, there either is a single object that is a chair or there is a collection of atoms. The conceptual scheme, then, is derived from this structuring and the idea of this conceptual scheme itself is a part of the next experience. Indeed, if you decide to employ a certain conceptual scheme, this influences how your next momentary experience is structured, but the point is that, as a matter of direct experience, each experience just *is* structured.

Now, in what sense exactly is your experience structured? Notice that the parts of your experience stand in certain relationships to one another: as we

already discussed, some parts of your experience can be constituents (parts) of another; some parts of your visual experience are to the left of others, some objects in the world within your experience are in front of others, some sounds are perceived as louder or higher than others, you can group some parts of your experience into distinct sensory modalities, and so on. The structure of an experience in a *broad sense*, then, is the subdivision of the experience into (meta-aware) parts together with the relationships that hold between these parts. In this sense, the structure of an experience is not really anything different from the experience itself, but just carries the connotational emphasis that we care about how the experience is constituted. In a more *narrow sense*, structures can also be said to be *abstractions* of certain relationships; e.g. when you look at your fingers on one hand, you will find five objects with a given order (left to right). You will also find this abstract structure when you look at your other hand, the toes on a foot, but also when you think of the five Platonic solids ordered ascendingly by the amount of faces. All of these complex parts of your experience share this abstract structure. You will also find it when you think of the natural numbers 1 to 5; in fact, your idea of these numbers can be understood to be an idea of this abstract structure itself. This narrow sense of structure, as an abstraction from experience, exists in a more independent way, as we shall discuss shortly. For now, it suffices to say that abstract structures are abstractions from experience and that experience is structured by virtue of instantiating these abstract structures. The structures instantiated in an experience also include cases more complex than a handful of natural numbers, of course. Since complex combinations of abstract structures are themselves abstract structures, we can think of the totality of abstract structures instantiated in one momentary experience as one abstract structure instantiated by this momentary experience.

Can there be such a thing as an unstructured experience? We might imagine an experience consisting only of a visual field filled uniformly with one shade of green. However, per my arguments in section 5.5, this does not qualify as an experience in the first place, because there is no meta-awareness. Instead, we imagine a experience consisting entirely of a meta-awareness of the shade of green, i.e. of *the sense that green is being experienced*. In this case, the sense of green being experienced encompasses a reference to the experience as a whole, since it explicitly includes within it that it is a part of the experience (as that is what it means for the part to be a *meta-aware* part). Therefore, even in this minimal example, there is a relationship between a part of the experience and the experience itself, which counts as structure. This trivially

extends to more complex experiences. Therefore, indeed, there can be no unstructured experience.

Hence, we can say that the ontological core of analytic nondualism consists of *structured* momentary experiences. What, then, is the ontological status of abstract structures (by themselves) in relation to structured experiences? Note that the parts of an experience instantiate an abstract structure (e.g. the fingers on your hand instantiating the abstract structure of five ordered things) by virtue of experience being structured in the broad sense. However, experience can only be said to be structured in the broad sense by virtue of instantiating these abstract structures. Therefore, there is a certain interdependence between (structured) experience and (abstract) structure. This seems to suggests that abstract structures might exist simply as aspects of structured experiences. However, in order for there to be *one* abstract structure shared by different parts of experience and even across different momentary experiences, this abstract structure must have an existence in its own right. Ontologically, then, we resolve this thusly: structure, in the broad sense, is an integral aspect of momentary experience, in the sense that they simply *are structured*; through *abstraction* of this structure away from subjective experience, abstract structures form an ontological category of their own, which nevertheless is dependent upon and supervenient on (structured) experience. So while abstract structures do not ontologically precede experience (as in OSR; cf. section 2.5.1), they exist on a realm of their own, wherefore it is possible to say that one and the same structure is instantiated multiple times.

So, given that experience has structure that can be instantiated multiple times, we can try to replicate aspects of this structure within the world; in other words, we can try to *formally model* experience. We will discuss two approaches for how to go about this: the first aims to replicate the structure of experience mathematically, while the second one focuses on propositions that describe an experience semantically.

5.6.1 Structural descriptions

Based on the above example of an experience of only green, imagine an ever-so-slightly more complex momentary experience consisting of the meta-awareness of the visual field filled with green and also a meta-aware auditory experience that you would experience if you only heard a 410 Hz sine sound

wave.[17] The meta-awareness of the sound references the experience as a whole which we take to be identical to the totality of its parts, but we take structure to be something that exists *amongst* these parts, so the totality of parts has to be a part itself. If we were to understand 'the totality of parts' – which is by itself just an intuitive and informal phrasing – as the collection/set of all parts, we could not use standard (ZFC) set theory to model the parts of an experience, since, there, no set can contain itself. We can either turn to to alternative versions of set theory (i.e. non-well-founded set theories) in which these self-containing sets are allowed or, otherwise, we can understand 'the totality of parts' to mean the *fusion* of all parts, in the sense used in the philosophical discipline of mereology (cf. [83]); a fusion of two parts produces another part *on the same level of abstraction*, like a union of two sets producing another set, and *un*like a collection of two elements producing a set. I favour this latter approach.

Notice that some parts of your experience are themselves constituted of other parts and/or constituents of other parts, i.e. the fusion of *some* parts are again parts of the momentary experience (e.g. the words forming this text). We might, then, try to mathematically model experiences using topology. A *topological space* (A, τ) consists of a set of points A together with a set τ of *closed subsets* of A.[18] A momentary experience, then, is modelled as the set of points A (which is the largest closed subset), and τ is the set of parts of the experience. (Note that the entire topological space (A, τ) *describes* the experience, while only A *models* it directly.) What, then, are the elements of the set A? Two answers are possible: if one believes that a momentary experience can be subdivided into elementary parts of 'atomic' qualia, then one might take A to model the set of these atomic qualia (or rather: the set of proto–atomic-qualia, with their singleton sets, $\{a\} \subseteq A$, modelling atomic qualia, for we take closed subsets of A to model parts of an experience); otherwise, we might simply not consider the elements of A at all and take the notion of closed sets as a primitive, as is done in *point-free topology*. An analysis in terms of topology can then be used to consider questions about the structure of the part-hood relation within experience, e.g. what the smallest part containing all parts of a given set is. (For a more elaborate approach to model experience using topology, cf. [84].) By itself, however, topology is not powerful enough to capture the whole structure of an experience, e.g. one part being to the left of another, but it is possible to

[17] While sound is possible only through temporal variations (i.e. vibrations), subjectively, a single sound is experienced momentarily, so such an experience is conceivable.

[18] I will not go into the further details of topological spaces here, for they are not all too important to understand the ideas of this subsection.

complement the topological space by other relations on the set of closed sets, leading to a more complex mathematical structure. The project of finding these precise descriptions of experiences in terms of mathematical structures is pursued in the field of *mathematical consciousness science* (cf. e.g. [84, 85] as well as the website amcs-community.org). For the purposes of this thesis, however, this paragraph shall suffice to give an idea of concrete mathematical modelling approaches; further discussions of *concrete* mathematical models of experience will not be relevant.

In principle, we can imagine that it is possible to completely describe a momentary experience by a *mathematical structure* (defined as a set of base elements together with one or more relations on that set), in the following sense. Given a momentary experience e, we say that a mathematical structure s_e is a *complete structural description* of e if,

1. for every part of the experience e, there is an element in s_e,
2. every element in s_e corresponds to a part of e,
3. for every relationship $\mathbf{R}$ in e, there is a relation R in s_e such that, for all tuples $\overline{\mathbf{a}}$ of parts of e that stand in that relationship $\mathbf{R}$, the tuple $\overline{a}$ of elements of s_e corresponding to the parts in $\overline{\mathbf{a}}$ are related by R (i.e. $\overline{a} \in R$),
4. and for every relation R in s_e, there is a relationship $\mathbf{R}$ in e such that, for all tuples $\overline{a}$ of elements of s_e that are related by R, the tuple $\overline{\mathbf{a}}$ of parts of e corresponding to the elements in $\overline{a}$ stand in the relationship $\mathbf{R}$ within the experience.

Per my understanding of what it means for an experience to be structured, as I laid it out above, there indeed is such a complete structural description for every momentary experience. (It is another question whether it is practically possible to write down these descriptions, but this is irrelevant for now.) Furthermore, it follows easily from the above definition of a complete structural description that, for every momentary experience e, the corresponding structure s_e is unique up to isomorphism.[19] In fact, the above definition reads like a definition of isomorphism, treating an experience like a mathematical structure. This is because mathematical structures are very close to what I called abstract structures above. Abstract structures can only be considered in instantiated form, since only then are they actual parts of experience.

[19]For the concrete models of experience sought in the field of mathematised phenomenology, insofar as they seek to describe *momentary* experiences, we might say that some mathematical structure s' is an *accurate structural description* of an experience e if there is a homomorphism from s' to the complete structural description s_e.

When we form an idea of abstract structures in experience, this idea is the instantiation itself. When you think of the natural numbers from 1 to 5, each idea of a number within this structure instantiates a part of that structure without the idea being anything more than this reference. When you consider the fingers on your right hand ordered thumb to pinkie, the same abstract structure is instantiated, but your thumb is more than a reference to what is also referenced by the number 1. (To summarise: abstract structures are abstractions from structured experiences, and mathematical structures are ideas, within experience, of abstract structures.) Therefore, mathematical structures, as ideas within our experience, are the closest handle we can get on abstract structures. And by this handle, we can consider arbitrary instantiations of abstract structures, including momentary experiences, and describe them structurally as mathematical structures.

Reflecting on the argument, given by Tegmark [5] (cf. section 4.2), for why the world *is* a mathematical structure, we might be tempted to conclude that a momentary experience *is* an abstract structure. There are at least two reasons for why this is not so, a speculative one and an analytical one. Firstly, it might be that two phenomenally distinct momentary experiences e_1 and e_2 are completely described by the same structure m (up to isomorphism). A reason for why this might be the case is related to the idea of inverted spectra: it is conceivable that there is an experience identical to the one you are having right now, except that what you now experience as green is experienced as what you know as red (and other colour qualia are switched as well), but all ideas and memories concerning these colours are altered accordingly (e.g. grass looks red in all the present memories, but the name associated with that colour is still green). Your present experience clearly is phenomenally distinct from the one with an inverted spectrum, but it might be that they are *structurally identical*, i.e. completely described by the same mathematical structure and hence instantiating the same abstract structure. In this case, an identification of experiences with abstract structures is impossible. However, if there is a one-to-one correspondence between momentary experiences and complete structural descriptions,[20] then this argument falls through.

The analytical reason for why experiences should not be identified with abstract structures, though, is stronger: the concept of an abstract structure alone does simply not contain within it that it is being experienced. This was different for Tegmark's argument, who showed that, *if* one believes that there is an external world, then one has to believe that it is (very likely) a

[20]Note that I am not saying that every mathematical structure is a complete structural description of some momentary experience.

mathematical structure. In this case, the external world is only an abstract idea that is taken to have some mind-independent referent, which might as well be a mathematical structure. The present experience, however, is not an abstraction or an abstract idea, but the concrete and immediate manifestation of reality, wherefore it cannot be identified with an abstraction like an abstract structure. We might say that the structural descriptions of an experience are merely *syntactic*, while only the experiences themselves are *semantic*.

Nevertheless, the circumstance that structure, in the broad sense, as instantiation of abstract structure, is an integral aspect of momentary experiences at the core of the ontology, means that this ontology is similar to a form of OSR (cf. section 2.5.1), for we take reality to be fundamentally structural (as structured experience). Furthermore, as we will see in detail in section 5.8, we take the world to be an idea within structured experience, which hence is itself describable by a mathematical structure. We will further explore the connections to Tegmark's mathematical universe hypothesis (cf. section 4.2) in that section.

5.6.2 Semantic descriptions

Another way to model momentary experiences is through semantic descriptions. As with structural descriptions, to model an experience is to form an abstract idea that mirrors and emulates aspects of the referenced momentary experience in order to analyse it using formal methods. While structural descriptions seek to directly model the structure of experience, given as the parts of the experience and the relationships between them, semantic descriptions are more indirect, in that they model an experience as the set of all propositions that are true as judged from within that experience; I call these subjectively-judged-to-be-true propositions *experiential facts*. These semantic descriptions are similar both to the *subject worlds* suggested by Hare (cf. section 4.3) as well as the *first-personally centred worlds* suggested by List (cf. section 4.4). Both make a difference between subjective facts ('first-personal facts' for List, 'propositions having to do with where the property of being present is instantiated' [6, p. 23–24] for Hare) and objective facts ('third-personal facts' for List, 'the way things are, physically speaking' [6, p. 23–24] for Hare). Since I do not differentiate between the world as it is in itself and some subject placed within it, but instead focus solely on subjective experience and the world within it, this distinction of facts is not fundamental and clear-cut in analytic nondualism. In particular, the world within experience is complex and three-dimensional (and not just

the two-dimensional visual field, etc.), wherefore the experiential facts describing an experience are not (only) naïve: when I look out of the window to see a tree and I hold out my hand, it is a fact that 'my hand *looks* bigger than that tree',[21] but so is 'the tree *is* bigger than my hand', because size is a property of the world within experience that goes beyond the mere visual field.

What, however, about propositions that are not known or propositions regarding objects that are not directly given in the present experience? As I have argued in the previous section, experience contains only meta-aware contents. However, it is important to note that awareness is prior to cognitive reflection and understanding. When you see a number of scattered dots on a piece of paper, you might not know how many dots there are exactly, and if, on another paper, there is the same scatter plot but with one dot missing, you might not be able to tell the difference between the two images right away, but the experience of looking at one is different from the experience of looking at the other, so there is an experiential fact describing the number of dots on the piece of paper you are looking at despite you not cognitively knowing that number. For another example, imagine you have rolled a die inside a leather cup and placed the cup upside down onto a table with the die underneath. You do not know which side it landed on, but it might still be that the experiential facts regarding (your memory of) the die as you put it into the cup, your muscle movements as you shook and placed the cup, and the sounds the die made in the cup are enough to derive, in principle, which side the die landed on. In other words, since the sounds of the die in the cup would have been ever-so-slightly different had it landed on another side, the side that the die *did* land on might still be described by an experiential fact of the momentary experience even before the cup is lifted. The point is that experiential facts are all the propositions that are true within a given experience, including *but surpassing* those that are known to be true within that experience.[22] This makes it possible for reality, as understood in analytic nondualism, to be governed deterministically (up to quantum randomness) by laws, as we will discuss in section 5.9.

[21] Note that indexicals like 'I' and 'my' are mere conveniences in phrasing, but are not necessary to express experiential facts, which could be phrased equivalently without them, though more cumbersomely: ('There is an awareness of a hand that belongs to the body with which the *self* given in this experience is associated, which ...').

[22] In this way, experiential facts are similar to the relative facts in relational quantum mechanics (cf. appendix A.4), where the *world relative to a physical system* is exhaustively described by the set of relative facts (about other physical systems) that have manifested themselves to that system (without any notion of cognitive knowledge of these facts).

To conclude, we consider the ontological status of propositions. Like structure, a proposition is an *abstraction* from experience. Concretely, it is an abstraction from a sentence thought, abstracted from the way the sentence is phrased using a language, leaving only the intended meaning of the sentence. For example, 'there is (an awareness of) a yellow candle' is a sentence that expresses a proposition that is in fact true of my current experience. If we were to understand propositions as abstract structures, this sentence would express a relationship between the part of my experience that is this candle and my concept of the colour yellow as I have formed it through seeing yellow things and learning that their colour is named 'yellow'. Propositions are *not* simply structural, though, for the meaning of the word 'yellow' is not just a complex concept referencing other things I know to be yellow, but a colour experience: the meaning of 'yellow' is the colour yellow. To illustrate, an alternative version of my current experience, with an inverted spectrum where what I call *yellow* is experienced as what I call *blue*, would judge the sentence 'there is (an awareness of) a yellow candle' to be true, but only because, there, the sentence expresses a different proposition in which the meaning of the word 'yellow' is the colour experience that I know under the name 'blue'.

