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The Relation Between Attention and Awareness  
in Visual Experience

by

Vivan Joseph

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for the degree of Doctor of Philosophy in Philosophy

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## Declaration

This thesis is submitted to the University of Warwick in support of my application for the degree of Doctor of Philosophy. It has been composed by myself and has not been submitted in any previous application for any degree.

## Thesis Abstract

We can distinguish different forms of attention, for example paying attention to what we are thinking about, paying attention to what we hear, and paying attention to what we see or otherwise visually experience. This thesis is concerned with the form of attention paid to what we visually experience – visual attention. A natural way to think of visual attention is as sufficient for visual awareness: visually attending to an object is sufficient for being visually aware of it. (Plausibly, the relationship is closer. Visual attention is a way of being visually aware.) But we shouldn't think of visual attention as necessary for visual awareness: we can be visually aware of objects that we are not visually attending to. In this thesis I provide a novel defence of the pre-theoretical conception of visual attention as sufficient, but not necessary, for visual awareness.

Some psychologists have interpreted evidence, in particular from experiments involving subjects with blindsight, as proof that visual attention to an object is possible in the absence of any visual awareness of it. I argue we should not think of these results as proving that attention is not sufficient for awareness, but instead see them as motivation for a distinctively philosophical inquiry into the role of visual attention. I examine different explanations of the significance of visual attention for thought and action, ending with my own.

Other psychologists have claimed, on the basis of experimental data, that visual attention is necessary for visual awareness. I argue this is inconsistent with the phenomenology of visual experience, and with other experimental data.

I conclude that visual attention is sufficient but not necessary for visual awareness.

## **Chapter 1: Setting the Scene**

In this chapter I begin by setting out what I take to be a recognisable pre-theoretical way in which we think about attention and awareness in visual experience. We can distinguish different forms of attention, for example paying attention to what we are thinking about, paying attention to what we hear, and paying attention to what we see or otherwise visually experience. This thesis is concerned with the form of attention paid to what we visually experience – visual attention. It is natural to think of visual attention as sufficient for visual awareness: visually attending to an object is sufficient for being visually aware of it. (Plausibly, the relationship is closer. Visual attention is a way of being visually aware.) But we shouldn't think of visual attention as necessary for visual awareness: we can be visually aware of objects that we are not visually attending to. Some psychologists have interpreted experimental data as showing that visual attention is necessary but not sufficient for visual awareness. This thesis aims to defend the pre-theoretical conception described.

### **1. Initial Motivations**

Those of us with normally functioning vision are able to think about and act with respect to our immediate physical environment on the basis of seeing it. We are able to think about and act with respect to particular objects in our immediate environment on the basis of visually picking them out: someone may draw my attention to the book I am looking for, allowing me to visually pick it out from the pile of books surrounding it. Conversely, our visually picking out or attending to a particular object becomes intelligible when it is for the purpose of thought or action.<sup>1</sup> However, visually attending to one object needn't mean losing sight of surrounding objects. I can attend to a particular book among a pile of books for the purpose of thinking about it, or acting with respect to it, while remaining aware of the other books surrounding it. This way of thinking about the relationship between attention and awareness in conscious visual perception has implications for the philosophical understanding of conscious visual perception, as well as for understanding the explanandum of psychological research on attention. I'll return to philosophical and psychological considerations shortly. Before that, I want to give a brief initial indication of what I mean by 'visual awareness' and 'visual attention'.

When I look around, I see a variety of objects of different shapes and colours, at varying distances and directions from me. This is true whether it is the clutter of books and papers on my desk, a scene of fields stretching

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<sup>1</sup> By 'thoughts' I mean the propositional content of a propositional attitude, such as believing or judging that something is the case, but I mean to restrict 'thoughts' to *conscious* thoughts, for example the propositional content of an occurrent belief or conscious desire.

down to a stream, or an unexpected face at the window. I am *visually aware*<sup>2</sup> of the books, the dog-walkers in the fields, and the face at the window – they figure in my visual experience.

If you realise I am looking for a particular book on my desk, and you know where it is (no doubt buried under several others), you might *draw* my attention to it. If my attention is *caught* by an unexpected face at the window, I might be sufficiently startled to altogether cease *paying* attention to what is on the television, even if just briefly. Not only am I aware of what my attention is drawn to, caught by, or paid to, but I know that I am attending to it. Visual attention to our environment is part of our everyday experience, and part of our everyday use of language. It is this very pervasiveness that makes sense of the much quoted sentence from William James' Principles of Psychology, "Everyone knows what attention is."<sup>3</sup>

James goes on to describe attention as

"... the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others..."<sup>4</sup>

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<sup>2</sup> As I will use the term 'visual awareness', if I am visually aware of something I am conscious of it (though I can also be conscious of things that are not visual, but auditory, for example). My visual experience includes what I am (consciously) visually attending to – what I have visually picked out – and what I am visually aware of but not attending to.

<sup>3</sup> James (1983) p. 381.

<sup>4</sup> James (1983) p. 381-382.

In addition to perceptual (e.g. visual or auditory) attention, James also means to include the paying of attention to what we are thinking about, an example of which might be completing a mental calculation. Focussing attention on a mental activity or task need not require any perceptual input at all – calculating the product of two numbers could quite conceivably be accomplished without relying on perceptual awareness. Indeed, if the mental arithmetic is difficult, ignoring perceptual input while executing the calculation would be an instance of ‘withdrawal from some things in order to deal effectively with others’. So visual attention is a type or form of attention, along with auditory attention (another form of perceptual attention), and the paying of attention to what we are thinking about (a non-perceptual form of attention).

While we are familiar with non-perceptual attention, the relation between visual attention and intentional behaviour may not be as obvious. When we pay attention to something we see – visually attend to it, as I shall say – that object becomes the focus for one sort of intentional behaviour. The object becomes the focus for intentional behaviour for which vision is necessary – *visually based* intentional behaviour. If I am visually attending to an object, I am in a position to respond to it intentionally, and my response to it will take precedence over my response to anything else I might also be seeing. So, for example, if I am looking for a particular book among a pile of books, I will be in a position to intentionally act with respect to the book I am currently attending to, not the book I am about to attend to, or the book I was attending to. This is true both when our attention is voluntarily exercised, as it

is in the case of looking for the book, and when our attention is involuntarily caught, as it might be by a sudden flash of light. Our visual attention to objects also *explains* our visually based intentional behaviour, and our visually based thoughts<sup>5</sup> about them. My reaching towards the book is explained by my visually attending to it – I can see where it is. My visual attention to the book also explains my thinking ‘That’s the book I want’. Moreover, my visual attention to the book explains the relation between that thought and action: my thought and action are about the book.

Philosophical interest in aspects of attention can be traced back to Aristotle (Hatfield (1998)), but more recent philosophical work on attention has tended to follow in the wake of several decades of empirical psychological research, beginning with auditory attention. Early work in the 1950s investigated the ‘cocktail party phenomenon’, the ability of listeners to select one out of several different simultaneously presented sounds (e.g. voices at a cocktail party). The circumstances under which this was possible as well as the extent to which listeners were aware of the other (ignored) sounds were investigated. Experiments made use of the dichotic listening task, which involved presenting different sounds or speech simultaneously to both ears via speakers or headphones. The experimental subjects had to complete some task, such as recalling the words played to one ear, or repeating (‘shadowing’) the words played to one ear (Styles (2006), Driver (2001)).

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<sup>5</sup> That is, thoughts for which vision is necessary.

An influential early theory of attention that made use of this research is Donald Broadbent's filter theory. In *Perception and Communication* (Broadbent (1958)), Broadbent examines experimental results in the light of communication theory and proposes a capacity limit on processing simultaneously presented stimuli, analogous to the capacity limit on communication channels such as telephone lines. Early in the book, Broadbent argues for the use of experimental methods that 'set the subject some objectively scorable task' rather than relying on subjects' descriptions of their experiences.<sup>6</sup> As we will see shortly, this has become the norm. In the 1958 work, Broadbent does at least mention the importance of congruence between the results of psychological research and common sense.<sup>7</sup>

More recently, Harold Pashler has described the approach of psychologists researching attention as follows:

"Most present-day attention researchers work in the tradition sometimes called *information-processing psychology*. Their avowed goal is not to characterize conscious experience per se, but rather to trace the flow of information among different representational systems in the mind/brain. For the most part, they place little stock in introspection as a means of achieving this goal, relying instead on recording observations of human behaviour in laboratory settings."<sup>8</sup>

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<sup>6</sup> Broadbent (1958) p. 8.

<sup>7</sup> Broadbent (1958) p. 35. On p. 300 he states that 'it would be a poor set of scientific principles' that were 'contrary to everyday observation', though in other places he is ambivalent (e.g. pp. 58-59).

<sup>8</sup> Pashler (1995) p. 73.

The limitations of this ambition are rather disappointing. If the aim of attention research in psychology is not to characterize conscious experience, surely the research excludes a vital part of what attention is. Pashler is careful to preface the quoted section by urging caution about the ‘confusion’ that can be caused by ‘smuggling terms like attention into scientific discourse from ordinary language’.<sup>9</sup> I think if psychologists use the word ‘attention’ to identify the subject matter of their research, they ought to be understood as making claims about that aspect of our everyday experience which James was happy to declare we all know.

Instead, psychologists tend to treat the characteristics of attention in its everyday sense, such as its selectivity and limited capacity, as phenomena to be individually investigated.<sup>10</sup> Of course, one way of conducting such an investigation has a long history in both philosophy (Hatfield (1998)) and psychology; James addresses the question of how many things we can attend to at once.<sup>11</sup> But the danger with this approach is that conclusions about attention could be drawn on the basis of the empirical study of just some of its characteristics, ignoring essential aspects of what attention is. A prime example of such a conclusion is the claim that visual attention to an object is possible in the absence of any visual awareness of it. Robert Kentridge and colleagues have interpreted data from spatial cuing

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<sup>9</sup> Pashler (1995) p. 71.

<sup>10</sup> Pashler (1998) pp. 2-3. In particular, “... our commonsense metaphysics of mental life points out, and in a very loose way might be said to try to explain, a number of phenomena: selectivity of perception, voluntary control over this selectivity, and capacity limits in mental functioning that cannot be attributed to mere limitations in our sensory or motor systems. These are the core phenomena addressed by attention research...” (p. 3).

<sup>11</sup> James (1983) p. 383.

experiments with a neurologically impaired subject to show that this is possible.<sup>12</sup> Yet in our everyday use of ‘attention’, we would be hard-pressed to think of a situation where visual attention was focussed upon an object in the absence of any visual awareness of it. I can’t voluntarily attend to one among the pile of books on my desk without being aware of the book, and if my attention is caught by a face at the window, I become aware of the face.

Another aspect of our everyday understanding of visual attention has come into question on the basis of a different experimental paradigm. Arien Mack and Irvin Rock’s experiments required subjects to focus their attention on a rapid visual discrimination task. An unexpected stimulus was briefly presented to the subjects while their attention was focussed on the discrimination task. A large number of subjects failed to notice the unexpected stimulus, and this result was taken to show that “... there seems to be no conscious perception without attention.”<sup>13</sup> Now, there may be occasions on which we concentrate on something, and as a result we ignore or fail to become aware of something else, but this surely does not prove that we are only ever aware of what we attend to. If visual attention is understood in the pre-theoretical sense outlined earlier, Mack and Rock’s claim means that visual attention to an object, such as one among a pile of books, precludes visual awareness of the other books in the pile. This seems straightforwardly wrong, suggesting that what is meant by visual attention in the claim is not the same as what is meant in the pre-theoretical sense outlined.

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<sup>12</sup> Kentridge et al. (1999).

<sup>13</sup> Mack and Rock (1998) p. ix.

It may seem at this point that too much weight is being put on what I have been calling variously a 'natural', 'everyday', and 'pre-theoretical' sense of visual attention as sufficient but not necessary for visual awareness. Felipe de Brigard<sup>14</sup> argues 'against the claim that, according to our commonsense psychology, consciousness is necessary for attention' on the basis that 'there isn't such a thing as *the* view of commonsense psychology about the relation between attention and consciousness'.<sup>15</sup> Can the issue be decided by surveying public opinion? I agree with de Brigard that it cannot, though my motivation for saying so differs from his. According to de Brigard,

"... there is little agreement, in so far as our commonsense psychology is concerned, about the relation between attention and consciousness. Although there may be some consistency to the way in which most people use these terms in common parlance, there are definitively certain situations in which our preference for one or another is context-dependent, i.e. dependent on the category against which each term is contrasted."<sup>16</sup>

I agree with de Brigard that it is a mistake to assume that the way we use the words 'attention' and 'consciousness' in our day-to-day speech is either entirely precise, or always consistent. However, my motivation in writing this thesis depends on my belief that philosophical research has a contribution to make to our understanding of visual attention and visual awareness. *Pace* de Brigard, I think philosophical investigation can reveal how we *should* understand visual attention and visual awareness. This is a claim about the

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<sup>14</sup> de Brigard (2010).

<sup>15</sup> de Brigard (2010) p. 190.

<sup>16</sup> de Brigard (2010) p. 200.

meaning of 'visual attention' and 'visual awareness': regardless of variations in current usage, we should understand visual attention to be sufficient, but not necessary, for visual awareness. To embark on this task, it will suffice if I begin with a conception of the relation between attention and awareness that the reader will recognise, whether or not this conception is acknowledged by everyone, in every situation.

I reject de Brigard's proposal, that we should 'further define' our pre-theoretical conceptions 'in cognitive and/or behavioural terms in conformity to verifiable evidence'.<sup>17</sup> Instead, we ought to conduct a *philosophical* investigation of the role that visual attention plays when it is understood as sufficient but not necessary for visual awareness. If I am right, visual attention conceived like this plays a role in our visual experience that so-called attention without awareness cannot play. In turn, what legitimises this conception of visual attention is that it plays this role.

I have said that according to a recognisable way of thinking about visual attention, if someone is visually attending to an object, they are also visually aware of it. I am not suggesting, though, that we should simply assume this pre-theoretical conception is correct. I think that this conception can be sustained by identifying *why* visual attention must be conscious to explain our visually based thoughts and actions in the way it does. That is, I think we can vindicate this conception of visual attention by determining what it is

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<sup>17</sup> de Brigard (2010) p. 200.

about the role visual attention plays in relation to our visually based thoughts and actions that requires it to be conscious.

I have also said if someone is visually attending to an object, such as one book in a pile of books, they may at the same time be visually aware of the other, unattended, books in the pile. When I reflect on my visual experiences, it seems quite clear to me that I am visually aware of objects that I am not visually attending to, but I will corroborate this evidence from introspection with experimental results.

In this thesis I will defend the conception of visual attention and its relationship with visual awareness that I have described against the revisionary conceptions proposed by some psychologists. The alternative conceptions some psychologists have interpreted their data to support, it will be argued, do not allow us to understand our visual experiences, and visually based thoughts and actions in the way we do. The thesis is structured around two questions:

- (i) Is a subject's visual attention to an object (or property) sufficient for the subject to be visually aware of it?
- (ii) Is a subject's visual attention to an object (or property) necessary for the subject to be visually aware of it?

While philosophical interest in attention has been growing in the last few years, there has been less interest in defending the pre-theoretical

conception of visual attention and visual awareness outlined here. In some cases, the treatment of attention has not properly distinguished perceptual attention from the paying of attention to what we are thinking about.<sup>18</sup> If, as I claim, visual attention to an object is sufficient but not necessary for visual awareness of the object, there is a significant difference between attention in thought and visual attention. When we pay attention to what we are thinking about, we are conscious of the thoughts that occupy our attention. When we visually attend to an object, we are conscious – visually aware – of the object, but we are often also visually aware of other adjacent objects. Consider again visually attending to a book on a shelf of books. In visually attending to one book, I visually pick it out, but I remain aware of other adjacent books. But I am not, in a corresponding way, conscious of thoughts I am not attending to. I am just conscious of the thoughts I am attending to. The relationship between visual attention and awareness is quite different from the relationship between attention in thought and awareness of those thoughts, and this difference is matched by a difference in the distinct contribution visual attention makes.

Another kind of philosophical treatment of attention approaches it from the perspective of empirical psychology.<sup>19</sup> This, in my view, gets things exactly the wrong way around. As the ubiquitous quote from William James reminds us, everyone knows what attention is. There may be variations in usage, but there is a clearly recognisable conception of paying attention to what we see,

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<sup>18</sup> E.g. Watzl (2011).

<sup>19</sup> E.g. Prinz (2005), (2011). This is also de Brigard's concluding proposal in de Brigard (2010).

according to which we are aware of what we are attending to. Equally clear is our ability to visually attend to one object while remaining visually aware of surrounding objects. Attention is part of our everyday lives. Our starting point should be what we know and experience: the pre-theoretical conception of visual attention and awareness I have outlined here.

## **2. Chapter Overview**

In Chapter Two I set out the evidence in Kentridge et al. (1999) and critically examine their interpretation of it as showing that blindseers are able to visually attend to objects they lack any visual awareness of. I begin by describing the experimental evidence (§2). I consider a challenge to Kentridge's interpretation from Christopher Mole (§3-§4), highlight a problem with the challenge (§5), and raise a question of my own: does the experimental task described in §2 measure the effects of *attention* in blindsight? I end by examining Kentridge et al.'s response to Mole (§6), and offering a tentative explanation of the mystifying description by the blindseer that he was 'trying to attend' (§7).

In Chapter Three I identify how visual attention, conceived as sufficient for awareness, explains our visually based object-directed thoughts and actions in a way that the selective enhancement the blindseer is capable of does not. I consider four candidates for this explanatory role. In §2 I consider whether visual attention enables us to have spontaneous (i.e. unprompted) visually based object-directed thoughts and actions; in §3 I look at Declan Smithies'

Rational Access account of the explanatory role of attention; in §4 I look at John Campbell's Relational View account of the explanatory role of attention, and in §5 I propose my own reasons-based account.

In Chapter Four I critically examine the claim that visual attention is necessary for visual awareness. The claim is based on the results of experiments in which subjects had to concentrate on a task, and while doing so failed to notice a task-irrelevant stimulus in full view, a stimulus which when they were not engaged in the task, they invariably did notice. I describe some of the experiments in §2. The common-sense explanation of why subjects in these experiments fail to notice the task-irrelevant stimulus is that they were concentrating on the task. When we are concentrating on a task, and this includes visual tasks, we tend to ignore distractions. In §3 I outline experimental evidence that supports the common-sense explanation.

In the concluding chapter, Chapter Five, I return to the key points of previous chapters.

## Chapter 2: Blindsight and Common Sense

In this chapter I set out the evidence in Kentridge et al. (1999) and critically examine their interpretation of it as showing that blindseers are able to visually attend to objects they lack any visual awareness of. I begin by describing the experimental evidence (§2). I consider a challenge to Kentridge's interpretation from Christopher Mole (§3-§4), highlight a problem with the challenge (§5), and raise a question of my own: does the experimental task described in §2 measure the effects of *attention* in blindsight? I end by examining Kentridge et al.'s responses to Mole (§6), and offering a tentative explanation of the mystifying description by the blindseer that he was 'trying to attend' (§7).

### 1. Introduction

Seeing objects and people can prompt us to think about them, and perhaps act with respect to them. When on the basis of seeing something we have a thought about it, or act with respect to it, the sort of seeing we are normally talking about is *conscious* visual perception, that is, visual experience. Correspondingly when we talk of an object 'grabbing our attention', or 'drawing someone's attention' to an object in their immediate environment, we are talking about getting them to perceptually (e.g. visually or aurally)

experience it. The same is true of talk of someone 'paying attention' to an object in their environment.

Visually based thoughts and actions need not, of course, be directed at a single object. I can think about the beautiful view from my window, and I can run away from multiple pursuers. When we do think about or act with respect to a single object on the basis of vision, the object is visually 'picked out' from its surroundings. Not all object-involving actions are, in this way, visually based and object-directed. If I close my eyes and spin around on the spot till I become disorientated and then reach out and grab the first object that comes to hand, my action of grabbing that object is neither visually based, nor is it directed towards that particular object: which object I end up grabbing is a matter of chance. We can contrast that case with another, where I see a particular object, such as a coin, and as a result of seeing it I reach out and grab it. In this instance, my action is visually based and object-directed. Similarly, if by chance the word 'raccoon' enters my thoughts, the presence of a racoon in my vicinity does not make my thoughts either visually based, or about that racoon. If, instead, on the basis of seeing the racoon, I think 'Raccoon!' then my thought is both visually based and object-directed. When an object-directed thought or action is visually based, the relevant visual information must be selected: visual information pertaining to the coin provides the basis for my grabbing of it; visual information pertaining to the racoon provides the basis for my thinking about it.<sup>20</sup> In some cases I

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<sup>20</sup> At this point I am leaving open how we think about what I have termed 'visual information' – that is, I am leaving it open whether, for example, we think of what is visually selected as physical objects and spatial locations, or some form of mental representation.

might express a visually based object-directed thought of mine using a perceptual demonstrative (e.g. 'That car is red' said of a car I see).

These preliminary considerations, brought together, extend our understanding of visual attention. What we normally mean when we talk about visual perception, including the visual perception involved in visually based thoughts and actions, is conscious visual perception, or, as I shall usually say, visual experience. Typically, when we talk of attention, the object being attended to is something that the person who is attending is aware (i.e. conscious) of. And what I have called visually based object-directed thoughts and actions require the selection of visual information pertaining to the relevant object. Now, attention in the case of perceptual phenomena is itself thought of as consisting, at least in part, of a kind of selection.<sup>21</sup> When someone's attention is drawn to an object, the relevant object is singled out – selected – from its surroundings. These considerations together suggest that visually based object-directed thoughts and actions require the thinker or agent to be visually aware of the relevant object because they require visual attention, and visual attention to an object is sufficient for awareness of it. (Actually, I think the way we usually think of visual attention goes further – I think we conceive of visual attention as a way of being visually aware, rather than simply as something 'constantly conjoined' with visual awareness.) When I think 'Racoon!' as one stares back at me, it seems that thought depends on me visually attending to the racoon, and when racoon and I

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<sup>21</sup> E.g. the 'selectivity of perception' is among the 'core phenomena addressed by attention research' Pashler (1998), p. 3.

hurriedly part company, it seems my moving away from the racoon depends on me having visually attended to the racoon.

Despite its natural appeal, this view faces a serious challenge. Individuals with the condition known as blindsight can have thoughts about objects, and carry out actions with respect to them, and though those thoughts and actions are based on visual information from the objects, the blindseer lacks any visual awareness of them.<sup>22</sup> A blindsighted subject can reliably detect whether, and in some cases what sort of object is presented to his blind field when he is prompted to respond. This is not merely object-involving in the sense outlined earlier, where the object might be involved purely by chance (e.g. the coin grabbed by chance, or the thought 'Racoon' that by chance is coincident with the presence of a racoon). The blindsighted subject's ability to detect objects can be spatially directed to a particular object, and result in intentional action (reporting the presence of the object). This suggests that visually based object-directed thoughts and actions *are* possible in the absence of visual attention to the relevant objects.

We are in a quandary. On the one hand, when we think or act on the basis of seeing an object, those thoughts or actions seem dependent on our visually attending to the object. On the other hand, in the blindsight cases there is evidently visually based behaviour directed towards objects without awareness of them. Given that blindseers *are* capable of visually based

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<sup>22</sup> For example, Robert Kentridge and Charles Heywood report the blindseer GY saying, of cues presented to his blind field, "I'd be none the wiser if you weren't putting any cues up just to confuse me". Kentridge and Heywood (2001) p. 174.

object-directed thoughts and actions without any visual awareness of the relevant objects, this immediately prompts a question. Is visual attention to an object *also* possible in the absence of any awareness of it?

While we don't normally think it is possible to attend to something while remaining unaware of it, it might be countered that our normal way of thinking of attention does not take into account recent discoveries about the nature of vision. In particular, our normal way of thinking of attention does not take into account the performance of blindsighted subjects (or the performance of subjects with unimpaired vision under certain conditions). Evidence from experiments with subjects with blindsight has been interpreted by some psychologists, among them Robert Kentridge, to demonstrate that visual attention *is* possible in the absence of visual awareness. The kind of pre-theoretical understanding of visual attention I outlined in the previous chapter has been the inspiration for some philosophers, among them Christopher Mole, to remain committed to the sufficiency of attention for awareness. Looking in some detail at the evidence and argument against sufficiency presented by Kentridge and his co-authors makes clear exactly what is being claimed. Careful examination of the defence of sufficiency made in response by Mole and the counter-response by Kentridge and colleagues also underlines the importance of ensuring that cross-disciplinary talk of attention does not end up being talk at cross purposes.

The exchange takes place primarily in two articles, one authored by Mole (Mole 2008), and the other jointly by Robert Kentridge, Lee de-Wit and

Charles Heywood (Kentridge et al. 2008). Those papers were themselves prompted by an earlier article co-authored by Robert Kentridge (Kentridge et al. 1999), contending that visual attention is possible in the absence of awareness; the latter article is outlined in the next section. In the section after that (§ 3), I set out Mole's commonsense view of attention. In Section 4, I examine a challenge to Mole's view from the case of a vigilant observer. In Section 5 I look at whether, through this exchange, Mole and Kentridge et al. have ended up talking at cross purposes. Section 6 looks at further evidence in favour of their view Kentridge and his co-authors put forward, and the final section considers how to understand a blindseer's description of himself as 'trying to attend' in the absence of visual awareness.

## **2. Attention in Blindsight**

'Blindsight' is

"... a condition caused by brain damage in which a person is able to respond to visual stimuli without consciously perceiving them. It is associated with damage to human primary visual cortex (otherwise known as striate cortex or area V1) which causes blindness in parts of the affected visual fields, with a size and shape to be expected from the classical retino-cortical maps. If, however, subjects are required to guess about stimuli presented to their blind fields, they may be able to locate them in space or to discriminate

them from each other, despite saying that they do not see them and have no awareness of them.”<sup>23</sup>

Within an experimental paradigm designed by Michael Posner and others,<sup>24</sup> an increase in the speed or accuracy of response to the presentation of a visual target preceded by a cue, when the cue correctly predicts the target’s location compared to when it incorrectly predicts the target’s location, is understood to be due to the effects of spatial attention.<sup>25</sup> The subject maintains fixation (that is, keeps looking directly at) the centre of the display, and shifts attention covertly (without movement of the eyes) to the cued location before making a report (typically a button press) to indicate whether or not a target is presented. Eye movement is usually monitored, so responses following overt orienting eye movements can be discarded.

Robert Kentridge, Charles Heywood and Lawrence Weiskrantz were inspired to use the Posner paradigm with a blindsighted subject, GY, by a spontaneous remark made by him during a set of experiments in 1997:

“GY is a very experienced subject, but in the vast majority of experiments he had participated in previously, stimuli were presented in locations on the horizontal midline. Quite by chance, during one of the breaks in testing, GY remarked that he had just

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<sup>23</sup> Weiskrantz (2007) p. 175.

<sup>24</sup> The paradigm is described in detail in Posner (1980).

<sup>25</sup> I examine the motivation for this in Sections 5 and 6.

realized that the stimuli were sometimes being presented well above the horizontal and so now he was trying to pay attention higher up in his blind visual field.”<sup>26</sup>

In their (1999) paper, Robert Kentridge, Charles Heywood and Lawrence Weiskrantz describe using the Posner paradigm to test whether GY could exercise attention in this way.

Items were presented to GY on a monitor screen, which was positioned in such a way that part of it was in GY’s blind field. GY’s task was to use a button press to report, as quickly as he could, whether or not a target was presented to his blind field when he heard an auditory signal. Just prior to the auditory signal, a visual cue signalled the probable location of the target, if one was presented. After each response, GY had to confirm whether or not he had been visually aware of the target. In half the trials, no target was presented, and in the trials in which a target was presented, the cue was valid (i.e. correctly predicted the location of the target) just over two-thirds of the time.

Two different sorts of cue were used, an arrow in the middle of the display which GY was visually aware of (‘central cue’), and a pair of bars one each above and below the target’s possible location in GY’s blind field (‘direct peripheral cue’). In the central cuing condition, GY was faster at detecting the target when the cue was valid than when it was misleading (i.e. indicated the

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<sup>26</sup> Kentridge and Heywood (2001) p. 168. GY’s visual deficit means he is not aware of what, without the deficit, he would see with the right half of both of his eyes (right homonymous hemianopia). His vision in the left half of both his eyes is normal.

wrong location for the target), and more accurate in his reporting of whether or not a target was presented when the cue was valid than when it was misleading. This indicates that the difference in the speed of his responses could not be explained simply as a trade-off between speed and accuracy.

If the central cue was misleading, the accuracy of GY's responses was around chance (53%).<sup>27</sup> When the central cue was misleading, and despite this GY's response was correct, his reaction time was 'significantly slower' than for his incorrect responses, or his responses when no target was presented.<sup>28</sup> That is, something appeared to be making his reaction times slower when his responses were correct despite the cue being misleading, in comparison to the speed of his reaction times when his responses were incorrect, or no target was presented.

In the direct peripheral cuing condition, GY was faster at detecting the target when the cue was valid, but no more accurate when the cue was valid than when it was misleading, though in both cases he was significantly better than chance.<sup>29</sup>

Perhaps most surprisingly, GY's responses were also faster and more accurate when the peripheral cue contingency was *reversed* – instead of directly signalling the possible location of the target, the peripheral cue – of which GY was unaware – most often (just over two-thirds of the time)

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<sup>27</sup> Kentridge et al. (1999) p. 1808.

<sup>28</sup> Kentridge et al. (1999) p. 1808.

<sup>29</sup> Kentridge et al. (1999) p. 1808.

signalled the *opposite* location (e.g. the upper quadrant if the cue appeared in the lower one). As the experimenters point out, “successful use of [the reversed peripheral cue] requires interpretation of the cue in light of the rule relating cue and target locations”.<sup>30</sup>

The results of the reversed peripheral cue condition (‘indirect peripheral cue’), however, need to be seen in light of the fact that, despite GY being a very experienced test subject, it took over 400 trials before his responses adjusted to the reverse contingency.<sup>31</sup> For the first 384 trials, his responses were faster to targets in the *wrong* condition, which in the case of the indirect peripheral cue condition were targets that appeared in the same location as the peripheral cue.<sup>32</sup> GY was not immediately able to adjust to the reversal of the cue contingency, rather his responses *became* faster and more accurate over the course of multiple trials. As Kentridge and colleagues also make clear, “there was a great deal of variability in the effect of cue validity which was often small and sometimes even negative...”.<sup>33</sup>

Though these results are surprising, you might feel that their importance is easily exaggerated. Strictly speaking, you might think, all they show is that in certain very rare circumstances, visual attention and visual awareness can dissociate. To concede even this, however, is to concede that attention is not sufficient for awareness. Making this concession, I believe, would be a mistake. Visual attention as we usually conceive of it *is* sufficient for visual

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<sup>30</sup> Kentridge et al. (1999) p. 1808.

<sup>31</sup> Kentridge (2011) p. 238.

<sup>32</sup> Kentridge (1999) p. 1808.

<sup>33</sup> Kentridge et al. (1999) p. 1809.

awareness: it is hard to make sense of how you might pay attention to the colour of the vase in front of you if you are not visually aware of it. What is needed is a way of showing that this conception of visual attention is not simply based on a prejudice of habit. In Sections 5 and 6 I set out some considerations against interpreting the results of the experiments with GY as proof of attention without awareness (a full defence of sufficiency will have to wait until the next chapter).

The disagreement between the two views (i.e. sufficiency and its denial) can be seen as a disagreement about the extent to which reflection on perceptual experience can inform us about its nature. There is agreement that a subject's verbal reports are a valid way of determining whether and what she is aware of when a stimulus is presented to her, but beyond that there is little agreement. In the next section, I set out Christopher Mole's defence of our everyday grasp of attention as sufficient for awareness, which forms part of what he calls 'commonsense psychology'.

### **3. Mole's Commonsense Psychology**

Commonsense psychology is motivated by the sort of considerations in favour of the sufficiency of attention for awareness outlined earlier; a view on the relation between attention and awareness based on common usage of those terms, usage which in turn is informed by reflection on the nature of experience.

"We catch someone's attention as a way to influence what he is conscious of, and it is by introducing something into his field of consciousness that we catch his attention... we expect the facts about what a person is attending to make an immediate difference to what it's like to be that person and we expect a person to be able to know what she is attending to in the immediate first-person, privileged-access, non-inferential way that characterizes knowledge of facts about consciousness.

The fact that we expect attention and consciousness to behave in these ways is made intelligible if we understand commonsense psychology to treat paying attention to something as a way of being conscious of that thing... According to commonsense psychology, then, attention requires consciousness."<sup>34</sup>

(In his description of catching someone's attention, it is noteworthy that Mole talks of introducing something into their 'field of consciousness', rather than drawing their attention to something in their visual field.)

The view from commonsense psychology, that attention is sufficient for awareness, comes with some qualifications. The first is that we don't, according to Mole, need to be aware of something *before* attending to it; we can become aware of something *by* attending to it.<sup>35</sup> The kind of examples Mole gives of things that we might become aware of by attending to them – the dust on a bookshelf, the background noise of electric lights – seem to be things we could easily ignore. Another, perhaps more obvious sort of choice,

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<sup>34</sup> Mole (2008) pp. 88-89.

<sup>35</sup> Mole (2008) p. 89.

might be stimuli such as an unexpected bright flashing light (whether in the centre or periphery of the visual field), or a peripheral moving object: stimuli that are not so easily ignored. This sort of involuntary capture of attention<sup>36</sup> can be distinguished from deliberately directed attention by its being unplanned and unintentional.<sup>37</sup>

The second qualification Mole makes is to draw a distinction between, on the one hand, being aware of an object as a result of attending to it, and on the other hand being aware of the property of the object in virtue of which we come to attend to it.<sup>38</sup> Drawing the distinction allows him to concede that we can become aware of an object by attending to it even when we are unaware of the property of the object in virtue of which it captured our attention. The concession is made in the light of experimental findings by Steven Yantis (Yantis 1993) that detection of a target is faster when the target appears in a previously unoccupied space in an array ('sudden onset') compared to when it appears at a previously occupied location ('no-onset'), despite most subjects being unaware of the target as having a sudden onset.<sup>39</sup> In this particular case, there seems to be room to draw a distinction between intrinsic properties of the target (e.g. its shape, size and colour), and the properties it has in virtue of its relation to other objects in the array (e.g. its onset). It is not in virtue of one of the target's intrinsic properties that we come to attend to it. In any case, the possibility of an involuntary *shift* in our

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<sup>36</sup> Sometimes called exogenous attention.

<sup>37</sup> I return to the matter of involuntary attention in §7.

<sup>38</sup> Mole (2008) p. 90.

<sup>39</sup> See footnote 2, p. 677, Yantis (1993). The 'no-onset' items in the array were letters 'camouflaged' by preceding digital-style figure-8 placeholders (see Yantis and Jonides (1996) pp. 1505-1506).

visual attention due to an object exhibiting a visual change seems to be consistent with our common sense way of thinking of visual attention. We can distinguish between our attention being caused to shift involuntarily, and attending to the thing that caused that shift of attention. Accepting that our attention may be caused to shift without our becoming aware of why does not require accepting that we are attending to something while remaining unaware of it. If we reversed the condition in the Yantis experiment to the sudden disappearance of an object within an array, it seems possible that our attention might shift involuntarily to the location the object had occupied, without our being aware that an object had just disappeared from there. What would then have caused the shift in attention is the sudden disappearance of the object, but what we would come to attend to is the location the object had previously occupied. (The extent to which this is actually possible can, of course, only be determined by empirical investigation.)

Mole's appeal to common sense would be presented with a challenge if it turned out that there are quite familiar cases of attention without awareness. If these were more of a common occurrence, there would be grounds to challenge his view as not representing the *common* sense view after all.

#### **4. The Vigilant Observer**

In their 1998 book, *Inattentional Blindness*, Arien Mack and Irvin Rock describe what they consider quite common instances of perceptual attention in the absence of awareness:

“It is not an uncommon experience to be looking for something or keenly awaiting its appearance in the absence of perceiving it, for example, waiting in silence in the dark for the phone to ring. Both the looking for and the awaiting are part of what we mean by attention in our ordinary language, but in cases such as these the looking for is not associated with any perception.”<sup>40</sup>

Mack and Rock use a cross-modal example of anticipatory attention (waiting in the dark for the phone to ring), but we can concentrate on the visual case. The sort of thing that Mack and Rock have in mind is presumably something like straining to see through a doorway into the pitch black room beyond. It certainly seems right to describe this as an instance of attention in the ordinary sense of the word. The question is what they mean when they say ‘the looking for is not associated with any perception’. A little later they refer to laboratory studies of vigilance, which

“... demonstrate an observer’s ability to monitor one particular region of blank space, which results in the more rapid or more sensitive detection of a stimulus in that location. Although the consequence of the vigilance may be a lower detection threshold and a more rapid perception of the target, *if no event occurs, there will be no perception*. In other

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<sup>40</sup> Mack and Rock (1998) p. 245.

words, one can be vigilant without actually perceiving, implying that perception and attention are distinct processes.”<sup>41</sup>

Evidently, awareness (‘perception’) is understood purely in terms of awareness of an object (stimulus). Mole’s response to this kind of case is to diagnose Mack and Rock’s mistake as ‘a kind of quantifier-shift fallacy’, which ‘confuses the perception of absence with the absence of perception’.<sup>42</sup> This needs some explanation. Mole’s gloss is that ‘the subject is perceiving that nothing has yet occurred’ (ibid.). This suggests a commitment to the vigilant observer having an accompanying belief, the belief that nothing has yet occurred.<sup>43</sup> This raises a further question: is it possible to visually experience an absence, or can we only perceive *that* there is an absence?

Roy Sorensen considers this question in his (2008). According to Sorensen, “In pitch darkness, we at least see the darkness.”<sup>44</sup> Sorensen, then, would agree that in my example of straining to look through the doorway into a pitch black room, we see something. He also thinks that the sort of seeing in question here is *non-epistemic* seeing<sup>45</sup> – visual experience of the darkness beyond the doorway, not the seeing *that* there is darkness beyond the doorway that requires the formation of a belief:

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<sup>41</sup> Mack and Rock 1998 p. 245-246, my emphasis.

<sup>42</sup> Mole 2008 p. 98.

<sup>43</sup> In this I am following Fred Dretske: “S cannot see that the lights are on without believing that the lights are on.” Dretske (1969) p. 13.

<sup>44</sup> Sorensen (2008) p. 240.

<sup>45</sup> Dretske (1969).

“When a bear follows you into a cave, he sees the same darkness as you. This darkness existed long before anyone saw it and would have existed even if no creature ever beheld it.”<sup>46</sup>

The implication here is presumably that the bear does not possess concepts, or form beliefs, and therefore that what both bear and we see is the darkness itself. We don't infer that it is dark (or that there is nothing to see), we directly experience the darkness.<sup>47</sup> So Sorensen and Mole both think that Mack and Rock are wrong to claim that conscious perception – visual awareness – must be awareness of the presence of physical objects, but for different reasons. It seems Mole thinks our awareness of the darkness beyond the doorway is accompanied by a belief to that effect, while Sorensen thinks we are aware of the darkness itself.

We might, instead, argue that the vigilant observer, like the person straining to look through a doorway into a pitch black room, is able to attend to a particular region of 'blank space' because that region of space is framed by things she can see. Someone who is straining to look through a lightless doorway can direct her gaze (and with it her attention) by using the doorway as a guide. We can fill this out by giving an account of what it is to see regions of space currently unoccupied by objects. Just such an account is suggested in papers by Mike Martin, Louise Richardson and Matt Soteriou. On this account, a visual field is a perspectively presented volume of space, including the objects, properties and relations contained within it, that is

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<sup>46</sup> Sorensen (2008) p. 248.

<sup>47</sup> Sorensen (2008) p. 238.

bounded by our sensory limitations.<sup>48</sup> The sensory limits in question are limits imposed by what our eyes are capable of taking in (i.e. from a fixed position, excluding, for example, the region behind our heads). Key to this notion of a visual field is that it includes the spaces between objects, some of which, from a given position, we will be visually aware of. We are visually aware of the space between our bodies and the nearest object in front of us, for example, and we are aware of the space framed by an open door. Both these spaces could be occupied by objects, and we are aware of them as such, as spaces that could be occupied by objects.

Using the notion of a visual field just outlined, we can ask what it is, in our example of straining to see through the doorway, that is being attended to. The answer seems to be that it is parts of the space framed by the doorway that are being attended to. If we then ask what it is we are aware of, here again the obvious answer seems to be parts of the space framed by the doorway. Given these answers, our attention and awareness seem to be in step, though what it is we are attending to and aware of is not a physical object, but a spatial area.

There are, then, a few different ways in which we can account for the kind of exercise of vigilance that Mack and Rock put forward as an instance of attention without awareness. Let's focus on my example of straining to see through a pitch-dark doorway. Taking our lead from Sorensen, we can account for the exercise of vigilance in terms of seeing the darkness beyond

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<sup>48</sup> This is an approximation of views presented in Martin (1992), Richardson (2010) and Soteriou (2011).

the doorway; we don't see any objects, but we are attending to and aware of the darkness. On the space-based account inspired by Martin, Richardson and Soteriou, we are visually attending to and aware of the space framed by the doorway. Mole's description of 'perceiving that nothing has occurred' emphasises our belief that there is no object we can see through the doorway, but this is quite consistent with us attending to and being aware of the darkness, and it is also consistent with us attending to and being aware of the space framed by the doorway. On any of these accounts, our attention and awareness are in step, and Mole's commonsense psychology emerges unscathed.

## **5. Cross Purposes**

Mole wants to use a 'somewhat similar distinction' to the one he uses against Mack and Rock, between a perception of absence and an absence of perception, against Kentridge et al.'s blindsight case. He grants that GY is indeed employing his attention in the experiments, which is in line with GY's own descriptions of what he is doing. He also concedes that "the facilitative effect shown by [GY] is attention involving".<sup>49</sup> What Kentridge and colleagues need to show, according to Mole, is that GY's abilities constitute a counterexample to his formulation of sufficiency:

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<sup>49</sup> Mole 2008 p. 100.

$\alpha$ : For all persons and all things, if the person is attending to the thing then the person is conscious of that thing.<sup>50</sup>

For there to be a counterexample to  $\alpha$ , a subject would need to attend to something (and it seems we should read 'thing' to mean *object*) without being aware of it.<sup>51</sup> This is not, according to Mole, what is happening in the case of GY: "the facilitative effect of the cue can be understood as a consequence of [GY] attending to the location in which the [target] appears",<sup>52</sup> the evidence does not require us to say that GY is attending to the target itself.

As Mole is well aware, this just pushes the threat back one step. It is an obvious move for someone who thinks that GY's case *does* constitute a counterexample to  $\alpha$  to reformulate the challenge with respect to space: GY is attending to a space (which happens to be the location of the target) which he is unaware of. Mole thinks he has an answer to the challenge, whereby he can show that GY *is* aware of the space to which he is attending, and his response is most interesting.

"In normal situations, as when sitting at one's desk, one experiences oneself as being oriented in a space, even when there are parts of that space to which one is not currently perceptually receptive. Regions of the space in which one is oriented are potential loci for attention. One can, even with one's eyes closed, direct one's attention to different parts of

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<sup>50</sup> Mole 2008 p. 100.

<sup>51</sup> "... it is possible to be paying attention to a part of the visual field while not being conscious of the stimulus presented in that part of the visual field." Mole 2008 p. 101.

<sup>52</sup> Mole 2008 p. 101.

the space around one's head... If all is silent then it may be that nothing in particular is experienced as being in these locations, but this does not prevent them from being parts of the space in which one experiences oneself as oriented, and it does not prevent them being loci of attention. The attention to locations in the scotoma demonstrated by the blindsighter can be thought of similarly... the part of space that falls within GY's scotoma *does* figure in his conscious experience as a part of the spatial field in which his experiences are oriented... It is possible, then, to claim that the blindsighter is paying attention to a part of space, and that that part of space *does* figure in his consciousness (as part of the space in which he is oriented), while still holding on to the fact that it is a part of space from which nothing is visually experienced."<sup>53</sup>

Clearly, 'experience' as it is being used here does not mean *visual* experience, or even *perceptual* experience, since we can experience ourselves as oriented in a space parts of which we might not be 'currently perceptually receptive' to. 'Attention', as it is being used here, also does not mean, or does not exclusively mean *visual* attention, since it is possible, according to Mole, to direct our attention to a space with our eyes shut. This suggests that the sufficiency claim that Mole is interested in defending is not a claim about the sufficiency of visual attention for visual awareness. In his book-length treatment of the subject (Mole (2011)), Mole makes this clear from the outset.<sup>54</sup> We might well think, however, that there are some important differences between non-perceptual and perceptual forms of attention: paying attention to what we are thinking about, and paying

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<sup>53</sup> Mole 2008 pp. 102-103.

<sup>54</sup> In the preface: "This book presents a single unified theory of attention, intended to apply to attention in all its forms." Mole 2011 p. vii.

attention to what we see. The phenomenological difference is nicely brought out by Mike Martin.

“Arguably, it is part of the manifest image of the mind that we are aware of objects of sense experience in a different way from being aware of the objects of thought, and that this is reflected in the ways attention can relate one to an object of sense as opposed to thought... it is tempting to think of experience in terms of a whole array of items stretching beyond what I have focused my attention on at a time—an array over which I could move my attention, as a beam or spotlight. It is as if I am aware of the whole array at a time, albeit more or less determinately, whether I now focus my attention on one part of it or not; and my awareness of some element of it can explain why I shift my attention from one part of the scene to another. There seems to be no corresponding array of items to shift one’s attention over in thought: if we think of thoughts as determinations of attention, then there can be no way of thinking of something without thereby to some extent to be attending to it.”<sup>55</sup>

Besides the phenomenological difference, there is the fact that we cannot acquire information about our environment *purely* through the exercise of attending to our thoughts. And in any case, it is quite clear that Kentridge et al. *are* making a claim about the relationship between visual attention and visual awareness. If this is right, then it seems the two parties to this exchange are talking at cross purposes. The upshot for our investigation is that we cannot use Mole’s argument as it stands to defend the sufficiency of visual attention for visual awareness against the challenge from blindsight.

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<sup>55</sup> Martin (1997) p. 78.

To make matters worse, neither Sorensen's take on seeing darkness, nor the space-based view of Martin, Richardson and Soteriou can be adopted as an alternative. Sorensen is explicit in denying that his analysis of seeing darkness applies to people who lack the capacity for visual awareness:

"Blindness is an absence of experience rather than an experience of absence... A man with blind-sight may be able to visually sense an absence of light stimulation in a room. However, the blind-sighted man does not have a black visual experience."<sup>56</sup>

The space-based view is also quite explicitly concerned with normal visual experience. It is difficult to see how any alternative might go, because it is difficult to construct an alternative that can make sense of how GY can visually attend to a location despite having no visual awareness of that location. It is worth remembering at this point that the initial motivation to consider that GY was attending came from taking at face value his own description of what he was doing:

"...GY remarked that he had just realized that the stimuli were sometimes being presented well above the horizontal and so now he was trying to pay attention higher up in his blind visual field."<sup>57</sup>

Now, one possible response to this is to flatly deny that GY was visually attending to anything. Whatever it is he was trying to do, the response would

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<sup>56</sup> Sorensen (2008) pp. 245-246.

<sup>57</sup> Kentridge and Heywood (2001) p. 168.

go, he was not trying to visually attend to anything, since what he took himself to be attending to – part of his blind field – he was not aware of, and visually attending to something is sufficient for being visually aware of it. But not only do we have the results of the Posner spatial cuing experiments to take into consideration, we also lack any explanation of *why* visual attention is sufficient for visual awareness. Without an explanation of what it is about visual attention to an object that makes it sufficient for visual awareness of the object, this response simply sounds prejudiced. (Accounts of visual attention that aim to do just this will be presented in the next chapter.)

So, for the moment, we ought to take GY's description of what he was trying to do at face value, despite its apparent departure from our usual use and understanding of attention to what we see. Taking his description of what he was trying to do at face value, what he was trying to attend to was a part of his blind field. There is no mention of the target stimulus (he was unaware of it). On the evidence presented so far, Kentridge and his colleagues have yet to show that the differences in the speed and accuracy of response GY showed in the spatial cuing experiments were due to his attention to the target stimulus, rather than, for example, his attending to a location that fell within his blind field. In addition, the *introspective* evidence from GY that he was attending is not the kind of evidence that constitutes proof in information-processing psychology. Some prospects for marshalling a response to Kentridge and colleagues' interpretation of the experimental evidence seem to be emerging.

With normally sighted subjects, the Posner spatial cuing paradigm is supposed to provide evidence for the effects of visual attention. Responses are faster and more accurate when visual attention is cued to the target, in comparison to when it is not. As Kentridge et al. put it,

“Any difference in the speed or accuracy of response to the target between trials where the cue correctly predicted its location (i.e. it is a valid cue) and trials where the cue was misleading (an invalid cue) is evidence of spatially selective attention.”<sup>58</sup>

But why should we accept that ‘any difference in the speed or accuracy of response to the target... is evidence of *attention*’, rather than evidence of some form of *attentional process* that is necessary, but not sufficient – in the absence of visual awareness – for attention? The best reason for thinking that the Posner spatial cuing paradigm provides evidence of the effects of visual attention is because it conforms to the recognisable pre-theoretical conception of attention described in the previous chapter. The use of a cue to direct attention is strongly reminiscent of drawing someone's attention to something in their environment by pointing. According to Posner, “orienting to stimuli in visual space is a restricted sense of attention”, where orienting is “the aligning of attention with a source of sensory input”<sup>59</sup> that may be voluntary or involuntary (‘externally’ or ‘centrally controlled’), and overt or covert (i.e. with or without accompanying head and eye movements, respectively).<sup>60</sup> The Posner spatial cuing task relies on visual attention being shifted covertly in

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<sup>58</sup> Kentridge et al. (2008) p. 106.

<sup>59</sup> Posner (1980) p. 4.

<sup>60</sup> Posner (1980) p. 5.

response to a cue of some sort (e.g. an arrow). In the preamble to the description of the task's design, Posner observes that "Natural language refers to the ability to look out of the corner of our eyes..."<sup>61</sup> This suggests that the task is designed to mimic one of the ways visual attention is used in everyday life (when it is covertly oriented, without eye or head movements), albeit not the way it is most often used (when it is overtly oriented). Given the way the cue is used, however, it makes perfect sense to think that what is cued is a *spatial location*. On some occasions, after all, the cue is misleading, and no target is present at the cued location, so on those occasions at least what is cued is *just* a spatial location. And of course this is exactly what the task is understood to be – a spatial cueing task. But in that case, why not think what is being attended to is *always* just a spatial location? The obvious reason for not thinking this is that with a normal subject, when the cue is not misleading, the subject attends in the usual sense – *consciously* attends – to the target stimulus. The task usually requires subjects to indicate as soon as they can the presence (and sometimes location) of the target, so with normal subjects when the cue correctly indicates the location of the target, it is the *target* to which subjects' (conscious) attention is drawn. Using the Posner task with a blindseer, however, takes us into unfamiliar territory, since it is no longer obvious that the blindseer is attending to the target (or, indeed, attending at all).

Our typical use of 'attention' in relation to things we see implies awareness of the thing attended to. If I say my attention is drawn to a face at the window,

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<sup>61</sup> Posner (1980) p. 6.

you would expect me to be aware of the face. The reason it is plausible that the Posner task is a measure of the effects of visual attention, I have just suggested, is that the spatial cuing it utilises mimics the drawing of attention that pointing achieves. Using the Posner task with a blindseer, however, raises the question of whether, in this novel situation, we can still consider it a measure of the effects of attention. A little earlier I conceded that the way we normally use 'attention' can only be an indication, and not a proof, of the sufficiency of attention for awareness. Without an explanation of why attention to something entails awareness of it, it remains an open question whether the results of testing GY measure the effects of his attention, or merely the effects of some attentional process that is necessary but not sufficient for attention. There is another important question. We have also to consider GY's own description of what he is trying to do, according to which he is 'trying to pay attention higher up in his blind field'.

We have seen that Mole's defence of the sufficiency of attention for awareness did not succeed. Mole attempted to defend the sufficiency claim by trying to show that GY was aware of what he was attending to. As we have also seen, Mole's argument relied on a non-visual construal of attention, while Kentridge et al.'s claim that GY was attending without awareness was a claim about visual attention. Roy Sorensen's analysis of seeing darkness, and the space-based view of Martin, Richardson and Soteriou are both exclusively concerned with normal visual experience and are not applicable to blindsight. Before I turn, in the next chapter, to the question of why attention *is* sufficient for awareness, there remain the two

questions outlined above regarding Kentridge's interpretation of the results of testing GY. One question asks of the Posner cueing task whether, when what is cued is within a blindseer's blind field, it still makes sense to think that the task is measuring the effects of attention. The other question asks how we should understand GY's description of himself as 'attending'. Should we be thinking in terms of GY *selecting* a part of his blind field? I consider this second question, which asks how we should understand GY's claim that he is 'trying to attend' to a part of his blind field, in the last section of this chapter (§ 7).

In the next section, I set out the evidence that Kentridge and his co-authors appeal to in support of their claim that GY *is* attending to the target stimulus. They begin by characterising attention as consisting of selection and enhancement of processing, and then show that whether the processing of an object occupying a location is enhanced can be sensitive to the properties of the object at that location. The connection between GY's performance in the spatial cuing experiments and the use of attention in everyday life is made a little circuitously. As Kentridge et al. read William James' characterisation of attention, it is comprised of 'two key components', selection (e.g. of an object, property or spatial location) and enhanced processing (e.g. of the object with that property or at that spatial location).<sup>62</sup> Ordinarily, when I draw your attention to something by pointing to it, you are able to select that particular object and process it in a way that is facilitated by my drawing your attention to it. The evidence of enhanced processing

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<sup>62</sup> Kentridge et al. (2008) p. 106.

elicited by the Posner task is similarly understood to be evidence of visual attention to the particular object that has been spatially cued. The spatial cueing experiments with GY demonstrate that his responses were faster and more accurate when the target was validly cued despite the fact that he was not aware of it. As I have emphasised, they don't *prove* that GY was attending to the target. I have suggested that the best reason – in fact, the *only* good reason – for thinking the Posner spatial cueing task is a measure of the effects of visual attention is its resemblance to the everyday use of pointing to direct someone's attention. The use of pointing to direct attention is premised on a tacit assumption that the viewer is visually aware of the pointing and what is pointed at. (Pointing to direct someone who is blind would be, quite literally, pointless.) Given that, the validity of the Posner task as a measure of the effects of attention in blindsight is questionable. But there is another closely connected issue. Part of what makes the Kentridge et al. (1999) paper so provocative is its mention of GY describing himself as 'trying to attend' to a part of his blind field. I will look at ways of trying to understand this in §7, but suppose, for the moment, we take this literally. We could salvage part of Mole's defence of sufficiency. We suppose GY was attending to a portion of his blind field. However, his performance in the Posner task showed the effects of selection and enhanced processing of the target. There is the potential for a gap opening up here, between what GY claimed to be attending to (a portion of his blind field) and what the Posner task provides evidence of enhanced processing of (the target). So GY's performance on the Posner task might not be evidence of the effects of attention.

It is this argument, or something very similar, that Kentridge and his co-authors take themselves to need to rebut. In the next section, I describe the evidence they marshal to show that changes in the speed of a response following the presentation of a cued target can depend on the properties of the object at that location. Since changes in the speed of response can depend on which object occupies the cued location, they argue that it is the *object*, and not merely the *location*, that is being visually attended to.

## **6. Attention to Space and Attention to Objects**

In their (2008), Kentridge et al. take themselves to be responding to an argument of Mole's that is pertinent to their denial that visual attention is sufficient for visual awareness. So what is the argument they take themselves to be responding to? In the abstract to their paper, they say Mole assumes that 'all that is attended in spatial attention is space', and in response object that 'spatial attention can be deployed with the specific goal of determining the properties of objects occupying the attended region of space.' It is a reasonable guess that they take Mole to be agreeing that GY is exercising his attention, and that they take Mole to be claiming that it is possible to visually attend to a spatial location without thereby attending to objects occupying that location. As we have seen, Mole's argument does not concern visual attention, so we should not understand Mole as making the claim that it is possible to visually attend to a location without thereby attending to objects occupying that location. But as I suggested at the end of

the last section, this seems to offer a way of salvaging part of Mole's defence of sufficiency.

Kentridge et al. want the spatial cuing experiments with GY to be accepted by supporters of sufficiency as a demonstration of the exercise of visual attention, and specifically a demonstration of GY's visual attention to the target stimulus. Perhaps mindful of the strangeness of the claim that GY is visually attending to something that he is visually unaware of, they start with a characterisation of attention derived from William James. According to James, attention is

"... the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others..."<sup>63</sup>

According to Kentridge and colleagues,

"Attention... involves a process of selection (withdrawal of processing from parts of the world in favour of other parts) and enhancement (the selective concentration of resources results in enhanced processing of the object of attention). In visual attention selection might be based on all sorts of properties, for example colour ('look out for red things'), shape ('look out for triangles') or spatial location ('look out for things on your left')." <sup>64</sup>

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<sup>63</sup> James (1890) p. 382

<sup>64</sup> Kentridge et al. (2008) p. 106.

Now, on James' description of attention, it is a 'concentration of consciousness', so selection ('withdrawal from some things') and enhancement ('dealing effectively with other things') constitute only part of what James thinks attention is. I have conceded that without an explanation of why attention is essentially conscious, our typical use of the word can only be an indication, and not a proof of attention's sufficiency for awareness. Providing that explanation is the subject of the next chapter, but even without an explanation we are not obliged to just accept Kentridge and colleagues' characterisation of attention as selective enhancement.

Kentridge, de-Wit and Heywood go on to say that selecting a location for attention 'only seems sensible' in order to 'facilitate processing of objects which might be presented at that location'.<sup>65</sup> Clearly, there are different ways in which we can understand this claim. Someone concerned to argue in favour of the sufficiency of attention for awareness might agree with regard to the normal case, but would certainly disagree in cases where there was no awareness of the putative object of attention. If, for example, while driving I look to my left to see if the way is clear, this would be an example of my selecting a location in order to acquire more information about objects which might be occupying it. If, on the other hand, I am in a pitch black environment, it would be highly questionable whether it makes sense to say that I was *selecting an object* that happens to lurk in my line of sight, even if I am somehow able to utilise visual information pertaining to it. (How we

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<sup>65</sup> Ibid.

understand the activity of making a selection, I will argue in the next section, ought to affect what we think of GY's claim to be 'trying to attend' to part of his blind field.)