Therefore, experiential facts provide an exhaustive description of a momentary experience: two momentary experiences are different if and only if the experiential facts describing them are different. In this sense, it might be that semantic descriptions surpass structural description in their descriptive power (that is, if two distinct momentary experiences can have identical complete structural descriptions). Nevertheless, experiential facts are still just an abstraction from experience and not constitutive of experience itself. In other words, although experiential facts reference qualia, they are not qualia themselves. What I am experiencing is the sense that there is a yellow candle; the proposition expressed by the sentence 'there is (an awareness of) a yellow candle' is nothing more than a description of that circumstance. This is different from List [7] (cf. section 4.4), who takes first-personally centred worlds to *be* sets of facts, which confuses the description with that which is being described. This does not further affect the validity of List's proposed theory, for it is just a small but important detail in phrasing: a momentary experience *is not* a set of experiential facts, but it is *exhaustively described* by a set of experiential facts. In this regard, a semantic description of an experience is closer to a *subject world* as proposed by Hare [6] (cf. section 4.3), who also emphasised that the world *is not* a subject world within a system of subject worlds. We already discussed the problems I see with Hare's ontological position in section 5.4.2.

5.7 The objective order of subjective experience

Structure is not the same as oder: even the white static noise one used to see on old television screens has a structure, while it has little to no order. So far, we have focused on the mere structure of experience, i.e. its division into parts and the relationships between those parts. Within this structure, we can find order. Obvious examples are the groupings of parts into different sensory modalities: sights, sounds, etc. (As discussed above, not all parts can be assigned a modality thusly, as there are complex, multimodal parts of experience as well.) Another example of order is our dividing the parts of our experience into the categories of mental/internal and physical/external: your thoughts and feelings are mental, while the objects you can touch are physical. This division is at the root of the conceptual dualism between world and mind and hence the nexus for ontological dualism. In analytic nondualism, though, it is simply accepted as an order of experience, as we will explore in section 5.8.1. Relatedly, our experience is ordered by virtue of grouping the world into objects in a consistent fashion: the division of the world into objects is not arbitrary, but exhibits an order, by which the objects of the present experience are consistent with those in your memory, with the other objects of the present experience, and with the interactive intentions you may have towards these objects. This order is what gives rise to (ideas of) conceptual schemes, in the sense discussed by Lakoff [64] (cf. section 3.3.2), through which the world is ordered.

Analytic nondualism takes reality *as we know it* to be fundamentally constituted of momentary experiences. If we can find properties that *all* momentary experiences share, this tells us something fundamental, i.e. something *objective*, about the nature of reality. This, then, is what we call the *objective order of subjective experience*; it is comprised of those aspects/properties that all momentary experiences must necessarily exhibit/contain, i.e. it specifies what an *imagined* momentary experience must satisfy in order for it to refer to an actually *existing* momentary experience. (Consequently, the objective order is that which all momentary experiences have in common.) This objective order, then, is all that could be called *objective reality* within the framework of analytic nondualism.

One aspect of this objective order of experience is the meta-awareness of parts of experience (cf. section 5.5): all parts of an experience, in order to be parts and by virtue of being parts, must be meta-aware, i.e. everything that is experienced is experienced *as the sense of being experienced*. Since the neces-

sary meta-awareness of all parts of an experience is a condition for something to count as a momentary experience, we can take it to describe the objective order of experience.[23] Can we find other aspects of the necessary/objective order of experience? We have seen that the present experience is ultimately subject-less (cf. section 5.2) and given as a *subjective now* (cf. section 5.3), and this extends to other momentary experiences like the present one, so these aspects also go towards describing the objective order of experience. This covers the extent to which we have examined the present experience so far. Indeed, these three aspects (necessary meta-awareness of parts, no subject, subjective now) also cover what is meant by 'other momentary experiences *like* the present experience', i.e. they define what it means for something to be a momentary experience in the first place. For every other instance of order that you can find in your experience, it might be that there exists a momentary experience that does not exhibit this order. Therefore, these three aspects already conclude what we can establish for certain about the objective order of experience.

5.7.1 Consistent experiences

Nevertheless, we can speculate beyond the boundary of certainty. Quite possibly, the objective order of experience is more complex, i.e. that there are other ways in which an experience must necessarily be ordered. I call these speculative aspects of the objective order of experience *consistencies*. (For example, that the division of the world within experience into objects is coherent and allows for deriving a conceptual scheme of which an idea can be formed is one such consistency; we will explore others below.) The momentary experiences exhibiting these consistencies are called *consistent experiences*. These consistencies are not inherent to the concept of momentary experiences, for we can conceive of momentary experiences that do not exhibit them, which might or might not actually exist. In other words, we cannot exclude the possibility that *inconsistent* experiences exist. Certainly, it might be that some or all of the consistencies that I discuss do, in fact, describe the objective order of experience, and that they are necessarily exhibited by all existent momentary experiences, but we have no place from

[23] If a *momentary experience* was simply an abstract concept defined as something that consists of those parts of an experience that are meta-aware, this point would follow analytically and hence would not be insightful at all. Note, however, that I argued that this understanding of experience as containing only meta-aware concepts is the only epistemically justified understanding of experience. Therefore, this insight about the objective order of experience concerns experience itself and not just some abstract concept defined within theory.

which we can judge whether this is the case.[24] Nevertheless, all the momentary experiences for whose existence we have some evidence (i.e. our past experiences and the experiences of other seemingly conscious creatures) do exhibit these consistencies. Therefore, an examination of these consistent experiences can provide insights into the nature of that part of reality that we are familiar with, even though its grasp cannot reach around the full immensity of possible experiences. This limitation, however, is not specific to analytic nondualism: if a believer of objective realism also beliefs in the existence of parallel universes with different laws of nature (as e.g. Tegmark [5] does), then their reach of investigation is nevertheless limited to the universe they find themselves in, i.e. they can only hope to know the laws governing *their* universe. Equally, a believer in analytic nondualism may or may not belief in the existence of inconsistent experiences, but their reach of investigation remains limited to the experiences they are familiar with and for whose existence they have some evidence, i.e. consistent experiences. Hence, for the rest of this chapter (with the exception of the next subsection), we will restrain our discussion to the properties and contents of consistent momentary experiences, constituting the slice of reality with which we are familiar.

One consistency of experience that is of central importance both for our understanding of time and of the role of science concerns memories of past experiences. As I argued in section 5.3, the circumstance that in one momentary experience I have a memory of another momentary experience is what orders them temporally. However, the presence of memories and the resultant temporal order is not arbitrary. In my present experience, where there is a glass of water to the right of my computer and there is a a memory of the experience I had a second ago where the glass in the same location. Now, I can conceive of a momentary experience which is just like the present one including the memory of the glass being on the right, but in which the glass is 'now' suddenly to the left of my computer. I have no reason to believe that such an experience exists, for it does not exhibit the consistency that I shall call *temporal continuity*, because there is a discontinuous jump in the circumstances of the 'latest memory' within the experience and the circumstances of the experience itself. Equally, I have no reason to believe that there can be such a jump between any two memories of past experiences in close temporal proximity. Concretely, the consistency of temporal continuity requires of a momentary experience that the temporal sequence

[24] Again, this is different for the established aspects of the objective order of experience, because these concern only the present experience, for which we do inhabit the place from which to judge it, and what it means for something to be a momentary experience altogether.

of momentary experiences that is induced by its memories thereof contains only continuous changes of circumstances.

Clearly, the point I am attempting to make rests on the meaning of the word 'continuity', which is hard to pin down. If time is continuous (cf. section 5.3) and if a momentary experiences could be modelled within some vector space (one could imagine deriving such a representation from complete structural descriptions of momentary experiences), then this continuity could be easily defined through a mathematical representation: let e be some experience and let m_e be a mapping, where $m_e(t)$ is the vector representing the experience referenced by the memory (within e) at time t (in an objective sense of time within e); then we could say that e is temporally continuous if m_e is a continuous function in the usual mathematical sense. If time is discrete or if a vector space representation of momentary experiences is impossible, such a definition is out of reach. Nevertheless, the basic idea remains, even if only as an informal intuition: a momentary experience e is temporally continuous if, for any two experiences e_1 and e_2 that are (referenced by) memories within e at times t_1 and t_2, respectively, when the difference between t_1 and t_2 is very small, then the changes between the contents e_1 and e_2 are also very small. We will explore the consistency of temporal continuity further in section 5.9, setting it as the proper target of science.

5.7.2 Why is there something rather than nothing?

The title of this subsection references one of the greatest mysteries there are and I do not claim that I can do justice to it within a mere subsection. Nevertheless, the answer that I will give will elucidate my understanding of what it means to exist (for a momentary experience) and is so simplistic that it does not need more than a subsection. Why is there something rather than nothing? *Because there can be.*

If something, say some momentary experience, can *possibly* exist, what stops it from actually existing? When one accepts objective realism and takes only the universe one find themselves in to actually exist, then only those experiences that are facilitated somewhere within this universe *actually* exist, even though other experiences *could* exist if the universe were different. But in analytic nondualism, experiences are understood to exist independently and on their own, unconstrained by an objective world or by other experiences. Without such constraints, there is nothing that stops a *possible* experience from being *actual*.

Personally, I find it instructive (though also a bit uneasing) to imagine that *there is nothing*, i.e. that nothing whatsoever exists: no world, no experience, not even a sense of 'nothingness'. This is a rather impossible task. After all, how could there be nothing? This nothingness leaves room for *everything*, for it contains within it the idea of *all that could be but is not*. But then nothingness, as a purely negative concept, cannot hold back that which is possible from being actual. Therefore, all that can *possibly* exist *actually* exists, *ex nihilo*. (This belief in the actuality of all that is possible is known as *modal realism*, famously espoused by David Lewis [86].)

What is possible? Regarding momentary experiences, all those are possible that exhibit and are in accordance with the objective order of experience. (If something does not exhibit the objective order of experience, it does not count as a momentary experience and can, at best, be an idea of a conceived/imagined momentary experience that does not refer to a corresponding and actually existing momentary experience.) Indeed, the objective order of experience is defined to be constituted of those properties that an experience must *necessarily* exhibit. However, this definition leaves room for possible-but-not-actual momentary experiences. The point now is that possibility and actuality are explicitly conflated: on the one hand, if an experience can possibly exist, given that momentary experiences have an independent existence in themselves that is unconstrained by anything beyond, there is nothing that could withhold a possible momentary experience from actually existing; on the other hand, even though we can *conceive* of momentary experiences that are not in accordance with the objective order, they are not even possible, since the objective order constrains what is possible.

5.8 The idea of an external world

> I'm not looking at you, I'm looking at the light that is bouncing off you. Turn the lights off and you're gone.
>
> — Julian Opie[25]

Imagine that you are looking through a *camera obscura*: you are standing inside a box that is placed somewhere in the world with a tree next to it, shut tight, but with a small hole on one wall through which light can pass, so that on the opposite in-side of the box there appears a flipped image of

[25]This quote was shown as part of an exhibition at the *Moco* museum in Amsterdam as I visited it on the 15th of July in 2023.

the tree. When you look at the wall, are your seeing the tree outside the box or are you seeing an image on the wall?

In front of me, I have a computer with a screen that is emitting light. This light is travelling in many directions, a part of it in the direction of my eyes. Before it reaches my eyes, it hits my glasses, where it is refracted and passes on differently than before. When I look in front of me, do I see the screen or do I see an image on my glasses?

Whenever you or I look out, do we see things or do we see an image, a shape within the excitations, caused by photons, of the cells on our retinas?

None of these questions has a clear-cut answer, for both answers in each case can be valid depending on what one means by 'see', and, moreover, the answers are compatible: you see the tree *through* the image on the wall, I see my screen *through* (the image on) my glasses, we see the world *through* the image on our retinas. None of this, as it stands, conflicts with the ideas we have seen in the previous sections, but it highlights that we require a more elaborate conception of a world that is placed within experience rather than outside of it. We already discussed this conception of the world *within* experience in section 5.1 at the beginning of this chapter. In this section, we focus on the circumstance that this world, while it appears as a content within consciousness, feels like it is *external* to you.

When you understand your visual field to be fully determined (i.e. perfectly correlated, *not* caused) by the shape of the excitations of your retinal cells, as science teaches us, and when you meditate on this understanding, the world can feel strangely two-dimensional. However, the world within your experience is richer than your visual field. When you close your eyes, the things previously in your visual field disappear, but nevertheless, there is a sense in which they remain, not within some objective world outside of experience, but *within experience*, for you understand them to still be there. What there is, on top of your mere sensory (i.e. visual, audiological, tactile, etc.) fields, is the *idea of an external world*, which is three-dimensional, contains objects, is governed by the laws of physics, and continues to exist when you are not looking. The mistaken impetus for many metaphysical theories is to see it as necessary that there must exist an objective world that this idea refers to. The position taken by analytic nondualism, however, is that this idea of an external world, within experience, is enough by itself and does not need to reference an objective world underlying the experience. Strictly speaking, this idea of an external world is only an aspect of the world within your experience (i.e. that you experience the world *as being external* to you). However, since the idea encompasses the world within experience entirely,

I will usually use both terms synonymously: the idea of an external world *is* the world within experience. Furthermore, it is all that the world can be known to be, as we discussed in section 2.2. In line with this, I will sometimes also refer to the idea of the external world simply as *the external world*.

We encountered the concept of the *idea* of an external world repeatedly in previous chapters. Here, I want to re-examine two of them. When discussing Nagel [2, 3] in section 3.3, we noted that, while he believes that the pursuit of objectivity gives us an ever clearer picture of the world, '[e]ven if we did arrive at such a self-transcendent idea, that wouldn't guarantee its correctness' [3, p. 74]. In other words, no matter how comprehensive and explanatorily complete our idea of an external world is, there is nothing that could proof that this idea is also a *correct* description of some objective world. The other mention of the idea of an external world in previous chapters was in section 4.2, in the form of Tegmark's [5] concept of the *consensus view*. To Tegmark, the consensus view describes our conception of the world as independent of experience. The aim of a *theory of everything*, to Tegmark, is to describe reality (the objective world) as it is in itself (as seen from the 'bird perspective') and to derive either our first-personal views (the 'frog perspective') or at least the consensus view from it. This dependence between the different perspectives, roughly as understood both by Nagel and Tegmark, is illustrated in fig. 5.1. The case made by analytic nondualism is exactly that there need not be any objective world underlying experience, but that experience, containing an idea of an external world, is enough by itself, as illustrated in fig. 5.2.

5.8.1 Internal and external

> With an enourmous effort I rise from my seat only to find that I still seem to be carrying it around with me, only now it's even heavier because it's become the seat of my own subjectivity.
>
> — Fernando Pessoa[26]

One crucial ingredient to the world, as it is in your present experience, is your body, in particular your perceptual system, i.e. your eyes with retinas, your ears with cochleas, your skin with Merkel cells, etc., all connected through your nervous system, which includes your brain. If it were possible to perfectly track the activities of each retinal cell and each nervous cell of the visual

[26]This passage appears on p. 22 of *The book of disquiet* by Fernando Pessoa, translated into English by Margaret Jull Costa, published in 2010 by Serpent's Tail (Profile Books Ltd).

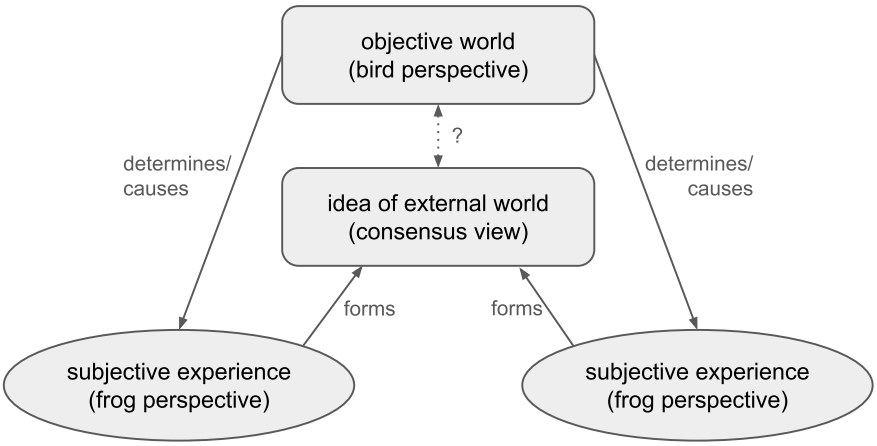

Figure 5.1: An understanding of reality that presupposes an objective, external world determining our subjective experiences must also account for our ideas of the external world and explain its relationship to the world itself. (Such an understanding is based on the conceptual dualism discussed in section 2.2; cf. fig. 2.1 on page 8.)