This is the point at which Kentridge and colleagues move to persuade doubters that there is 'good evidence that selection and enhancement processes are independent' (p. 107). What they mean by this is that the selection of a location does not preclude the possibility of the visual processing of an object at that location being enhanced, *even if the perceiver is unaware of the object*. Why, they ask, should we assume that "attending to a location is not part of the same process as attending to the properties of objects at that location"?<sup>66</sup> That is, as long as there is evidence of enhanced processing in the form of speeded responses in the Posner paradigm, why shouldn't that be sufficient to conclude that it is the object, and not just the location, that is being attended to? They offer empirical evidence they believe weighs in favour of this view, evidence concerning the enhancement of processing of properties of objects at attended locations. If what is attended to is an area of space and not any particular object that might occupy that space, then enhancement of processing should occur for *any* object occupying that space. If, instead, enhancement of processing depends on which object occupies that space, we have a case for thinking of this object-specific exercise as being attention to the object. The evidence comes from a set of experiments, conducted on subjects with normal vision, by Roger Remington and Charles Folk, published in Remington and Folk (2001).

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<sup>66</sup> Kentridge et al. (2008) p. 107.

Remington and Folk begin by noting that

“... there seems to be widespread agreement on two related assumptions common to both space-based and object-based selection [one of which is] when a location or object has been attended, all features of the attended object are selected regardless of their relevance to the immediate task...”<sup>67</sup>

Remington and Folk set out to test this assumption by separating the effects of task-relevant and task-irrelevant features of the presented stimuli while also precisely controlling the allocation of spatial attention.

The set-up is a bit complicated, but necessary to fully understand how they go about showing that the enhancement of processing following spatially allocated attention is sensitive to the properties of the object which occupies the space. The key points of the first set of trials are as follows. The feature dimension of the target stimulus subjects were expected to respond to was indicated at the start of each trial: its identity – whether it was a 'T' or a 'L', or its orientation – whether it was tilted left or right. Every presentation included stimuli (both target and distractors) with both feature dimensions ('T' or 'L' letters tilted one way or the other), so subjects had to *ignore* the irrelevant feature dimension.

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<sup>67</sup> Remington and Folk (2001) p. 511.

There were four clearly defined locations on the display at which stimuli appeared, only one of which was the target stimulus. The target stimulus was clearly identifiable by its colour (it was the only red letter). Distractors (non-target stimuli) included 'foils' with target characteristics (they were also tilted 'T' or 'L', but in white) and others ('neutral' distractors) with only non-target characteristics (the letters 'E' and 'F', upright and in white). Before the stimuli were presented, one of the four locations was cued. The cued location was not always the location where the target stimulus was subsequently presented (the target stimulus appeared only 25% of the time at the cued location).

What subjects were required to respond to was *either* the orientation of the target (right or left), *or* its identity ('T' or 'L'). In *identification* trials (i.e. trials where the subjects were expected to identify whether the target was a 'T' or 'L', ignoring its tilt) if the target was 'T', subjects were to respond by pressing their right index finger, and if the target was 'L' subjects were to respond by pressing their right middle finger. In *orientation* trials (i.e. trials where subjects had to identify right or left tilt of the target, ignoring whether it was a 'T' or 'L'), if the target was tilting to the left responses were made by pressing the right index finger, right-tilting target responses were made by pressing the right middle finger. Responses to 'T' (identification) and left-tilt (orientation) were both 'compatible' (i.e. made by pressing the right index finger). In contrast, responses to 'T' and right-tilt were incompatible (i.e. made by pressing different fingers).

Response times were fastest for cued irrelevant-dimension compatible targets, and slowest for cued relevant-dimension incompatible foils. So if, for example, on an orientation trial, the target was a left-tilted 'T', and it was cued, the response time would be much faster than if a right-tilted foil had been cued. What is of particular interest is that, while there was a significant difference in response time between compatible and incompatible irrelevant features of the target (cued or not), there was *no* significant difference in response time between compatible and incompatible irrelevant features of the foil (cued or not). So for example in an orientation trial, if the target's irrelevant feature (its identity – whether 'T' or 'L') was incompatible with its relevant feature (i.e. required a different finger press response), the response would be slower than if its irrelevant feature was compatible. However, in an orientation trial, whether the irrelevant feature (identity) of the foils was compatible with their orientation or not made no significant difference in response time. In other words, the task-irrelevant features of foils were just ignored. Remington and Folk take their results to provide evidence against the assumption that 'all features of the attended object are selected regardless of their relevance to the immediate task': even when the foil was cued, whether its irrelevant feature was compatible or not made no significant difference in response time.

How does this evidence support Kentridge, de-Wit and Heywood's rejection of the distinction between attention to a location and attention to an object at that location, on which they base their claim that "attention can act without

consciousness"?<sup>68</sup> The fact that there was no significant difference in response time between cued and un-cued non-target items with incompatible irrelevant features shows, they say, that “spatial attention can be deployed in order to determine whether objects with a specific property are present”, and as “the facilitation of processing in attended space only applies to objects with that specific property”,<sup>69</sup> it doesn’t make sense to them to argue that it is the space *and whatever objects occupy it* that are being attended to. Even if we suppose, as I suggested we should for the moment, that GY was attending to a portion of his blind field, Remington and Folk’s results are not decisive. The Remington and Folk experiment shows that when our visual attention is spatially cued, we can exercise discrimination regarding whether what we find at that location is relevant. The subjects in the experiment were visually aware of the colour of the object at the cued location, and were able to ignore it if it was not red. It does not follow from this that blindseers, who lack any visual awareness of objects in their blind field, could selectively ignore objects based on their colour in this way. We have to further suppose that blindseers can exercise some equivalent discriminative capacity.

Once we drop the assumption that GY was visually attending to a portion of his blind field, Kentridge and his colleagues are once again faced with the challenge I posed in the previous section. The challenge I posed in the previous section asked whether, when what is cued is within a blindseer’s blind field, it still makes sense to think that the Posner task is measuring the effects of attention at all. Subjects in the Remington and Folk experiments

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<sup>68</sup> Kentridge et al. (2008) p. 110.

<sup>69</sup> Kentridge et al. (2008) p. 109.

were visually aware of the cued targets. The reason we ought to think of the Posner task as a measure of the effects of visual attention, I have said, is its similarity to the use of pointing to visually attract someone's attention to something. When a blindseer is asked to attempt the Posner task, whatever it is that is facilitating the speeding of his response times is not conscious. We can, therefore, quite legitimately question whether it is attention at all.

Kentridge, de-Wit and Heywood present, by reference to the Remington and Folk experiment, a compelling case for the enhancement of processing (in terms of speed of response) that cuing a location can bring about being sensitive to the properties of the object at the cued location. This shows that the selection of a location does not simply mean everything at that location receives enhanced processing. It also shows that what it is that receives enhanced processing can depend on the intentions of the attending subject (in the experiment described, the subject's intention to report the orientation or identity of the red target rather than the white distractors). All this is, as far as I can tell, quite consistent with the way we normally think of looking for something. Abstracting from the complexities of Remington and Folk's experiment, if I am looking for something and I am directed to the right place, I will find it more quickly. If, instead, I am directed to a location occupied by something that is clearly not what I am looking for, my search will be delayed. But it seems quite plausible, even without the experimental evidence, that the properties of the unwanted object will not affect the length of the delay. What *is* interesting about Remington and Folk's results is that we learn something about the circumstances under which we *cannot* ignore

irrelevant information. (According to their results, the task-irrelevant dimension of the target *did* affect response times, so it seems we cannot always ignore what is irrelevant when it is a property of the object we are looking for).

However, what Remington and Folk's results do not show is that in the very different circumstances of the experiments with GY, what was being measured was attention. If visual attention, conceived as sufficient for awareness, can explain our visually based thoughts and actions in a way that blindseers' selection and enhancement cannot, we can be confident that visual attention plays a distinctive and therefore indispensable role. In that case, Remington and Folk's results will not motivate the revision of what we mean by 'attention', from something that is essentially a conscious phenomenon to something that is not.

There is a further twist to the exchange between Mole and Kentridge. In response to newer experimental data produced by Kentridge and colleagues,<sup>70</sup> Mole has conceded that attention to an object is *not* sufficient for awareness of it.<sup>71</sup> Does this new evidence settle the question against the sufficiency of visual attention for awareness? Norman, Heywood and Kentridge made use of a task in which (normally sighted) subjects are required to register (by pressing a button) the appearance of a target which may or may not be validly cued.<sup>72</sup> In this task, the target is located within one

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<sup>70</sup> Norman et al. (2013).

<sup>71</sup> Mole (2014).

<sup>72</sup> The task is from Egly et al. (1994).

of two identical rectangular shapes displayed. The two rectangles are either both positioned vertically, or both positioned horizontally. In both horizontal and vertical positions, the cue and target could appear at either end of either of the rectangles. When the rectangles are positioned vertically, the distance between the top of one and the top of the other is the same as their height; when they are positioned horizontally, the distance between the left (or right) end of one and the left (or right) end of the other is the same as their length. The task is constructed to test whether there is a reaction time advantage when the target is invalidly cued with the cue appearing in the opposite end of the same rectangle compared to the invalid cue appearing in the other rectangle. Since the distance between cue and target in both cases is the same, the fact that reaction times are reduced when the invalid cue is located within the same shape as the target suggests that attention is being directed to the object (the shape) and not just a spatial location. The innovation to this task introduced by Norman, Heywood and Kentridge was to mask the rectangles, so subjects had no visual awareness of them. Despite subjects being unaware of the rectangles, there was a small reaction time advantage when the invalid cue was located within the same rectangle.

So what do these results prove? Do they prove that, even in the case of normally sighted subjects, attention can be directed to objects that they are visually unaware of? As with the Remington and Folk data, the proper response is to insist that visual attention – conceived as sufficient for awareness – is indispensable if it can explain our visually based thoughts and actions in a way that unconscious selection and enhancement cannot. It

should be clear this is a perfectly legitimate response, since the question being considered is what we *mean* by 'attention' in visual perception. There is a prima facie case for visual attention being sufficient for awareness: you will struggle to pay attention to the colour of an object you are not aware of. Before beginning any investigation into whether visual selection of an object and subsequent enhanced processing of it can be dissociated from visual awareness of it, we need to determine what (if any) distinctive role visual attention (conceived as sufficient for awareness) plays. If visual attention so conceived plays a distinctive role by explaining some aspect of our visually based thoughts and actions that unconscious selection and enhancement cannot, any motivation for investigating whether visual attention and awareness can dissociate is undermined. In very plain terms, our first move should be to ask what visual attention does for us. It is only once we have determined what it does for us that we can consider whether it can continue to play that role even if it is detached from visual awareness.

Instead of thinking of Kentridge and his colleagues – as they themselves do – as having proved the insufficiency of attention for awareness, we should think of them as sharpening a preliminary and distinctively *philosophical* question: what (if any) role does visual attention – conceived as sufficient for awareness – play that the selection and enhancement blindseers are capable of cannot? It is the task of the next chapter to try and answer that question.

In the next and final section of this chapter I turn to the second of the two questions raised in the previous section: how we should understand GY's description of himself as 'trying to attend to a part of his blind field'. Is this best understood in terms of his *selecting* a part of his blind field? In particular, I examine what is involved in *making a selection*, to see if we can understand GY's description in terms of the two components of Kentridge et al.'s characterisation of visual attention (selection and enhancement).

## 7. The Role of Selection

To end this chapter, I want to try and understand GY's description of himself as 'trying to attend to a part of his blind field', and elaborate a little on some of the details that emerge. I start by looking again at the characterisation of visual attention used by Kentridge and his co-authors, according to which

"Attention... involves a process of selection (withdrawal of processing from parts of the world in favour of other parts) and enhancement (the selective concentration of resources results in enhanced processing of the object of attention)."<sup>73</sup>

What I want to do is place some constraints on how we think of the exercise of the first of these two components, selection. What I will argue is that it makes even less sense, if anything, to understand GY's claim in terms of his making a selection of a part of his blind field than it does to think of him as, in one sense, attending to it. I should emphasise from the outset that I am not

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<sup>73</sup> Kentridge et al. (2008) p. 106.

suggesting this is the interpretation Kentridge and colleagues intend in their use of 'selection'. It is reasonably clear when they use 'selection' in relation to blindsight they are attributing the capacity for selection to a part or parts of the visual system, and not to the subject. I'm interested in trying to understand GY's claim, and one potential gloss I want to investigate – and reject – is that he was trying to *select* a part of his blind field. The first question I want to ask is when it makes sense to say, of a subject engaged in the Posner task, that it is the subject herself who is selecting the object that receives enhanced processing.

I think we can say two things about what it is for a subject to make a selection. The first is that making a selection is an intentional activity, and as such must be an activity that the subject consciously engages in. Anscombe tells us what is distinctive about intentional actions is that to them, "a certain sense of the question 'why?' has application".<sup>74</sup> As Anscombe goes on to say, "This question is refused application by the answer: 'I was not aware I was doing that'."<sup>75</sup> I might intentionally be doing *something* – turning a light switch on, for example – but that does not mean I am intentionally alerting the prowler lurking outside. Even if it transpired that there was a causal connection between my turning on the light and the prowler's presence – a sound, perhaps, of which I remained unaware but which could be shown to have affected my behaviour – I could not be described as intentionally alerting the prowler to my presence. How could I? I wasn't aware of his presence. So it seems someone who is unaware of a stimulus cannot respond to it

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<sup>74</sup> Anscombe (1957/1963) p. 11.

<sup>75</sup> Anscombe (1957/1963) p. 11.

intentionally. In the experiments with GY, his response to the auditory tone, of which he was aware, was intentional. The response he chose may have been influenced by his visual system detecting the presence of the target stimulus, but his intention cannot have been to respond to *that stimulus*, since he was unaware of it.

The second thing we can say is that selection is an activity that involves making a choice in light of alternatives. Whether I select a cake from a counter full of cakes, or select the only available shelter to take cover from the rain, I am making a choice in light of alternatives (other cakes, and getting wet, respectively). What's more, when I make a selection, I need to be aware of the available possibilities *before* making the choice – that is what distinguishes making a selection from having my choice made for me, or having no choice at all. If I have my choice made for me, or there are no alternatives to choose from, I am not making a selection.<sup>76</sup>

To see how this relates to GY we need to first distinguish between being unaware of something because it is occluded or masked in some way, and just being unaware of it. If I was trapped in a dense fog where all I could see was a uniform grey, I might still be able to select a part of my visual field. If I was blind, however – lacking any sensation whatsoever – it no longer makes sense to say I am selecting a part of my visual field. This was Sorensen's

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<sup>76</sup> Some selections will involve deliberation, and explicit reasons for the selection of one object rather than any other, but this is not a requirement for making a selection. As Anscombe also tells us, the sense of the question 'Why?' that is applicable to intentional actions is applicable even when the answer is 'For no reason' (Anscombe (1957/1963) p. 25). Similarly, what matters for the making of a selection is that it is made in the light of an alternative or alternatives, not that it must be the result of an explicit reason or process of deliberation.

reason for denying blindseers can perceive darkness. GY's visual deficit only affects part of his visual field, but we should not think of it as resembling my situation in the fog, adjusted to affect only part of his visual field. We need to think of it as a *blindness*, a complete absence of sensation, in the affected part of his visual field. That is, we should think of GY's blindsight as *making his visual field smaller*, rather than as obscuring part of it. Once we think of it in this way, it just doesn't make sense to say he can select part of his blind field. Some of GY's comments, reported by Kentridge and Heywood, point to this way of thinking of his visual deficit. In response to inquiries about his experience of cues, he said "I'd be none the wiser if you weren't putting any cues up just to confuse me." and "I just listen for the beep and press a button."<sup>77</sup> The blindseer DB, in the interview conducted by Lawrence Weiskrantz following the initial tests of his visual abilities, expressed surprise at his success.

"In the interview that followed, and which was recorded, DB expressed considerable surprise. 'Did you know how well you had done?', he was asked. 'No,' he replied, 'I didn't – because I couldn't see anything; I couldn't see a darn thing.' 'Can you say how you guessed – what it was that allowed you to say whether it [a stick held up in his blind field] was vertical or horizontal?' 'No, I could not because I did not see anything; I just don't know.' Finally, he was asked, 'So you really did not know you were getting them right?' 'No,' he replied, still with something of an air of incredulity."<sup>78</sup>

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<sup>77</sup> Kentridge and Heywood (2001) p. 174.

<sup>78</sup> Weiskrantz (2009) p. 87.

There is no suggestion of their visual field being *obscured*, and explicit descriptions of ‘absolute blindness’ in the affected area (e.g. Weiskrantz (2009) p. 86), which strongly indicates that we should think of all blindseer’s visual fields as *reduced in size* by the extent of their blind field, rather than as obscured or ‘fogged’ in some way.

To return to GY, we can certainly admit he is attentively listening for an auditory tone, and making a selection in terms of his response following the tone, but we should not conclude he is selecting a part of his blind field. So what is he doing? Recall the remark of his that inspired the attention-in-blindsight experiments:

“Quite by chance, during one of the breaks in testing, GY remarked that he had just realized that the stimuli were sometimes being presented well above the horizontal and so now he was trying to pay attention higher up in his blind visual field.”<sup>79</sup>

Contrast that with other remarks of his, also reported by Kentrige and colleagues:

“When I am aware [of the cue] I can try to attend to the other [i.e. valid] location... when I was not aware of any of the cues [during low-contrast cue experiments] I could not try to

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<sup>79</sup> Kentrige and Heywood (2001) p. 168. GY’s visual deficit means he is not aware of what, without the deficit, he would see with the right half of both of his eyes (right homonymous hemianopia). His vision in the left half of both his eyes is normal.

switch my attention.’ In other words, GY could only voluntarily direct his attention when he had awareness of the cue location.”<sup>80</sup>

This second remark makes it very clear that whatever GY is doing, it *is* intentional. We have seen that it doesn’t make sense to describe GY as *selecting* something of which he is not aware. I have also argued, in the previous section, that it does not follow from the simple fact that the Posner spatial cueing task measures the effects of *conscious* visual attention that it is also measuring the effects of visual attention in GY’s case. Pending an explanation of why visual attention is sufficient for visual awareness, we should remain sceptical about GY *visually* attending to objects in his blind field. So what sense can we make of his ‘attending’ to parts of his blind field?

What follows must be speculative, in the absence of an account from GY himself describing the relevant phenomenology in detail. Mole’s defence of sufficiency relied on a non-visual construal of attention, according to which

“One can, even with one’s eyes closed, direct one’s attention to different parts of the space around one’s head...”<sup>81</sup>

Perhaps this is the best way to understand GY’s description of himself as ‘attending’. He was thinking about a location in his blind field; not visually attending to it, but attending to it in thought. Exactly what the nature of the connection is between GY’s thinking about a location in his blind field and his

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<sup>80</sup> Kentridge et al. (1999) p. 1809.

<sup>81</sup> Mole 2008 p. 102.

performance in the Posner task, I leave as a question for further phenomenological and psychological investigation.

Before moving on, in the next chapter, to considering explanations of why visual attention is sufficient for visual awareness, I want to rule out a potential explanation that may be suggested by considerations in this section. It might be tempting to think that attention is sufficient for awareness because attending is an intentional activity, and we are aware of our intentional activities. I will end this chapter by rejecting this route to arguing for the sufficiency. I am going to question whether visual attention is always intentionally exercised. Specifically, when attention is involuntarily drawn or shifted to something, that shift of attention may not be intentional.

GY's second comment, about awareness of the cue, highlights an important aspect of attention I have not yet examined. Some – but only some – exercises of visual attention are voluntary. We can be distracted from what we are paying attention to.<sup>82</sup> I might be distracted from what I am attending to by peripheral movement, or a bright light. An involuntary shift of attention triggered by movement in the periphery of my visual field might alert me to the presence of an animal; the prowler looking at one window might be distracted by a light coming on at another. Though we are aware of what we attend to, and we are aware that our attention has shifted, the involuntary

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<sup>82</sup> I am not saying here: we can *always* be distracted from what we are paying attention to, regardless of how much we are concentrating on it. I mean only that it is possible for us to be distracted.

shifting of attention is, arguably, not intentional.<sup>83</sup> To exemplify, if while paying attention to the book in my hand I am distracted by a flashing light in the periphery of my visual field, there is a sense in which my shift of attention, from the book to the flashing light, is unintentional. That is, there is a sense in which I did not mean to shift my attention from the book, it just happened. When we contrast this with an example of a voluntary shift of attention, the point is brought out more clearly. I can visually single out – attend to – one book in a pile of books while remaining aware of the other books in the pile. I might decide to shift my attention from one book to another. In this case, I am antecedently aware of the object to which I am going to shift my attention; the shift of attention is voluntary and intentional. While *coming to attend* to something we see may not be intentional for the reasons just given, the voluntary *maintaining* of attention is more clearly intentional. Of course, this characterisation of visual attention as sufficient but not necessary for awareness needs arguing for on both counts, and that is the work of the next two chapters.

So I will not be attempting to defend the sufficiency of visual attention for visual awareness on the basis of the activity of visually attending being an intentional activity, because I am not sure that it is always exercised intentionally. Nevertheless, as I will argue in the next chapter, I believe there is a close connection between attention and intentional action. The most important point I have tried to make in this chapter is that there is an

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<sup>83</sup> Though Anscombe is discouraging about the prospect of illuminating intentional action by appeal to the difference between voluntary and involuntary action (Anscombe (1957/1963) pp. 10-11), she does go on to say “It is also clear that one is refusing application to the question ‘Why?’ (in the relevant sense) if one says ‘It was involuntary’...” (Anscombe (1957/1963) p. 12).

underlying assumption supporting Kentridge et al.'s claim that GY is visually attending to stimuli he is visually unaware of. The assumption is that the Posner task, which measures the effects of *conscious* visual attention on response times and accuracy with normally sighted subjects, also measures the effects of visual attention in the case of a subject with blindsight. But to make this assumption is just to beg the question against the conception of visual attention as sufficient for visual awareness. To say that the Posner task can measure the effects of attention regardless of whether or not the subject being tested is aware of the stimuli is in effect to admit that a decision has already been made about the role attention plays: it selects object to receive enhanced processing. I have been arguing that decision is premature. The way we typically think of visual attention is as sufficient for awareness – it would be to misunderstand or misuse the word to ask someone who is not visually aware of an object to pay attention to it. Given that, our first step needs to be to determine whether attention conceived in this way plays a distinctive and therefore indispensable role.

One possible reaction to the Kentridge et al. (1999) results is to dismiss them as irrelevant to this conception of attention. I think that would be a mistake. Instead, we should see the results as posing a characteristically philosophical question: *why do we think of attention as an essentially conscious phenomenon? What role does visual attention so conceived play that the selection and enhancement blindseers are capable of does not? In the next chapter, I consider four potential answers to this question.*

### **Chapter 3: The Sufficiency of Visual Attention**

The task of this chapter is to identify how visual attention, conceived as sufficient for awareness, explains our visually based object-directed thoughts and actions in a way that the selective enhancement the blindseer is capable of does not. I consider four candidates for this explanatory role. In §2 I consider whether visual attention enables us to have spontaneous (unprompted) visually based object-directed thoughts and actions; in §3 I look at Declan Smithies' Rational Access account of the explanatory role of attention; in §4 I look at John Campbell's Relational View account of the explanatory role of attention, and in §5 I propose my own reasons-based account.

#### **1. Introduction**

We are considering the question of whether a subject's visual attention to an object is sufficient for her to be visually aware of the object. On the face of it, this seems like an easy question to answer. Whether I am turning my attention to each of the items on my desk as I look for a particular one, or my attention is grabbed by a flashing light, I am visually aware of what I am visually attending to. As we saw in the preceding chapter, however, this

everyday way of talking about attending to objects that we see faces a challenge exemplified by the abilities of a subject with blindsight. According to Robert Kentridge and colleagues,

“Attention... involves a process of selection (withdrawal of processing from parts of the world in favour of other parts) and enhancement (the selective concentration of resources results in enhanced processing of the object of attention).”<sup>84</sup>

They also think that data from their spatial cuing experiments with the blindseer GY have helped establish that

“selective enhancement of an object’s properties by spatial attention can occur without any conscious experience of those properties or their enhancement.”<sup>85</sup>

The selection and enhancement that visual attention involves co-occur with visual awareness in ordinary cases, but this may be merely a co-incidence, as it were. According to the Kentridge picture, visual attention is not essentially conscious: attention is not sufficient for awareness.

Reflection on the role of visual experience seems to suggest otherwise. If you ask me how I know how the magician performed his trick, and I say it’s because I was paying attention to his hands and I saw him palm the coin, my answer seems to settle the question. In contrast if I say I don’t know, or (more inexplicably still) I say it’s because I was paying attention to his hands

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<sup>84</sup> Kentridge et al. (2008) p. 106.

<sup>85</sup> Kentridge et al. (2008) p. 110.

though I wasn't aware of anything, or I attribute my success to a part of my visual system, that would just raise further questions. Of course, someone impressed by the blindsight data might interject here that this merely reflects our lack of familiarity with attention in the absence of awareness. A constructive approach to defending the sufficiency of attention for awareness will not, therefore, appeal to custom and habit. Instead, a constructive approach will seek to arrive at a deeper understanding of the nature of visual attention by asking *why* attention should be conscious. Fortunately, we already have a preliminary answer. Conscious attention to an object *explains* our visually based thoughts and actions with respect to it: my paying attention to the magician's hands explains how I know how he did his trick – I was aware of him palming the coin. So also when I hit the bullseye with my arrow, or correctly read out the letters on an eye chart. My paying attention to the object (the target, or each letter on the chart) implies my awareness of it, and my awareness of it, in a way to be illuminated, explains my thoughts and actions.

Clearly, to mount a credible defence of the claim that visual attention to an object is sufficient for visual awareness of it, the explanation attributed to visual attention cannot be one that is also available as an explanation of the blindseer's visually based object-directed thoughts and actions. So the correct response to Kentridge's evidence against sufficiency is to identify how visual attention to objects explains our thoughts and actions in a distinctive way.

An obvious starting point is to look for differences between the visually based abilities of blindseers and those of normally sighted people. Blindseers lack visual awareness of course, but if that is the most we can say, it will be hard to motivate a defence of the sufficiency of attention for awareness. It will be difficult, that is, to give any sense to our natural inclination to think of visual awareness as explaining our visually based thoughts and actions. As a consequence, it will also be difficult to avoid the charge that it is purely on the basis of habit that we cling on to our conception of visual attention as sufficient for visual awareness. So we need to ask whether there are, in addition to the lack of awareness, any further deficits. In particular, are there any visually based deficits which will answer the question: What is it that visual attention to an object enables us to do that the selective enhancement of blindseers does not enable them to do? An answer to that question could provide a convincing candidate for the explanatory role of visual attention.

To get a fix on the kind of answer we are looking for, it may be helpful to briefly consider a possible candidate that we can reject quite quickly. A good example for this purpose is the detailed visual information that people with normal sight enjoy, and that GY's blindsight lacks. After some consideration, it becomes apparent that providing detailed visual information turns out not to be a good candidate for the explanatory role of visual attention. The main reason is that portraying the difference between blindsight and normal vision as a matter of degree, a difference between minimal visual information and

detailed visual information, simply mischaracterises the difference.<sup>86</sup> Daniel Dennett tries to argue for this characterisation of the difference.<sup>87</sup> Dennett suggests that the difference between a blindseer and someone with normal vision is a difference in the quantity of available information ('richness of content').<sup>88</sup> He points to the possibility of training a blindseer to improve his performance through practice, and by learning to prompt himself. There is good evidence that blindseers can improve their performance with practice, some of which we saw in the last chapter. GY improved his performance with practice on the indirect peripheral cueing condition. There is also evidence, which we will see in §2.2, that blindseers can perform a range of actions without needing to be prompted. I am, however, aware of no evidence that blindseers can learn to prompt themselves in the sense Dennett means. He asks whether a blindseer could be trained to function normally by learning to prompt himself.<sup>89</sup> In §2.1 I try to show why I don't think this is a coherent possibility. But I hope there is some initial plausibility to the thought that it is just a mistake to characterise the difference between blindsight and normal visual experience as a difference in the quantity of available information. What makes the abilities of blindseers so remarkable, and of considerable philosophical interest, is that they are exercised in the complete absence of visual awareness.<sup>90</sup>

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<sup>86</sup> Cf. Weiskrantz (2009b). There is also evidence of a blindseer demonstrating visual discrimination of objects in his blind field well beyond the capabilities of normally sighted subjects. The blindseer DB's performance identifying very low contrast stimuli in his blind field was better than the performance of normally sighted subjects (Trevethan et al. (2007)).

<sup>87</sup> Dennett (1991) pp. 325-343 and Dennett's (1995) commentary in Block (1995) pp. 252-253.

<sup>88</sup> Dennett (1995) p. 252.

<sup>89</sup> Dennett (1991) pp. 330-331. He actually wonders whether a blindseer could 'become conscious' in this way.

<sup>90</sup> This is the case with pure or 'type 1' blindsight. I touch on type 2 blindsight in §2.2 below.

A companion consideration is that visual attention can be deployed covertly, i.e. to the periphery of the visual field, outside central foveal vision (all the attention orienting experiments with GY relied on this). The visual experience of someone who is covertly attending to an object will lack the detailed visual information of the object that overt (foveal) attention to it would provide, and in that sense covert attention lacks the quantity of information provided by overt attention. But covert attention is still *conscious*, the person is still visually aware of the object. So describing the difference between blindsight and normal visual experience in purely quantitative terms does not explain why in one case but not the other there is visual awareness of the object.