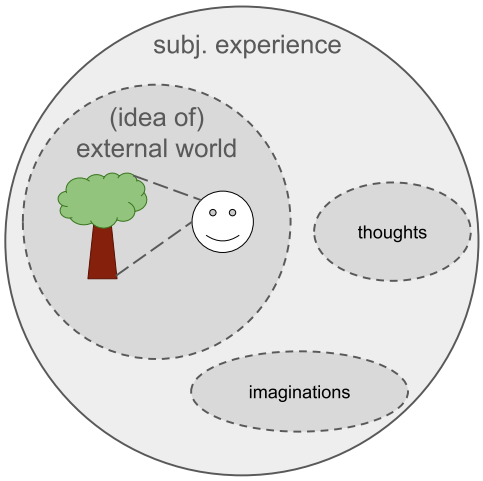

Figure 5.2: In analytic nondualism, the idea of an external world, placed within experience, is all that the world can be known to be and, hence, is taken to be. (The relationship between the ideas of an external world in different subjective experiences will be explored below in section 5.10.)

system in your brain, neuroscience tells us that we would see strong correlations between these measurements and your reported experience. However, even if there is a perfect correlation between the activity of your perceptual and nervous system and your experience, in analytic nondualism, it makes no sense to say that brain activity *causes* experience.[27] Instead, this correlation points to a *consistency* of experience that I call the *embedded facilitation of experience*, which requires that, within the idea of the external world in each momentary experience, there is something embedded within it that *facilitates* the experience, i.e. the spatial centre of the experience must constitute a *perspective* (cf. section 5.4.2). (We might also say that each experience must be *embodied* or *situated* within itself.) In a sense, this consistency requires that all parts of the experience be doubly given: as themselves and through some (not necessarily aware) representation within the embedded facilitation. Neither, however, is ontologically supervenient on the other, as both are just parts of experience with certain correlations between them.

To further illustrate what I mean by an embedded facilitation, it is instructive to consider a hypothetical experience where there is no such facilitation. This would be an experience of what is called a (philosophical) *ghost* in the philosophy of mind (as the counterpart to a zombie), i.e. a locus of experience that is not embedded within the experienced world [87]. In video games with a third-person perspective, the playable character is usually viewed from some distance above and behind, the viewpoint of the player emanating from somewhere in empty space.[28] Such a view on the world corresponds to the experience of a ghost. While such an experience with a view from somewhere in empty space is conceivable, it is questionable that it actually exists, for it does not contain an embedded facilitation within the experienced world. The experiences we are familiar with, on the other hand, all contain one (viz. our nervous systems including our brains), which is why I take the presence of an embedded facilitation to be a consistency of experience. The question of what counts as an embedded facilitation is equivalent to the question of what the conditions of consciousness are; we return to it in section 5.11.

[27] Our idea of an external world contains e.g. photons and our retinas. Therefore, the processes in the brain, as they are initiated by photons hitting our retinas and culminate in patterns corresponding to the objects of our experience, can be understood as being *constructive* of our experiences. It is not an active process with brain processes causally *constructing* our experience, since this would require a 'pre-experiential', objective world for this process to happen. Rather, it is more accurate to say that our experience is *deconstructed* into brain processes.

[28] *Super Mario 64* is an honourable exception, where the player's viewpoint is almost always the view from a camera held by a creature called *Lakitu* sitting on a small, hovering cloud and hence embedded in the world.

Analytic nondualism does grant the distinction between internal/mental and external/physical parts of experience. The latter are those parts of your experience that belong to your idea of an external world, while the former are those that do not immediately correspond to any aspect of your idea of an external world, like inner thoughts, feelings, and imaginations. (As I explained in the previous paragraphs, there is a correspondence between the inner parts of your experience and the external world through the brain, but this is merely a correlation between internal and external parts that can be found within experience, not an *immediate* correspondence.) The distinction between internal and external parts of an experience is not clear-cut and it depends on the conceptual scheme (cf. sections 3.3.2 and 5.6) that is structuring the experience. For example, you can understand sounds, like the voice of some human, to be external parts of your experience, belonging directly to this human as an object within your idea of an external world, or, alternatively, you can understand the world to contain only moving particles that excite your eardrums and lead to an appearance of sound as an inner part of your experience, corresponding only indirectly to the external world. In ontologically dualist theories,[29] the cut between internal/mental and external/physical aspects of reality has to be decided in advance in order for these theories to be well-defined. In analytic nondualism, the question of where this cut is made concerns only the structure of each momentary experience individually and does hence not require a clear-cut answer in order for the ontology to be well-defined.

5.8.2 What it means to be real

Due to my rejection of a necessary, objective world to which the appearances in our experiences correspond, and my identification of the world within experience as the 'real' world, my understanding of what it means to *be real* is rather unorthodox. In analytic nondualism, every momentary experience and all parts of a momentary experience are real – as that: contents of consciousness.[30] While, orthodoxly, for something to *be real* usually means that it is an aspect or a part of some objective world (cf. section 2.5), in analytic nondualism, there simply is the distinction between internal and external parts of experience, which are both taken to be equally real. For example, I can imagine some object, whereby this object really exists *as an imagination* (i.e. as an internal part of the experience). However, this does

[29] As I concluded in chapter 3, all theories based on objective realism must ultimately either be dualist in some way or otherwise absurdly eliminative about the mental aspects of reality.

[30] Note that is use the terms 'to be real', 'to exist', and 'to be there' largely synonymously.

not imply that there also exists an experience in which a corresponding object is experienced as part of the external world. (Hence, analytic nondualism does not give credence to any new-age beliefs along the lines of 'thought creates matter'.)

A famous example of the orthodox understanding of what it means to be real is McTaggart's [88] declaration that time is unreal, by which he meant that it is not an inherent aspect of an objective world. In analytic nondualism, this makes no sense, for we evidently perceive time and can ground it in the experiential presence of memories of *past* experiences, as I did in section 5.3, so time *is* real. This does not mean that momentary experiences are objectively ordered temporally, for there is no place that the temporal ordering of experiences could be given *outside* of experiences, so it is given only *within* each subjective, momentary experience. In this sense, if we take what McTaggart means by 'unreal' to be what I mean by 'not objective', then my position regarding time is actually quite compatible with his.

Another common example of things being declared *unreal* is the case of hallucinations, illusions, etc., in short: *non-veridical perceptions*. When someone hallucinates, it is said that they perceive the world differently from what it is *really* like. Since analytic nondualism takes their experiences to be just as real as any other experiences, this characterisation does not work. What characterises hallucinations in analytic nondualism are *incongruences* within the idea of an external world inside an experience: when someone hears a voice that does not correspond (directly or indirectly) to a part of their external world, this is incongruent with their usual understanding of where voices come from and with the reports of other people who are not hearing the same voice.

The case is similar for illusions. Take, for example, the famous Müller-Lyer illusion [89] consisting of two lines with arrowhead ends, pointing inward for one line and outward for the other line (see fig. 5.3). On first sight, the line with the inward-pointing ends looks longer than the other line (to most viewers). On closer inspection, e.g. when covering the ends or putting a ruler next to the lines, it turns out that both lines are actually identical in length. An orthodox analysis would say that the relative lengths of the lines were perceived different from how they *really* are. In analytic nondualism, however, the appearance of the lines in the first experience was as real as in the second, so we have to grant that the lines *really* differed in length; this assessment, however, is later found to be incongruent with the assessment made on closer inspection. The reason that the latter assessment receives priority, i.e. that it is taken to be a part of the idea of an external world whereas the former

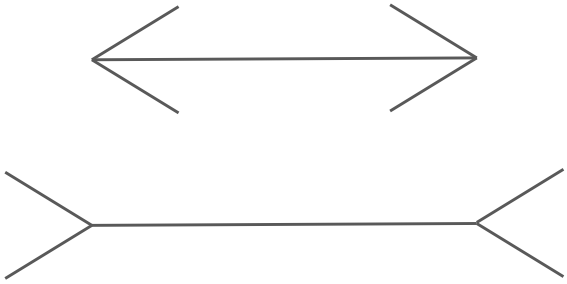

Figure 5.3: In the Müller-Lyer illusion [89], there are two equal-length straight lines, but to most viewers the lower line appears to be longer.

assessment then gets viewed as a mere internal (mis)perception, is that it is congruent with the greater number of other parts of experience: you will find that both lines are drawn on a computer screen with the same number of pixels, can be measured to be the same length by a ruler, and also appear identical in length when the two lines are brought closely together with their ends overlapping; these factors are in line with what it takes to convince someone who has never seen the illusion that the lines are *actually* identical in length. This does not detract from the truth, however, that the lines do differ in *experientially perceived* length in the first experience. In this sense, the notion of veridicality depends on which parts of the experience are taken to constitute the idea of an external world. Incongruences within the idea of an external world, then, are what we call illusions.

5.9 The aim of science

The main point of analytic nondualism is that an *objective* world is not required for a metaphysical account of experience. In this section, I have been speaking of an *external* world. Orthodoxly, these two terms are synonymous. In our theory, however, the world within experience *is* the world, or synonymously, the idea of the external world *is* the external world. Hence, rather than rejecting the existence of the external world (as some forms of anti-realism might do) or denying its necessity in accounting for experience

(as we did with regards to an objective world), we are simply rejecting the objectivity of an external world. In other words, we are reinterpreting what we mean by 'external world': not an objective world causing experience, but an (experienced-as-being-)external world within experience.

Therefore, science, whose aim is to describe the external world, does not lose its target, but is simply directed towards a new target. In orthodox worldviews based on objective realism, the target of science is understood to be an objective, external world, with our experiential idea of this objective external world serving as a mere proxy. In analytic nondualism, on the other hand, the idea of an external world itself is the proper target of science (cf. figs. 5.1 and 5.2). Nevertheless, this has little to no implications for the vast majority of scientific endeavours, for the aim of science is still to describe and explain the external world (now understood as nothing but an orderly part of experience) and predict the future experiences we should expect to have. Even for the scientific study of consciousness, the only consequence of the reinterpretation of the aim of science is that the aim of the pursuit must be reinterpreted accordingly: we are not looking for the structures in the world that *cause* consciousness, but rather try to identify those structures in our external worlds that constitute *perspectives* (cf. section 5.4.2) and that can serve as *embedded facilitations* at the centre of an experience. We will explore this line of thought further in section 5.11.

Indeed, the idea of an external world is all that scientists throughout history have ever had access to and it is hence what has always been described by science,[31] even if these descriptions have usually been taken to be of something 'beneath' experience. Analytic nondualism accepts all these scientific descriptions as insights into the objective order of experience (limited to consistent experiences, which constitute the slice of reality we are familiar with). In this sense, analytic nondualism is in line with naturalism, for the grounding of the world in subjectivity does not imply supernatural laws governing it. Rather, analytic nondualism takes the external world within experience to be ultimately governed by the laws of physics (i.e. that no momentary experience in which the laws of physics are broken can exist). Furthermore, based on the *embedded facilitation of experience in the world* (i.e. that every internal and external part of an experience must be reflec-

[31] Psychology, apart from pure behaviourism, seems like an exception to this, for it seeks an understanding of the internal parts of experience rather than of the external world. However, in its 'actually scientific' forms (as opposed to e.g. some of the more spiritual works by C. G. Jung), it does not concern subjective experiences directly, but focuses on *reports* thereabout, which are parts of the external world. Therefore, we do not need to treat psychology separately here.

ted within the brain or some other embedded facilitation), the entirety of experience is ultimately governed by the laws of physics. Therefore, while analytic nondualism denies that the external world described by physics has an objective and mind-independent existence, it nevertheless entails a view that one might call physicalism.

5.9.1 Assuring consistency without an objective world

The usual objection against theories like analytic nondualism that disregard (or deny) the existence of an objective world is that such an objective world is, in fact, not redundant but necessary in order to ensure the consistency of experience. If not for an objective world governed by fundamental laws, what is there to stop an apple from appearing in front of you where before there was just air? The answer was given in section 5.7: each momentary experience, in order to exist, must exhibit and be in accordance with the objective order of experience. In other words, it is not some objective world that is governed by fundamental laws, but experience itself is governed by fundamental laws (i.e. the objective order of experience). Restricted to the consistent experiences we are familiar with, this order includes consistencies like *temporal continuity*, which assures that objects do not just appear and disappear in an experience without a cause given within the memories present in this experience. Similarly, it assures that no object is experienced as suddenly starting to float without cause, no water as flowing uphill, no heat without a chemical reaction producing it. In short, in order for a momentary experience to be *temporally continuous*, no phenomenon can be experienced without there being a scientifically valid explanation, based on the memories of the past state of the world, for that phenomenon. And all the experiences we are familiar with (the consistent ones) *are* temporally continuous. Therefore, the aim of science is exactly to describe this temporal continuity of experience, which is expressed through the constant relationships we find within our experience between the presently experienced external world and the memories of the world as it was before. Based on the scientific understanding of the temporal continuity, we can then predict the contents of future experiences.

Practically, this prediction can only be based on cognitively known facts, of course. Theoretically, though, temporal continuity applies to the contents of our experience beyond the limits of our current knowledge. To illustrate, let us return to an example from above: you have rolled a die underneath an opaque cup and do not yet know which side it landed on (cf. section 5.6.2). Your ignorance regarding the die does not imply that there exist six different

future experiences of you finding each possible number as the up-side of the die when lifting the cup. Rather, given the way your hand moved when shaking and placing the cup and the sounds the die made inside the cup and on the table, there might well be only one momentary experience where you have lifted the cup that is temporally continuous with these memories of the die-cup-shaking process. In this way, temporal continuity allows for experience to be governed deterministically, which would mean that, given some experience e, all experiences e' that have a memory of e (i.e. $e \prec e'$) form a single *coherent sequence* of momentary experiences (cf. section 5.3), i.e. whenever $e \prec e_1$ and $e \prec e2$, then either $e_1 \prec e_2$ or $e_2 \prec e_1$.[32]

More importantly, the temporal continuity of experience offers an explanation of the consistency of experience *within* experience: the world within experience is not consistent by virtue of some consistently evolving world underlying it, it is consistent *by virtue of each momentary experience being temporally continuous*. Asking why the world within experience is consistent the way it is (e.g. why physicists can derive the speed of light to have the particular value it has) is no different than asking why some objective world is consistent the way it is; ultimately, *it just is*. This, then, is the sense in which experience can account for itself without the need either for an underlying, objective world, as theories based on objective realism have it, or for every experienced object to have a subjective experience of its own, as Kastrup's analytic idealism [4] has it.

5.9.2 Scientific realism

The miracle argument. A famous argument in the philosophy of science for believing in an objective world that causes our experiences and is described by science is known as the *miracle argument* [37, §2.1]. According to the argument, the most plausible explanation for why our scientific theories are so successful (in predicting future observations) is that they are *true*, i.e. that the entities and mechanisms they posit actually exist, for anything else would make the success of science a *miracle*. Recall that (some of) the forms of scientific anti-realism we discussed in section 2.5.1 claimed that we should not accept *unobservable* entities like e.g. electrons as objects that really exist and instead treat them as a useful fiction that helps us to

[32] If one takes all potential outcomes of quantum-mechanical events to be truly *possible* and accepts the modal realism I have outlined in section 5.7.2, then one must believe that there are experiences e, e_1, e_2 with $e \prec e_1$ and $e \prec e2$, but $e_1 \not\prec e_2$ and $e_2 \not\prec e_1$, i.e. that there are disjoint coherent sequences of experiences each constituting the 'future of e'. We will explore this in appendix A.5.

make sense of the observable world. These are the positions against which the miracle argument is predominantly posed. Now, while analytic nondualism is anti-realist about a (necessary) objective world, it is realist about the world within experience. In the terms of [37] discussed in section 2.5.1, analytic nondualism rejects the ontological commitment of scientific realism. However, insofar as the world that is described by science is understood to be the world within experience, analytic nondualism accepts both the semantic commitment and the epistemological commitment of scientific realism, as I will explain shortly. Because of this, the success of science is not a miracle in analytic nondualism, for it does accept scientific theories as true *of the world within experience*.