There are better candidates for the explanatory role of visual attention. In this chapter I will consider four of them, one each in Sections 2, 3, 4 and 5. The first takes as its inspiration the fact that blindseers need to be prompted to make guesses about objects in their blind field. Visual attention to an object obviates the need to be prompted to consider it. Could this be evidence that the explanatory role of visual attention is to make visual information spontaneously accessible for use in the control of thought and action? I look at an argument Ned Block has put forward against the inference from a deficiency in blindsight to a function of visual awareness (§2.1). If Block is right, visual awareness is not necessary for visual information to be spontaneously accessible for thought and action, and therefore that cannot be the explanatory role that visual attention plays. I consider an ability of blindseers we did not come across in the previous chapter, their ability to

spontaneously act with respect to objects in their blind field, which indicates that the connection between spontaneous visually based object-directed action and awareness is not the same as the connection between spontaneous visually based object-directed thought and awareness (§2.2). I outline some evidence for David Milner and Melvyn Goodale's theory that there are two separate visual systems (§2.3). This presents a choice. Either we reconceive visual attention as actually composed of two varieties of attention, with only one being conscious, or we continue to treat it as a single phenomenon. I opt for continuing to treat visual attention as a single, conscious phenomenon. When we pay attention to objects we see, regardless of whether the attention is a prelude to action, or it is attention paid just out of curiosity, we don't think of attention as possible in the absence of awareness. To keep hold of this pre-theoretical view of attention, we need to treat visual attention as a conscious phenomenon. Consequently, we have to give up explaining the distinctive role of visual attention as making information spontaneously accessible for thought and action.

In Section 3, I consider a different proposal: visual attention explains our visually based object-directed thoughts and actions by justifying them. Declan Smithies has argued that visual attention to an object provides us with justifying reasons for our visually based object-directed thoughts and actions. A blindseer may think about an object in his blind field, or act upon it because he can visually detect it, but he lacks access to justifying reasons for his thoughts and actions.

In Section 4, I consider the role visual attention plays in grounding our visually based object-directed thoughts and actions. John Campbell has argued that blindseers lack the distinctive way of knowing which physical object a demonstrative refers to that visually attending to it provides. Visual attention to objects provides us with knowledge of the reference of demonstratives, and justifies our thinking of objects as mind-independent. The visual selection and enhancement that is preserved in blindsight does not provide blindseers with knowledge of the reference of demonstratives, or with justification to conceive of objects as mind-independent.

In Section 5 I set out an alternative to both Smithies' and Campbell's views, which identifies an explanatory role for visual attention that neither Smithies nor Campbell give due weight to. Visual attention to an object, I argue, explains how our thoughts about it, and our actions with respect to it, are integrated. Visual attention to an object also prioritises responding to that object over other intentional, visually based responses.

## **2. Spontaneous Accessibility**

In this section I consider the proposal that visual attention makes information spontaneously accessible for use in the control of thought and action. The motivation for this view of the explanatory role of attention comes from the observation that blindseers need to be prompted to make guesses about objects in their blind field. As we saw in Chapter 1, GY is able to detect the presence of a target displayed to his blind field; he is able to do this well

above chance and his response time is faster following a valid than a misleading cue. In those experiments, the presentation of the target stimulus was signalled to GY by an auditory tone, which was also his cue to respond.<sup>91</sup> This marks a substantial difference between GY's ability to detect objects in his blind field and the ability of normally sighted people (and, presumably, GY when he uses his intact hemifield). When we open our eyes we are confronted by the world: our thoughts about the objects we see and our actions with respect to those objects generally need no prompting. It is very tempting to conclude, therefore, that the distinctive way in which visual attention explains visually based object-directed thoughts and actions is by prompting them. When I am visually attending to an object, in addition to the selection and enhancement of processing of the object by my visual system, I am aware of it. Being aware of it in this way – attentively aware of it, so to speak – seems to explain why I don't need to be prompted to think about it, or act with respect to it. This suggests that the explanatory role of visual attention to an object is to make visual information from that object spontaneously accessible for the purpose of thought about the object, and action with respect to it.

Ned Block (e.g. Block (1995)) has argued, in effect, that the inference to an explanatory role for visual attention from the inability of subjects with blindsight to prompt themselves is not valid. In §2.1 I look at his argument, which makes use of the hypothetical condition of 'super blindsight'. I question the coherence of super blindsight as described by Block. I conclude that

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<sup>91</sup> Kentridge et al. (1999) pp. 1805-1806.

Block is right to question the validity of the inference, but that because of the questionable coherence of super blindsight, the issue is one which needs to be resolved by looking at actual cases. In §2.2 I look at empirical evidence from both a monkey and a human that seems to support the existence of a partial kind of ‘super’ blindsight. Both demonstrate spontaneous visually based object-directed actions in the absence of visual awareness. In §2.3 I outline an influential hypothesis, David Milner and Melvyn Goodale’s two visual systems hypothesis, that purports to explain how this partial super blindsight is possible. The empirical evidence from ‘partial super blindsight’ along with the evidence Milner and Goodale draw on for their hypothesis strongly indicates that visual attention to an object is not necessary for visual information from it to be spontaneously accessible for the purpose of action with respect to it. This presents a choice. Either visual attention is no longer treated as a unitary, conscious phenomenon and the defence of the pre-theoretical conception of attention as sufficient for awareness is given up, or a different explanatory role for attention is found. Sections 3-5 of this chapter all consider explanatory roles for attention conceived as a unitary, conscious phenomenon.

## 2.1 Blindsight and Super Blindsight

When we talk of paying attention to things we see, part of what we mean is that we are aware of the things we are paying attention to. I cannot pay attention to the magician’s card trick while remaining completely unaware of it. Robert Kentridge and others have challenged this conception of attention,

arguing that GY's visual abilities demonstrate that attending to an object is not sufficient for being aware of it. I have responded that a recognisable and quite typical way of talking about attending to things we see – what I have called visual attention – points to a conception of visual attention that plays an explanatory role for us: visual attention explains, for example, how I know what I am looking at. If visual attention plays an explanatory role that cannot be played by the visual selection and enhancement the blindseer is capable of, we have the basis of a defence of the sufficiency of visual attention for visual awareness. The challenge is to identify what this explanatory role is, and why it cannot be played by the visual selection and enhancement the blindseer is capable of. A promising first step in identifying the explanatory role of visual attention is to compare the abilities of blindseers and the normally sighted. Blindseers, it appears, are unable to make reports about objects in their blind field unless they are prompted to do so. Accordingly, the proposal we are considering here is that visual attention is necessary for us to be able to spontaneously access visual information in the service of object-directed thought and action.

The strategy behind this proposal faces a challenge brought by Ned Block. Block (Block (1995)) has argued against drawing conclusions about the function of consciousness from the deficits exhibited by blindseers. According to Block, blindseers lack not only visual awareness, but also a functionally defined kind of consciousness. Block argues for a distinction between what he calls phenomenal consciousness and access consciousness. Phenomenal consciousness (or 'P-consciousness') is

“... experience. P-conscious properties are experiential ones. P-conscious states are experiential, that is, a state is P-conscious if it has experiential properties. The totality of the experiential properties of a state are ‘what it is like’ to have it.”<sup>92</sup>

The state of being visually aware of an object is an example of a phenomenally conscious state. It is noteworthy that phenomenally conscious properties are not to be identified with any cognitive, intentional or functional properties.<sup>93</sup>

We correctly attribute an access conscious (or ‘A-conscious’) state to a subject when a representation of the content of the state is

“... poised for use as a premise in reasoning,... poised for rational control in action, and... poised for rational control of speech.”<sup>94</sup>

On Block’s analysis, blindseers lack visual representations of objects presented to their blind fields that are P-conscious, but those representations are also not A-conscious, and their inability to spontaneously report the presence of the objects is due to the lack of access consciousness. Block’s main aim in his (1995) is to demonstrate how one kind of argument about the function of what he calls phenomenal consciousness is invalid. The kind of

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<sup>92</sup> Block (1995) p. 230.

<sup>93</sup> Block (1995) p. 230.

<sup>94</sup> Block (1995) p. 231. Block allows that a state may be access conscious even if it is not poised for the rational control of speech. Block also allows for the possibility that a phenomenally conscious state may not be access conscious, and therefore not reportable (pp. 232-233, p. 234).

argument he is targeting infers from the fact that the blindseer's lack of visual awareness is accompanied by an inability to spontaneously report the presence of objects in his blind field that a function of visual awareness is to make visual information accessible for spontaneous report. This argument is invalid, Block maintains, because there could be (and Block thinks there is) something *e/se* missing in blindsight, and it is the lack of this further component of normal functioning ('access consciousness') that is responsible for the blindseer's inability to spontaneously report objects presented to their blind field.

To support his case, Block considers the hypothetical possibility of *super* blindsight. The super blindseer can prompt himself to make guesses about what is in his blind field in such a way that

"Visual information from his blind field simply pops into his thoughts in the way that solutions to problems we've been worrying about pop into our thoughts, or in the way some people just know the time or which way is North without having any perceptual experience of it."<sup>95</sup>

Visual information is access conscious for the super blindseer without being phenomenally conscious. The super blindseer is able to spontaneously report the presence of objects in his blind field. To accept super blindsight as a coherent possibility is to accept that we can conceive of access consciousness in the absence of phenomenal consciousness. If we can

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<sup>95</sup> Block (1995) p. 233.

conceive of access consciousness in the absence of phenomenal consciousness, phenomenal consciousness – and therefore visual awareness – cannot be conceptually necessary for the availability of visual information for spontaneous response. Yet it seems very plausible that visual awareness *is* necessary for spontaneous, visually based thoughts and actions. According to the pre-theoretical conception I have described, it is *because* I am aware of (and attending to) the magician's hands that I come to know how he does his trick. The surprising abilities of subjects with blindsight appear to challenge this view. Blindseers can acquire visually based information about their environment in the absence of any awareness. However, in the experiments with GY described in the last chapter, the unconscious visual information he acquired was not available to him for spontaneous responses. A modified view therefore suggested itself: visual awareness is necessary for visually based information to be used spontaneously. If the super blindseer can do everything his normally sighted counterpart can do, even this modified view is incorrect.

So it is a pressing question to ask whether super blindsight as envisaged by Block is a coherent possibility. The sketch Block provides suggests the super blindseer prompts himself to guess about what is in his blind field, following which answers 'simply pop into his head'. What the sketch does not make clear is exactly how the super blindseer's self-prompting is supposed to work. In actual cases of blindsight (even the remarkable discrimination and identification abilities demonstrated by DB<sup>96</sup>), the blindseer has to be

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<sup>96</sup> Trevelyan et al. (2007).

prompted by the experimenters to respond when a stimulus is presented to his blind field.<sup>97</sup> Perhaps we can fill out Block's sketch by trying to imagine how super blindsight might work.

Suppose a super blindseer is sat in front of a blank monitor screen, and his task is to press a button when he thinks something is presented on the screen. He doesn't have to identify it, just press the button as soon as he thinks it appears. He may become quite good at this if the stimulus is presented in the first few seconds, or minutes. But what if there is a much longer delay? In the controlled environment of a laboratory, with clear instructions explaining his task, this might be feasible. But in a natural environment, with unpredictable eventualities, how does the super blindseer know when to prompt himself, or in which direction to look? And how does he interpret his 'guesses'? As he watches an empty bus stop, let us suppose he detects a woman walking up to it. He prompts himself again, and again detects a woman at the bus stop. Is it the same woman? He may detect the same properties again, but given the discrete, periodic nature of his visual information about the world, mistaking one thing for another very similar one will always be more of a possibility for him than for a normal subject. More generally, it seems he is prone to missing events that occur, as it were, 'in between prompts'. Perhaps there is some way of augmenting his abilities to deal with this, but it seems like we will have to attribute yet more ill-defined

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<sup>97</sup> In Treves et al. (2007) DB's almost incredible identification of 25 of 28 animal outlines so faint (2% contrast) that normally sighted control subjects could at most identify 2 is described as 'spontaneous' (p. 2097). To clarify, what Treves et al. mean is that DB was not choosing from a list, though he was given some indication of the kind of thing ('animals', 'modes of transport' or both) to expect. All the tests carried out on DB reported in the paper were forced response tests, meaning DB was prompted to respond. My use of 'spontaneous' is as a synonym for 'unprompted'.

abilities to him for it to be plausible that his self-prompting will enable him to function like a normally sighted person.

There are other ways in which the super blindseer's lack of visual awareness will affect what he can do on the basis of unconscious visual information. As I have characterised the relationship between visual awareness and attention, people who enjoy normal vision are, on occasion, prompted to attend to something because of their visual awareness of it. I may be looking for a particular book among a pile of books, and shift my attention over each of the books in turn to determine if it is the right one. I know which direction to shift my attention in, because I am aware of all the books in the pile and I know which ones I have just looked at. How does the super blindseer know which direction to shift his attention in? Our visual environment is typically quite complex, and often includes moving objects (e.g. people, other animals, and vehicles). If the super blindseer shifts his visual 'selection' from one object to another, he will no longer be receiving any visual information about the first object, and could therefore lose track of it. In contrast, I can continue to be aware of objects I am not attending to, including moving objects. My characterisation of the relationship between visual attention and visual awareness on which these claims rely is defended in chapter 4. But I think even without these questions about the coherence of super blindsight, we should be sceptical.

How could a periodic source of information, derived from someone repeatedly prompting themselves to guess what is in their environment,

provide the sort of continuous flow of information visual experience can provide us with? I suppose someone could insist that super blindsight could provide a continuous flow of information, but the nature of this information, and the way the super blindseer manages it, then become mysterious. How could someone who has learned to prompt himself do so both voluntarily and continuously? And if he receives continuous information, what form would this information take? Would it be like a running commentary on the objects in his line of sight? How, without some sort of guidance, would he be able to voluntarily focus his visual attention on particular objects? I cannot myself make much sense of how any of this this would work.

If the super blindseer does not receive a continuous flow of visual information, his visual abilities would appear to be functionally (and not just phenomenally) different. To borrow John McDowell's memorable phrase, when we open our eyes we are 'saddled with content'.<sup>98</sup> The super blindseer is not saddled with content; he has to pull out information a piece at a time, and it is arguable that for that reason the kind of visual information he has access to is qualitatively different. Suppose someone with normal vision was to look at an event proceeding, such as an object moving, or changing colour. If she attended to the object without blinking or looking away, she would see the object moving, or changing colour. Put in the same position, the super blindseer would only detect different stages of the event. Arguably, this is not just a difference in quantity of information, it is also a difference in the kind of information. A subject with normal vision is able to perceive the

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<sup>98</sup> McDowell (1994/1996) p. 10 "... experience is passive. In experience one finds oneself saddled with content."

continuous progress of events. The super blindseer is only able to detect discrete states of the world.

There may well be ingenious ways of adding to Block's sketch, and answering the questions about super blindsight I have raised. But the important point, I think, is this. Super blindsight was introduced by Block as a device to help us understand the possibility of access consciousness without phenomenal consciousness. Instead, it has raised more questions than it has answered. As a way of illustrating a conceptual possibility, it has not delivered.

Block is, however, right to conclude that the concurrent absence of visual awareness and the ability to spontaneously report the presence of objects does not of itself prove that the lack of the first causes the lack of the second. It is logically possible that the absence of the ability to spontaneously report is unrelated to the absence of visual awareness, or that a third factor is responsible for the absence of both. This possibility notwithstanding, it remains very plausible that visual awareness of objects has some role to play in prompting object-directed thoughts and actions. When we speak of being distracted by something we see, what we mean is that something we see captures our attention, and we start thinking about it *because* we are conscious of it. It isn't obvious how a person could be distracted by something she was not aware of. Block's sketch of super blindsight is inconclusive, since it simply doesn't provide enough information for us to envisage it working. What we need to decide whether spontaneous visually

based object-directed thoughts and actions are possible in the absence of visual awareness of those objects is an actual case of super blindsight. Interestingly, it turns out that there are actual cases, albeit in a limited kind of way.

In §2.2 below, I consider two cases that could be described as ‘partial super blindsight’. The first case is of a monkey named Helen whose visual cortex (the area damaged in subjects with blindsight) was removed. The psychologist Nicholas Humphrey, who studied Helen closely over a long period of time, not only provides a clear description of her ‘super blindsight’ like abilities, but also offers what I think are intriguing pointers to understanding what her abilities are missing. The second case is of a human blindseer, TN, with bilateral blindsight (i.e. a complete lack of visual awareness). Both Helen and TN have demonstrated some astonishing visually based abilities in the absence of visual awareness.

## 2.2 Helen and TN

What might ‘super blindsight’ actually be like? Two cases of partial super blindsight, one involving a monkey, the other a human with bilateral blindsight (i.e. a lack of visual awareness across the whole visual field), provide some answers. The first case, which I describe in some detail, concerns a female rhesus monkey named Helen. Helen had her visual cortex surgically removed when she was an adolescent (visual cortex is the area of the brain damaged in humans with blindsight). Nicholas Humphrey spent

eight years training and observing Helen after her operation. His observations of the changes in her behaviour, and his surmises about her visual abilities and deficits are, I think, both intriguing and suggestive.

Humphrey describes how immediately following the operation, Helen appeared to be entirely blind.<sup>99</sup> For the first year, she showed little sign of any change, though he noticed that Helen sometimes appeared to turn her head or move her eyes in the direction of a moving object. Nineteen months after surgery, Humphrey started training Helen to reach through the bars of her cage for morsels of food he was holding in his hand.<sup>100</sup> If he kept his hand stationary, Helen would reach at random for it. If he waved his hand, or waggled his fingers, Helen was able to reach in roughly the right direction, and she improved with practice. To make sure Helen wasn't using her sense of hearing, or some other non-visual cue, Humphrey tested her ability to reach for the food in complete darkness and found her performance fell to chance levels.<sup>101</sup> Initially, Helen could not tell whether the object was within her reach or not.<sup>102</sup> Following a hiatus in training, Helen's abilities improved to the extent that she was able to reach for stationary objects (black objects against a light background).<sup>103</sup> The size of the objects she was able to detect also decreased, from hands to ¼ inch cubes to black dots 2 millimetres wide. There were, however, some noteworthy differences in Helen's reaching behaviour from that of a normal monkey:

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<sup>99</sup> Humphreys 1972 p. 682. In an earlier paper (Humphrey and Weiskrantz 1967) the authors explain that Helen's eyes retained some reflex responses (optokinetic nystagmus and pupil responses).

<sup>100</sup> Humphrey and Weiskrantz (1967) p. 595.

<sup>101</sup> Ibid.

<sup>102</sup> Humphrey and Weiskrantz (1967) p. 596.

<sup>103</sup> Humphrey and Weiskrantz (1967) p. 597, Humphrey (1974) p. 243.

“Her reaches were always either preceded or accompanied by fixation eye movements. These eye movements appeared to be normal saccades, bringing the fixated object to the centre of the retinae. To fixate an object before reaching for it is natural to any foveate animal, but it is worth noting that Helen was never seen to do something which is certainly within the capacity of a normal monkey – namely to reach for an object which was neither presently nor just previously in the direct line of sight. While her eyes could locate an object in the peripheral field, her hand, it seemed, did no more than follow her eyes.”<sup>104</sup>

Even more dramatic improvements in Helen’s abilities were to come. When Humphrey moved (with Helen) to Cambridge, he started taking her on a leash for walks outside.

“To begin with, as might have been predicted from her previous behaviour, these walks were fairly hazardous. She continually bumped into obstacles, she collided with my legs, and she several times fell into a pond. But then, day by day, there was an extraordinary change in her behaviour. On the one hand she began systematically to anticipate and skirt round obstacles in her path, while on the other she began actually to approach the trees in the field, turning towards them as we passed by, walking up and reaching out to grasp their trunks. There was an old elm tree which she specially liked to climb, and, with her perched in a hole in its trunk, I would hold up bits of fruit and nuts for her to reach for; and now she did something else she had not done before – she would reach out when the target was within arm's length but ignore it if it was too far away. It was clear that, given at

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<sup>104</sup> Humphrey (1974) p. 243, emphasis in original.

least the experience of three-dimensional space, she was quickly developing a kind of three-dimensional spatial vision.”<sup>105</sup>

While Helen would only reach for small objects if she first fixated them, she was able to use her peripheral vision to avoid obstacles, though as Humphrey explains, her spatial vision was not quite normal.

“All in all, Helen had made a remarkable recovery, yet no one who observed her for long would have been persuaded that even the grosser aspects of her spatial vision were in fact entirely normal. It was hard to pinpoint what was wrong. But my impression was that her visual space was a purely subjective, self-centred space in which she could place things in relation to her own body but could not place them in any more stable spatial framework. When, for instance, a small bit of black tape was stuck to the floor in the presence of surrounding obstacles she would return to try to pick it up again and again, never learning to ignore it on the basis of where it lay in relation to the stable objects round about it; every time she moved away and then caught sight of the tape again she appeared to treat it as a new discovery. By contrast, when a bit of tape was stuck to the table in front of her cage she would reach to it once or twice and then ignore it, while continuing to take currants from other parts of the table. In the latter case she did not move her body and consequently could keep track of the tape's position.”<sup>106</sup>

Something else he notes about Helen's visual abilities is that if she became distracted by anything her visual abilities deserted her.

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<sup>105</sup> Humphrey (1974) p. 244.

<sup>106</sup> Humphrey (1974) p. 248.

“A door slamming behind her or an unexpected pinch on her flank might be enough to make her quite oblivious of the obstacles in the arena. Despite the apparent effortlessness of her performance when she was relaxed, vision never became entirely ‘second nature’ to her.”<sup>107</sup>

When after eight years Helen was euthanized to allow her brain to be examined, it was discovered that a small area of visual cortex had not been removed. It was estimated that the spared area of cortex corresponded to a small area in the upper right-hand quadrant of her visual field. Humphrey is quite sure that this small area of spared vision could not explain Helen’s spatial visual capabilities: “... it would have taken more than a magician to have done what Helen did by some clever kind of squinting.”<sup>108</sup>

The picture Humphrey paints of the development of Helen’s abilities, and of her persisting deficits, is suggestive. Helen went from only being able to detect movement to being able to discriminate stationary black objects as small as a couple of millimetres from a light background, reminiscent of Block’s hypothetical super blindseer ‘trained to prompt himself’. Though she became able to detect whether objects were within her reach or not, Humphrey says she was never observed reaching for an object that was ‘neither presently nor just previously in her direct line of sight’. It seems that though she could detect and avoid objects in her peripheral vision, she was unable to use vision to direct her reaching unless she fixated the objects first.

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<sup>107</sup> Humphrey (1974) p. 248.

<sup>108</sup> Humphrey (1974) p. 252.

In contrast, normally sighted humans (and monkeys, as Humphrey points out) can quite easily reach for an object in their peripheral view. It is difficult to reconcile her skill at avoiding obstacles with her more limited ability to reach for them. If she could visually detect peripheral obstacles well enough to avoid them, why wasn't she able to reach for them? The answer suggested by this disparity seems to be that the two forms of visual detection functioned differently, one for obstacle avoidance, the other for reaching.

Humphrey also describes how Helen would keep returning to a bit of black tape stuck to the floor and try to pick it up, 'never learning to ignore it'. He speculates that Helen's sense of space was 'a purely subjective, self-centred space in which she could place things in relation to her own body but could not place them in any more stable spatial framework'. Helen could reliably detect objects in her direct line of sight, but seemed unable to maintain a sense of where objects she had previously encountered were located. Why might this be the case? Presumably, given enough time, she could learn to find her way around a fixed environment using touch, in the same way as someone who is blind. She had, however, become so adept at visual detection that

"When twenty-five currants were scattered at random over an area of 5m<sup>2</sup> she took only 55s on average (over four trials) to pick up every one."<sup>109</sup>

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<sup>109</sup> Humphrey (1974) p. 245.

It seems unlikely she could use touch to get a sense of her position in her environment while moving that quickly. A monkey with normal vision would probably not have mistaken the tape for food, but even with a more convincing decoy, having investigated the decoy once, would probably work out from the thing's location that it was the same object. Helen lacked any visual awareness of her environment, and therefore also lacked visual reference points for remembering the location of objects. While her ability to visually detect objects became quite acute, it was not accompanied by any visual sense of a stable physical environment in which she was located. In contrast, when she remained stationary, she could use her own position as a stable reference point to locate objects in relation to.

Perhaps most difficult of all to comprehend is Humphrey's description of Helen as systematically anticipating and avoiding obstacles in her path, and even turning towards trees as she passed them. Humphrey's speculation that Helen's sense of space was 'a purely subjective, self-centred space' that lacked an independently stable spatial framework suggests a way into understanding these incredible-seeming abilities of Helen's. In the absence of any visual spatial awareness, with (presumably) no auditory or olfactory spatial awareness, Helen's sense of space extending beyond her touch consisted only of the range of movements she was able to intuit she could make that would culminate in contact with something familiar, such as a bit of food, or a tree to climb. With intact visual experience we can be visually aware of objects *before* we move towards them; we move towards them *because* we are first visually aware of them. Helen's case seems, in this

respect, reversed. Her perceptual – tactile – awareness of objects *followed* her movement; she moved and then she experienced the thing she was moving towards. Her movements were motivated by her expectations of what she would end up with, and her expectations were based on her past experience, in a way rather like any behaviourally trained performance. The difference is that the movements were in many cases the sorts of movements monkeys naturally make, and at least some of the ‘rewards’ (a bit of food, or a tree to climb) could be directly accessed by making the movements, and were not dispensed by a trainer.

Humphrey’s observations of Helen also suggest a difference between her spontaneous visually based object-directed actions, and the hypothesized abilities of Block’s super blindseer. With Helen’s growing confidence in her abilities based on her past success, she grew better at determining which movements (if any) would result in her coming into contact with the objects she detected. If that is the right description of her visually based abilities, they fall well short of the spontaneous guesses credited to the super blindseer. The super blindseer is supposed to be able to spontaneously visually identify and locate objects as effectively as a normally sighted person. Helen’s visually based abilities, in contrast, only allowed her to determine what movement she had to make to come into contact with the object she detected.

Drawing clear conclusions from Helen’s case is, of course, problematic. The kind of subjective reports of awareness that can be provided by human

subjects, and the descriptions of their experience and intentions, could not be provided by her. Lawrence Weiskrantz (Weiskrantz (2009)) has reported the existence of what he has dubbed 'blindsight type 2' (Weiskrantz (2009) pp. 41-42), where the blindseer has an experience of some sort, though not one they describe as seeing.<sup>110</sup> Type 2 blindsight can co-vary with stimulus parameters (it seems to with GY, though not always with another blindseer, DB – Weiskrantz (2009) p. 42), and therefore could be interpreted as a kind of visual awareness.<sup>111</sup> Typically, type 2 blindsight occurs when the stimuli are fast moving, or have a high contrast and appear or disappear abruptly. It is likely that Helen's early detection of stimuli, which was the basis of her early training, was of this kind. It is also possible that some of Helen's later abilities were due to something like type 2 blindsight. While Humphrey is convinced the small area of visual cortex that Helen retained could not explain the majority of her abilities, that it had some effect on Helen's behaviour cannot be ruled out. Another reason that it is difficult to compare Helen's situation to human cases of blindsight in people like GY is that most human cases involve the loss of much smaller parts of the visual field. In GY's case, for example, only the right half (hemifield) of both of his eyes is affected, the vision from the left half of both of his eyes is intact.

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<sup>110</sup> Weiskrantz writes of the blindseer DB "With increasing stimulus salience, e.g. luminous contrast or velocity of movement, he may start to acknowledge a 'feeling' that something is happening and is usually able to locate where the feeling comes from in space. The feeling may have spatial properties... [but] He nevertheless denies that such feelings are 'seeing'." (Weiskrantz (2009) p. 226).

<sup>111</sup> This is a matter of contention. Weiskrantz has emphasized the 'absence of acknowledged seeing' (Weiskrantz (2009) p. 42). Others (e.g. fytche and Zeki (2011)) have argued that type 2 blindsight is a kind of visual experience. Awareness of motion in blindsight is also known as the Riddoch phenomenon or syndrome.

The discovery of a human who suffers from a visual field defect of both hemifields is, therefore, significant. Recently, Beatrice de Gelder and others carried out a test on a human subject with bilateral blindsight (i.e. the loss of visual awareness of his whole visual field).<sup>112</sup> The subject, TN, "... walked like a blind man, using his stick to track obstacles and requiring guidance by another person when walking around the various laboratory buildings during testing."<sup>113</sup>

De Gelder and her colleagues persuaded TN to participate in a test to see if he would be able to use his blindsight to avoid obstacles in the sort of way Helen had learned to. They

"... constructed a complex obstacle course consisting of boxes, chairs, and so on, arranged randomly along a long corridor, without any person to guide him and with the removal of his walking cane. An experimenter always followed behind him during his traversing the course in case of a fall or collision, which seemed a real possibility given his clinical blindness. Astonishingly, he negotiated it perfectly and never once collided with any obstacle, as witnessed by several colleagues who applauded spontaneously when he completed the course."<sup>114</sup>

Though de Gelder and her co-authors concede that they cannot completely rule out the possibility that TN might have used non-visual cues such as some form of echolocation, they think this very unlikely, as neither he nor the person following behind him were heard to make any sound. While TN's

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<sup>112</sup> The condition is very rare, since it requires selective damage to occur in not one but two parts of the brain (both sides of the visual cortex).

<sup>113</sup> De Gelder et al. (2008) p. R1129.

<sup>114</sup> De Gelder et al. (2008) p. R1129.

negotiation of the obstacle-laden corridor is fascinating, and provides useful corroboration of the evidence from Helen, it is, in my view, a great pity and a missed opportunity that the investigators did not conduct an in depth interview with him to determine how he viewed the exercise. What did he think he was doing, as he avoided obstacles in his path? What, in short, motivated him to move one way rather than another? An answer to this question would be of great help in understanding the phenomenon from the subject's point of view.

With Helen and TN, in stark contrast to their remarkable abilities to perform visually based object-directed actions, there is no evidence of comparable spontaneous visually based object-directed thoughts. As Humphrey puts the point in relation to Helen,

“After years of experience she never showed any signs of recognising even those objects most familiar to her, whether the object was a carrot, another monkey, or myself.”<sup>115</sup>

Unlike Helen, human blindseers can accurately identify objects when prompted to do so, but there is still no evidence they can do this in the spontaneous way that they can perform visually guided actions. An obvious question at this point is why this should be the case. In §2.3 below, I outline an influential answer to this question, David Milner and Melvyn Goodale's two visual system hypothesis. According to Milner and Goodale, there are distinct visual systems serving perception and action that function in parallel.

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<sup>115</sup> Humphrey (1974) p. 252.

Visual awareness depends only on the former system; 'perception for action' functions to an extent independently of awareness. One possibility, therefore, is that instead of having a single conception of visual attention, we ought to have two, one corresponding to each visual system. This is Milner and Goodale's proposal. Visual attention comes in two varieties, only one of which is conscious.

### 2.3 Two Visual Streams

Using evidence from a range of sources including lesion studies in animals and pathological and normal vision in humans, David Milner and Melvyn Goodale have argued for the existence of two visual systems or 'streams', one (the ventral stream) specialising in functions related to visual awareness ('vision for perception'), and the other (the dorsal stream) specialising in functions related to action ('vision for action').

"The visual system... has to be able to accommodate two somewhat distinct functions – one concerned with acting on the world and the other with representing it. How does the brain achieve these different ends? In theory, a single multipurpose visual system could serve both the guidance of actions and the perceptual representation of the world. In practice, however, we believe that evolution has solved the problem of reconciling the differing demands of these two functions by segregating them in two separate and quasi-independent 'visual brains'. In brief, it is our contention that, despite the protestations of

phenomenology, visual perception and the visual control of action depend on functionally and neurally independent systems.”<sup>116</sup>

“... we do not wish to deny the obvious fact that when carrying out a visuomotor act a person is typically visually aware of the stimulus to which their action is directed, and of the limb that is making that action. It is our claim, however, that all of this *visual* awareness will be mediated by processing in the ventral stream and that this processing will typically unfold independently of, and in parallel with, the visual control of the action itself. This does not contradict our claim that the visual information *used* by the dorsal stream to specify and control the constituent movements of a goal-directed action (including an eye movement) is inaccessible to consciousness. The compelling nature of visual consciousness makes it difficult to resist the intuition that it is one’s perception of the goal object that is guiding the action. But sometimes the truth can be counterintuitive...”<sup>117</sup>

There are, for our purposes, two significant claims being made. The first is that the two visual systems or streams are to a significant extent independent of each other (to exactly what extent is the subject of debate). The second is that only one of the systems gives rise to visual awareness – we are only visually aware of what is processed in the ventral stream. I want next to look at some of the evidence Milner and Goodale draw on for their hypothesis, and how they think the two visual systems work together in normal vision, before ending this section by considering whether the two visual systems

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<sup>116</sup> Milner and Goodale (2006) p. 1.

<sup>117</sup> Milner and Goodale (2006) p. 222 (*italics in original*).

hypothesis places any further constraints on the explanatory role of visual attention than already imposed by the visually based abilities of Helen and TN.

Milner and Goodale note that in some non-human vertebrates visual processing for different visually guided behaviours is known to be carried out separately, and that this is also generally accepted for some visually guided behaviour in primates, such as saccadic eye movements.<sup>118</sup> In addition, they argue there are several ways in which the inputs, processing and outputs for visually guided actions differ from those of object recognition.

“... to fixate and then reach towards a goal object, it is necessary that the location and motion of that object be specified in egocentric coordinates (that is, coded with respect to the observer). But the particular coordinate system used (centred with respect to the retina, head, or body) will depend on the particular effector system to be employed (that is, eyes, hand, or both)... In addition, since the relative positions of the observer and the goal object will change from moment to moment, it is obvious that the egocentric coordinates of the object’s location and its surface and/or contours must be computed on each occasion that the action occurs. A consequence of this last requirement will be that the visuomotor system is likely to have a very short ‘memory’... In sharp contrast to the viewer-based coding required for visuomotor control, visual coding for the purposes of perception must deliver the identity of the object independent of any particular viewpoint... Whatever the particular coding mechanisms might be (and they could vary across different classes of objects), the essential problem for the perceptual system is to code

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<sup>118</sup> Milner and Goodale (2006) p. 40.

(and later recover) object identity... It is objects, not object views, that the perceptual system is ultimately designed to deliver. As a consequence, human perception is characterized by 'constancies' of shape, size, colour, lightness, and location, so that the enduring characteristics of objects can be maintained across different viewing conditions. The outputs provided by this type of processing are well suited for the long-term storage of the identities of objects and their spatial arrangements."<sup>119</sup>

Computations for visually guided actions are carried out immediately prior to the action being performed, and rely on metrically accurate information.<sup>120</sup> Processing in the ventral stream, instead, relies on a 'scene-based frame of reference', which "preserves the relations between the object parts and its surroundings without requiring precise information about the absolute size of the object or its exact position with respect to the observer".<sup>121</sup>

According to Milner and Goodale, blindsight is not best characterised as a form of unconscious perception, but rather ought to be thought of as "a collection of residual visuomotor responses".<sup>122</sup> This sits somewhat awkwardly with the abilities of blindseers to detect and identify stimuli in their blind field. Addressing this point, Milner and Goodale suggest that blindseers "might be able to use information derived from visuomotor control systems to generate above-chance performance even on a forced-choice test of detection or discrimination".<sup>123</sup>

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<sup>119</sup> Milner and Goodale (2006) pp. 41-42.

<sup>120</sup> Milner and Goodale (2006) p. 229.

<sup>121</sup> Milner and Goodale (2006) p. 239.

<sup>122</sup> Milner and Goodale (2006) p. 75.

<sup>123</sup> Milner and Goodale (2006) p. 78. It is difficult to make sense of DB's performance at form discrimination as documented in Trevethan et al. (2007) in this way. In addition to identifying

From the mass of evidence that Milner and Goodale marshal in support of their two visual streams hypothesis, I want to mention two well-known neurological deficits. The first is visual form agnosia, where patients who have “roughly intact visual sensory function... are severely impaired at recognizing, matching, copying, or discriminating simple visual stimuli.”<sup>124</sup> Milner and Goodale tested a patient known as DF, who demonstrated the ability to perform various actions which required her to correctly adjust her hand movements, including reaching for and grasping objects, and ‘posting’ a card through a variably oriented slot.<sup>125</sup> Despite being able to perform all these actions without difficulty, DF was unable to identify what the objects she was reaching for were, or the orientation of the slot through which she successfully ‘posted’ a card.<sup>126</sup> Unlike patients with blindsight, however, DF was aware of and could visually identify surface properties (i.e. surface textures) and colours. What she was unable to do was identify objects by their shape or orientation.

“[DF] said that objects seemed to ‘run into each other’, so that two adjacent objects of a similar colour such as a knife and fork will often look to her like a single indefinable ‘blob’. Conversely, she will sometimes see two differently coloured parts of a single object as two different objects.”<sup>127</sup>

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low contrast outline objects given an indication of which general category to expect, he was able to identify some photographed objects without any indication of what to expect.

<sup>124</sup> Farah (2004) p. 13.

<sup>125</sup> Goodale and Milner (2004) Chapter 2.

<sup>126</sup> DF was also unable to identify shapes and faces (Goodale and Milner (2004) p. 9).

<sup>127</sup> Goodale and Milner (2004) pp. 9-10.

The second condition I want to mention is optic ataxia, which usually occurs as part of a group of symptoms known as Bálint's syndrome. Patients with optic ataxia cannot use visual information about the location of a target to reach for it,<sup>128</sup> and can struggle to adjust their hand movements to grasp objects properly, and to complete the 'posting' task that DF was proficient at. Patients with this condition can, however, give accurate verbal descriptions of the relative locations of the objects which they struggle to reach for and grasp, and distinguish between differently sized and oriented objects.<sup>129</sup> In optic ataxia, the deficits seem to correspond to what is spared in visual form agnosia – in the latter, there seems to be action without visual awareness, and in the former visual awareness is accompanied by difficulties executing visually guided actions. This indicates that visuomotor abilities can function independently from reports of visual awareness, and that reports of visual awareness can function independently from effective visually guided action.

Visually based object-directed actions can also dissociate from visual awareness in non-pathological cases. In experiments carried out by Bruce Bridgeman and colleagues, normally sighted subjects were asked to move a pointer, which was hidden from their view, to point to the location of a displayed target (rather like pointing under a table to a person on the opposite side). On some occasions, the target was moved during a saccade (i.e. one of the routine rapid movements between fixations our eyes make, and of which we are generally unaware). On one set of trials, the display was

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<sup>128</sup> Goodale and Milner (2004) p. 33.

<sup>129</sup> Goodale and Milner (2004) p. 33-35. The abilities of patients with Bálint's syndrome seem to vary. The Bálint's patient RM is described as having "great difficulty in reporting where objects were located even when he directed his gaze at them." (Friedman-Hill et al. (1995) p. 853).

turned off before subjects were asked to point. Despite the subjects' lack of awareness that the target had moved while their eyes were saccading, their pointing was influenced by its movement (they moved the pointer to point towards where the target had actually been, and not in the direction it had previously occupied).<sup>130</sup>

This selection of evidence is, I think, enough to show that visually guided actions and visual awareness can be dissociated from each other in both pathological and normal cases. As we have seen, Milner and Goodale's hypothesis is that 'vision for action' and 'vision for perception' function to an extent independently of each other. With normal vision, according to Milner and Goodale, the two visual systems interact in a way analogous to the way a human might control a semi-autonomous robot. The ventral stream, which gives rise to visual awareness, is involved in 'flagging' target objects, and specifying the kind of action to be carried out. The dorsal stream, which operates outside conscious awareness, carries out the body-centred metrically precise computations for the action to be performed.<sup>131</sup> The extent to which the two systems are independent of each other is a matter of debate<sup>132</sup> and contention,<sup>133</sup> but the details of those debates are not important for our purposes. There are two points to take from the evidence

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<sup>130</sup> Bridgeman et al. (1979).

<sup>131</sup> Milner and Goodale (2006) pp. 205-206 and pp. 231-232; Goodale and Milner (2004) pp. 98-100.

<sup>132</sup> For example, Pierre Jacob and Marc Jeannerod allow that in some circumstances both ventral and dorsal systems might use the same information: "The experimental results suggest that the motor system may draw upon the same information as the perceptual processing when its natural temporal profile is upset and when, e.g. the onset of action is delayed." Jacob and Jeannerod (2003) p. 111.

<sup>133</sup> Robert Briscoe and John Schwenkler argue that conscious visual information is used by the dorsal 'perception for action' system when the actions being performed are complicated, delicate or unfamiliar. Briscoe and Schwenkler (2015).

for Milner and Goodale's hypothesis outlined here. The first is further confirmation that visual awareness of an object is not necessary for performing spontaneous (i.e. un-prompted) visually based object-directed actions. What we saw evidence of with Helen the monkey and TN (who has bilateral blindsight), is reinforced with evidence from normal subjects (Bridgeman et al. (1979)). The second and related point is that visually based object-directed actions and thoughts dissociate in both directions. Some visually based actions can occur without accompanying visually based thoughts (e.g. Bridgeman's experiments on movement during saccades). Some visually based thoughts can also occur without a commensurate ability to carry out visually based actions (as reported by Goodale and Milner of some Bálint's patients). The evidence from Helen and TN, and visual form agnosia, optic ataxia and Bridgeman's experiments together strongly indicates that visual awareness is not necessary for spontaneous visually based actions. There is, however, no evidence that spontaneous visually based thoughts are possible in the absence of visual awareness.<sup>134</sup>

Milner and Goodale's proposal is that there are two kinds of visual attention.

"... there is more than one substrate supporting selective visual attention and... only one of these substrates is linked with conscious experience. In particular, we would propose that attentional mechanisms associated with the ventral stream are critical in determining visual awareness of objects and events in the world. Yet at the same time, we believe that

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<sup>134</sup> Even DB's remarkable performance, identifying a greater number of barely visible outline figures in his blind field than normally sighted subjects managed (Trevethan et al. (2007)) needed to be prompted.

there are also selective attentional mechanisms in the dorsal stream... that are not obligatorily linked to awareness. In the blindsight example, the argument would be that when the patient points to a target in his blind field, that target must have been 'selected' by attentional mechanisms in the dorsal stream (and/or associated subcortical structures) so that the appropriate visuomotor transformations could be facilitated. But since in most blindsight patients the target stimulus would have no access to mechanisms in the ventral stream, perceptual or attentional, no visual awareness of the target would be possible."<sup>135</sup>

But is this conclusion forced on us? If we accept this explanation of the dissociation evidence, we can no longer conceive of visual attention involved in visually based object-directed thoughts and actions as a unitary, conscious phenomenon. 'Dorsal attention' could (and in the cases considered *would*) be unconscious. But visual attention – attention to objects we see – as we typically think of it, does not distinguish attending for the purposes of acting on an object from attending for the purposes of thinking about the object. Regardless of my purpose in paying attention to an object I see, the way we usually think of attention, my attending to an object implies I am aware of it.

The motivation for resisting Milner and Goodale's proposal that there are two kinds of visual attention is the same as the motivation for resisting the claim by Kentridge and colleagues that GY is attending to stimuli in his blind field. Visual attention paid to an object explains our visually based thoughts and actions with respect to it. When I hit the bullseye with my arrow, or correctly

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<sup>135</sup> Milner and Goodale (2006) p. 185. In the Epilogue to this book, they refer to the Kentridge et al. (1999) data, saying "... these demonstrations of 'attention without awareness' imply that although attention may well be a necessary condition, it is not a *sufficient* condition for conscious awareness..." (p. 234, emphasis in original).

read out the letters on an eye chart, my paying attention to the object (the target, or each letter on the chart) implies my awareness of it, and my awareness of it provides an explanation of how my actions are successful. Of course, in the face of the evidence for visually based abilities without visual awareness, this explanation needs to be supplemented with an account of what is distinctive about the contribution that conscious attention makes, and that is the goal of this enquiry. The evidence from Helen and TN, together with the further evidence from Milner and Goodale, leaves little room for doubt that the distinctive explanatory role of visual attention is not to make visual information accessible for spontaneous object-directed thoughts *and* actions. But this does not force Milner and Goodale's conclusion on us.

In the next section, I consider a different proposal for the role of visual attention. According to Declan Smithies, visual attention to an object provides us with reasons for our visually based object-directed thoughts and actions. A blindseer may think about an object in his blind field, or act upon it because he can visually detect it, but he lacks access to justifying reasons for his thoughts and actions.

### **3. Rational Access**

In this section I consider Declan Smithies proposal that visual attention to an object provides us with reasons for our visually based object-directed

thoughts and actions (Smithies (2011a)).<sup>136</sup> Smithies' strategy is to steer a course between two opposed views of attention, both of which he cautions against. On one of these views, attention is characterized purely in phenomenological terms, without any regard for the function it might fulfil; the other view makes the opposite claim. As Smithies points out, in our ordinary way of thinking about attention, it makes a phenomenal difference to visual experience, but also fulfils a function – it influences what we think about and do. Not only are disagreements between the two views liable to be the result of mutual misunderstanding, but more importantly, both fail to capture something essential to the nature of attention. Ordinarily, I know what I am visually attending to, and it affects what I think or do.

Though Smithies' aim is to provide an account of attention that identifies the function it fulfils, his characterization is primarily phenomenal.

“... attention is essentially a phenomenon of consciousness. If attention is understood in terms of its distinctive phenomenology, then it is built into the concept of attention that there is a phenomenal contrast to be drawn between attentive and inattentive modes of consciousness. On this view, attention is a distinctive mode of consciousness, so there is consciousness without attention, but there is no attention without consciousness.”<sup>137</sup>

There are two, related, aspects of the phenomenology of attention that Smithies emphasises. The first is that attention structures the stream of

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<sup>136</sup> Smithies' analysis of attention (Smithies (2011a)) accompanies related work on the epistemic role of consciousness (Smithies (2011b), Smithies (2014)), which I will also be drawing on.

<sup>137</sup> Smithies (2011a) p. 247.

consciousness into an attended foreground and an unattended background, where the difference is marked by a phenomenal contrast between foreground and background. The second is that the structuring of consciousness into foreground and background involves a 'competition for selection', where, echoing William James, attention to an object can be seen as the result of selection from 'several simultaneously possible objects'.

With regard to the function that attention fulfils, Smithies' preliminary proposal is that "... attention selects information and makes it accessible for use in the control of action, reasoning, and verbal report."<sup>138</sup> As empirical support for this proposal he cites a famous set of experiments conducted by George Sperling on visual persistence in subjects with normal vision.<sup>139</sup> Sperling used a tachistoscope to briefly illuminate (for 50 milliseconds) a stimulus consisting of a row or rows of letters and numbers, which subjects had to try to report immediately afterwards.<sup>140</sup> Despite varying the number and arrangement of the characters<sup>141</sup>, the average number the subjects were able to write down was between 4 and 5.<sup>142</sup>

In the third set of experiments, Sperling changed the subjects' task from trying to write down all the displayed characters in the right order to trying to

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<sup>138</sup> Smithies (2011a) p. 252

<sup>139</sup> Sperling (1960). Ulric Neisser dubbed the phenomenon Sperling was studying 'iconic memory' in his 1967 work *Cognitive Psychology*.

<sup>140</sup> The brief exposure time was to minimise the possibility of eye movements during the presentation, and was itself varied in one condition. There were 'no systematic changes' despite the exposure times being varied from 15 milliseconds to half a second (Sperling (1960) p. 6).

<sup>141</sup> A variety of different arrangements were tested, from single rows of 3-7 characters to 3 rows with 4 characters per row.

<sup>142</sup> Sperling (1960) pp. 5-6.

write down a specific subset of them. Subjects were trained to respond selectively: immediately after the brief presentation of the stimulus they heard one of three different tones that signalled to them which of the three rows (top, middle or bottom) of the grid they were supposed to record. This partial report task produced some interesting results. Subjects were able to record an average of around 4 characters from the 3x4 grid.<sup>143</sup> Since the subjects did not know in advance which of the three rows they would be required to record, Sperling assumed that their partial reports ought to be treated as a random sample of the total number of characters they had available for report. Quite how these results should be interpreted is a matter of contention. Block has claimed that the Sperling experiments are evidence that "... perceptual consciousness is richer (i.e. has a higher capacity) than cognitive access".<sup>144</sup> Ian Phillips has pointed to the possibility that, at the very small timescales of the experiments, the tone might have a *postdictive* effect. That is, the perception of the stimulus grid could be affected by the tone, even though the tone followed the presentation of the grid.<sup>145</sup> For Smithies' purposes, that debate is not critical; what is important is that the row of characters the subjects recorded depended on their attention being cued to it by the tone. Attention to a particular row of characters – the *selection* of those characters – made them *accessible* for report (in this case, written rather than spoken). And we should be able to draw a more general conclusion, abstracting from the circumstances of the Sperling experiments.

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<sup>143</sup> Sperling (1960) p. 7.

<sup>144</sup> Block (2011) p. 567.

<sup>145</sup> Phillips (2011).

If I visually attend to an object in my environment, I am able to use what I see for the purposes of action, reasoning and verbal report.

While this provides a very plausible explanation of what, under normal circumstances, visual attention enables us to do, it fails to make the case for the sufficiency of attention for awareness. As we know, blindseers are also able to use visual information for the purposes of action and report in the absence of visual awareness. (Given that they can identify objects without being aware of them, there appears to be no impediment to blindseers using that information in reasoning either.) But selection for access is only a preliminary characterisation of the function of attention. Attention is sufficient for awareness, according to Smithies, because it makes information accessible in a specific way. Attention makes information “fully accessible for use in the rational control of thought and action.”<sup>146</sup>

While visual awareness of an object may not be necessary for visually based thoughts or actions with respect to it, “... unconscious visual information... is not rationally accessible to the subject as a justifying reason for belief or action.”<sup>147</sup> A blindseer may acquire a theoretical grasp of why his guesses and actions are reliable, by understanding theoretical explanations of how his visual system is supposed to process visual information of which he remains unaware. Smithies allows that he may use that as a reason for becoming confident in his guesses and actions. However, that would not make it the case that the unconscious visual information that the blindseer’s guesses and actions are

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<sup>146</sup> Smithies (2011a) p. 248.

<sup>147</sup> Smithies (2011a) p. 262.

influenced by is accessible to him as a reason for those thoughts and actions. Rather, it would be his theoretical grasp of why his guesses and actions are reliable that constitutes his reason for placing confidence in them. Something similar would be true of Helen the monkey, or TN the bilaterally blindsighted subject. Their actions might be (or become) fluent and confident because unconscious visual information was spontaneously accessible for the control of their actions but, says Smithies,

“... the mere feeling of confidence is not sufficient for justifying one’s beliefs and actions – justification is not so easy to come by!”<sup>148</sup>

We can agree that a feeling of confidence may not be sufficient for justifying beliefs and actions, but we should also acknowledge that in day to day life some of our beliefs are adopted, and some of our actions are performed, because we are confident about them. I might be utterly confident that I have the answer to a quiz question right, or that I remember where I left my keys, and I might act accordingly, because of my feeling of confidence. But this, we might also think, is an important difference between memory and perception.

<sup>149</sup> It would be most unusual for someone to form a visually based object-directed belief, or to try to perform visually based object-directed actions, in the complete absence of visual awareness of the relevant object. This is what makes blindsight so remarkable. So, we might think, on Smithies’ view

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<sup>148</sup> Smithies (2011a) p. 262.

<sup>149</sup> Timothy Williamson makes the point that we can have ‘bare factual memories’, memories that are not accompanied by any indications of how we acquired them (Williamson (2007) pp. 110-111).

it is *visual experience of the object* that justifies visually based object-directed beliefs and actions. But as we will see, this is not quite his view.

“The basic intuition is that it is no more rational to believe or act on the basis of unconscious visual information than it is to believe or act on the basis of blind guesswork. After all, there is nothing that is accessible to the subject on the basis of introspection that distinguishes the one case from the other. This diagnosis relies on a crucial assumption, which is that the rationality of one’s beliefs and actions depends solely on factors that are accessible to the subject on the basis of introspection. The underlying rationale for this assumption is that these are ultimately the only facts that one has to go on in engaging in critical reflection about what to believe and do.”<sup>150</sup>

This explains what seems so unusual about someone coming to believe, or acting, purely on the basis of unconscious visual information: it would be irrational and unjustified, in the same way that beliefs and actions based on guesswork would be. Now, what is motivating Smithies’ intuition is a particular view of the nature of rationality and justification. According to this view, ‘the rationality of one’s beliefs and actions depends *solely on factors that are accessible to the subject on the basis of introspection alone*’. Rationality and justification do not depend on how reliably true one’s beliefs are, or how reliably successful one’s actions are. Rationality and justification, on Smithies’ view, depend (in a particular way) on the mental states of the believer.

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<sup>150</sup> Smithies (2011a) p. 263.

Unlike blindseers, people with normal vision are able to consciously attend to objects, and this provides them with justification for their visually based object-directed beliefs and actions. According to Smithies, visual awareness provides a subject with justification by providing her with reasons for belief. Blindseers lack these reasons for belief and action because they lack visual awareness. But Smithies also wants to accommodate another intuition, according to which

“My envatted mental duplicate has justification to form beliefs on the basis of perceptual experience, memory, testimony and so on, although forming beliefs in this way is unreliable in the circumstances.”<sup>151</sup>

The thought here seems to be that justification does not depend on the facts that obtain, but only on the mental states and dispositions of the subject. Specifying those mental states and dispositions is itself something of a delicate matter. On externalist theories of content, the content of at least some beliefs will, in one case but not the other, depend on objects and features of the external world. But before looking at some of the potentially problematic aspects of Smithies’ view, there is an obvious but important point I want to emphasise. We can find the central insight of the first intuition – call it the Blindsight Guessing Intuition – plausible without that committing us to finding the second, which I will dub the Vat Justification Intuition, plausible. We can agree that blindseers’ lack of visual awareness leaves their visually based beliefs without introspectively accessible reasons. We are not thereby

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<sup>151</sup> Smithies (2014) pp.100-101.

obliged to agree that the visual experience available in a vat provides a level of epistemic justification comparable to visual experience of the external world. An ancillary point is that we can also agree there is something interesting in common between a properly embodied individual (call her 'World') and her vat-connected duplicate ('Mind'), without agreeing it is epistemic justification.

The combination of the Blindsight Guessing Intuition and the Vat Justification Intuition draw Smithies to what he calls Phenomenal Mentalism:

“One’s phenomenally individuated mental states determine which doxastic attitudes one has justification to hold.”<sup>152</sup>

The thought here is that it is non-epistemic facts, facts about the phenomenal character of mental states that are true of both Mind and World, that provide the basis for epistemic justification. The qualification that it is *phenomenally individuated* mental states, rather than simply *phenomenally conscious* mental states is required because, as Smithies notes, that a mental state is phenomenally conscious is neither necessary nor sufficient for it to provide epistemic justification.<sup>153</sup> It is not sufficient because factive mental states, such as seeing that there is a face at the window, do not provide epistemic justification. If they did, Mind and World would differ in the epistemic justification their beliefs have. It is not necessary, because many beliefs will be partly justified by other beliefs, for example background beliefs, and

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<sup>152</sup> Smithies (2014) p. 108.

<sup>153</sup> Smithies (2014) pp. 108-111.

background beliefs are not phenomenally conscious states. However, beliefs are 'disposed to cause phenomenally conscious states of judgement'.<sup>154</sup> It will be a matter for contention whether background beliefs can be effectively separated from other states lacking phenomenal consciousness, including the unconscious states involved in blindsight, in this way. To enter this debate would, however, take us too far afield.

Timothy Williamson (Williamson (2007)) has highlighted a number of potential problems for internalist theories of epistemic justification like Smithies', targeted at the Vat Justification Intuition. The Vat Justification Intuition is (at least part of) Smithies' motivation for thinking, for example, that factive perceptual states such as seeing that there is a face at the window provide no additional justification for believing that there is a face at the window by virtue of being factive. Put another way, the aspects of their visual experiences that Mind and World do not have in common contribute nothing to justifying their beliefs. Now, Williamson is prepared to concede that Mind has *some* justification to believe what she does on the basis of her visual experience, but insists that World has *more* justification.<sup>155</sup> But accepting this undermines the Vat Justification Intuition, according to which they are both equally justified.

Smithies cites Stewart Cohen's 'new evil demon' hypothesis in (Cohen (1984)) as inspiration for the Vat Justification Intuition. In that paper, Cohen's

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<sup>154</sup> Smithies (2014) p. 109.

<sup>155</sup> Williamson (2007) p. 118. Alvin Goldman's distinction between strong and weak justification concedes the same point (Goldman (1988)).

purpose is to question the plausibility of reliabilist theories of justification. Early in the paper, Cohen presses the point that belief forming processes that are unreliable can nevertheless produce justified beliefs.<sup>156</sup> This is quite consistent with the claim that false beliefs are less justified than true ones. To say that that false beliefs and true beliefs are equally justified is to make a stronger claim.

One motivation for making the stronger claim is an identification of epistemic justification with something like responsibility or culpability. This is Cohen's view.

"Intuitively, if [someone's] belief is appropriate to the available evidence, he is not to be held responsible for circumstances beyond his ken."<sup>157</sup>

But now consider this:

"Beliefs produced by good reasoning are paradigm cases of justified belief and beliefs arrived at through fallacious or arbitrary reasoning are paradigm cases of unjustified belief. Whether or not reasoning results in false belief, even if this happens more often than not, is irrelevant to the question of whether the reasoning is good."<sup>158</sup>

There is a clear sense in which someone who has taken all available precautions should not be held responsible for circumstances beyond his

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<sup>156</sup> Cohen (1984) p. 281.

<sup>157</sup> Cohen (1984) p. 282.

<sup>158</sup> Cohen (1984) p. 283.

control. But, of course, someone may *think* they have taken all available precautions without that being the case. And someone may *think* they have reasoned well and carefully, without that being the case. We can vary Cohen's 'new evil demon' hypothesis and suppose not only that Brian the brain-in-a-vat's conscious experiences are generated by a computer, but also that his ability to reason has been tampered with. Brian, as far as he can tell, has taken every epistemic precaution, and is, as far as he can tell, reasoning well and carefully. In fact, however, Brian is simply guessing. According to Smithies, 'it is no more rational to believe or act on the basis of unconscious visual information than on the basis of blind guesswork' because 'there is nothing that is accessible to the subject on the basis of introspection that distinguishes the one case from the other'. In Brian's case, too, there is nothing that is accessible to him on the basis of introspection that distinguishes his actual situation from the one he takes himself to be in. But it is quite a stretch to conclude that Brian's beliefs, arrived at on the basis of guesswork, are justified. This suggests that justification is not purely determined by what is accessible to the subject on the basis of introspection.

This by no means constitutes a 'knockdown' argument against the Vat Justification Intuition. Smithies could, for example, insist that the Vat Justification Intuition is premised on the basis of one of the mental duplicates actually having veridical perceptual experiences, and having a capacity for reasoning that is intact. But if that was the response, it would only serve to lend support to the thought that justification does, after all, have some connection to truth, and to undermine the idea that the mental states of

subjects, narrowly construed, can justify their beliefs independently of any such connection.<sup>159</sup>

Once the notion of epistemic justification is broadened to include evidence which may not be accessible to the subject by introspection, some of the motivation for the Blindsight Guessing Intuition is also undermined.