The semantic commitment of scientific realism. Semantically, analytic nondualism takes science to describe the world within experience literally: e.g. atoms really are parts of the idea of an external world once you know about them. While you may not be able to directly experience an individual atom, this is no requirement for them to be taken as real: neither can you ever experience a single end of some line drawn on a piece of paper all by itself (you can experience a shorter line or a dot, but this is different from the end of the line), yet you readily accept the end of the line to be a part of the line and hence a real part of your experience. Similarly, although you can never experience an individual atom, you experience *collections* of atoms all the time in form of the material objects in your external world. Moreover, when you see an image of an atom on the screen of an electron microscope, you are, in a sense, *looking at* an individual atom, even if only through the image on the screen.

For atoms themselves to be parts of your experience, you need to know about them and conceive of them as constituting the objects around you. In this way, they are *internal parts* of your experience, like thoughts and feelings, for they depend on thoughts (i.e. knowledge of them) to be experienced. However, you clearly understand atoms to constitute the objects of the external world, which makes them *external parts* of your experience. Therefore, atoms (and electrons and all other unobservable entities posited by science) are both internal and external parts of experience. This again highlights that the boundary between internal and external cannot be not clear-cut, as we discussed in section 5.8.1. These parts that are both internal and external are what make it possible to understand the world in the first place, for they provide the link between the external world (within experience) and the thoughts (internal parts) that constitute understanding and *knowledge*.

The epistemological commitment of scientific realism. Since these (internal) thoughts constituting knowledge, the external world, and the both-internal-and-external parts that connect them all exist on the same level simply as parts of experience (i.e. there is no schism or gap between subjective thoughts and an objective world as in dualistic theories), they can, in principle, constitute *real* knowledge of the world. Therefore, analytic nondualism accept the epistemological commitment of scientific realism. However, this concerns only the *possibility* of knowledge. As we saw when discussing the *pessimistic induction* in section 2.5.1, what we take to be true knowledge at one point in time can, and often does, turn out to be incorrect later on. (In analytic nondualism, a falsification of a scientific happens when there arises an incongruence within some experience between this theory and an external part of the experience.) Still, even an incorrect theory is often correct under restriction of the situations to which it applies; e.g. it is not incorrect to understand light as made up of photons when discussing certain phenomena, like the photo-electric effect, even if this understanding, by itself, is incongruent with other phenomena, like the double-slit experiment. It is conceivable that we might eventually arrive at theories that will be congruent with all possible experiences to which they apply without such restrictions. These theories, then, would constitute true knowledge of the world or, concretely, of the temporal continuity of experience.

5.10 Shared reality

In section 5.4.1, I pointed out that analytic nondualism does not entail solipsism. However, since the world is placed within experience, there remains something solipsistic about the theory: even though there are multiple experiences, each experience has a world of its own.[33] But is it *uniquely* its own? The answer is no, and this is crucial. To illustrate, imagine that you are printing out a document twice, so that you have two equal pieces of paper. Clearly, these papers are not identical: they are placed in different locations, have different subtle printing inaccuracies, and are simply made of non-identical particles. Consequently, each *material* part of one paper differs from each *material* part of the other paper, since the papers do not overlap in space. However, the papers do not only have material parts, but also abstract, or *logical*, parts. (For the seminal discussion of logical parts, see this paper [90] by L. A. Paul.) One such logical part of each piece of paper is

[33]Because of this, I considered naming the theory 'collective solipsism' at one point, but decided against it because it does not do justice to the ideas that are presented in this section.

the *text* printed on them. This text is an abstract structure (cf. section 5.6) that is instantiated within both pieces of paper. Now, you might say that one paper has a logical part that is its text and so does the other, but that both these texts are still only equal but not identical. Since these texts are abstract structures, however, they do not contain as sub-parts either the location at which they are printed, the specific particles of toner that show them, or anything else that differentiates them; there is simply no way in which they differ. Therefore, they truly are identical, i.e. it is *one and the same* text that is a logical part of each of the two pieces of paper.

5.10.1 A shared world

How does this extend to the world within your experience? Imagine that you and I are looking at some tree. Since we certainly cannot inhabit the same location in space, our perspectives on the tree are slightly different: you might see a leaf that is obstructed by a branch in my view, and so on. So the visual sensation of the tree is not identical between our experiences. However, the tree is more than just a bundle of sensations within our experience, it is a complex object within our complex ideas of the world. And at some level of abstraction, away from mere sensations, there is a logical part of the tree, describing its shape and size and location in space and so on, which is an abstract structure, and *it is one and the structure that is instantiated within both our experiences*. I will cal any such abstract structure that is shared between a set of momentary experiences an *intersubjective part* of each experience within the set, or simply an intersubjective part of the set. The largest *external* intersubjective part of a given set of momentary experiences is what constitutes the *shared world* of these experiences. And this is all that the shared world is: not some underlying, objective world, but only that which is intersubjectively shared by the ideas of an external world within different experiences. Hence, the (intersubjectively) shared world supervenes on subjective experiences. This conception of a shared world is roughly illustrated in fig. 5.4. Note that this shared world, understood as an abstract structure, can only be experienced when instantiated within an experience and not independently on its own; therefore, it does not constitute what Nagel [3] calls a *view from nowhere*.

This view is also in line with List's [7] suggestion (cf. section 4.4) of treating first-personally centred worlds as ontological primitives (as I have been doing throughout this chapter correspondingly with momentary experiences) and treating third personal worlds (corresponding to what I call the shared world) as ontologically supervenient [7, p. 25]: 'One partitions [the set of first-

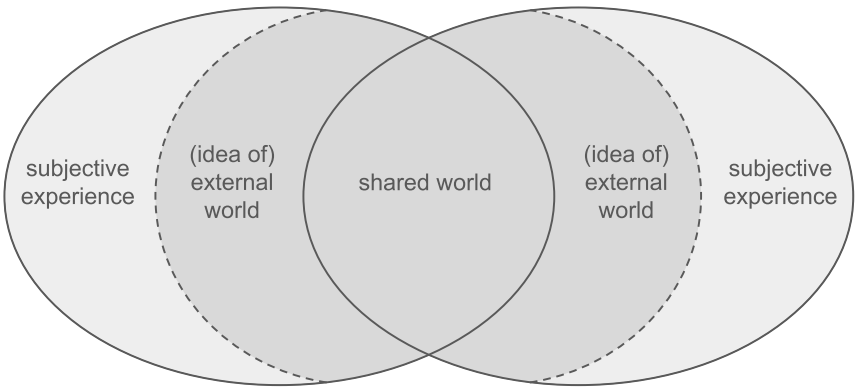

Figure 5.4: In analytic nondualism, the shared world between two (or more) subjective experiences is nothing more than those aspects (instantiated abstract structures) that are shared by the ideas of an external world within the experiences.

personally centred worlds] into equivalence classes of worlds that are third-personally equivalent. We could treat the set of such equivalence classes as the set of third-personal worlds.'

In section 5.6.1, we discussed the close connection between abstract structures and mathematical structures. Having now established that our shared world is best understood as an abstract structure instantiated within our experiences, we can draw a connection to Tegmark's [5] mathematical universe hypothesis (cf. section 4.2). Where Tegmark puts the universe at the basis of his ontology and then identifies conscious beings as substructures of this universe structure, which then, somehow, have a 'frog perspective' on it, analytic nondualism flips this ontology and starts with the frog perspectives instead. Nevertheless, his analysis of the universe (world) as identical to a structure is compatible with the just outlined concept of a shared world within analytic nondualism. Tegmark's [5] ideas about the *multiverse*, concerning which other universes might exist, are also shared by analytic nondualism: according to the mathematical universe hypothesis, all *mathematical* structures that *can* consistently constitute a universe in fact do so; in analytic nondualism, all momentary experiences that *can* exist (i.e. that are in accordance with

the objective order of experience) do so,[34] so likewise all *abstract* structures that *can* be instantiated within the idea of an external world within some momentary experience thusly are so.

5.10.2 A medium of interaction and free will

We have now arrived at the point where we can address a major objection to the theory outlined so far. More than being just something that causes our experience, an objective world underlying our experiences is also what is orthodoxly taken to constitute a *medium of interaction*. Within analytic nondualism, the decisions you make and the actions you take have an influence on your future experiences, but if our shared world just consists of those parts that happen to coincide between our experiences, roughly speaking, your actions cannot have a direct influence on my experience. Hence, the objection goes, analytic nondualism cannot account for our interacting with each other, i.e. for the decisions made within the experience of one being to affect the experience of another being.

To address this objection, we have to consider what it means to make a decision. Imagine that you are going to a bakery to buy a coffee and a piece of pastry. You see a *pao de deus* and a *pastel de nata* (two Portuguese pastries that I can wholeheartedly recommend) and you are unsure which one to choose. After some deliberation, you decide to go for the pastel. Now, what lead to you making that decision? You might say that you were not so hungry, so you went for the smaller pastry, or you might say that you already had a pao de deus yesterday, or simply that you spontaneously felt like it. But where did these thoughts that culminated in a decision come from? As a matter of experience, they just arose, seemingly out of nowhere. Can you really be said to be the author of these thoughts? Well, that depends on what *you* are. The subject of experience, consciousness itself, surely is not the author, for these thoughts just appear as contents of consciousness. Your self, on the other hand, might sensibly be called the author of these thoughts, but your self, too, is just a content of consciousness. The question then is whether you, your self, *could have* made a different decision. Since, as I posited in section 5.8.1, all parts of an experience must have an embedded facilitation within the world (within experience), i.e. experience is perfectly correlated with brain activity, and the world within experience is governed by physical laws, which we understand to be (mostly) deterministic, analytic nondualism entails that you could *not* have: if the neural activities in

[34] Recall from section 5.7.2 that the possible momentary experiences are exactly the actually existing momentary experiences.

brains are deterministic processes, then the state of your brain when entering the bakery already determined the decision you would eventually reach. To phrase it more rigorously in the language of analytic nondualism: only the experience of choosing the pastel de nata and having the memory of the experience entering the bakery is temporally continuous, by virtue of both experiences being embedded in brain states that are governed by the laws of physics, since the brain state of entering the bakery determines the series of subsequent brain states. An experience where you choose the pao de deus and have the same memory of entering the bakery would simply be as discontinuous as an experience of seeing a cup of hot coffee manifesting itself in your hand out of thin hair. Now, all of this rests on our physical understanding of the world as evolving deterministically. The exception to this understanding are quantum-mechanical effects, which introduce indeterminism to our understanding of the world. I will discuss the implications of analytic nondualism for interpreting quantum mechanics in appendix A.5, but for now, it suffices to note that quantum indeterminism has little implications for your ability to decide. Even if there was a quantum event that determined which pastry you chose, as a matter of experience, the final decision still simply arose within consciousness.

The argument in the previous paragraph closely follows Sam Harris's [91] argument for why '[f]ree will *is* an illusion' [91, p. 5]. I have explained my problem with the term 'illusion' in section 5.8.2, so I would phrase my own position slightly differently than Harris: free will is real, simply because each decision you make evidently *feels* like a decision, so it is a real aspect of your experience; the deterministic processes in your brain, on the other hand, are usually not reflected within your experience. Furthermore, your self can sensibly be called the author of your thoughts and can decide which thoughts to think. We can even assign a causal role to free will, because your decisions (partially) determine which future experiences exist: you cannot decide to have a pastel de nata and then later experience eating a pao de deus (unless it is explained for some other way, of course). However, as a matter of direct experience, your decisions, your thoughts, and your self are all simply parts of momentary experiences that simply arise in consciousness as they do. Likewise, then, free will is also just a content of consciousness, something that you experience. And it remains limited to this realm within experiences: free will is not a *fundamental* force of reality.

Before you make any decision, the question of which momentary experiences actually exist is always-already answered, because existence, by itself, is an *atemporal* circumstance, with temporality existing only within (existing) experiences (cf. section 5.3). Hence, your future experiences also exist, not

right now, but atemporally and with their own *now*. Therefore, even the causal power of free will is real only against the background of these always-already/atemporally existing experiences. It might be questioned whether this understanding of free will is deserving of the name '*free* will'; I think it is, because, as a matter of experience, your decisions are not restricted by any outside forces, but only by the constitution of the self, as a part of experience facilitated by a brain, itself. In terms of philosophical labels, this makes me a *compatibilist* about free will, since I accept both the reality of free will as well as quasi-determinism[35]. (For an overview of the philosophical positions on free will defended in the literature, refer to e.g. [92].)

Since free will is not a fundamental force of reality, it also does not need to act on anything, neither some objective world nor on other experiences directly. The aspects of the objective order of experience that determine which experiences of you making a decision actually exist (e.g. you choosing the pastel) are the same as (or closely related to) those aspects that determine which experiences of someone else watching you make that decision actually exist, i.e. given the state of your brain when entering the bakery, and assuming that there is a corresponding experience of a bakery employee with a shared world between the two experiences at that moment, if only the experience of you ordering a pastel exists as following your previous experience, then likewise only the experience of the employee hearing you order a pastel exists. In this way, even if all interactions fundamentally are atemporally predetermined, the shared world can be seen as constituting a medium of interaction.

5.10.3 Shared ideas

So far, we have restricted the discussion of intersubjective parts of experiences to the (experienced) external world. However, we can also share parts of our experience that we would clearly designate as internal parts, like ideas and abstract objects, and more concretely, numbers, shapes, and fictional stories. We have considered the case for numbers above already, where we noted that our ideas of numbers, as mathematical structures/objects, are instantiations of abstract structures that do not refer to anything else (cf. section 5.6.1). The same is the case for our ideas of shapes, like the Platonic solids. Therefore, these abstract structures, insofar as they are instantiated within all of a set of experiences, are also an intersubjective part of this set and hence just as much a part of the shared reality of these experiences as

[35] I.e. that the world within experience is governed deterministically with the exception of indeterminism introduced by quantum-mechanical events, which, however, has no implications for free will.

their shared world is. Fictional stories, equally, can constitute parts of our shared reality. For example, Harry Potter is a *real* object not only in my experience, but also (I assume) in our shared reality, even if he is missing the property of *being physical* and is just an internal part of experience. Furthermore, statements about him can be just as true or false as statements about Daniel Radcliffe, insofar as they are determined within our shared reality.

Many of the stories we humans tell contain reoccurring elements and narratives; e.g. many stories are instantiations of what is known as the *hero's journey* (cf. e.g. [93]). In general, these reoccurring narratives are what C. G. Jung [94] calls *archetypes*. The totality of these archetypes, furthermore, constitute what Jung calls the *collective unconscious*. In analytic nondualism, archetypes can be understood as abstract structures that are instantiated within internal parts of experience. The collective unconscious, as the totality of these abstract structures instantiated within the internal parts of a set of momentary experiences, then constitutes the proper internal counterpart to the external concept of a shared world.

5.11 Dissolving the hard problem

In ontologies committed to objective realism about the world, there is an explanatory gap between any objective description of the world and a description of the subjective experiences of beings within it. In particular, there is no satisfying explanation for why processes happening in an objective world would produce subjective experiences in the first place. This is what is pointed out by the hard problem of consciousness, as we discussed in section 3.2.1. In analytic nondualism, there is no objective world that needs to be reconciled with subjective experience. However, there is still an external world *within* experience, where physical processes happen that are correlated with direct experience. Therefore, there is still something that needs to be reconciled, but, as we will see below, there will be no insurmountable *hard problem* analogous to the one that exists for objective realism.

In section 5.4, we noted that you are justified to believe that conscious experiences from other beings' perspectives exist, i.e. that they are conscious. However, these experiences are absent; the subjective experiences of other beings do not occur in your present experience. This is the point I already made in section 5.2: from within your experience, every other being is an object (in a technical sense that is compatible with the recognition of a corresponding subjectivity of other beings). All that occurs in your experience

and all that can be called 'their consciousness' is their behaviour, which can be understood as a complex physical process just like the behaviour of any other complex physical system around you. (As I pointed out in section 5.9, analytic nondualism entails a form of physicalism by which the world can be exhaustively described and explained in physical terms, even though this world does not exist objectively but only within subjective experiences.) There simply is no conscious experience that needs to be reconciled with the behaviour and neural activity of other beings *within your experience*. Hence, there is no hard problem of consciousness regarding *other* beings.[36]

But what about other people talking (i.e. exhibiting behaviour) *about their conscious experience*? Does this not imply that their conscious experience must, in fact, play a causal role in your experience and hence that even the subjective form of physicalism I am endorsing is false? This is a question we already discussed in section 3.2.3, where we concluded that, in order for physical states to be sufficient causes for talking/writing about consciousness, there must be a certain *physical representation of consciousness* in the brain, which instantiates a kind of self-reference that allows for the formation of thoughts (and consequently uttered sentences) about consciousness despite the subjective/experiential aspects of consciousness being absent. This physical but non-experiential representation, however, is exactly what traditional, physicalist accounts of consciousness, which are denying or disregarding the subjective and non-physical aspects of consciousness (e.g. the account of Hofstadter [75]) are describing. Hence, in this limited pursuit of explaining the 'consciousness behaviour' of *other* beings, they are successful, since there the subjective aspects of consciousness are, indeed, absent.

The situation is different for *your* consciousness, which has two aspects: primarily, the subjective/internal aspect, i.e. your present experience, but also the physical/external aspect, i.e. that the neural processes in your brain can account for your behaviour in physical terms. I already noted that there must be a perfect correlation between the two aspects and that this *embedded facilitation* of experience within the world might be a necessary property of experience (cf. section 5.8.1). Unlike theories based on objective realism, analytic nondualism does not claim that these patterns of brain activity *cause* experiences, but that they are simply correlations within experience. It is possible to imagine that these correlations are different from how they

[36]The brains of other people might then be understood as information processors akin to computers. I examine to which degree the analogy between brains/minds and computers is valid in an essay I wrote some time ago, foreshadowing some of the points I am making in this section. The essay can be found here: https://maxpohlmann.github.io/and/computational_conceptions_mind.pdf

actually are (e.g. that a light beam with a wavelength of 450 nm hitting your retina is associating with a colour quale of red rather than blue), but it is impossible for you to imagine that there is your current brain activity without *any* experience, because whatever you imagine would not be an experience associated with *your* brain. In other words, you cannot imagine to be a *zombie* (cf. section 3.2.1), since there is, by definition, nothing that it would be like to be. Therefore, in analytic nondualism, there simply is no question of how brain activity gives rise to a subjective experience, since, firstly, brain activity cannot be said to cause experience, and secondly, brain activity can exist only *within* experience. Hence, there is no hard problem of consciousness regarding your own conscious experience, either. All that remains of it are questions about the specific correlations between brain activity and subjective experience, but these are empirical questions, or what Chalmers [56] would call *easy problems*, that are answerable by the usual scientific means, e.g. by experimentally examining psychophysical correlations and *linking propositions* [95].

A few clarifications regarding the previous paragraph are necessary. *Firstly*, of course there are certain patterns of brain activity, e.g. those controlling your liver function or what one might call the unconscious mind, that are usually not directly reflected in your experience. Those, then, are just like any other processes in the world that are not correlated with experience. The point of the embedded facilitation of experience is simply that all parts of experience are embedded somehow in the experienced world, e.g. within *some* subset of neurons in the brain (that Teller [95] would call the *bridge locus*). *Secondly*, you can indeed imagine yourself to be unconscious. However, this either means that you imagine adopting the perspective of another being (or of a ghost) watching your body, which is different from imagining what it would be like to be unconscious *for you* – indeed, imagining yourself to have no experience from another being's perspective is trivial, because within one experience no experience of any other being is present, as we discussed above – or otherwise it means that you are simply imagining that no experience whatsoever is present, but then there also is no brain activity that *could* be associated with an experience. So neither case constitutes a scenario in which you have brain activity that could be associated with a subjective experience but is not. *Thirdly*, the above argument applies only in one direction: there cannot be *your* brain activity without there being *your* experience; it does not say that there can be no experience without brain activity. As I noted in section 5.8.1, the requirement that experience must have an embedded facilitation within the experienced world is only a speculation regarding the objective order of experience and we cannot know for certain that philosoph-

ical ghosts cannot exist. However, since we have no reason to believe that such ghost experiences exist, there is also no need to account for them.

In conclusion, in analytic nondualism, there simply is no hard problem of consciousness regarding the experiences of other beings, since their subjective consciousness is not a part of the present experience, and there is no hard problem of consciousness regarding the present experience, because there is no sense in which we could even imagine there to be brain activity with a non-trivial absence of an associated experience. The essential point within the arguments regarding both other beings' consciousness as well as your own is simply that subjective consciousness is not a property or an aspect of the world. *You cannot find consciousness in the world – you can only find the world in consciousness.* Therefore, analytic nondualism does not provide an explicit solution to the hard problem of consciousness, but rather, by adopting the worldview presented by analytic nondualism, the hard problem of consciousness is dissolved.

One question in connection to the hard problem, however, remains unanswered: *which beings, exactly, are conscious?* Phrased differently: *which momentary experiences, that I can conceive of being had from the perspective of beings (objects) in my experience, actually exist as subjectively had experiences?*[37] The arguments discussed in section 5.4 force us to accept that this question is ultimately unanswerable, as it transcends the present experience. In section 5.7, we pointed out a few properties a momentary experience must have in order to fall under the concept of experience at all, but beyond this, all speculation about the necessary ingredients of a momentary experience must remain that: speculation. Nevertheless, I also pointed out that the experiences that we are familiar with and in whose existence we have reasons to believe (viz. your past experiences and experiences of beings that 'seem' conscious) are *consistent* (i.e. exhibit certain consistencies) and that, while we are not in a position to rule out the existence of inconsistent experiences (e.g. that of a philosophical ghost), it is reasonable to limit ourselves to consistent experiences. This, then, is where pursuits in phenomenology and consciousness studies (including mathematical conscious studies; cf. section 5.6.1) find their place in analytic nondualism, as they are concerned with carefully describing the structure of familiar, consistent experiences and, partially, with speculating about which aspects of experience are necessary aspects of experience.

[37] As I mentioned in the respective sections, this question is also equivalent to the questions of what actually counts as constituting a *perspective* (cf. section 5.4.2) and, relatedly, as an embedded facilitation (cf. section 5.8.1).

While theories of consciousness cannot grant us certain knowledge about absent experiences, they can provide justifications for believing in the existence of some conceivable experiences over others. One concrete example of such theory is the *integrated information theory* (IIT) proposed by Giulio Tononi [96] (for a presentation of the most recent version, see [97]). Not dissimilar to analytic nondualism, IIT starts with conscious experience (rather than a world), recognising its reality and formulating five axioms that phenomenologically describe properties of familiar conscious experiences. Based on these axioms, IIT provides a mathematical formalism which can assign 'levels of consciousness' to physical systems (e.g. brains) and predict the contents of conscious experiences had from the perspectives of these systems based on how they *integrate information*. In my view, these predictions made by IIT constitute valid justifications for believing in the existence of certain conscious experiences over others; i.e. if IIT predicts that a certain physical system is conscious of certain contents, we are justified in believing that the conscious experience we conceive of being had from the *perspective* of that system, involving the predicted contents, actually exists.

5.12 Ontic agnosticism

> [The agnostic code]
>
> We cannot know with certainty if God or Christ exists. They COULD. Then again there COULD be a giant reptilian bird in charge of everything. Can we be CERTAIN there isn't? NO, so it's pointless to talk about.
>
> — *South Park* (TV series), season 15, episode 14

In previous sections, I repeatedly pointed out that analytic nondualism entails agnosticism about anything that transcends the present experience, since that is the only thing we can ever know for certain. (Practically, of course, a belief in analytic nondualism remains compatible with a belief in the existence of some absent experiences, i.e. those for which you have some concrete reason to believe in.) Nevertheless, momentary experiences exist on their own, so the collection of actually existing momentary experiences is a properly decided and objective fact of reality. In other words, the question of whether an idea of a conceived momentary experience refers to an actually existing experience has an objectively true answer – either there is an experience corresponding to the idea of an experience that is consciously experienced or there is not –, but it is unanswerable from within the present experience.

Therefore, the agnosticism we are forced to accept is of an *epistemic* nature (which is how agnosticism is classically understood in general).

I also pointed out that, given your certainty about the present experience, it is reasonable to assume that there are other momentary experiences like it and that these momentary experiences constitute the core of the ontology of analytic nondualism. Without experience, there would be no place from which to judge something to be real and, as I argued in sections 5.8 and 5.10, experience can account for itself without the need for an underlying objective world, so reality is indeed *sufficiently* described as consisting of momentary experiences. Nevertheless, we are also not in a position to say that nothing that is non-experiential, like an objective world independent of experience, exists (but only that it is not necessary). If we allow for the possibility of such non-experiential things existing alongside momentary experiences, the already large ontology (containing all *possible* momentary experiences) gets even larger, which some would object to on grounds of parsimony. However, the parsimony of an ontology should not be measured by the number of things whose existence it admits, but by the number of assumptions it makes, and assuming that non-experiential things do not exist would be an assumption that is not justified. Therefore, we should allow for the possibility of non-experiential things existing. Nevertheless, since we have no access to them whatsoever, they remain *ontological hypotheticals* and are not part of the *core* ontology of analytic nondualism, the latter being the part of the ontology on which we have a grip and with which we can work.

So, let us assume that there is an objective and non-experiential world that reflects your idea of an external world: it contains this piece of paper (or the screen) on which this text is written, your body, and all the objects around you, as existing objectively and independently from your experience of these objects. (Since your experience exists on its own and is consistent without this world, the latter cannot be said to be the metaphysical cause of the former, but merely *mirrors* it.) But now, let us also assume that there exists an objective world that contains a brain-in-a-vat hooked up to a computer that is exchanging signals with the brain in such a way that the brain activity is perfectly correlated with your present experience. And lastly, let us also assume that there exists an objective world in which a computer is running a large simulation of a world, including precise simulations of the brains of the inhabitants so that one simulated brain is perfectly correlated with your experience (cf. section 2.5.3). None of these scenarios preclude each other, as each might possibly exist on its own. Indeed, you must be epistemically agnostic about the existence of each one of these objective worlds. When you ask which one it is that lies 'behind' your present experience, the case

is slightly different, because all three would be consistent with your experience, so the question is metaphysically *indeterminate*. Therefore, regarding all questions that concern reality *beyond* experience, the form of agnosticism you have to adopt is not epistemic, since that would imply that the questions have actual (unknowable) answers, but *ontic*, because there simply is no fact of the matter what the world beyond experience is like, because there is no such thing as '*the* world beyond experience'.[38] This ontic agnosticism about the world beyond experience constitutes a form of anti-scepticism (cf. section 2.5.3), since sceptical considerations are not taken seriously as questioning our understanding of the world beyond experience, but just add further possibilities to the set of equivalent objective worlds.

I mentioned in section 5.9 that most pursuits in science are not affected by the reinterpretation of the target of science. One (semi-)scientific enterprise that is affected by the reinterpretation of the role of science, though, comprises those metaphysical endeavours that speculate about the world beyond experience. One example is the theory of conscious realism by Hoffman et al. [61, 62] (cf. section 3.2.2), who describe the objective world as being made up entirely of posited entities they call conscious agents, our experiential worlds being the interface to that world. Insofar as theories of this kind seek to describe the world in a way that cannot be directly experienced or that has direct implications for experience, they are futile endeavours, for ontic agnosticism entails that there is no sense in which they could be true or false. To the degree to which the formalisms of these theories can be used to make predictions about future experiences, they can constitute useful tools, but this does not get them closer to their aspiration of describing a world beyond experience. For example, even if the theory of conscious agents were able to derive a complete account of our experiences with all their parts, it is still plausible that there is an equivalently powerful theory that does not posit the existence of entities akin to conscious agents. Hence, even such a derivation would be no justification to believe in conscious realism.

Note that this is different for merely physical (i.e. not *meta*physical) theories positing entities we cannot perceive directly by themselves: I cannot see (or otherwise experience) a single atom directly, but the physical theory of atoms is so explanatorily valuable that it warrants accepting atoms as parts of my idea of an external world. The speculative metaphysical theories I am talking about, on the other hand, posit entities that go entirely beyond our

[38] It might be that there exists exactly one objective world that is consistent with your present experience, but we cannot know whether that is the case. Hence, ontic agnosticism builds on top of epistemic agnosticism.

experienced worlds and exist only non-experientially. Therefore, the question of whether these posited entities exist in the world beyond our experience is not only unknowable but indeterminate. The mathematical universe hypothesis by Tegmark [5] is also a speculative metaphysical theory, since it seeks to describe *the* objective world underlying experience. It is special, though, because it identifies the universe to be something that is already present in experience: structure. We already saw in section 5.10.1 how this allows us to adapt Tegmark's ideas to fit in with analytic nondualism. In the context of this section, the structure with which Tegmark identifies our universe/world can be seen as the structure that all objective worlds (including, perhaps, the structure by itself) must have in common in order to be compatible with our subjective experiences. In its identifying this structure to the *unique* objective world underlying our experiences, however, the mathematical universe hypothesis is as speculative and incompatible with ontic agnosticism as any other metaphysical theory of the kind I discuss.

6 Conclusion and summary

We have now reached the end of the main text of this thesis. Let us recap what we have done. After an introduction in chapter 1, we discussed the relevant philosophical background for the thesis, in the form of traditional dichotomies in philosophy, in chapter 2. Then, in chapter 3, we considered the metaphysical position I called objective realism; we also discussed the problems and difficulties that objective realism faces, in particular in accounting for the presence of subjective experiences. In chapter 4, we saw unorthodox positions in metaphysics that have been proposed in recent decades, some of which are still clearly committed to objective realism, others not or less obviously so. Nevertheless, these positions provided insights and ingredients that we then saw incorporated into the novel metaphysical position presented in this thesis: analytic nondualism, which I laid out extensively in chapter 5. Analytic nondualism, now, constitutes a proper alternative and counterpart to objective realism. (Lastly, in chapter 6, we recapped what we have done in previous chapters, culminating in this self-referential sentence, which is followed by a summary of analytic nondualism and a discussion of possible future work.)

Summary of analytic nondualism. Since these primary arguments for accepting analytic nondualism (over objective realism) can easily get lost amongst all the detailed considerations of the previous chapter, I shall summarise them here. What you experience right now is simply given as an experience. The feeling that some of the things you experience are *out there* in an external world is also just something you experience. Indeed, you feel that your experience is structurally divided into that what is out there, the objects around you, and what is inside, your thoughts and imaginations. Even if you scientifically understand the appearances of objects (in colour and 3D) to be inside, evoked by some unknowable things-in-themselves, these things-in-themselves are, prima facie, still just ideas within your experience of things that you take to be out there. Within this experience, though, there is nothing that actually points to there being something 'beyond' or 'underneath' this experience.

There are considerations that might lead you to want to take there to be something underneath experience, but these considerations can be resolved in other ways. In order to assure the coherence of experience (i.e. that exper-

ienced objects do not just appear or disappear, or that you can consistently tell how far the thunderstorm is away by counting the seconds between flash and thunder), you do not need to posit a world governed by natural laws, but can just take experience to be governed by natural laws. In order to explain why measured brain activity is correlated with experience and to assert that you can have no experience that is not somehow facilitated by your brain, you do not need to posit that your experience is *caused* by your brain as existing within some objective world, you can just take this to (possibly) describe one of the natural laws governing experience itself. In order to explain how you can interact with other conscious beings, you do not need to posit an objective world as a medium of interaction, but have to recognise that your feeling of having free will is just an appearance in consciousness and that your free will does not affect reality at a fundamental level, thereby freeing you of the need of having a medium of interaction that facilitates interactions at a fundamental level in the first place. In order to share a world with other beings, then, you do not need one objective world that is behind the experiences of all beings, but you can take the shared world to simply be that which is structurally *identical* amongst the experiences.