According to the Blindsight Guessing Intuition, the blindseer has no more reason for believing or acting on the basis of unconscious visual information than someone who is just guessing. But if what is motivating the comparison is an appeal to what is accessible to introspection in both cases, the comparison becomes suspect. Despite this, the central thought, that blindseers lack reasons for their visually based thoughts and actions, remains very plausible. The challenge is to explain why. In other words, the challenge is to identify a plausible explanatory role for conscious attention where visual awareness is doing the explanatory work.

Smithies' proposal is that attention is sufficient for awareness because attention makes information fully accessible for use in rational thought and action. A thought or action is 'rational' in Smithies' sense if the subject has access to a reason which justifies that thought or action. Blindseers are capable of using unconscious visual information to think and act, but those thoughts and actions are no more rational than thoughts and actions based on blind guesses. Thinking or acting on the basis of a blind guess is not justified because no reason for the thought or action is accessible by

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<sup>159</sup> Cf. Roessler (2009) pp. 1021-1022.

introspection alone. In the case of blindsight, the visual information that would justify the thought or action is also not accessible by introspection alone. I have tried to show that what is accessible on the basis of introspection alone is not always sufficient for justification. Someone might be so deceived that they think they are not guessing when in fact they are. If that is right, the explanatory role of visual attention cannot be to make visual information accessible for use in rational thought and action, because what is accessible on the basis of introspection alone is not always sufficient to constitute a justifying reason for thought and action.

Visual attention may still play an epistemic role. In the next section, I consider the role of visual attention in providing us with a distinctive way of understanding demonstrative expressions, and grounding our conception of physical objects as mind-independent. John Campbell has argued that visual attention to an object is necessary to have knowledge of the reference of visual demonstratives. Blindseers lack that distinctive kind of knowledge, and consequently vision does not provide them with justification to conceive of objects as mind-independent.

#### **4. The Relational View**

According to John Campbell (Campbell (2002)) to know the reference of a visual demonstrative expression (e.g. 'that car' in an utterance of 'That car is red', where the speaker is referring to a car she sees), it is necessary to be visually aware of it, and visually attend to it. (Equivalently, to know the

reference of a visual demonstrative expression it is necessary that visual attention be conceived as sufficient for awareness. My intended use of 'visual attention' from this point will be this conception of it.) Blindseers may be able to refer to objects in their blind field by means of descriptions, like 'The car in my blind field', but they lack our distinctive knowledge of the reference of visual demonstratives. Why should this be? Campbell uses a pair of contrasting cases to give the claim initial plausibility. He then develops a theoretical explanation of why blindseers lack this distinctive knowledge.

I start in §4.1 with the pair of contrasting cases Campbell uses to illustrate why visual attention is necessary for understanding visual demonstratives. They provide some useful initial purchase on the connection between attention and demonstratives, but also prompt some questions. In §4.2 I look at the connection Campbell makes between understanding visual demonstratives and psychological views of attention. Understanding a proposition should not depend on being able to determine whether it is true, but should determine how to verify it. Correspondingly, on Campbell's view, knowledge of the reference of a demonstrative determines ways of verifying what is said using it. Campbell's theoretical account of the explanatory role of visual attention relies on maintaining a separation between visual experience of an object and visually based thoughts about it. Visually experiencing objects does not depend on the use of language. Young children, for example, can visually experience objects before they have mastered sufficient language to refer to or describe them. However, there will normally also be some connection between visual experience and visually based

thoughts. Visual experience must play a role in our verifying that an object, for example the car referred to in 'That car is red', is in fact red. To provide an account of this connection – in our example, how visual experience of the car is related to the way we verify its colour – Campbell draws on psychological theories of visual attention.

I said the distinction between visual experience of an object and visually based thought about it is an important part of Campbell's theory. This is because visual attention is supposed to explain *how* we have a particular kind of visually based object-directed thought – thoughts expressed by utterances containing visual demonstratives – and *how* we perform a particular kind of visually based object-directed action – actions that are intentional under a description containing a visual demonstrative. To play this explanatory role, visual attention must be both distinct from and more basic than the thoughts and actions it explains. Campbell's characterisation of visual attention to an object is as a basic, unanalysable relationship between subject and object, which he calls the Relational View. But as we have seen, blindseers also have visually based object-directed thoughts, and perform visually based object-directed actions. Visual attention might explain *our* visually based object-directed thoughts and actions, but how is this different from what the blindseer can do? Unless visual attention plays a *distinctive* explanatory role, we have no appropriate basis for distinguishing attention conceived as conscious from the selection and enhancement of blindsight. Campbell's response is that visual attention to objects is what enables us to refer to them using visual demonstratives, and what grounds our conception

of objects as mind-independent. The selection and enhancement of blindsight, in contrast, does not enable blindseers to refer to objects using visual demonstratives, and cannot provide them with a conception of objects as mind-independent. I look at Campbell's Relational View in §4.3.

#### 4.1 The Sea of Faces

To illustrate the way in which visual attention is necessary for understanding visual demonstratives, Campbell makes use of a pair of contrasting cases. To make referring to them easier, I'll call the first 'the Cityscape', and the second 'the Sea of Faces'.

The Cityscape:

"Suppose... that you and I are sitting side by side looking at a cityscape, a panorama of buildings. If I am to think about any one of those buildings, if I am to formulate conjectures or questions about any of those buildings, if I am to be able to refer to any one of those buildings in my own thoughts, it is not enough that the building should simply be there, somewhere or other in my field of view. If it is simply there in my field of view, though unnoticed by me, I am not yet in a position to refer to it; I cannot yet think about it. If I am to think about it, I have to single out the building visually: I have to attend to it. And if I want to refer to that building, to make a remark about that building for your benefit, I have to draw your attention to it. That is what pointing is. Pointing is at once the most basic kind of reference to objects, and the single most useful way of drawing someone else's

attention to an object... the attention that is needed here is, as it were, a matter of experiential highlighting of the object..."<sup>160</sup>

In the next chapter, I will question whether to have a visually based thought about an object we have to attend to it. It seems quite obvious to me that, for example, I can attend to a single book in a pile of books while remaining aware of the rest of the pile, and therefore am able to refer to 'the pile'.

(There is experimental evidence that purports to show attention is necessary for awareness. I look at, and respond to that evidence in the next chapter.)

The key claim for present purposes is that, in the normal case, in order to refer to an object on the basis of perception, and in order to understand such reference, we need to perceptually attend to the object. To give us a sense of why this is, Campbell asks us to consider a different sort of case, where visual attention is missing.

The Sea of Faces:

"I think that the simplest way to grasp the common-sense difference between the blindseer and the ordinary subject is to consider an ordinary case in which you and I are sitting at a dinner table with a large number of people around and you make a remark to me about 'that woman'. There are a lot of people around; I can't yet visually single out which one you mean. So on anyone's account, I do not yet know which woman you are talking about. Suppose now that we add to the example. My visual experience remains as before: a sea of faces. I cannot consciously single out the person you mean. All I get

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<sup>160</sup> Campbell (2002) p. 2.

consciously is the sea of faces. But now we add some of what the blindseer has. You refuse to give me any further clues as to which person you mean, but you say, 'Try to point to the woman I mean'. As first I protest that I can't do that, since I don't know who you're talking about, but I do try to point, and to my surprise you say I'm pointing right at the person you mean. Suppose now that my conscious experience remains a sea of faces, but we extend the reach of my reliable guessing so that it encompasses everything the blindseer can do. So I can make reliable guesses about what the person is eating, wearing, and so on, as well as reaching and pointing appropriately. But so long as my conscious experience remains a sea of faces, there is an ordinary sense in which I do not know who you mean. The problem here does not have to do with whether I am reliable: we can suppose that I am quite reliable in my guesses and we establish this over a series of such cases. The point is rather that I do not know who you mean until I finally look at where my finger is pointing, or look to see who is wearing the clothes I described in my guesses. It is only when I have finally managed to single out the woman in my experience of the room, when it ceases to be a sea of faces and in my experience I focus on that person, that I would ordinarily be said to know who was being referred to. So it does seem to be compelling to common sense that conscious attention to the object is needed for an understanding of the demonstrative."<sup>161</sup>

There is a helpful similarity between the 'panorama of buildings' in the Cityscape, and the 'sea of faces': in both cases there is, in a sense, an undifferentiated view or scene, of which we have a 'gist'. Clearly, we need more than just the gist of a scene to be able to refer to a particular object

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<sup>161</sup> Campbell (2002) pp. 8-9.

within it. To refer to a particular object within the scene requires *picking that object out*, like pulling out a single wire from a tangle of wires. The conclusion Campbell is guiding us towards is that picking an object out requires visually attending to it. But isn't this a little quick? Why, we might wonder, should the visual singling out be *conscious*? The purpose of the *Sea of Faces* is to provide some initial plausibility for the need for visual attention (conceived as sufficient for awareness). The crucial point is epistemic. I come to know which of the diners my companion is referring to by visually attending to the woman.

But suppose we continue to put pressure on the role visual attention is supposed to play. After all, I seem to have all the right answers to questions about the person, and I can even point to her. All my behaviour indicates I *do* know which woman is being referred to. Why should my lack of visual attention to her make a difference? The question being pressed here is a question about the explanatory role of visual attention: what is the blindseer not able to do because of his lack of visual attention? To answer this question, we need to begin at the level of our communicative intentions. Whether I am pointing at an object to attract your attention to it, or using a perceptual demonstrative to communicate something about it, my intention is to attract your attention to the object. There is no other sensible way of understanding my behaviour. As Campbell says,

"... at the highest level of determining the objectives of the subject, there simply is no alternative to appealing to the beliefs and intentions of the agent, and that includes the

demonstrative beliefs and intentions of the agent. If we were blocked from appealing to the agent's intentions, we would simply have no idea where to begin in giving a model of control of the agent's mental operations... and appeal to the agent's demonstrative intentions requires us to appeal to the agent's conscious attention to objects..."<sup>162</sup>

My intention is not just to attract your attention to some object or other, but to *a particular visible object*. To do that using a visual demonstrative, I need to *visually select* the object, and as we saw in the last chapter, for someone to select something, they need to be aware of it. To know which object I am referring to, you need to visually select the same object. But for Campbell visual experience of objects is more than this, it is more than just a way of coordinating behaviour. Visual attention to objects is what explains how we can refer to them using visual demonstratives, and verify the propositions expressed by utterances that include visual demonstratives ('demonstrative propositions'). To refer to objects in our environment using visual demonstratives, and to verify demonstrative propositions about them, we need to have experience of the objects themselves: we need to visually attend to those very things. Visual attention to an object is what enables me to visually select *that very object* to think about, to refer to, or to verify something said about it. Now, if visual attention to the object is what enables me to have demonstrative thoughts<sup>163</sup> about it, and verify demonstrative propositions about it, attending to the object can't itself depend on verifying propositions about its appearance (for example, that it is a car and is red). To

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<sup>162</sup> Campbell (2002) pp. 13-14.

<sup>163</sup> That is, demonstrative propositions that are the content of conscious thoughts (e.g. occurrent beliefs or desires).

illustrate how visual attention to an object does not depend on first visually verifying its properties, Campbell turns to information processing theories of attention. Attention to an object sets the target for the underlying information processing necessary to experience it. As Campbell puts it, conscious attention to the object 'causes and justifies' the information processing necessary to experience it, and also to verify what is said about it.<sup>164</sup> At the level of thought about objects, Campbell separates understanding a proposition from verifying it. Understanding a proposition determines how, given the opportunity, we will try to verify it. The connection between understanding and verification is also couched in terms of our understanding of the proposition causing and justifying our methods of verification. Campbell calls this connection between understanding and verification the Classical View. The Classical View sets out the connection between understanding and verification, and attention and information processing.

#### 4.2 The Classical View

We need to know what, on Campbell's view, is the connection between knowledge of reference and verifying a proposition on the one hand, and visual attention on the other. I will start with the distinction between understanding a proposition (knowing what it is for it to be true) and verifying the proposition. It is very plausible that we can understand claims about the distant past, for example 'Cleopatra died from an asp bite', that we may not be in a position to conclusively verify. While it is possible to understand a

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<sup>164</sup> Campbell (2002) p. 26.

proposition without being able to determine whether it is true, or its significance for the truth of other propositions and for action, our understanding of the proposition surely affects how we would go about determining its truth, and what its significance for other propositions and possible action is.

Campbell's analysis of the relation between understanding and determining the truth of a proposition is that our understanding of it both *causes* and *justifies* the way we would go about verifying, finding the implications of or acting upon it. So if we are in a position to verify the claim that 'Cleopatra died from an asp bite' by reading an eyewitness account of her last moments, our verifying the proposition in that way is caused by our understanding of the claim. Our method of verification is also justified by our understanding of the claim – reading the eyewitness account is the right way of verifying the claim. This combination of causal and justifying theses Campbell calls the Classical View.<sup>165</sup>

The distinction in the Classical View between understanding and verification also applies to the contribution perceptual demonstratives make to the propositions they are used to express. In the case of utterances containing perceptual demonstratives, knowledge of the reference of the demonstrative is what causes and justifies ways of verifying what is said about the object.

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<sup>165</sup> Campbell (2002) pp. 22-24. To my mind, the causal dimension of the Classical View is a little strained in relation to understanding propositions. It would be more natural to say that our understanding of a proposition causes us to see the appropriateness of ways of verifying it. Saying that 'conscious attention justifies the use of computational procedures' (p. 26) as Campbell goes on to say, also, in my view, rather strains what we normally mean by justification.

Knowledge of the reference of the demonstrative is provided by visual attention to the object. Visual attention causes and justifies the visual information processing necessary for acting on or verifying uses of perceptual demonstratives. When the information processing is in the service of an action, such as reaching for 'that book', Campbell's view closely resembles Milner and Goodale's two visual systems hypothesis (§2.3). Visual attention sets the target for action, after which information processing procedures, which need not be conscious, take over.

For visual attention to play the distinctive explanatory role it does in Campbell's theory, it is vital that visual experience of objects is distinguished from visually based thoughts about them, including judgements about their visible properties, like colour or shape. In the case of their visible properties, however, this distinction might seem difficult to maintain. It might seem difficult, that is, to see the redness of a car without seeing that it is red. To maintain the distinction of experience from thought for such cases, Campbell differentiates between 'using an object's possession of a property to single it out visually', and 'verifying a proposition to the effect that the object has that property'.<sup>166</sup> Both the notions of visually singling an object out on the basis of its appearance and determining its visible properties are fleshed out by reference to information processing accounts of attention, in the first instance Feature Integration Theory.

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<sup>166</sup> Campbell (2002) p. 29.

As Anne Treisman describes Feature Integration Theory (FIT) in her 1988 Bartlett Memorial lecture (Treisman (1988)), different sensory features such as colour, orientation and size are processed separately, automatically, in parallel, and pre-attentively.<sup>167</sup> So perceived shapes are processed separately from perceived colours, and both are registered automatically, in parallel, and without attention. There are separate 'feature maps' of the properties registered (for example, a feature map for red, another for blue and a third for green). Attention uses location as the key to recombine the features, which are integrated into the representation of the object we are conscious of. Some of the evidence for FIT comes from experiments in which subjects had to engage in visual search tasks. When the targets were defined by a disjunction of features (e.g. a blue letter or the letter 'S') none of which were shared by any of the distractors, the number of distractors did not significantly affect the length of time to locate the target (the target with the unique feature 'calls attention to its location', or 'pops out'). When targets were defined by a conjunction of features (e.g. green and the letter 'T') and distractors shared one or other of those features, search time increased with the number of distractors.<sup>168</sup>

Campbell uses FIT to illustrate the distinction between being visually aware of an object and forming visually based judgements about its appearance. Someone can 'visually single out' an object on the basis of its colour, which is to say they can discriminate the object from its surrounding environment on the basis of its colour, without knowing which colour it is (e.g. without

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<sup>167</sup> Treisman (1988) p. 203.

<sup>168</sup> Treisman (1988) pp. 204-205.

knowing it is 'red'). The role of attention in FIT, to recombine features of the object, is necessary for visual experience of the object. The object can be visually experienced, however, without forming judgements about its appearance, such as what colour it is. For example, young children can see objects before they have mastered the language necessary to refer to or describe them.

Campbell notes that the 'spatial attention' in FIT that is responsible for recombining features of objects 'may be a relatively low-level phenomenon' for which 'there is no very evident reason to think it is a phenomenon of consciousness'.<sup>169</sup> In connection with this he briefly mentions the Kentridge et al. experiments with GY detailed in the last chapter, describing them as a 'striking example of spatial attention without awareness'. This should make us pause. To begin with, the distinction between visual attention and 'spatial attention' is not self-evident. Campbell has this to say on the distinction:

"This kind of spatial attention is a precondition of consciousness of the object. The features must be bound for there to be experience of the thing. But the spatial attention itself may be a relatively low-level phenomenon. The kind of low-level exercise of attention that Treisman's model argues is required for binding, contrasts with the kind of exercise of conscious attention that I am arguing is required for knowledge of the reference of the demonstrative."<sup>170</sup>

and

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<sup>169</sup> Campbell (2002) p. 31.

<sup>170</sup> Campbell (2002) p. 31.

“Experience of an object is the upshot of low-level attention to a particular location. But once you have experience of the object, you can now attend to it consciously...”<sup>171</sup>

It seems that Campbell is distinguishing between two kinds of visual attention, a ‘low-level’ kind, and a conscious kind. There is always a danger of confusing homophones, but that is a minor consideration. More significant is the lack of any corresponding distinction in FIT between ‘low-level attention’ and conscious attention. Most significant of all is that Kentridge and his colleagues do not take themselves to be making a claim about a kind of ‘low-level’ attention that comfortably co-exists with conscious attention. As we have seen in the last chapter, they are making a claim about visual attention. In both the original paper (Kentridge et al. (1999)), and in the reply to Mole (Kentridge et al. (2008)), it could not be clearer:

“It has long been assumed that attention and awareness are inextricably linked (James 1890) and the assumption is implicit in many contemporary theories of consciousness... To examine the question of whether attention and awareness are inextricably linked or whether the operation of selective attention is demonstrable in the absence of awareness, we tested the ability of a blindsight patient, GY...”<sup>172</sup>

“Some authors, including ourselves, claim that the fact that the processing of unseen objects can be modulated by spatial attention (e.g. Kentridge et al., 1999; 2004; 2008;

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<sup>171</sup> Campbell (2002) p. 33.

<sup>172</sup> Kentridge et al. (1999) p. 1805.

Marzouki et al., 2007; Sumner et al., 2006) demonstrates that visual attention is not a sufficient precondition for visual awareness.”<sup>173</sup>

Far from being content with making a claim concerning a separate kind of ‘low-level attention’, Kentridge and his colleagues are mounting a challenge to the conception of visual attention as sufficient for visual awareness, the very same conception Campbell is trying to defend. This misunderstanding on Campbell’s part is not critical for his project, but it serves to emphasise the gulf between some psychological conceptions of visual attention, and the typical pre-theoretical conception of it I am defending.

To return to the main point: Campbell uses FIT to flesh out the distinction between visually experiencing an object and visually based thoughts about it, even when those thoughts involve judgements about its appearance. He also uses the role location plays in FIT as the basis for his explanation of the connection between experience of an object and thought about it.<sup>174</sup>

According to FIT, the integration of features that is the product of what Campbell calls ‘low-level attention’ makes experience of the object possible. Obviously, it is critical that features of objects are recombined in the right way – if I’m looking at a red circle and a green triangle, my visual system should not recombine them as a green circle and a red triangle. The means by which ‘low-level attention’ correctly integrates the object’s features is

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<sup>173</sup> Kentridge et al. (2008) p. 105.

<sup>174</sup> This is the ‘double use of feature maps’, Campbell (2002) pp. 28-34.

location.<sup>175</sup> Location also plays a key role, on Campbell's view, when it comes to verifying judgements about an object's appearance:

"... the way in which you experience the object has to retain the capacity to single out the correct location, at the level of the feature map, when you attempt to verify the proposition. If your grasp of the demonstrative is to be capable of causing and justifying your use of feature maps to verify propositions about the observational properties of the object, then your grasp of the demonstrative must include information about the location of the thing. Hence, your experience of the object must include information about the location of the thing."<sup>176</sup>

Given that the main contribution FIT makes to Campbell's theory is to highlight the role of location in visual processing, and given also the quite different conception of attention FIT employs from the conscious attention Campbell is interested in, there is room for doubt about how snugly it fits with the rest of Campbell's project.

In later work,<sup>177</sup> Campbell changes the emphasis of the role of attention somewhat. Instead of emphasising the necessity of attention for verifying demonstrative propositions, visual attention is identified with the selection of an object or region. This change of emphasis is made with reference to the Boolean Map theory of Liqiang Huang and Harold Pashler (Huang and Pashler (2007)). Boolean Map theory sets out to provide answers to two

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<sup>175</sup> "Attention selects within a 'master map of locations'..." Treisman (1988) p. 203. Treisman is clear that by 'location' she means locations in the world (Treisman (1998) p. 32).

<sup>176</sup> Campbell (2002) p. 33.

<sup>177</sup> Campbell (2011) and Campbell and Cassam (2014).

questions: 'What can an observer visually consciously access at one moment?', and 'How do observers select what to access?'.<sup>178</sup> Answering these questions requires distinguishing *selection* from *access*, and it is this distinction that Campbell is particularly interested in. As Campbell puts the distinction, it is between "Selecting a region or object by using some property of it, such as its colour or texture" and "Accessing a property of that selected region or object."<sup>179</sup>

For Huang and Pashler, selection is exemplified by what the subject has to do to distinguish the target stimulus from distractors in visual search experiments (the more distractors there are, the more difficult the task of selecting the target is).<sup>180</sup> What the subject can access is what the subject 'apprehends', and is also what the subject is visually aware of at an instant.<sup>181</sup> (What subjects apprehend may not correspond to what they report since what they report may be based on introspection, and "...observers may be unable to distinguish between actually having certain information explicitly represented in awareness and having the ability to access that information quickly whenever they want it..."<sup>182</sup>)

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<sup>178</sup> Huang and Pashler (2007) p. 603.

<sup>179</sup> Campbell (2011) p. 325.

<sup>180</sup> Huang and Pashler (2007) pp. 599-600.

<sup>181</sup> "...an observer's visual awareness corresponds to one and only one Boolean map at any given instant. This momentary conscious apprehension provides access to both the shape of the Boolean map (the set of potentially multiple location values) and the identity of associated feature labels and represents the latter as properties belonging to the former." Huang and Pashler (2007) p. 602. An example of a feature label is 'red' as a colour label (ibid.).

<sup>182</sup> Huang and Pashler (2007) p. 609.

A crucial difference between the way Huang and Pashler understand selection and access, and the way that Campbell understands them, is that Campbell identifies conscious attention with selection<sup>183</sup> while Huang and Pashler identify conscious attention with access. We get an idea of what Campbell means by access through some examples of behaviours that require accessing a colour property. Campbell mentions reporting the colour, using the colour in reasoning (e.g. inductive reasoning about other objects with the same colour), and matching the colour to other instances of the same colour (e.g. grouping objects with the same colour together).<sup>184</sup>

We started with Campbell's common sense-motivated connection between visual attention and the reference of visual demonstratives (the Sea of Faces). The accompanying theoretical account of the Classical View of propositions added depth by distinguishing understanding from verification. The parallel distinction between conscious attention and the underlying information processing it causes and justifies provided a characteristic picture of the relation between the two. The graft of psychological views of attention onto this essentially common sense-motivated picture is not, in my view, either very neat or entirely necessary. Neither Anne Treisman's FIT, where the role of attention is to 'glue' features processed separately back together,<sup>185</sup> nor Huang and Pashler's Boolean Map theory, where we are

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<sup>183</sup> "Attention is selecting an object or region, and finding out something about its properties. So, there is accessing a property of an already selected object or region, and there is using a property as the basis on which an object or region is selected in the first place... My point is that we can find a constitutive link between attention and consciousness in terms of the use of a property as the basis on which an object or region is selected, rather than in terms of access." Campbell (2011) p. 324.

<sup>184</sup> Campbell (2011) p. 331.

<sup>185</sup> The glue metaphor comes from Briand and Klein (1987).

momentarily conscious only of single features at a time, have much in common with the phenomenology of visual experience, or the pre-theoretical conception of visual attention I am defending. Moreover, the contributions they make to Campbell's theory – the importance of location, and the selection/access distinction – could be made without them. The greatest danger, however, as I have tried to show with regard to Campbell's gloss on Kentridge et al. (1999), is that in trying to combine two very differently motivated approaches to the explanation of human behaviour, a false impression of harmonious co-existence between them is created.

Putting that point to one side, we can now see three different levels of explanation in Campbell's view, and how they fit together: conceptual thought (in particular, demonstrative thoughts about perceived objects), conscious attention (in particular, visual attention to objects), and information processing (FIT and Boolean Map theory). Now, someone who was sceptical about the need for attention to be conscious may be quite happy to think that *something* must play the role that conscious attention plays for Campbell, but insist this role can be played adequately by attention as conceived by Robert Kentridge, or Anne Treisman. I suggested that demonstrative reference to an object on the basis of seeing it requires selecting the object, and selecting something requires prior awareness of it. For Campbell, the explanatory role of visual attention is something deeper. It is not just that the blindseer lacks visual *sensations*, for example, but that the blindseer's selective enhancement does not entitle him to think about objects in the way that, by consciously attending to them, we can. Visual attention to objects is what

justifies our conception of them as mind independent. If we want visual experience to play this role, however, we need to adopt a *Relational* View of experience.

#### 4.3 The Relational View of Experience

Reflection on the nature of visual experience and attention appears to show that visual attention, conceived as sufficient for awareness, is necessary for visually based object-directed thoughts and actions. If I want to pick up a particular object, or refer to it using a demonstrative, I need to visually attend to it. The remarkable abilities of blindseers, who can perform some quite astonishing visually based object-directed actions, and have visually based object-directed thoughts, both in the absence of any awareness of the relevant objects, proves that visual attention is not in general necessary for visually based object-directed thoughts and actions. Robert Kentridge and colleagues have seized on the evidence from blindsight as proof that visual attention and visual awareness can come apart: visually attending to an object is not sufficient for being visually aware of it. We need not accept this conclusion if we can identify something distinctive about the way in which visual attention explains our visually based object-directed thoughts and actions. Campbell's proposal is that blindseers cannot have the kind of knowledge of the reference of a visual demonstrative that someone who consciously attends to the referent can. Before looking at why he thinks this, I want to briefly return to the Sea of Faces to highlight something about it that seems a little surprising.

In the Sea of Faces we were asked to imagine someone who was capable of visually based thoughts and actions in response to a visual demonstrative, without being able to consciously attend to the woman being referred to. Though hardly mundane, this would not be surprising if the reference of the demonstrative was singled out by pointing at her, given the results of GY's performance at the Posner cueing task that we saw in the last chapter. But that was not how the Sea of Faces was presented, and that is not necessary for using demonstratives. Demonstratives don't need to be accompanied by pointing. It may just be obvious which object a speaker is referring to. Gareth Evans puts this very clearly:

"A common way in which audiences are enabled to know which object is the referent of an expression in a particular context is by virtue of the speaker's exploitation of the object's *saliency*. The saliency can be brought about by the speaker himself, as when he accompanies the utterance of a demonstrative expression by a pointing gesture... Alternatively, a speaker can exploit some extreme or heightened saliency which an object has anyway (without his bringing it about)..."<sup>186</sup>

The stated purpose of the Sea of Faces is to bring out the difference between the blindseer and the ordinary subject. What is surprising, therefore, is the suggestion that a blindseer could be capable of visually based thoughts and actions in response to a visual demonstrative without an accompanying cue. How would the blindseer notice, to use Evans' phrase,

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<sup>186</sup> Evans (1982) p. 312, emphasis in original.

the ‘heightened salience’ of an object in his environment? To do that would seem to require more than just the ability to isolate an object from its background for it to receive enhanced processing and be identified. It would seem to require the ability to compare the contextually determined salience of, potentially, a whole range of objects. If what I said in §2.1 (this chapter) regarding the discontinuous and selective manner in which blindseers exercise their abilities is correct, they cannot access potentially varied information (e.g. hair colour) about a group of objects all at once. This also highlights an important disanalogy between the Sea of Faces and genuine blindsight. The evidence from experiments involving subjects with blindsight supports the ascription of a *selective* enhancement of processing, not an unconscious ability to determine the *gist* of a scene.<sup>187</sup> The situation in the Sea of Faces is exactly the reverse.

This, however, isn’t the kind of difference Campbell focuses on as significant for providing knowledge of reference. Instead, Campbell focuses on the way in which visual experience grounds our thoughts of objects as mind-independent, and as the source of the physical properties (e.g. being round and rigid) that determine their behaviour (e.g. rolling). To highlight the way in which our visual experience of objects does this, Campbell uses an exercise of imagination, which I will call the House Next Door:

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<sup>187</sup> “Studies in scene perception have shown that observers recognize a real-world scene at a single glance. During this expeditious process of seeing, the visual system forms a spatial representation of the outside world that is rich enough to grasp the meaning of the scene, to recognize a few objects and other salient information in the image, and to facilitate object detection and the deployment of attention... Behavioural studies have shown that observers can recognize the basic-level category of the scene (e.g., a street; Potter, 1976), its spatial layout (e.g., a street with tall vertical blocks on both sides (Schyns and Oliva, 1994), as well as other global structural information (e.g., a large volume in perspective) in less than 100msec.” Oliva (2005) p. 251.