To be fair, the former options in all these cases may seem more attractive, which you may take as sufficient justification for believing in an objective world. However, given the alternative options, the attractiveness of the former options does not prove the existence of an objective world. But the availability of the alternative options does prove that such an objective world is not *necessary* to account for experience. Therefore, experiences can be seen as existing on their own; an objective world might perhaps exist and *mirror* the events of experience, but since its existence is not necessary, it cannot be said to *cause* the events of experience.

Next to this argument for why an objective world is not necessary to account for experience, there is an argument for why it is not sufficient either, viz. the hard problem of consciousness: given an objective world in which processes take place as described by physics, there is no explanation for why the processes happening within brains are accompanied by a subjective experience whose contents are correlated with these processes; in other words, there is no explanation how physical processes lead to conscious experiences. Indeed, there might, one day, be a science of consciousness based on objective realism that tells us *which* physical processes lead to conscious experiences, but within the worldview of objective realism, it is impossible to explain *why and how* processes in the *objective* world can bring forth *subjective* experiences. Within analytic nondualism, on the other hand, there is no hard problem of consciousness: the conscious experience of *other* beings does not occur

within my experience, where they, indeed, just are complex objects governed by physics whose behaviour is entirely explainable (in principle) through the processes in their brains and bodies; regarding your own conscious experience, there is nothing to explain or account for, because your brain activity does not cause or bring forth your conscious experience, but is simply a content within it.

Another strength of analytic nondualism is that it is not plagued by sceptical possibilities. Within objective realism, the questions 'But what if you are actually a brain-in-a-vat?' and 'Are we living in a computer simulation?' are real questions that would have real (but likely unknowable) answers. In analytic nondualism, the world that you experience is real and just the way it is, not illusory or actually some other way. It might be that there exist objective worlds corresponding to these scenarios and mirroring your experience, but this does not detract from the reality of your experience. Furthermore, the question of which of these (possibly existing) worlds is 'behind' your experience does not have an answer, for any of these worlds, insofar as they exist, equally mirror but do not cause your experience.

In line with this, in analytic nondualism, there is no distinction between the way the world is and how we experience it, since the world within experience is the primary and relevant notion of the world. Nevertheless, this does not imply that we always have full knowledge of the world or reality in general. Even though the experience of the starting position and the movement of a thrown die might, in principle, be enough to derive its landing position, this does not entail that this derivation can be done within any experience, i.e. that there must be knowledge of the (well-determined) landing position within the experience before looking at the die. More generally, while the question of which momentary experiences exist is well-determined and you can be justified to belief in the existence of particular momentary experiences, this does not entail that you can ever have certain knowledge of the existence of particular absent experiences.

Analytic nondualism is not easy to accept, but it is the worldview to which you are lead if you do not want to leave the firm ground of certainty (with only tentative speculation about what is beyond). It provides answers to long-standing mysteries (regarding the hard problem of consciousness as well as the interpretation of quantum mechanics, as I explain in appendix A) and is free of sceptical doubt. Therefore, I think it is worth trying to adopt analytic nondualism as one's worldview.

Future Work. As I briefly mentioned in chapter 1, the relevant literature that I did not consult for reasons of time is vast; a comparison of analytic nondualism with other philosophical systems should be insightful in itself and allow for strengthening the position of analytic nondualism by incorporating aspects of the other systems. (The list of authors whose works would be relevant for future work on analytic nondualism would fill a page, but I shall name just a few.) Schopenhauer [98] examined the concepts of subject and object and their relationship/interdependence, which should be interesting to compare to my focus on 'objects in subjectivity' and insistence that there are no objects outside of subjectivity and no subjects prior to experience. Hegel's phenomenology of spirit [99], equally, provides an examination of experience and the subject of experience. Mach [100] offers an analysis of sensations (as contents of experience) and of the relation of the physical to the psychical, both of which are of great relevance to analytic nondualism as well. Furthermore, since analytic nondualism has its roots in eastern philosophy, deepening the connection to schools of thought like *Advaita Vedanta* hinduism (cf. e.g. [71]) and *Dzogchen* buddhism (cf. e.g. [72]) would be valuable as well.

Apart from a comparison to philosophical systems that incorporate a similar set of ideas as analytic nondualism, another avenue for future work concerns a more elaborate working-out of certain aspects of the theory. For example, the concept of a personal identity, derived from a stream of memories within an experience, can be worked out further and connected to the analyses of personal identity by Parfit [77] and Hare [6]. In that context, the system of analytic nondualism would benefit from a more rigorous analysis and characterisation of (subjective) time as grounded in memories. Lastly, given the focus on *structured* experiences, the connection to the field of mathematical consciousness science could be strengthened by formulating the tenets of analytic nondualism in a formal/mathematical setting.

A Quantum mechanics

In this appendix, I start by introducing the basics of quantum mechanics and examining some interpretations thereof. We then see how considerations stemming from these interpretations can constitute a reason for disbelieving in objective realism (cf. chapter 3). Lastly, we consider the implications analytic nondualism has for interpretations of quantum mechanics.

A.1 Basic principles

In this section, I give a brief introduction into the basics of quantum mechanics by explaining four principles/phenomena that differentiate it from classical physics. Note that I will use notation from the quantum formalism without introducing it formally, since that simply exceeds what is relevant for this thesis; the interested reader is referred to [101]. Before we go into mind-bending quantum phenomena, we need to define two simple terms: observables and states. Given a physical system (from microscopic ones like photons or electrons to macroscopic ones like cats, measurement apparatuses, or entire rooms), an *observable*, sometimes also just called a *variable*, is a property of that system for which a definite value, at a particular point in time, can be obtained by performing a measurement; examples include the position of a particle, its speed, or its *spin* (roughly speaking, the angular momentum of elementary particles), the dead-or-alive status of a cat or a measurement reading on a screen. A complete description of a physical system at a particular point in time regarding a given set of observables is called a *state*. In classical physics, a state is simply a set of variable–value pairs. We will see below that quantum states are more complex than that. The symbol Ψ is often used as a variable for a particular quantum state, and the notation $|x\rangle$ (known as a *ket*, as a part of the so-called bra-ket notation) is often used to denote a particular state, where x is some label for that state. Furthermore, when we treat systems composed of multiple subsystems, we use subscripts to denote whose subsystem's state is meant; e.g. for a system composed of subsystems A and B which each are in some state x and which are *disentangled* (details below; for now, read: uncorrelated), we denote their joint state by $\Psi_{AB} = |x\rangle_A \cdot |x\rangle_B$ (the $\cdot$ is often omitted).

Superpositions. In the famous *double-slit experiment* (first demonstrated by Thomas Young [102]), a beam of light is shone at a plate that mostly blocks the light except for two closely proximate slits in the plate through which light can pass onto a screen. On the screen, then, one can observe an *interference pattern*, which I shall not explain further but simply point out that this can be explained by treating the beam of light as a wave rather than a stream of individual photons. Other physical experiments (in particular, the *photo-electric effect* as demonstrated by Einstein [103]), however, show that light cannot be understood entirely as a wave and that it does behave as a stream of particles (viz. photons) in certain conditions. The fact that light (as well as other particles and even macroscopic objects) cannot be understood entirely as either waves or particles (objects) is known as the *particle–wave duality*. An interesting consequence of this is that when single photons are repeatedly shone at the slitted plate, they are registered as individual photons on the screen at a definite position, but the statistical pattern of their positions shows the same interference behaviour as when a beam of many photons is shone at the plate, suggesting that each photon *interferes with itself*. However, since the interference is due to the two slits (i.e. there is no interference for a plate with only one slit), this implies that *each* photon must pass through *both* slits; we say that the state of the photon, with regards to the observable describing the position of the photon when it is at the plate, is a *superposition* of 'left slit' and 'right slit'. In symbols, we might write $\Psi = |\text{left slit}\rangle + |\text{right slit}\rangle$ for the superposition quantum state of the photon (ignoring the normalisation that would be necessary in a more formal and precise treatment).

Importantly, this is different from saying that the photon went through either slit but we do not know which. In versions of the experiment where detectors are placed behind the slits, so that each photon can be determined to have passed through either of the slits, no interference pattern will be visible on the screen. When many photons are sent onto the plate in such experiments, we do not know for each photon through which slit it passed, but that it passed through either one of the slits and not both. To deal with this other kind of uncertainty, the quantum formalism assigns a *mixed state* (of 'left slit' and 'right slit') to such ensembles of photons; this is in contrast to *pure states*, which encompass both superpositions and classical states with definite value assignments. The important thing to remember is that only superpositions, not mixed states, lead to interference effects.

Another crucial aspect of superpositions, aside interference effects, involves *collapse*. In a double-slit experiment with detectors, there necessarily is a gap between the slitted plate and the detectors; while the photon is in that

gap, it is still held to be in a superposition of having went through the left slit and the right slit, and after passing a detector, it is held to be in a classical state of having gone through either slit. We say that the detector *collapses* the superposition (or the 'wave-function', which is a name for the mathematical object describing a state in the quantum formalism). However, as we will see in a paragraph below, the quantum formalism allows for the pair of detectors to also be in a superposition of either one detecting the photon, but only one outcome is ever actually observed. Hence, it is unclear when exactly, between detection and detector-observation, the collapse happens, if at all. Different interpretations of quantum mechanics have different answers to this question.

Quantisation. In the *Stern-Gerlach experiment* [104], a stream of electrons is sent through a magnetic field that has been set up in a certain way, upon which the electrons hit a screen. Based on the spin (recall: the angular momentum) of each electron in the relevant direction respective to that of the magnetic field, it is diverted in a certain way by the magnetic field; the setup can hence be seen as a measurement of the spin of some electron in a given direction. If spin were a property that could take on a value from a continuous range of values, we would expect the electrons to form a straight line on the screen. Instead, the electrons land in two discrete spots on the screen, suggesting that the spin of an electron in a particular direction can assume only one of two values, i.e. spin is *quantised*. Conventionally, we say that the spin of an electron (or any other fundamental particle with spin) is either *up* or *down* in a given direction. By establishing a three-dimensional (orthogonal) basis of directions, we can speak of the x-, y-, and z-direction. As an example, if we observe the spin of some electron in the x-direction ('x-spin' for short) to be up, we might write for its state $\Psi = |\text{up}_x\rangle$. (For different purposes in different fields using the quantum formalism, different label conventions are used.)

Uncertainty. We can perform a *sequential* Stern-Gerlach experiment by putting two magnetic fields with perpendicular directions in order such that one half of the electrons leaving the first field (say, those with spin up) enter the second field, where their stream is then split in half again. Let us say that the first magnetic field splits the stream based on the electrons' x-spin and the second field based on the y-spin. We might be tempted to believe that the electrons leaving the second field determined to have y-spin up can now be said to be in a state $\Psi = |\text{up}_x \text{ and up}_y\rangle$. However, when we put another magnetic field which diverts the electrons based on their x-spin, as

well as a screen, in sequence to the above setup, we will find that there will be two equal points on the screen again. This means that there are electrons whose x-spin has been determined to be up by the first x-direction field, whose y-spin has then been determined to be up by the second field, but whose x-spin was then determined to be down by the third detector. Note that this does not happen if two x-direction magnetic fields are put in sequence directly; in such a setup, only one spot will be visible on the detector screen. The reason it happens in the three-field setup is that the spins of a particle in perpendicular directions are *incompatible* observables, i.e. getting information about one observable necessarily destroys information about incompatible observables [105].

Without going into detail of the formalism: if an electron is in a state $|\text{up}_x\rangle$ and its spin is measured in the x-direction, there is a 100%-chance that the spin will be measured to be up; if an electron is in a state $|\text{up}_x\rangle$ and its spin is measured in the y-direction, there is a 50%-chance each that the spin will be measured to be either up or down. This is because the state can be equivalently expressed as a superposition: $|\text{up}_x\rangle = |\text{up}_y\rangle + |\text{down}_y\rangle$ (whereas $|\text{down}_x\rangle = |\text{up}_y\rangle - |\text{down}_y\rangle$, though the details, as I wrote above, are beyond the scope of this thesis; furthermore, normalisation has again been ignored for simplicity). Because of incompatible observables, it is impossible to fully determine all variables of a physical system simultaneously. Hence, there is always and necessarily an inherent *uncertainty* regarding at least some observables of a system.

Until this point, it seems that these phenomena can easily be be accommodated by the objective realist picture. Quantisation might be a bit surprising, but is easily accepted. The particle–wave duality challenges a picture of the fundamental entities of the world as either particles or waves, but it nonetheless is possible to say that they are entities existing in the objective world that exhibit both particle and wave behaviour of which our minds are simply unable to have a unified picture. Similarly, even though superpositions and uncertainty show that not all properties of systems are definitely determined at all times, we can accept this indeterminacy as being an objective aspect of the world, i.e. take quantum states to be complete descriptions of reality,[1] hence respecting the objective realist belief in objectivism. The

[1] Alternatively, one might take quantum states to be encodings of incomplete information about underlying well-determined *hidden variables*. The possibility of accounting for quantum phenomena by positing hidden variables, however, has been ruled out by numerous theorems, e.g. Bell's theorem [106] or the PBR theorem [107], unless one rejects certain assumptions the theorems are based on.

next quantum phenomenon, however, poses a greater challenge to objective realism, as I will argue below.

Entanglement. When two physical systems are *entangled*, there is an inherent correlation between their quantum states with respect to one or more observables. In symbols, for the state of a joint system of two entangled systems A and B, each in a state x, we write $\Psi_{AB} = |x\rangle_A \otimes |x\rangle_B$. In certain physical processes, it happens that two particles are created that are entangled, or particles might become entangled through interaction, though he details of how entanglement comes to happen are beyond the scope of this appendix. As an example, say we have two entangled electrons, e_1 and e_2, that each have opposite spins (in some direction) and they are in a superposition of either one having spin up or down (the so-called *singlet state*); in symbols, for the joint state of the entangled pair e_1e_2 we write $\Psi_{e_1e_2} = (|\text{up}\rangle_{e_1} \otimes |\text{down}\rangle_{e_2}) + (|\text{down}\rangle_{e_1} \otimes |\text{up}\rangle_{e_2})$. Crucially now, when we measure the spin of e_1, the joint superposition collapses and we immediately know the quantum state of the other electron as well, no matter how far apart the two electrons are by that point. Concretely, say we measure e_1 and get the result that the spin is up; then the joint quantum state collapses to the state $|\text{up}\rangle_{e_1} \otimes |\text{down}\rangle_{e_2}$, from which we can 'trace out' that the state of e_2 must be $|\text{down}\rangle$, when before the measurement of e_1's spin, the traced-out state of e_2 was $|\text{up}\rangle \otimes |\text{down}\rangle$. (The setup just described above is a version of the famous Einstein-Podolski-Rosen (EPR) paradox [108].) These results have been confirmed experimentally and it has furthermore been ruled out, in lines with our discussions in the previous paragraphs, that the electrons already had a well-determined spin at the time of their entanglement. This suggested to Einstein that there might be some kind of non-local interaction between the electrons, since the measurement of one particle of the entangled pair immediately alters the quantum state of the other particle, leading him to speak of *spooky action at a distance* [109]. It is important to note, though, that these joint collapse phenomena do not allow for faster-than-light communication: say we have an entangled pair of electrons, as described above, with one electron being on Earth and one on Mars; when we measure our electron on Earth, we immediately also know what results our friends of the Mars colony will obtain when they measure their electron, but since we cannot influence what result our measurement obtains, we cannot transmit any information in this way.

A.2 Wigner's friend

As we saw, quantum mechanics works a lot with thought experiments. The thought experiment that is especially relevant for the purposes of this appendix is commonly known as *Wigner's friend*, thought up by Eugene Wigner in a text titled 'Remarks on the Mind–Body Question' [110], in which he considers whether consciousness plays a role in the collapse of superpositions. I here present the setup of the Wigner's-friend thought experiment in the version from [111, §3] with minor adaptations: in a lab, there is a quantum system S that is in some superposition $|0\rangle + |1\rangle$, together with Wigner's friend F, while Wigner W himself is outside the room. At an agreed-upon time, F performs a measurement of S and observes either outcome 0 or 1. Some time thereafter, W opens the door and is informed by F about the outcome of the measurement. The question now is at what point in time the superposition of S collapsed. From the perspective of F, they assign to S either the state $|0\rangle$ or $|1\rangle$ right after observing the respective outcome. When describing the situation from the point of view of W, if he treats F as a quantum system (which nothing within the quantum formalism would forbid), the situation looks different: when F measures S, the two systems become *entangled*, so that the joint system is then in the state $(|0\rangle_S \otimes |\text{observed } 0\rangle_F) + (|1\rangle_S \otimes |\text{observed } 1\rangle_F)$; only after the door is opened and the measurement outcome communicated does the joint superposition collapse and W assigns states corresponding to the measurement outcome to S and F. Before opening the door, F and W assign different quantum states to S while both are using the quantum formalism, which is the circumstance that makes this thought experiment a paradox. It raises (or at least emphasises) questions about the nature of quantum states and superposition collapse. The paradox is resolved differently by different interpretations of quantum mechanics.

Before we consider responses to the paradox, we briefly consider a variation of the Wigner's-friend thought experiment, presented in a paper by Frauchiger and Renner [112], that has gained a lot of attention in the literature in recent years. The experiment involves two separate labs with two version each of S, F, and W, that can communicate in certain ways, though we shall not consider the details further. The authors make a *reductio ad absurdum* argument, proving the incompatibility of three intuitive-sounding assumptions. Assumption (Q) says that the theory of quantum mechanics is correct and complete, i.e. that it can be used by any of the agents (observers) to reason about systems of arbitrary size, including other agents. Assumption (C) lets agents reason as if from the point of view of another agent, i.e. upon

establishing 'another agent can conclude fact f', they can conclude fact f themselves. Assumption (S) requires that measurement outcomes are unique from the point of view of an agent. This result allows for the classification of interpretations of quantum mechanics based on which assumption they reject. Nurgalieva and Renner [111] point out that assumption (S) is only violated if a single agent is allowed to say, after e.g. measuring the spin of an electron, 'I measured both up and down'; since such a scenario is quite absurd, potentially correct interpretations of quantum mechanics must reject either (Q) or (C) or otherwise point out and reject hidden assumptions of the argument.

A.3 Interpretations of quantum states

Explaining the phenomena and resolving the paradoxes of the previous section is in large part a matter of interpreting quantum states. Broadly speaking, there are two views of quantum states: ontic and epistemic. Following Harrigan and Spekkens [113], and ontic state is a complete specification of a quantum system as it really is in itself, whereas an epistemic state of some system is an encoding about the (complete) information a certain observer has about that system. The ψ-epistemic view of quantum states holds that quantum systems *have* well-determined ontic states, but that the quantum states of the quantum formalism merely encode incomplete information about that ontic state; this view, however, is the kind of hidden-variable theory that is ruled out by the PBR theorem [107]. Pienaar [114] refers to the ψ-epistemic view of quantum states as 'epistemic in the narrow sense', but maintains that one can still view quantum states as 'broadly epistemic', i.e. encoding information about something other than underlying ontic states.

Another important term in this discussion is the *Heisenberg cut*. Quantum systems can be in superpositions (e.g. of spin up and down), but when a measurement is performed, only definite outcomes (i.e. either spin up or down) are ever observed. This prompts splitting the world into two parts: the quantum world where quantum phenomena like superpositions occur and the classical world where outcomes are definite; this partition is known as the Heisenberg cut [115]. The cut is set differently by different interpretations and the concept will become more clear when we discuss particular interpretations.[2] (For the overview of interpretations presented in this section, I am indebted to [111].)

[2]The Heisenberg cut is reminiscent of and connected to the divide between world and mind discussed in section 2.2 and similarly debatable; e.g. Descartes would have placed

The ontic view of quantum states. Firstly, we consider interpretations of quantum mechanics that have an ontic view of quantum states. These interpretations understand the quantum state assigned to a physical system by the quantum formalism as being a complete description of the system in itself (with respect to the encoded observables). These interpretations in particular are committed to objectivism: quantum states describe systems objectively as they are in themselves and hence identical to all observers. Hence, they must also assume an objective Heisenberg cut. The arguably most prominent such interpretation is the *conventional Copenhagen* interpretation. According to it, there is a clear distinction between quantum systems and classical systems; superpositions of quantum systems collapse precisely when they interact with classical systems. Although the precise place of the Heisenberg cut is unspecified, conscious observers are securely placed on the classical side. (So when a measurement apparatus measures the spin of an electron in a superposition, either that collapses the superposition or otherwise the measurement apparatus becomes entangled with the electron, the then joint superposition only collapsing once the measurement apparatus is looked at by an observer.) The Wigner's-friend paradox is resolved by saying that W is wrong to model the lab containing S and F as a quantum system because it contains a classical system, viz. F. (With regards to the Frauchiger-Renner argument, this means that assumption (Q) is rejected.) So when F measured S but W has not yet opened the door, the lab is not in a superposition (from any perspective, since superpositions are taken to be objective and do not depend on a perspective), but W is merely oblivious of the measurement outcome (which could be modelled by W assigning a mixed state to the lab). The challenge faced by the conventional Copenhagen interpretation is to explain why certain systems cannot be treated as quantum systems. The possible response that it is consciousness that has a causal effect on the world in collapsing superpositions, as held e.g. by Wigner, is a highly contentious one.

A different response is given by *objective collapse theories*, which modify quantum theory by introducing a mechanism by which superpositions of macroscopic objects collapse spontaneously; macroscopic objects may therefore be treated as classical systems. Hence, the Heisenberg cut is objective and does not depend on conscious observers. In Wigner's-friend, S might briefly become entangled with the measurement apparatus, but since the latter is a macroscopic system, the joint superposition is taken to collapse very shortly thereafter. Since quantum theory must be modified to include such an ob-

cognition on the side of mind, while I would place it into the brain on the side of the world and only subjective experience on the side of the mind.

jective collapse mechanism, assumption (Q) is rejected. To my knowledge, there is no further experimental evidence for the necessity of such a collapse mechanism, making objective collapse theories an *ad hoc* solution for those who want to maintain an ontic view of quantum states but reject a causal role of consciousness as well as many-world interpretations (see below). Interestingly, since both the conventional Copenhagen interpretation and objective collapse theories deny that the lab (the joint system of S and F), in Wigner's-friend, can be in a superposition (in themselves, in particular not from the perspective of W), they could be tested experimentally by checking whether W can observe interference effects of the lab, since only superpositions can lead to interference effects; to date, such an experiment has been beyond our experimental capabilities.

Another class of interpretation that have an ontic view of quantum states are known as *many-world interpretations* (MWIs); I will focus on Hugh Everett's *relative state interpretation* [116]. According to it, there is no collapse of any superposition; rather, the entire universe is in one total and evolving superposition. Whenever a measurement of a quantum system is performed, the rest of the universe becomes entangled with this system and is then in a superposition of any outcome having occurred; in popular parlance, we say that the universe *branches*. To illustrate, we consider Wigner's-friend again: after F measured S, the entire system (our 'universe' in this thought experiment) is in the state $\big((|0\rangle_S \otimes |\text{I observed } 0\rangle_F) + (|1\rangle_S \otimes |\text{I observed } 1\rangle_F)\big) \cdot |\text{oblivious}\rangle_W$. After the door is opened and the result is communicated, the system is in the state $(|0\rangle_S \otimes |\text{I observed } 0\rangle_F \otimes |F \text{ observed } 0\rangle_W) + (|1\rangle_S \otimes |\text{I observed } 1\rangle_F \otimes |F \text{ observed } 1\rangle_W)$. So at this point, our thought-experimental universe is in a superposition, where each of the composite states corresponds to a branch of the universe, each of which MWIs take to be equally real. Objectively, there is only one state that the universe and hence each subsystem is in, which Everett refers to as the 'absolute state'. From within the branches, it looks like only one outcome has been observed; hence, each observer within a particular branch assigns 'relative states' to the systems around him (relative to himself). Relative states supervene on absolute states and are in some sense, along with the experience of superposition collapses, *illusory*, since they do not describe the world as it really is objectively. The Heisenberg cut in MWIs is objective and has an empty classical side, since the entire universe including all observers is treated as a quantum system. As for the three assumptions by Frauchiger and Renner, the literature I have consulted does not provide a clear placement of MWIs. While Frauchiger and Renner [112] stated that MWIs contradict (S), we noted above that Nurgalieva and Renner [111] pointed out that this is not so (unless agents treat themselves

as being in superpositions, observing multiple outcomes, in contradiction to their own experience). Since any system is treated as a quantum system by MWIs, they are taken to be compatible with (Q). The agents in the thought experiment are reasoning from and about their experiences, so they are bound to use relative states. Hence, the conclusions they draw are not about the universe as it is objectively but only about the branch they are in. One might argue that the agents are not using objectively correct absolute state assignments and therefore simply cannot predict their experiences using the quantum formalism, contradicting (Q) after all.

So we see that all considered interpretations of quantum mechanics that have an ontic view of quantum states either invoke non-physical mental causation or otherwise reject the validity of quantum theory when used to reason about macroscopic objects.[3] Unless we are ready to accept one of these solutions, we are forced to consider the alternative to the ontic view, i.e. the (broadly) epistemic view.

The epistemic view of quantum states. In the relative state interpretation, only relative states are practically usable by agents/observers to reason about their environment. Absolute states of a branching universe are only maintained to avoid having to account for superposition collapse and to hold onto the ontic view of quantum states, but absolute states have no further explanatory merit. Instead of positing absolute states, which describe reality as it is objectively, to underlie relative states, which describe systems from the point of view of observers living in one branch of the universe, we can just take quantum states to be *fundamentally* relative. This is the approach chosen by interpretations that have been referred to as 'epistemic-pragmatist' [117] and 'Copenhagenish' [118] interpretations.

Pienaar [114] offers four principles for a characterisation of Copenhagenish interpretations: (i) a measurement does not entail a branching of the world (no many-worlds); (ii) the view of quantum states is 'broadly epistemic' (rather than ontic); (iii) quantum theory can be applied to physical systems of arbitrary scale (corresponding to assumption (Q) from [112]); (iv) quantum theory offers a complete description of systems without the need for hidden

[3]There are, of course, many more interpretations that we did not consider. Perhaps most notably, the *de Broglie–Bohm theory* is another interpretation with an ontic view of quantum states proposing a modification of quantum theory itself (thereby rejecting (Q)) rather than just providing an interpretation. Other than that, the discussed interpretations cover the ones that are most popular amongst physicists and philosophers these days. Furthermore, I am not aware of any interpretation a discussion of which would have significantly altered the given line of argument.

variables. Point (ii) means that quantum states are taken to represent information, in a broad sense. As we saw above, it has been ruled out that this information can be about underlying ontic states of the respective systems. Indeed, this is also explicitly ruled out by point (iv). Instead, the information represented by quantum states is taken to be about something other than ontic states (though what exactly differs per interpretation). This means that different agents/observers can validly assign different quantum states to the same system; hence, reasoning as from the point of view of another agent in the Frauchiger-Renner scenario becomes impossible/inconsistent, wherefore this class of interpretations rejects (C). A related commonality of these interpretations is that they posit a *subjective* Heisenberg cut: it depends on the particular observer relative to which the cut is defined which systems are treated as quantum and which as classical systems, with the observer themselves always placing themselves on the classical side (at least to some degree, i.e. one's body may be regarded as a quantum system) and other observers usually placed on the quantum side.

Adopting such a view where the quantum states of observed systems are relative to the observer entails that either (a) quantum states, just like a centred view on the world, colour, and a sense of now, be put firmly in the subjective viewpoint of observers (cf. section 3.1) and cannot be seen as directly corresponding to anything in the objective world, or otherwise (b) objectivism, the belief that there is one way how things in the world are at a given point in time, must be given up entirely. The two options are closely related, but do not necessarily entail each other, as we will see below.

One concrete instance of a Copenhagenish interpretation is *QBism*, which chooses option (a). It views quantum states as subjective in a stronger sense than just being relative to an observer/agent,[4] in that quantum states are taken to encode all the information that a particular agent has about a given system, but also depends on 'the agent's general worldview, temperament, etc.' [114, p. 4]. The quantum formalism merely tells agents how they should assign states and calculate the probabilities of measurement outcomes. The quantum states do not, however, describe the world underlying those experiences. QBists view quantum theory as a normative theory, informing agents about what to do and what to expect, rather than a descriptive theory of the world. QBism is compatible with a belief in objectivism, i.e. that there is one way the world is; quantum states simply do not describe this world. Note

[4]While the term 'observer' is a rather vague one with no clear definition, QBism requires observers to be conscious, be able to make decisions and take actions, wherefore the term 'agent', as a strong definition of an observer, is more apt in this context.

that this does not mean that QBists belief that the outcomes of quantum measurements are actually deterministic. Rather, they belief that 'nature does what it wants, without a mechanism underneath' [119, p. 19]. However, when quantum theory is taken to be a normative theory informing agents about the probabilities they should assign to possible outcomes, the question remains what it is about reality that accounts for this 'should', or in more philosophical terms: what *grounds* the (statistically confirmed) probabilities given by quantum theory? While Chris Fuchs, one of the originators of QBism, has expressed interesting ontological considerations in [119], I have not found a satisfactory response to this question.[5]

A.4 Relational quantum mechanics

Another interpretation that falls under the heading of Copenhagenish interpretations is Carlo Rovelli's *relational quantum mechanics* (RQM), also known as the relational interpretation. In my view, it is the most convincing interpretation to date, wherefore I decided to present in within a separate section on its own.[6] In contrast to QBism, where the vague concept of an observer is strengthened to an agent that observes the world consciously and that can take actions, in RQM any physical system can play the role of an observer and any interaction between physical systems counts as a measurement. In particular, consciousness plays no role in RQM. (This is also why the RQM literature prefers the neutral term 'variable' over 'observable'.) The central notion of RQM is that of *relative facts*: whenever two systems interact, the variables of one system take on values relative to the other system, playing the roles of observed system and observer, respectively. Crucially, variables take on valuations only at the moments of interaction and only relative to the observing system. These momentary and relative variable valuations are what constitute the relative facts. Interactions are always symmetric and lead to relative facts being established 'at both ends'.

Based on relative facts, systems can assign quantum states to the systems around them; as a simple example, when you measure the spin of an electron,

[5]Should you be interested to read more about ontological considerations with regards to QBism and to RQM (see next subsection), as well as a comparison of the two interpretations, I refer you first and foremost to [114] (which compares QBism and RQM) and [119] (which present some ontological ideas in the context of QBism), but also to an essay I wrote recently, which can be found here: https://maxpohlmann.github.io/and/epistemic_interpretations_of_QM.pdf.

[6]Note that some formulations of this section have been adapted or partially copied from the essay linked in the previous footnote.

the measured spin is a fact relative to you and you assign a corresponding quantum state to the electron; hence, quantum state assignment are relative as well (which is the sense in which RQM views quantum states as *broadly epistemic*). Note that we could just as well speak of the quantum state of the electron relative to some (unconscious) measurement apparatus or any other system that interacts with the electron so as to have relative facts about it. Hence, the quantum state does not describe the electron in itself, but is merely taken to be a 'computational tool to compute the likelihood of events' [120, p. 9] regarding the electron. However, based on the relative facts an observing system has about an observed system, the quantum state the former should assign to the latter is uniquely determined (unlike in QBism, where the quantum state is allowed to depend on personal attitudes of observers). Hence, the quantum state describes something intrinsic about the relationship between observing and observed system. So while the quantum state is not ontic as in describing a system objectively, it has a 'certain kind of ontological significance' [114, p. 4]. In particular, since relative facts get established at the time of interaction, this is also when superpositions collapse (because the assigned quantum state must be updated). Hence, the uncertainty present in the quantum formalism describes an inherent uncertainty of reality (and not one that is present merely in the epistemic attitudes of observers without an explicit grounding in reality as in QBism).