He asks us to imagine compiling indirect evidence of the inhabitants and contents of the house next door. On the basis of the sounds we hear, we build a series of hypotheses concerning what the people are like, and the things they own. So we might hear their voices, or the sounds of drilling or hammering, or a guitar being played. Some of the objects we hypothesise our neighbours owning may not even make a noise. Hearing the sound of a television, we hypothesise the existence of plug sockets. We could end up with a fairly substantial number of hypotheses, which through careful listening and cross-referencing we are able to test. As a result, we are able to confirm the existence of the hypothesized objects, can uniquely identify them, and on that basis refer to them. So what difference will it make, Campbell asks, when we finally meet the neighbours and see their possessions?

“The contrast between the knowledge you have now, on the basis of a look at the objects, and the knowledge you had before of the existence of objects with particular functional roles, is that when you see the thing, you are confronted by the individual substance itself. On seeing it, you no longer have knowledge of the object merely as the postulated occupant of a particular functional role. Your experience of the object, when you see it, provides you with knowledge of the categorical grounds of the collections of dispositions you had earlier postulated.”<sup>188</sup>

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<sup>188</sup> Campbell (2002) pp. 115-116.

Visual experience of the objects makes a difference, by providing us with (knowledge of) the source of the evidence we have gathered. Before seeing the objects, we were only aware of, as it were, *indirect* (though not necessarily *inconclusive*) evidence of their nature (the sounds they made). When we see them, it is not just their potential behaviours, such as a propensity to break, or roll, that we experience.<sup>189</sup> Nor is it just the opportunities they afford us to interact with them that we experience, like reaching for and grasping them.<sup>190</sup> Nor, again, is it that the objects just produce sensations in us,<sup>191</sup> or that we experience the changes in our visual systems the objects cause.<sup>192</sup> It is, rather, their intrinsic nature that is evident in our experience of them: in seeing an object we are 'confronted by the individual substance itself'.

The difference between hearing the sounds of activity from the house next door, and being 'confronted by the individual substance itself' has the ring of something revelatory, which might distract from a quite straightforward point about the difference between hearing the sounds, and seeing the sound-emitting objects. The sounds that objects make do not have any very obvious connection with the intrinsic spatial properties of those objects, such as (spatial) volume, or mass, or shape.<sup>193</sup> The buzz of the electric shaver, the creak of floorboards and the sound of doors slamming all require background information to identify which objects are responsible. The same point does

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<sup>189</sup> Campbell (2002) p. 139.

<sup>190</sup> Campbell (2002) pp. 142-143.

<sup>191</sup> Campbell (2002) p. 139.

<sup>192</sup> Campbell (2002) p. 226.

<sup>193</sup> I mean sounds in the ordinary sense. To a creature attuned to them, the vibrations caused by something moving through a dense medium could be a clear indication of its size, shape and speed.

not usually hold for seeing objects: in seeing an object, we are usually left in no doubt which object is responsible for our seeing it. The source of the experience is evident in the experience itself.<sup>194</sup>

Campbell thinks of the difference between the blindseer's and the normally sighted subject's visually based abilities along the same sort of lines as the 'before' and 'after' of the House Next Door. He makes the point with reference to what James Gibson called affordances:

“Suppose you had a blindsighted subject who lacked awareness of the contents of his blind field, but had a great deal of visual information about them and could act on the objects in his blind field just as rapidly and accurately as an ordinary subject. What would this subject be missing? Suppose this subject had an object in his blind field, say a lamp. Why should we not say that this subject is in a position to understand the demonstrative, ‘that lamp’? Of course, the subject can formulate descriptions such as ‘whatever is in my blind field’ that might uniquely identify the thing. But why should we not say that the subject can interpret the demonstrative ‘that lamp’ in just the way that we ordinarily do, without having to form descriptions singling out the thing?... In Gibson’s terms, the blindsighted subject could be said to have information about many of the ‘affordances’ provided by the object; an ‘affordance’ being something that the object will provide you with if you act suitably on it... An affordance is a dispositional characteristic of the thing, a tendency it has to yield a certain result if treated in a particular way ... The natural view to oppose to Gibson is that visual experience does not provide us with knowledge of

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<sup>194</sup> Matthew Nudds makes a similar point in his (2001), p. 221.

affordances. It provides us with knowledge of the categorical properties of objects which are the reasons why the objects have the affordances they do.”<sup>195</sup>

It is in our experience of objects, Campbell says, that we are confronted with the categorical things themselves. In contrast, the blindseer’s reaching and pointing towards objects is merely the performance of actions he senses he can make, and not a response to his experience of the objects. I think Campbell is right that the blindseer’s visually based object-directed thoughts and actions are different from the corresponding thoughts and actions of a normal subject but, I will be arguing, I don’t think Campbell’s characterisation of our experience of objects best captures this difference.

On Campbell’s Relational View, visual experience of objects provides us with our conception of objects as mind-independent. To have a working idea of how the Relational View is supposed to do this, we need to have an idea of the following two things: the difference between the Relational View and the alternative ‘Representational View’ of visual experience, and what, in Campbell’s opinion, is wrong with the Representational View. According to the Relational View, the qualitative or phenomenal character of our visual experience is constituted by the things and properties we see (more on phenomenal character shortly). A little more precisely, in my case it is the visible properties of the objects, such as their shape and colour, and their spatial arrangement, from my (spatiotemporal) point of view.<sup>196</sup> Visual experience is a relation between the spatially arranged objects and their

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<sup>195</sup> Campbell (2002) pp. 142-144.

<sup>196</sup> Campbell (2002) p. 116.

properties, the subject, and the subject's point of view. It is a corollary of the Relational View that visual experience is not identical to, nor wholly constituted by the visual processing carried out by the visual system.<sup>197</sup>

The key difference between the Representational and Relational Views is also what, in Campbell's opinion, is wrong with the Representational View. This is the Representational View's characterisation of the qualitative or phenomenal character of visual experience as something that could be common to both seeing an object, and an indistinguishable hallucination as of the object. Some explanation is in order here. The 'phenomenal character' of a visual experience is made up of its qualitative properties, properties such as the greyness of clouds, the curve of a smile and the brightness of the sun. Of course, if I am hallucinating clouds, whatever I am experiencing is not clouds, but I may still be experiencing greyness.<sup>198</sup> (I should make explicit at this point what I assume throughout this thesis, that I am located in a physical environment which I visually experience, and my experiences – for the most part, anyway – are veridical.) The point is that the Representational View has a *substantive* explanation of why a veridical visual experience of mine is indistinguishable, on the basis of introspection alone, from a hallucinatory visual experience.

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<sup>197</sup> Campbell (2002) p. 118.

<sup>198</sup> Mark Johnston (Johnston (2004)) has argued we should think of hallucinations as 'uninstantiated complexes of sensible qualities and relations' (p. 135). These complexes (the 'primary objects' of hallucination) may strike us in such a way that we mistake them for real objects. Veridical visual experiences, in contrast, will consist of *instantiated* complexes of sensible qualities. My aim is not to defend Johnston's position here, but (as will emerge presently) to identify an explanatory role for visual attention that is compatible with views like his.

To illustrate, suppose my neighbour has, without my knowledge, implanted a virtual reality device in my head which can provide all the same sorts of input to my nervous system that it would receive were I going about my daily business. I am quite unaware that he has switched it on while I am sitting, typing away on my laptop. The hallucinatory experiences I subsequently start having seem in every way to me to be an uninterrupted continuation of my previous veridical experiences. I cannot by attending to my experiences (i.e. engaging in the process of introspection) tell that I am hallucinating. I should emphasise here that the mere fact that I cannot distinguish the veridical experience from the hallucinatory experience does not fully capture the situation I have in mind. I might not be able to distinguish my experience at one moment from my experience at the next moment for a variety of reasons. The difference between the first and second experience might be very subtle, or my ability to engage in the process of introspection might be compromised.<sup>199</sup> In the situation I am describing, however, I am able to engage in the process of introspection effectively, and I am attending to all the subtleties of my experience. I am also assuming that I can meaningfully declare my visual experience at one moment the same as my visual experience at the next moment – that is, there *are* qualitative aspects of the experiences to be compared. To complete the picture of the Representational View, I am assuming that, given these conditions, for my visual experience at one moment to have the same qualitative aspects (which is to say, phenomenal character) as my visual experience at the next

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<sup>199</sup> Fiona Macpherson (Macpherson (2013) p. 35) covers a range of possibilities succinctly: “It is common to believe that the circumstances that one finds oneself in can alter one’s ability to know things.”

moment, it is sufficient that my nervous system receives the same inputs at both moments. (Put a little differently, given these conditions it is sufficient that my neurophysiological state is the same at both moments.) In contrast, on the Relational View my veridical and hallucinatory experiences do not have the same phenomenal character, they are merely indistinguishable to me.

The first question Campbell poses for the Representational View asks, if we think of the phenomenal character of visual experience as something that is common to both seeing and hallucinating, how can we visually experience the intrinsic nature of objects? The distinction Campbell uses, between the intrinsic or categorical properties of objects and their dispositional properties is not, I think, either self-evident or uncontroversial, but there are some fairly uncontroversial examples. An example of a categorical property is shape. An example of a dispositional property that Campbell gives is the propensity to roll. If, for the moment, we set aside issues over the distinction, we can get a sense of the point Campbell is driving at. He is interested in the way we think about 'medium sized physical objects'.<sup>200</sup> We think of the physical objects we see, like the books, chairs, houses and ballpoint pens we encounter every day, as existing whether or not we are perceiving them. We think of them as possessing the physical properties that determine their behaviour; to use one of Campbell's examples, we think of the roundness and rigidity of an object as explaining its propensity to roll. We also think of them as public objects

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<sup>200</sup> E.g. Campbell (2002) p. 232.

that can be encountered by different observers.<sup>201</sup> Visual experience has to explain how we can conceive of objects in this way, Campbell says.<sup>202</sup> In saying this, I don't believe he is thinking exclusively of our *acquisition* of concepts like 'book', 'chair' or 'house'.<sup>203</sup> The Representational View can provide an account of the acquisition of those concepts. I think what Campbell is most concerned with is that visual experience has to *justify* how we think about objects. He says

"We cannot extract the conception of a mind-independent world from a mind-dependent image."<sup>204</sup>

There is, as far as I can tell, nothing self-evidently absurd about someone whose experiences have all been hallucinations conceiving of the 'world' they experience as mind-independent. That is just the kind of claim a sceptic about the external world would make. The only way I see of making sense of the 'extraction' of the conception of a mind-independent world is in terms of justification: we cannot *justify* our conception of a mind-independent world on the basis of a mind-dependent image.<sup>205</sup> If we focus on the case of visual experience, our visual attention to objects provides us with justification to think of them as existing unperceived, as the source of the physical properties that determine their behaviour, and as public. How, Campbell asks, can visual experience as conceived on the Representational View

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<sup>201</sup> Campbell and Cassam (2014) p. 34.

<sup>202</sup> Campbell (2002) p. 121.

<sup>203</sup> He makes this clear in his (2005), p. 162.

<sup>204</sup> Campbell (2002) p. 121.

<sup>205</sup> Cf. what Cassam calls the 'justification problem' in Campbell and Cassam (2014) p. 107.

provide us with justification for these ways of thinking about objects?

Campbell offers what he thinks is the best response an advocate of the Representational View can make: visual experience, according to the Representational View, 'provides the conception of an objective world simply by displaying the world as objective', and 'involves grasping demonstrative propositions as the contents of experiences'.<sup>206</sup> This seems like the right direction for someone who believed in the Representational View to move in. To return to my example of the diabolical virtual reality device implanted in me by my nefarious neighbour, it would certainly seem to me when I am hallucinating that I am confronted by physical objects that exist whether or not they are perceived by me, have the physical properties such as roundness and rigidity that explain their dispositions to do things like roll, and are public. I would be wrong on all counts, but nothing about my visual experience would reveal that I was. It is in his counter-response against the Representational View that Campbell appeals to the explanatory role of visual experience.

"Experience is what explains our grasp of the concepts of objects. But if you think of experience as intentional, as merely one among many ways of grasping thoughts, you cannot allow it this explanatory role... if all there is to experience of objects is the grasping of demonstrative thoughts about them, then experience of objects is just one among many ways in which you can exercise your conceptual skills. At this point we do not have any

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<sup>206</sup> Campbell (2002) p. 121.

way of explaining why there should be anything fundamental to our grasp of concepts about experience of objects.”<sup>207</sup>

The point being made here is not just that explanandum and explanans must be distinct. It could be argued that our demonstrative thoughts about objects have a different phenomenology from our visual experience of them, or it could be argued that visual experience of objects is non-conceptual.<sup>208</sup> The deeper point is rather that in terms of reference and justification, ‘experience of objects has to be something more primitive than the ability to think about objects, in terms of which the ability to think about objects can be explained’.<sup>209</sup> For my visual experience of the car to explain my ability to refer to it demonstratively, and understand demonstrative reference to it, my visual experience of the car must include – be in part constituted by – the car itself. For visual experience of objects to justify the way we think about them, as existing unperceived, as the source of the physical properties that determine their behaviour, and as public, the objects themselves must be constituents of our experience. If that is not how we conceive of perceptual experience, we are not entitled to think that we *can* refer demonstratively to objects, or that the way we think about physical objects *is* justified by the nature of the objects themselves.

Taking these points in turn, if the car is not a constituent of my visual experience, my attempt at demonstratively referring to it may fall short of it (it

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<sup>207</sup> Campbell (2002) p. 122.

<sup>208</sup> Campbell (2002) p. 125.

<sup>209</sup> Campbell (2002) p. 122.

may only seem to me that I am demonstratively referring to it). According to one line of thought tracing its ancestry to Russell,<sup>210</sup> the distinction between definite descriptions and singular terms like demonstrative expressions and proper names depends in part on the latter needing a referent to be truth-evaluable. Evans writes

“A genuine referring expression has as its sole function the identification of an object such that if it satisfies the predicate, the sentence [containing it] is true, and if it fails to satisfy the predicate, the sentence is false. But if the expression fails to identify an object at all, then the truth-evaluation of the sentence cannot get started, and the whole sentence is an aberration.”<sup>211</sup>

The line of thought continues, which object I mean to refer to is determined by which object I have in mind. When I say ‘That car is red’ intending to demonstratively refer to a car, the proposition expressed by my utterance is only truth-evaluable if I have a particular car in mind (typically, the car I am visually attending to). On the occasions when my attempt at demonstrative reference fails to refer to the object I take myself to be referring to, for example because I am hallucinating a red car, there is no particular physical car I have in mind. If my intention is to refer to the particular physical car I am having a visual experience of, and there is no physical car I am experiencing, the demonstrative picks nothing out. One of Campbell’s criticisms of the Representational View is that if the phenomenal character of my visual experience is the same whether I am seeing the car or hallucinating, the

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<sup>210</sup> See for example Evans (1982) Chapter 2.

<sup>211</sup> Evans (1982) p. 42.

phenomenal character of my visual experience cannot determine which particular car I have in mind. If, on the other hand, the car is a constituent of my visual experience of it, the phenomenal character of my visual experience *can* determine which particular car I have in mind: the car I have in mind is the car that is a constituent of my visual experience.

The way in which visual experience justifies our conception of objects as mind-independent (i.e. as existing unperceived, as the source of the physical properties that determine their behaviour, and as public) is analogous. If my visual experience is to justify my thinking of objects as mind-independent, my visual experience had better be of mind-independent objects. For the same reasons I cited earlier in this chapter (§3), Brian the brain-in-a-vat is not justified in believing he is confronted by mind-independent objects, and neither am I when the virtual reality device is causing me to hallucinate. But if the phenomenal character of my visual experience is the same whether I am seeing the car or hallucinating, the phenomenal character of my visual experience cannot justify my conception of objects as mind-independent. If, on the other hand, objects are constituents of my visual experience, the phenomenal character of my experience – composed of the various properties of the objects constituting it – *can* justify my conception of objects as mind-independent.

These are powerful points but not, I think, fatal for the Representational View. One line of response begins with the thought that demonstrative reference, and justification of our conception of objects as mind-independent,

need not depend solely on the phenomenal character of visual experience. The phenomenal character of my visual experience of the car is necessary, but does not guarantee that I succeed in demonstratively referring to it; the phenomenal character of my visual experience of objects more generally is necessary, but not sufficient to justify my conception of them as mind-independent. In both cases, the world also needs to be a certain way, and whether it is or not may not be evident from the phenomenal character of my visual experience of it. I will return to both these points shortly.

As will be obvious by now, Campbell thinks the blindseer's visual abilities cannot justify his conceiving of objects as mind-independent, and they do not enable him to demonstratively refer to objects. Though he might be able to point at an object in his blind field, for example a lamp, and having done so use the expression 'that lamp', the expression is really just a disguised description, 'the lamp I am pointing at'. Before I turn to critically examining the explanatory role of visual attention as envisaged by Campbell, I want to briefly take stock.

The question that has been driving this chapter asks what distinctive role visual attention plays. The obvious answer, that it is necessary for us to think about and act upon objects in our environment, turns out not to be true. Blindseers can have visually based thoughts about objects in their environment, and perform visually based actions on objects in their environment, all without any visual awareness of those objects. Despite this, I have said, it remains very plausible that visual attention does, in some way,

explain how we think about, and act upon, the objects we see, and moreover it remains plausible that this explanatory role is not shared with the selective enhancement blindseers are capable of. Campbell's proposal for the explanatory role of visual attention is that it enables us to understand demonstrative reference to objects, and justifies our conception of objects as mind-independent. According to Campbell, if we want attention to play this explanatory role, we have to accept the Relational View of visual experience. Looking ahead, I will outline a commitment of the Relational View that I find unacceptable. I will, in the next section (§5), propose an alternative explanatory role for visual attention to Campbell's that does not carry that commitment. I return first to the connection between demonstrative reference and the Relational View.

I will not challenge Campbell's point that blindseers cannot demonstratively refer to objects, as I think he is right. I do, however, want to put some pressure on his explanation for this. According to Campbell, the blindseer cannot demonstratively refer to objects because though he may acquire visual information about the dispositional characteristics of objects (e.g. he may perceive that an object affords him the opportunity to reach for or point to it), he cannot visually acquire knowledge of the categorical properties of objects that are the basis for those dispositional characteristics. I have suggested a much simpler explanation: to use a visual demonstrative to refer to an object, I have to first *visually select* the object, and to visually select the object I have to be *visually aware* of it. In short, I have to visually attend to it. I pointed out at the end of Chapter 1 that selecting something requires prior

awareness of it, and of the range of items from which it is selected (this is what it means to make a selection). Much the same can be said of the most typical conditions in which we demonstratively refer to an object: we are visually aware of a range of objects from which we select (i.e. visually attend to) one to refer to. It seems very plausible, therefore, that demonstratively referring to an object requires the object to be visually selected – this, at any rate, is the point I take from the Sea of Faces. Cast in the role of the protagonist of the Sea of Faces, I manage to describe and point at the woman referred to in a demonstrative proposition. Despite this, I am not able to visually pick her out from the sea of faces. But suppose instead of responding to someone else's use of a demonstrative, I attempt to use a demonstrative myself, while my visual experience remains a sea of faces. My utterance of 'That woman is tall' could not possibly refer to a particular woman I see, since I don't see any *particular* woman, just a sea of faces. (Precisely the same could be said about pointing at an object in that situation.) It is only having visually selected a particular woman that I would normally go about trying to demonstratively refer to her. Blindseers, lacking any visual experience whatsoever, are also unable to visually select particular objects to demonstratively refer to. Suppose a blindseer is asked to guess what is directly ahead in his blind field, and suppose he guesses it is a woman, and can describe her. The best way for him in conversation to refer to the woman he has visually detected is to use a description like 'The woman I have detected in my blind field'. Any other way of verbally identifying her runs the risk of being true of multiple referents.<sup>212</sup> In contrast,

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<sup>212</sup> Cf. Strawson (1959/2003) p. 20. As I have characterised the blindseer's abilities, he is

his normally sighted companions, who we can presume are able at once to be visually aware of the 'gist' of the scene (and therefore of all contextually relevant women) can be sure of qualifying their use of a demonstrative in such a way as to leave no doubt who they are referring to (e.g. 'That woman wearing a hat'). Given that these considerations are suggested by Campbell's Sea of Faces, why doesn't he make use of a similar argument?

I think Campbell doesn't use a similar argument, despite it being suggested by his Sea of Faces scenario, because he thinks the phenomenal character of perceptual experience, and visual experience in particular, plays a more fundamental role in demonstrative reference, and in justifying our conception of objects as mind-independent. If the phenomenal character of my visual experience is to determine which object I have in mind when I attempt to demonstratively refer, then the phenomenal character of my visual experience does need to be constituted by the objects that my experience is of. Since, on the Representational View, the phenomenal character of my veridical and hallucinatory experiences is the same, the phenomenal character cannot determine which object I have in mind when I attempt to demonstratively refer. On the Relational View, the phenomenal character of my visual experience is constituted by the objects it is an experience of, so the phenomenal character of my experience does determine which object I have in mind when I attempt to demonstratively refer. Similarly, if the phenomenal character of my visual experience is to justify my conception of

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able to detect properties of objects in his blind in a piecemeal fashion, but he cannot detect properties of multiple objects at once. In contrast, I claim, we can be at once visually aware of objects adjacent to the one we are visually attending to.

objects as mind-independent, then it does need to be constituted by the objects that my experience is of. But we don't have to agree with Campbell about this. We don't have to agree that the phenomenal character of visual experience has to play this sort of fundamental role. We might think that the phenomenal character of visual experience, *together with the way the world is*, determines which object I have in mind when I attempt to demonstratively refer. Whether the world is the way it appears to be may not be evident from the phenomenal character of my visual experience of it.

There is another reason to think that the phenomenal character of visual experience does not play the role Campbell thinks it does with regard to demonstrative reference. We use visual demonstratives to refer to people we see on television. I might say, of a politician I see on television, 'That man has blood on his hands'. The reference of the demonstrative expression is not physically present, but my visual attention still plays a role, and the demonstrative still functions as a singular term. An alternative reading of 'deferred' demonstratives like this is to treat them as disguised descriptions.<sup>213</sup> Emma Borg (Borg (2002)) has argued that deferred demonstratives should not be treated as descriptions, on the grounds that their behaviour in modal contexts and their behaviour when no reference is picked out is in accordance with what we expect of singular terms rather than descriptions. If I say 'That man has blood on his hands' referring to the man I see on television, I mean that particular man. In contrast if I use the definite description 'The man on television has blood on his hands', the man picked

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<sup>213</sup> This is what Evans advocates, Evans (1982) p. 145.

out may vary depending on the modal context (in different possible worlds, different men might be picked out). In a situation where there is no such man – say because the television is off – the proposition expressed using the deferred demonstrative has no truth value. The equivalent description comes out false, since there is no man who satisfies the description.<sup>214</sup> This isn't intended to be a robust defence of Borg's account of deferred demonstratives. Rather, it suggests a way in which visual attention can play a role in determining which object I have in mind when I attempt to demonstratively refer, without the phenomenal character of my visual experience playing the fundamental role Campbell sees it as playing.

If I am right about the connection between visual selection and demonstrative reference, there is an alternative explanation of why blindseers cannot demonstratively refer to objects. According to this alternative explanation – that demonstrative reference requires conscious visual selection (i.e. visual attention) – visual experience does not need to be constituted by the objects it is an experience of. When I attempt to demonstratively refer to an object, the phenomenal character of my visual experience, together with the way the world is, determines which object I have in mind. The blindseer, lacking any visual experience, has no particular object in mind.

In the next and final section of this chapter (§5), I will outline an alternative explanation to the one Campbell provides of why our visual experience

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<sup>214</sup> Borg (2002) pp. 220-222.

inclines us to think of objects as existing unperceived. The alternative I describe does not require visual experience to be constituted by the objects it is an experience of. In §5 I will also propose that visual attention plays an explanatory role similar to the one proposed by Declan Smithies. I want to end this section by identifying a commitment of the Relational View that I find unacceptable. It is this commitment that is my principle reason for resisting the Relational View.

According to the Representational View, when I am having a veridical visual experience, and when (due to the diabolical virtual reality implant) I am having an indistinguishable hallucination, I can be in a position to know the phenomenal character of my visual experience. What is unique about my position as the subject of both the hallucinatory and veridical experiences can be partly explained by the position I am in with regard to knowing the phenomenal character of my visual experience. I think this captures a natural conviction for people to have, of being authoritative regarding their own thoughts and experiences. Of course, this kind of authority is not *infallible*. I might still use the wrong words to describe my experiences, or fail to pay proper attention to my experiences and therefore fail to grasp their phenomenal character.<sup>215</sup> Nevertheless, according to the Representational View, I can be in a position to know the phenomenal character of my experience whether I am hallucinating or not. The same cannot be said for the Relational View. On the Relational View, in the veridical case the

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<sup>215</sup> Fiona Macpherson has argued for a disjunctive theory of introspection (Macpherson (2010)), according to which we may not always be able to judge whether we are in a state with phenomenal character. When we are *not* in that situation, however, we *are* able to judge that we are in a state with phenomenal character. We still have the sort of authority regarding our own experience that, I have suggested, we think we have.

physical objects themselves are constituents of my visual experience. The situation when I am hallucinating is, in that respect, utterly different: the physical objects I seem to be experiencing are not constituents of my experience. The Relational View still allows, despite this significant difference between my hallucinatory and veridical experiences, that the two visual experiences may be in principle indistinguishable on the basis of introspection.<sup>216</sup> Now, if the phenomenal character of my veridical visual experience is constituted by the physical objects and properties it is an experience of, it follows that either my hallucinatory visual experience must lack phenomenal character altogether (since it is not an experience of physical objects), or it must have a different phenomenal character – my hallucinatory and veridical visual experiences do not, according to the Relational View, have the same phenomenal character. In either case, I am evidently not able to introspectively determine the phenomenal character of my hallucinatory visual experience: I cannot even in principle be in a position to know the phenomenal character of my hallucinatory experiences. This implication of the Relational View, I suggest, is fundamentally at odds with a very natural conviction for us to have, of being authoritative regarding our own thoughts and experiences. It is certainly at odds with my conviction that I can be in a position to know the phenomenal character of my visual experience when I am hallucinating. Some may think setting limits to introspection is in itself a good thing. Timothy Williamson has argued against the view that we can take refuge in “a cognitive home in which everything lies open

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<sup>216</sup> Campbell (2002) pp. 116-117.

to our view.”<sup>217</sup> Others, and I number myself among them, feel aggrieved and not a little resentful at these efforts to evict us from our ‘cognitive homes’.

I am not labouring under the illusion that the considerations in favour of the Representational View that I have sketched will prove persuasive. I am not able to do justice to the complexities or details of the debate between the two views here. Nor do I want to suggest that I have provided persuasive reasons for anyone to reject the Relational View. There is a wealth of argument and considerations in Campbell’s work that I have, of necessity, passed over. My concern has been to give an indication of *my* motivation for rejecting the Relational View. In the next and final section of this chapter, I outline an alternative explanatory role for visual attention that does not depend on accepting the Relational View of experience.

In my discussion of Campbell I have tried to show how the explanatory role of visual experience as he conceives it provides a defence of the sufficiency of visual attention to an object for visual awareness of it. Campbell uses the Cityscape and Sea of Faces to make a *prima facie* case for the necessity of visual attention to the way we understand visual demonstratives. In the Sea of Faces, our inability to pick out the reference of the demonstrative in our visual experience, Campbell suggests, shows we do not know who is being referred to. This provides initial motivation for his theoretical account of the role of visual attention. To know the reference of a visual demonstrative, we need to visually attend to the object being referred to. Knowledge of the

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<sup>217</sup> Williamson (1996) p. 554.

reference of a demonstrative contributes not just to our understanding of the proposition expressed using it, but also in verifying whether that proposition is true. The distinction between understanding a proposition and verifying whether it is true characterises what Campbell calls the Classical View. On the Classical View, knowledge of the reference of a demonstrative causes and justifies the way we go about verifying propositions it is used to express, acting upon those propositions, and reasoning on the basis of those propositions. Visual attention to an object causes and justifies (i.e. sets the objective for) the information processing necessary for verifying what is said about the object, and acting on the object. There is also the visual processing that enables us to attend to objects in the first place, and to illustrate how these are two different stages of visual information processing, Campbell appeals to Treisman's Feature Integration Theory and Huang and Pashler's Boolean Map theory. Distinguishing visual experience of objects from visually based thoughts and judgements about them allows Campbell to propose that visual attention plays the explanatory role of anchoring demonstrative reference, and justifying our conception of objects as mind-independent. The selection and enhancement blindseers are capable of can neither provide them with the same understanding of the reference of demonstratives, nor justify them in conceiving of objects as mind-independent. If we accept Campbell's proposal for the role of visual attention, we are entitled to conclude that it *is* sufficient for visual awareness. Accepting Campbell's proposal does, however, carry with it a commitment to the Relational View. I have outlined my motivation for not wanting to accept the Relational View, as a result of which I have an alternative proposal for

the explanatory role of visual attention that does not carry the commitments of the Relational View, a proposal that moreover can also provide an account of why we are inclined to conceive of objects in our environment as mind-independent. Setting out that proposal is the task of the next and final section of this chapter.