The relativity of relative facts and quantum states can be likened to relativity in other areas of physics. For example, the speed of an object is only defined relative to a fixed reference, and the notion of simultaneity is only defined with respect to a reference system in special relativity. However, while two (stationary) observers may agree upon the speed of an object relative to some reference, and every observer can determine the notion of simultaneity as seen from another reference frame using a Lorentz transformation, such a comparison of viewpoints is not as straight-forward in RQM. Relative facts *can* be compared between systems, but only, again, through a physical interaction between systems. Crucially, however, there is no *view from nowhere* that provides a full description of the world independent from any observer. This is the sense in which RQM rejects objectivism, choosing option (b) of the two options for epistemic interpretations we saw above.

Since consciousness/subjective experience plays no role in RQM, it would be misguided to characterise it directly in terms of subjective viewpoints. Conscious observers with subjective viewpoints are just (more or less) special cases of physical systems where we can intuitively speak of quantum states 'from the point of view of an observer' rather than 'relative to an observing system'; the two phrasings are semantically equivalent, though. In partic-

ular, conscious observers can be modelled as quantum systems. However, no system can take itself to be in a superposition. Hence, the (subjective) Heisenberg cut is always precisely such that only the system which is under consideration as the observing system, to which facts and states are relative, is seen as a classical system.

Let us see now how RQM resolves the Wigner's-friend paradox. When F measures S and observes some definite outcome, this outcome becomes a relative fact to F. Relative to W, F and S become entangled and are in a joint superposition. In particular, W can 'trace out' the state of S and will find it to be in a superposition, while to F it is in a definite state. This disagreement between W and F, however, is not a paradox but an explicit feature of RQM. When the door of the lab is opened, W interacts with F, establishing relative facts between the systems: relative to W, F is no longer in a superposition but in a definite 'I observed outcome x'-state.[7] There remains a conceptual difficulty for RQM: before W opens the door, F is in a proper superposition relative to W, which only collapses upon interaction. But, since universe branches as in MWIs are rejected, the result that F will communicate to W seems to be already determined before the door is opened, so the superposition state W assigns to F no longer encodes an inherent uncertainty of reality, but only an uncertainty of W. This, however, is a misconception based on a belief in objectivism, which has to be given up in RQM. In particular, there are two circumstances that elucidate the situation: (1) reality is taken to be determined only relative to the systems within it, so the facts of reality are only the relative facts, and (2) before opening the door, W has no relative facts about F, so the superposition state W assigns to F *does* encode an inherent uncertainty of *reality relative to* W. The fact that reality relative to F is consistent with reality relative to W (i.e. that F communicates the result that they did in fact measure) is not assured by some state of the objective world, but because interactions are always symmetrical, so there is only one pair of relative facts about the interaction between F and W (describing the interaction from each perspective) that is consistent with the previously established relative facts of each perspective.

Some aspects of RQM sound reminiscent of Everett's relative state interpretation. In contrast to the latter, however, RQM denies that measurements lead to a branching of the universe with each possible measurement result being observed in equally real branches; instead, measurements are simply

[7] The fact that W can use this to draw conclusions about S is because the relative fact of F about S is a *stable fact* for W due to decoherence effects. I will not explain this further and direct the interested reader to [121].

interactions which establish relative facts for the involved systems. Furthermore, while Everett maintained that the relative quantum states are illusory and objectively the universe is in one big superposition described by its absolute state, RQM rejects that there can be such an objective description of the universe irrespective of any system within it. As we noted above, this contradicts objectivism. Hence, objective realism is not compatible with an ontology that can accommodate RQM. The question arises what kind of ontology is compatible with RQM, then.

An ontology for RQM. Information, as given by relative facts, is a central notion in RQM. It is removed from any mental connotations and expresses simply the configuration of a physical system relative to another (observing) system. In particular, for the purposes of understanding quantum mechanics, our knowledge is nothing more than the configuration of the neurons in our brains. A relative fact, then, is a correlation between a variable of an observed system and a ('pointer') variable of the observing system. Hence, the ontology of RQM is committed to the existence of physical systems (in themselves) as well as a world in which they can interact, i.e. it is committed to metaphysical realism. This is also evident in Di Biagio and Rovelli writing that 'RQM takes the notions of physical system and quantum events happening between systems as primary' [120, p. 10]. This statement, however is juxtaposed with the same authors saying that RQM '[bases] its ontology on relative facts' [121, p. 7]. Moreover, they write of 'reality relative to one system' and identify it with 'the collections of facts relative to that system' [120, p. 6]. In this setting, the ontological status of relations (i.e. relative facts) and their relata (i.e. physical systems) is in need of disambiguation. A careful reading of the following passage yields a possible answer:

> [T]he description of the way distinct physical systems affect each other when they interact (and not the way physical systems 'are') exhausts all that can be said about the physical world. *The physical world* must be described as a *net of interacting components*, where there is no meaning to 'the state of an isolated system', or the value of the variables of an isolated system. The state of a physical system is the net of the relations it entertains with the surrounding systems. *The physical structure of the world* is identified as this *net of relationships*. [emphases added] [122, §3.1]

We might understand it at follows: the physical (external) world consists of physical systems that form the basis of the ontology. Contrary to the passage, something *can* be said about the physical systems in themselves,

namely what they are (e.g. an electron is an electron irrespective of being observed) and what *invariant properties* (e.g. nonrelativistic mass) they have. (Rovelli [123, p. 79] writes: 'to attribute properties to something when it does not interact is superfluous [...], for *there are no properties outside of interactions*. [Endnote:] The properties I am referring to are those that are variables: that is, those described by functions on the phase space, not the invariant properties such as the nonrelativistic mass of a particle.') All other properties, however, only exist with respect to interactions as relative facts. Concretely, physical systems, defined by what they are and what invariant properties they have, are ontological primitives, as are the relations between systems; all other properties of systems are defined only as relative facts with respect to other systems and hence ontologically depend on the relations. In this sense, the net of interacting systems is all that is left to be seen from an objective viewpoint.

Another answer to our question of the ontological status of relations and relata is possible: if we take seriously the statement that RQM '[bases] its ontology on relative facts' [121, p. 7], we are lead to adopt an ontology that is based *entirely* in relations. Such an ontology might be provided by OSR (cf. section 2.5.1), which has been considered as an ontological framework for RQM (see e.g. [122, §3.2]). In such a framework, physical systems are not ontological primitives, but depend ontologically on relations, i.e. it is meaningless to speak of a system without relations to other systems and any system can be said to exist and have properties only with regard to the relations it has to other systems. The following sentence by Rovelli can be seen to be in line with this view: 'There are no elementary entities that we can describe except in the context of their interaction with something else' [124, p. 148].

Both the first solution (taking the world to be a net of objectively existing but property-poor physical systems) and the second solution (taking the world to be constituted fundamentally of relations, i.e. OSR) can be seen as constituting an objective viewpoint or a 'view from nowhere'. In the next section, we consider another possible solution that does not require such a view from nowhere, by exploring how analytical nondualism works as an ontological foundation for an interpretation of quantum mechanics, in particular for RQM.

A.5 How analytic nondualism interprets QM

In this last section, we shall consider the implications analytic nondualism has for interpreting quantum mechanics. Concretely, analytic nondualism, as an ontology, is mostly compatible with RQM. Subjective experiences, with their experienced external world, constitute what in RQM is called 'reality *relative* to a physical system', where the relation between subjective experiences and physical systems is given through the concepts of *embedded facilitation* and *perspectives*, which we discussed in section 5.8.1 and section 5.11, respectively. (*Reality relative* to some system that is not conscious does, of course, not constitute a perspective and, as understood in analytic nondualism, is just a theoretical/abstract concept to make sense of quantum phenomena using RQM.) In RQM, the focus is on the interaction between systems, but in section 5.10.2, we saw that interaction between systems/experiences only happens within experiences and hence only on top of always-already/atemporally existing momentary experiences, so interactions do not *dynamically* alter reality. Furthermore, analytic nondualism allows for all *possible* momentary experiences to actually exist and, according to our current understanding of quantum theory, there is nothing about a random quantum event that would make one potential outcome *impossible*. (Compare this to classical mechanics, where it is actually impossible for, say, a perpetuum mobile to exist.) In combination, these aspects of nondualism imply an alteration of RQM towards a 'subjective many-worlds' interpretation (which RQM proper does not endorse). To see this, let us illustrate how analytic nondualism works as an ontological foundation for an interpretation of quantum mechanics by returning to the example of the Wigner's-friend thought experiment.

The setup is as above, except that we replace the arbitrary quantum system by the famous Schrödinger's cat (to be put to slumber rather than killed), for vividness. Concretely, we have 'subjects' W and F (i.e. two coherent sequences of experiences with a shared world between them) and a system S consisting of a cat in a box together with some tranquilliser-injecting mechanism; F is in a room with S and W waits outside the room. We begin at time t_0. Then, the process that either does or does not put the cat to sleep is executed, bringing us to time t_1, after which F looks into the box and finds either outcome, now at time t_2. Lastly, F opens the door and informs W of the outcome, ending the experiment at time t_3. We assume that the box and the door are properly closed so that before opening each, no information about the goings-on inside at all is available to F or W, respectively.

Now consider what is happening from each perspective. Firstly, at t_1, the experience had by F contains no information about the wakefulness of the cat, i.e. F's experience in the case where the cat is asleep and F's experience in the case where the cat is awake are indistinguishable and hence *identical*. In other words, in the experiential world of F, the wakefulness of the cat really is indeterminate, i.e. it is in a (macroscopic) superposition. Now F opens the box and finds the cat either asleep or awake; in fact, both experiences are *possible* (according to our understanding of quantum mechanics) and hence actually *exist* as consistent continuations of the preceding experience (cf. section 5.7.2). Consider now W's experience. At t_1, the wakefulness of the cat in W's experience is just as indeterminate as in F's; furthermore, the state of F, as an agent with knowledge, is determined to also be oblivious about the cat's state. At t_2, in the experience of W, the state of F, as an object in the world of W, becomes entangled with the state of the cat: to W, the room is now in a superposition of a state where F is looking at an asleep cat and a state where F is looking at an awake cat. Finally, at t_3, there are two consistent experiences of W: one where he joins F in gleefully petting the cat and one where they discuss the ethics of needlessly tranquillising a cat for science.

It is crucial to notice that it is not the quantum event itself nor its observation by *some* conscious being that leads to a collapse of the superposition and a split in the timeline; rather, the collapse is nothing else but the circumstance that the superposed states cease to be *indistinguishable* within the respective conscious experience. The observation does not affect the world or *cause* a collapse, it simply introduces a distinguishing criterion to the conscious experience. If we consider the experience E_s^F where F sees a sleeping cat and the experience E_w^F where F sees a wakeful cat (at time t_2), one might say that the momentary experience preceding E_s^F is different from the one preceding E_w^F, because in the one the cat is already dead and in the other alive, but the point is that as momentary conscious experiences of F, these 'two' experiences are indistinguishable and hence one and the same. Therefore, the observation constitutes a branching of the *subjective* timeline of each observer.

Above, I have been quite sloppy with my use of temporal concepts, talking of 'following' and 'preceding' moments. It should be clear that I am referring to jumps in time as given by the steps of the thought experiment and am not requiring time to have a discrete structure. Furthermore, the thought experiment is, like every though experiment, idealised. Importantly, the lid of the box and the door of the room are assumed to *entirely* block off any information from leaving the respective containers. By distinguishability, I

do not mean whether there is cognitive understanding of what has happened within the experience, but whether there is any difference between the two possible experiences whatsoever. If F, after the possibly-cat-tranquillising process is executed, hears a sound from the box, but is not sure whether the cat meowed vitally or snored somnolently, the experiences are, already then, no longer indistinguishable. Lastly, we need to consider what the above interpretation of the thought experiment means for our notion of a shared reality. Specifically, at t_2, there are two possible experiences, E_s^F and E_w^F, of F, and one experience E^W of W where he is oblivious about what happened in the room. Then, the shared reality of, say, E_s^F and E^W is simply not defined with respect to the cat, because the state of the cat is not something that is shared between the experiences. Were we always to require a fully and well defined notion of shared reality between subjective experiences, it would be tantamount to requiring a God's-eye view (an objective viewpoint) of reality. Allowing for the external world to be indeterminate (regarding unobserved experimental outcomes) and for the shared reality to be undefined (in certain aspects) is the paramount strength of analytic nondualism in making sense of quantum mechanics.

Afterword

I feel an immense sense of closure.

During my early adolescence – I think I was about 10 or 11 – I had a phase where I questioned the reality of anything, up to the point of a bit of an existential crisis, plagued by the solipsistic possibility that my own experience was the only thing that really existed and that no-one and nothing else was 'real'. (Looking back, it seems that I may have been suffering from a somewhat mild form of depersonalisation–derealisation disorder.) This only lasted for a few weeks, I think, until I managed to think myself out of it by telling myself that, while I may never know for certain that other people have experiences as well, it seems highly unlikely that my own experience should be the only existent thing *at all*. Though I did not know it back then, this was the initial impetus for the worldview that I have presented in this thesis.

Some years later, in 2013, I watched a video by Michael Stevens (on his YouTube channel *VSauce*), in which he discusses solipsism and related philosophical ideas.[1] I recognised the concept from my earlier episode and became enamoured with ideas from metaphysics and the philosophy of mind, reading about them online and, in the process, developing a metaphysical standpoint that made sense to me, based on my earlier experience.

At the end of 2016, I created a text file on my computer, in which I started jotting down ideas about consciousness and metaphysics with the intention to eventually turn them into a coherent text at some point. (Rereading these notes now, given that I have not actually looked at them for a long time even while writing this thesis, I am surprised to see how consistent the theory I presented in this thesis actually is with the unordered ideas I wrote down all the way back then.) In the subsequent years, I added on to these notes continually, appended new ideas and refinements, and added insights from other texts I read. Most significantly, Sam Harris's book *Waking Up* [1], which I read in 2017, has had a huge influence on the development of my ideas, as did the meditation practise I took up upon reading this book.

[1] *VSauce – Is Anything Real?*; see https://www.youtube.com/watch?v=L45Q1_psDqk.

In 2020, I felt I was ready to finally turn all these notes and the ideas floating in my head into a coherent piece of writing in which I present my worldview. Given a lack of time and/or a tendency for procrastination, I at least created an item in my to-do app, giving myself the humble task (with questionable grammar) to 'write consciousness'. This task has been glaring at me ever since. Given that I have now spend a little over half a year working on this thesis, it is no wonder that I could not find the time before.

The process of writing this thesis was extremely rewarding, but also quite challenging. Since it was supposed to be a piece of academic writing placed within academic philosophy rather than a mere write-up of the idiosyncratic ideas of some guy, I began by reviewing the literature. With each new book I opened or paper I found, I either felt animated to expand the scope of the thesis, to discuss one more interesting position or to add another section to the background chapter, or otherwise felt disheartened because someone else had already discussed what I held to be personal insights in a much more thought-out, well-structured, and eloquent manner than I could ever hope to do. Moreover, I felt that I knew way too little about this vast philosophical field that exists around these questions that I had become so enamoured with. How could I write about my ideas without having studied the ideas of those that came before me and, more importantly, the criticisms of their ideas that apply to mine as well? The only way for me to rid myself of this disheartenment was to admit and accept my ignorance of vast ranges of the literature, try to incorporate my understanding of that which I had read so as to write something that will have a place within the forum of philosophy, and hope that there is at least something novel and, more importantly, true about my ideas that makes them worthwhile for me to write down and for someone else to read. In this spirit: I hope that you do not consider reading this thesis a waste of time. I certainly do not consider writing it as such.

Today, after handing in this thesis, I can finally check off my task to 'write consciousness'. I will have finished my basic academic education (technically only after the public defence, but still). And I will have thought a thought that I had almost 15 years ago to its conclusion. (It is quite a satisfying coincidence that tomorrow marks the end of the year as well.) Though I will probably never be able to stop thinking about the nature of the mind and of reality, today marks the conclusion of many things in my life. That is why I feel an immense sense of closure.

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