## **5. The Integration View<sup>218</sup>**

There is a crucial difference between, on the one hand how the blindseer's unconscious visual information is connected to his visually based thoughts and actions, and on the other how a normally sighted person's visual experience is connected to her visually based thoughts and actions. When I say 'That car is red' while visually attending to the car, my thoughts about the car are connected to what I am saying about it by my awareness of it. In contrast, when the blindseer makes a guess about the colour of a stimulus, what connects his thoughts to his utterance is only the unconscious visual information that inclines him to make his guess. As Smithies carefully pointed out (§3), there is, for the blindseer, no introspectively accessible reason for his thoughts and actions. There I argued, against Smithies, that the explanatory role of visual attention could not be to provide *justifying* reasons for our visually based thoughts and actions. My disagreement with Smithies stems from his characterisation of justifying reasons as derived solely from what is introspectively accessible to the subject. I find it compelling that, out

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<sup>218</sup> Alan Allport (Allport (2011)) has argued in favour of a different 'integration' view from the one I propose here. Allport's view is, roughly, a view of attention as the integration resulting from competition between networks of neurons.

of two people who both have qualitatively indistinguishable visual experiences, the one whose experiences are veridical is more justified than the other. But suppose we separate Smithies' initial insight, that blindseers lack reasons for their visually based thoughts and actions, from the further claim about the nature of epistemic justification. If we do that, I think we have a candidate for the explanatory role of visual attention.

The thought is that when we ask someone with normal vision why they are performing a visually based object-directed action, assuming they answer honestly and sincerely, their visual attention to the object will provide their reason. Similarly, if we ask ourselves why we are having the visually based object-directed thoughts we are, our answer will rely on our visual attention to the objects we are thinking about. These reasons need not, however, be like the *justifying* reasons in Smithies' proposal. If, unbeknownst to me, I am hallucinating a red car, and cite the apparent object of my visual experience as part of my reason for acting, that is, in a perfectly ordinary sense of 'reason', a reason for my so acting, though not much of a justification. I have *explained* why I pointed and said 'That car is red' – I have given my reason.<sup>219</sup> Similarly, we can speak of someone's reason for acting in a certain way, or thinking a certain thing, even when the person in question agrees, after the event, that they were wrong to act in that way, or think that thing. When my neighbour's fiendish prank, of implanting me with a virtual reality device, is revealed to me, I can give reasons for my thoughts and actions while under the influence of the device by explaining that (and what) I

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<sup>219</sup> Dancy draws a similar distinction between motivating and normative reasons (Dancy (2000) pp. 2-3).

was hallucinating. But the role of visual awareness in providing reasons is not restricted to language-users. Visual awareness can also provide non-linguistic animals and pre-linguistic infants with reasons for acting: the objects or properties experienced can constitute reasons for their actions. My visual awareness of the bear can provide me with a reason for moving away (or towards) it, but the bear's visual awareness of me can also provide the bear with a reason to move towards (or away) from me. The objects or properties experienced from the subject's point of view can constitute reasons for their actions, and (in the case of language-using subjects) reasons for their beliefs. This, I think, captures the essence of what I called Smithies' Blindsight Guessing Intuition.

As an explanatory role for visual attention this needs further development, of course. A blindseer who learns about his condition could, just as honestly and sincerely, cite unconscious visual information as a reason for his guessing there is a picture of a horse in his blind field, or as a reason for his pointing in the direction of the stimulus presented to his blind field. To distinguish this sort of reason from the kind we are interested in, we need to add the condition that the reason must be accessible on the basis of introspection alone. Since the reason is provided by perceptual awareness of the object or property, both the bear's actions on seeing me, and my beliefs and actions on seeing the bear can be explained by reference to our visual experience of each other. With this condition in place, reasons based on unconscious visual information or information processing are ruled out. This includes cases of unconscious visually based action in subjects with normal

vision, such as the unconscious adjustment of pointing observed in the experiments carried out by Bruce Bridgeman and colleagues (Bridgeman et al. (1979), outlined in §2.3 above).

This still falls short of what we are looking for. A practiced blindseer could honestly and sincerely give as his reason for successfully performing a visually based action his confidence that he would succeed. In §2.2 I described the case of TN, the man with bilateral blindsight (i.e. a lack of visual awareness extending over the whole of the visual field) who successfully navigated his way along a corridor, past a series of obstacles, without the use of his cane. It is quite plausible that, had TN been asked why he chose to take the particular steps along that corridor that he did, he would have given as his reason that he felt confident taking the steps he did. It isn't clear from the paper documenting TN's navigation of the obstacle course (de Gelder et al. (2008)) whether he had in fact navigated obstacles like that before, but it makes perfect sense that the more familiar and practiced someone gets at an activity, the more likely they are to perform it with confidence. To rule out this sort of confidence as the kind of reason for visually based object-directed actions we are interested in, we need to consider the role visual attention plays in *integrating* our behaviour. My proposal is that visual attention to an object or property (perhaps together with other conscious sensory information) can provide us with reasons for thinking about the object or property and acting upon the object. Those reasons, constituted by the experienced object or property, are accessible on the basis of introspection alone, and integrate our thoughts and experiences

with our actions. When I have a visually based thought about a red car, that thought is integrated with my pointing at the car by my visual attention to the car: from my point of view, my visual experience of the car, my pointing at it and thinking about it are all explained by the car I am visually attending to. If I was visually aware but not attending to the car, my thoughts and actions would not be directed towards it – it is visual attention to an object that makes it possible to consciously select it for the purpose of visually based object-directed thought or action. My reason for having the experience, having the thought, and performing the action is the same. Similarly, the bear's visual experience of me, and its subsequent turning away from me, are integrated: they are both explained by the same reason, namely that the bear was visually attending to me. From the bear's point of view, its turning away from me followed an assessment of me as uninteresting (or whatever), an assessment which depended on the bear visually attending to me (though it is unlikely the bear would put it in those terms). Could the blindseer's confidence integrate his visually based object-directed thoughts and actions? What makes confidence even slightly plausible as a candidate is, I take it, that it suggests success. Someone who is practiced at an activity is, we would hope, also successful at it. How, though, is the blindseer to judge his visually based object-directed thoughts and actions as successful? If the blindseer has a reason for thinking he is pointing at a red car, it will be because he is told he is doing this; if he has a reason for his thought to the effect there is a red car, it will be because he is told there is one. More generally, the reasons the blindseer will have for 'guesses' to the effect that there is some object or other in his environment will be based on the

testimony of others, or on his own non-visual perception (e.g. touch, or hearing). In contrast, visual attention provides us with reasons for our visually based object-directed thoughts and actions: we consciously select the object or property which our thoughts and actions are directed towards. In providing objects or properties as reasons for our visually based object-directed thoughts and actions, visual attention also makes apparent the *way* in which we encounter the objects our thoughts and actions are directed towards – we encounter them visually. Visual attention stitches our visually based object-directed thoughts and actions together.

In my argument against Smithies' account of the explanatory role of conscious attention, I used a sceptical scenario to argue against his account of visual attention providing us with justifying reasons. I pointed to the possibility of someone being deceived in such a way that they took themselves to have reasons for their thoughts and actions based on their visual experience, when in fact they didn't, because their ability to reason had been tampered with. Is my reasons-based account susceptible to the same sort of sceptical challenge? I believe it is, which is why it needs to be cast in a conditional form: *if* a subject is visually attending to an object (or having a hallucinatory experience as of attending to an object), the reason for any thoughts she might have about the object is the same as the reason for any actions she might direct towards the object: namely, her experience of the object. If, instead, she merely *thinks* she is having a visual experience, and in fact is not, her thoughts and actions are not integrated in the way she takes them to be. I however do take myself not just to be *genuinely* having

visual experiences with the phenomenal character they appear to have, but also to be *veridically* visually experiencing the world around me. On that assumption, the reasons for my object-directed thoughts and actions are the same – the objects themselves. What is more, I am able to *explain* my visually based object-directed thoughts and actions in a way that the blindseer cannot. I am also able to explain my visually based object-directed thoughts and actions in a way that bears and pre-linguistic children cannot, but bears and pre-linguistic children, unlike blindseers, have reasons for their experiences and actions that integrate those experiences and actions.

Visual attention to objects provides subjects with introspectively accessible reasons for their visually based object-directed thoughts and actions that integrate those thoughts and actions. In the case of language-using subjects, visual attention to objects also provides them with reasons they can *give* for their thoughts and actions. There is something else that visual attention to objects does. Visual attention to objects puts us in a position to respond intentionally to them. When we pay visual attention to an object, our attending to it puts us in a position to intentionally respond to it, where that response takes precedence over other intentional visually based responses we might be in a position to make. Visually attending to an object gives it, in that way, *priority of intentional response*. This is true both when our attention is voluntarily exercised, as it is when looking for a particular book among a pile of books, and when our attention is involuntarily captured, as it might be by an unexpected flash of light. In both cases, we are poised to respond intentionally to the object of attention, and our response to it will take priority

over any other visually based intentional responses we may be in a position to make. This characterisation of the role of visual attention with respect to intentional actions captures something that is central to the pre-theoretical conception of attention I have identified. If I am visually attending to a book, my next visually based intentional action will be directed at the book. If I want to act with respect to another object in my environment, I have to first shift my attention, whether overtly or covertly, to it. I can also shift my attention between tasks, so a task like juggling that requires a reasonable amount of sustained visual attention can be performed in addition to an unrelated task, such as walking, that requires infrequent visual attention. Actions that require concentrated visual attention, like playing the 'wire loop' (or 'buzz wire') game, where I have to guide a metal loop along a length of wire without either coming into contact, probably cannot be performed alongside any other visually based intentional actions, though I may continue to make *unconscious* visually based movements like saccades. The thought motivating this way of thinking of the relation between visual attention and intentional action is that when we visually attend to an object, the object is uppermost in our minds, and therefore it has priority with respect to any visually based purposive action we perform. This suggests a difference between the blindseer's visually based object-directed actions and our own. What is uppermost in the blindseer's mind is likely to be the action, rather than the object towards which the action is directed. But this is not to say that the blindseer cannot prioritise his intentional visually based object-directed actions on the basis of his unconscious selective enhancement of processing. It seems quite possible that he can. TN's negotiation of

obstacles while walking along a corridor seems to be an example of prioritised intentional visually based object-directed actions. What blindseers cannot do is shift their visual selection from one object to another on the basis of prior visual awareness of the second object. I will argue in the next chapter that this is something that those of us with normal vision can do, and frequently do.

There are some similarities between my account of the relation between visual attention to an object and intentional action, and Wayne Wu's account (Wu (2011)) of attention as selection for action. Attention, according to Wu, is a subject-level phenomenon, but one for which he provides different explanations depending on whether the attention is voluntary (selection for intentional action) or involuntary (selection for unintentional action).<sup>220</sup> The most crucial difference between Wu's account and the one offered here, however, is that on Wu's account, attention need not be conscious. On Wu's account, GY's performance in the Posner task is an instance of attention.<sup>221</sup> Wu's account of attention is not, by that fact alone, going to be of any help in explaining why visual attention is sufficient for visual awareness.

At the end of §4 I promised an alternative to Campbell's account of our inclination to think of objects as existing unperceived. Providing this account will be my final task for this section. The account I am going to sketch comes from Gareth Evans' paper *Things Without the Mind*.<sup>222</sup> In this seminal paper,

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<sup>220</sup> Wu (2011) p. 108.

<sup>221</sup> Wu (2011) p. 111.

<sup>222</sup> Evans (1985)

Evans links spatial perception with the conception of objects as existing unperceived.

It seems undeniable that most of us *do* think of physical objects as existing whether or not they are being perceived. If visual experience contributes to our conception of objects as existing unperceived, what contribution does it make? According to Campbell, nothing short of the object being a constituent of the experience will entitle us to conceive of the object as existing unperceived. As I have tried to show in the previous section, this brings with it a substantial commitment. It is not a commitment that I am prepared to make. Evans' Kantian argument for the role of spatial perception in our conception of objects existing unperceived offers the prospect of an alternative explanation without having to make the commitment of the Relational View.

Evans observes that

"... the idea of unperceived existence, or rather the idea of existence now perceived, now unperceived, is not an idea that can stand on its own, stand without any surrounding theory. How is it possible that phenomena *of the very same kind* as those of which [one] has experience should occur in the absence of any experience? Such phenomena are evidently *perceptible*; why should they not be perceived? To answer this question, some rudimentary theory, or form of a theory of perception is required."<sup>223</sup>

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<sup>223</sup> Evans 1985 pp. 261-262

The rudimentary theory of spatial perception needed must link our conception of objects as things that can exist unperceived with conditions of our spatial world, conditions on the way the world must be for us to perceive objects. Examples of the sort of condition include such things as there being sufficient available light for us to see the object, our eyes working properly, the object being close enough and large enough to see, and so on. The point being made here does not depend on providing an exhaustive list of the conditions upon which successfully perceiving an object depends. Rather, the point is that in grasping the rudimentary theory of spatial perception, we grasp that there are such conditions on the way the world (including us as perceivers) must be, and we understand these conditions must be met to successfully perceive objects. We need also to be able to detect (or think we can detect) whether, for at least some of these conditions, they have been met or not.

An object may exist and be perceptible yet still not be perceived because the conditions for perception are not met. If we believe that some of the relevant conditions for perception have not been met, we have a reason that is sufficient for explaining why we are not perceiving the object. This also means that we do not need to think of an object's existence as dependent on our perception of it – we do not need to think it ceases to exist when we stop perceiving it, because we have *other* sufficient reasons for not perceiving it. Additional constraints (the conditions necessary for perception) have been placed on our perceiving an object over and above the object simply *being perceptible* (i.e. simply being such that it could be seen). I may not be

currently visually experiencing an object I was earlier visually experiencing because it is at another location not visible from my own, or because it is occluded by another object, or because it is too dark, or for a range of other reasons consistent with my understanding of the necessary conditions for visually experiencing objects.

Evans' account can also be used to explain why, when my devious neighbour switches on the virtual reality device he has implanted in my head, I continue to think – quite wrongly now – of the objects I am hallucinating as existing unperceived. My hallucinatory experience appears to be spatial, and in conjunction with my grasp of the conditions necessary for perception (the 'rudimentary theory of perception'), gives me a reason – though not a justifying reason – for thinking the objects I am hallucinating can exist unperceived. So Evans' account can be used to explain why spatial visual experience (whether veridical or hallucinatory) together with a grasp of the conditions necessary for perception, gives us a reason for conceiving of objects as existing unperceived. Evans' account does not, of course, provide us with *justification* for any thoughts about hallucinatory objects.

Once we acknowledge the part played by the spatial dimension of our visual experience in our conception of objects as existing unperceived, we also have the basis for an account of why we think of objects as public, and as the source of the physical properties that determine their behaviour. I won't spell out the account – I think it is pretty obvious how it would go.

I began this chapter with the question of whether a subject's visual attention to an object is sufficient for her to be visually aware of the object. The most natural answer is that it is. It is natural to think that without visual awareness of objects we could not have visually based object-directed thoughts and perform visually based object-directed actions. The visually based abilities of blindseers show this is wrong: visually based object-directed thoughts and actions *are* possible without visual awareness of the relevant objects. The sufficiency of visual attention for visual awareness cannot be defended by appealing to the necessity of attention for having visually based object-directed thoughts and performing visually based object-directed actions. I argued, therefore, that we needed to identify another explanatory role for visual attention, a distinctive way in which visual attention explains our visually based object-directed thoughts and actions, an explanatory role that the selective enhancement blindseers are capable of does not make available to them.

The first proposal I considered (§2) was that visual attention makes visual information spontaneously accessible for the purpose of visually based object-directed thoughts and actions. The cases of Helen the monkey, and TN the bilaterally blindsighted human (§2.2), showed that visual attention is not necessary for visual information to be spontaneously accessible for the purpose of visually based object-directed thoughts *and* actions, since both Helen and TN were capable of using visual information, spontaneously (i.e. without prompting), for the purpose of visually based object-directed action. In §2.3 I set out some evidence in support of Milner and Goodale's two visual

systems hypothesis. The evidence is, I accepted, decisively in favour of visual awareness dissociating from visually based actions in both directions: visually based object-directed actions can be performed in the absence of visual awareness of the relevant objects, and visual awareness of objects is possible without a commensurate capacity to act on those objects. Milner and Goodale conclude that attention also comes in two varieties, one conscious and one unconscious. I rejected their conclusion, but conceded that the explanatory role of visual attention could not be to make visual information spontaneously accessible for the purpose of visually based object-directed thoughts and actions.

The second proposal for the explanatory role of visual attention I considered in this chapter was Declan Smithies' Rational Access View (§3). Smithies argued that attention makes visual information fully accessible for the rational control of thought and action. However, the kind of reasons visual attention provides, according to Smithies, are *justifying* reasons, which must be accessible on the basis of introspection alone. I argued that reasons accessible on the basis of introspection alone might fail to justify our thoughts and actions. For example, my cognitive abilities might be compromised, and I might think I am acting on the basis of a visual experience, when in fact I am not, because I am acting on the basis of a guess. There remains, nonetheless, something very plausible about the central piece of Smithies' view, that visual experience provides us with reasons.

The third proposal I considered is John Campbell's view according to which visual attention to objects grounds our ability to refer to them demonstratively, and justifies us in thinking of them as mind-independent (i.e. as existing unperceived, as possessing the physical properties that determine their behaviour, and as public objects). To be entitled to think of visual attention as grounding demonstrative reference to objects, and justifying our thinking of them as mind-independent, we need to think of visual experience relationally. That is, we need to think of the objects we visually experience as constituents of our experience. This carries with it the commitment that we cannot, in principle, know the phenomenal character of our hallucinatory experiences, and I confessed myself unable to accept this commitment. In the hypothetical case I describe, where without my knowledge my villainous neighbour implanted a virtual reality device in me, it seems to me self-evident that I know the phenomenal character of my resulting hallucinatory visual experiences. Moreover, I have tried to show that there is an alternative explanation of why blindseers cannot use visual demonstratives in the way we do, and an alternative account of our inclination to think of objects as existing unperceived. I have also, in this section, proposed an explanatory role for visual attention according to which it provides us with reasons for thinking and acting, accessible on the basis of introspection, that integrates our thoughts with our actions. Finally, I have tried to show how I think visual attention to an object puts us in a position to intentionally respond to it, where that response takes precedence over other intentional visually based responses we might be in a position to make.

In my sketch of Evans' account of the relation between spatial perception and our conception of objects as existing unperceived, the lynchpin is our grasp of the conditions necessary for perception. I want to end this chapter by saying a little more about the phenomenal character of our spatial visual experience. Our spatial visual experience allows visual attention to integrate our visually based thoughts and actions because it conforms to some constraints. The phenomenal character of our visual experience is systematically related to the actions available to us. For instance, it visually seems to me as if I am in a position to touch the objects within my reach as I walk past them; it visually seems to me that I have to walk around objects in my path. But the phenomenal character of our visual experience is not just systematically related to our visual sense of our own position with respect to the object we might happen to be visually attending to, but also to other parts of our environment. It not only visually seems to me as if I am in a position to touch the cup I am visually attending to, but it also visually seems to me as if I am within reach of the table the cup is resting on, and the wall behind the table. We are, a lot of the time, visually aware of more of our surroundings than just the object we happen to be attending to, and this contributes to our visual experience having the spatial qualities it seems to us it does. When, for example, I attend to a friend's face while remaining aware of the crowd surrounding her, my awareness of the crowd provides me with a sense of the spatial relations between my friend and the people surrounding her, and between all of them and me. If I lose sight of her because people in the crowd move between us, I am reassured that she has only disappeared from my view and not from existence – my grasp of the necessary conditions for

visually perceiving things provides me with the alternative explanation. If this is correct, visual attention is not necessary for visual awareness. In the next chapter, I defend this seemingly obvious feature of visual experience in the face of empirical evidence that, it is claimed, shows it is false.

## **Chapter 4: Awareness Without Attention**

In this chapter I critically examine the claim that visual attention is necessary for visual awareness. The claim is based on the results of experiments in which subjects had to concentrate on a task, and while doing so failed to notice a task-irrelevant stimulus in full view, a stimulus which when they were not engaged in the task, they invariably did notice. I describe some of the experiments in §2. The common-sense explanation of why subjects in these experiments fail to notice the task-irrelevant stimulus is that they were concentrating on the task. When we are concentrating on a task, and this includes visual tasks, we tend to ignore distractions. In §3 I outline experimental evidence that supports the common-sense explanation.

### **1. Introduction**

When I look at the silhouette of a tree against the sunset-sky, what is striking about the scene is the contrast between the dark shape of the tree, and the vivid sky behind it. When I visually attend to the tree, visually picking it out, it still seems to me that I remain visually aware of the sky. Or again, when I visually attend to my computer screen, it certainly seems to me that I am also visually aware of the window behind it, and the clutter of objects around it. In

general, it seems to me that my visual sense of my own position within my surroundings is provided by my visual awareness of my surroundings, over and above my awareness of any object I happen to be visually attending to. The clear exception is when I am concentrating on something. If I am 'lost in thought', or looking intently for something, I may not notice something else in full view. But if we leave those situations to one side, it seems to me that visual attention to an object is not necessary for visual awareness of it. I presume that other people's visual experience is, in this respect, the same.

This seemingly obvious observation has been challenged by psychologists who, on the basis of the performance of subjects engaged in tasks manipulating visual attention, have said things like "... there is no *conscious* perception without attention."<sup>224</sup> In this chapter, I will defend the view that visual attention to an object is not necessary for visual awareness of it. To defend the view that attention is not necessary for awareness, I only need to provide *one* plausible instance, or kind of instance, of awareness without attention. What I claim is that we are *routinely* visually aware of objects we are not visually attending to.

In the next section I describe two sets of experiments in which subjects failed to report objects in full view while their attention was focused on a task. In the following section, I describe some empirical results that support the evidence from introspection, that unless we are concentrating on a task of

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<sup>224</sup> Mack and Rock (1998) p. 14.

some kind, we are aware of and can report the presence of objects we are not visually attending to.

## **2 Inattentional Blindness**

Arien Mack (Mack and Rock (1998)) has claimed that attention is necessary for awareness. The claim was made on the basis of research carried out into the phenomenon now generally known as *inattentional blindness*. Mack and Rock's research began partly as an investigation into which features of objects are pre-attentively processed, that is, which features of objects, such as colour or shape, are processed before attention comes into play. The question makes sense in the context of the debate, in the psychology of perception, between 'early' and 'late selection' theories of attention. As the psychologist Jon Driver, in his review (Driver (2001)) of selective attention research explains, early psychological research into auditory attention focussed on what was known as the 'cocktail party effect', and in particular on two questions. Roughly, the questions ask 'On what basis can information be selected?', and 'What, if anything, is retained of information that is not selected?'. In the context of the proverbial cocktail party, the first question asks how we are able to pick out one conversation at the party from all the others going on simultaneously. The second question asks what we can recall of the conversations we were not paying attention to. It is differing answers to the second question that gave rise to the debate between 'early' and 'late selection' models of attention. Donald Broadbent's Filter Theory (Broadbent (1958)) proposed that, apart from certain basic qualities of

sounds on the basis of which the sounds were filtered, unattended information was discarded.<sup>225</sup> Broadbent's Filter Theory is an example of an 'early selection' theory of attention. Other theories, motivated by evidence that unattended information was processed to a greater degree than Broadbent's theory predicted, argued for 'late selection' models of attention. Mack and Rock's research began as an investigation into the role of attention in the processing of different aspects of visual stimuli.<sup>226</sup>

Their experiments, like the Posner paradigm described in Chapter 2, made use of covertly deployed attention (i.e. attention directed outside fixation). The centre of the computer screen, which the subjects were to fixate for the period of each trial of the experiment, was initially marked by a small cross. A larger cross was subsequently briefly displayed, with the duration of display intended to be too brief to allow saccadic movement, but not too brief for the subjects to see it. The *distraction task* was to report which of the arms of the larger cross were longer, the vertical or horizontal one, a task that required concentration. The larger cross was positioned either at the centre of the display at fixation, or a little outside fixation. After the larger cross had disappeared, a patterned mask was briefly displayed to prevent any residual information from the previous display affecting the experiment, and then the subjects reported which of the arms they thought was longer. In the *critical trials*, a small shape, the *critical stimulus*, which the subjects were not expecting, was displayed near the larger cross for the same duration. The

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<sup>225</sup> "... the Filter Theory... supposes a filter at the entrance to the nervous system which will pass some classes of stimuli but not others." Broadbent (1958) p. 42.

<sup>226</sup> Mack and Rock (1998) pp. 2-4.

critical stimulus varied depending on what was being tested for: if the experiment was a test for whether colour captured attention in these conditions, the critical stimulus was a small brightly coloured square, if the experiment was a test for whether shape captured attention, the critical stimulus was a small black square or other simple shape, and so on. Immediately after the critical trial, subjects were asked whether they had seen anything during the trial they had not seen on the preceding trials, and if so, what it was. In the *control trials*, subjects were asked to maintain fixation on the small central cross but ignore the larger cross and only report what else, if anything, they saw.

Mack and Rock found that when the larger cross was displayed at fixation and the critical stimulus was displayed outside fixation, around 25% of subjects reported not seeing anything different from the non-critical trials.<sup>227</sup> More surprisingly, when the larger cross was displayed outside fixation and the critical stimulus was displayed at fixation, between 60% and 80% of subjects did not notice the critical stimulus.<sup>228</sup> In other words, when the subjects were attending to an area they were not fixating (i.e. staring directly at), they were much more likely *not* to notice something appearing in the area they *were* staring directly at. In the control trials, in contrast, “subjects virtually always succeeded in seeing and correctly identifying the critical stimulus and its location”.<sup>229</sup>

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<sup>227</sup> Mack and Rock (1998) p. 13.

<sup>228</sup> Mack and Rock (1998) p. 17.

<sup>229</sup> Mack and Rock (1998) p. 10.

Mack and Rock started their research with ‘what appeared to be a self-evident assumption’ that “some percept, if only a minimal one, must exist prior to the engagement of attention, because attention requires an object...”.<sup>230</sup> On the basis of their results, they ‘arrived at what seems to be exactly the opposite conclusion’, that “there is no conscious perception at all in the absence of attention and therefore no perceptual object can exist preattentively.”<sup>231</sup> Their reason for thinking their starting assumption is self-evident is that they consider attention to have ‘an inherently intentional nature’ – that is, when we are attending, we are always attending *to* something. They resolve this ‘apparent contradiction’ by distinguishing between conscious and unconscious perception of the object of attention. “It is not that no perceptual object can exist preattentively, but only that no conscious perceptual object can do so.”<sup>232</sup>

This is consistent with the kind of description someone might give of an *involuntary* shift of visual attention, but seems to be quite at odds with the kind of description of many cases of *voluntary* shifts of visual attention. If I am attending to one book in a pile of books, perhaps while searching for a particular title, it very much seems to me that I know where to direct my attention to next *because* I am visually aware of the other books in the pile. It also seems to me that I usually know *which* object I am attending to, whether it is to a particular face in a crowd, or one particular book in a pile of books. If I am, as it seems to me, visually attending to just that book, and I am, as it seems to me, at the same time visually aware of the other books, then it

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<sup>230</sup> Mack and Rock (1998) p. 227.

<sup>231</sup> Ibid.

<sup>232</sup> Ibid.

follows that I am visually aware of the other books without visually attending to them. The alleged difficulty with relying exclusively on introspection of our visual experience, as J. Kevin O'Regan and Alva Noë have suggested,<sup>233</sup> is that we might be subject to something analogous to the 'refrigerator light illusion': whenever we open the fridge door to check whether the light is on, it always seems to be, but this is because opening the door turns the light on. In effect, the claim is that the only way we have of checking whether we are aware of something is by attending to it. This seems to just beg the question at issue, but to give the evidence from introspection some independent support, in the next section I present empirical evidence that weighs in its favour.

Before that, I want to describe one more quite influential set of experiments into inattentional blindness. This set of experiments were conducted by Daniel Simons and Christopher Chabris (Simons and Chabris (1999)) and, perhaps because they employed a more naturalistic paradigm, can seem even more striking. Simons and his colleagues recorded videos of two small teams of people passing a basketball between each other. The experimental subjects were required to watch the videos, each of a minute and a quarter, and asked to keep a mental count of the number of passes one of the teams made. In one condition (the hard condition), two separate counts had to be kept, one of bounced passes, and the other of aerial passes. A little over half the way through the video, one of two unexpected events occurred. In one case, a person in a gorilla costume walked through the two teams passing

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<sup>233</sup> O'Regan and Noe (2001) p. 947.

the ball. In the other case, a tall woman holding an open umbrella walked through the two teams. Both unexpected events lasted for 5 seconds. After seeing the video, the subjects were immediately asked to write down their counts, and were then asked the following four additional questions they were not expecting: (i) Did you notice anything unusual on the video? (ii) Did you notice anything other than the six players? (iii) Did you see anyone else besides the six players appear on the video?, (iv) Did you see a gorilla/woman carrying an umbrella walk across the screen? If any of the subjects answered 'Yes' to any of the questions, they were asked to provide details, and as soon as a subject mentioned the unexpected event any remaining questions were skipped. Overall, only just over half the participants noticed the unexpected event, though less noticed the unexpected event in the hard condition. Several of the subjects who had not noticed the unexpected event, on being told about it refused to believe it had happened until the video was replayed for them. In common with some of the results of (Mack and Rock 1998), the critical stimulus in these experiments (the gorilla or the umbrella-carrying woman), passed through the same area as the objects which were the focus of attention. Unlike Mack and Rock's experiments, Simons and Chabris' experiments involved moving (images of) real-world objects.

An aspect of their results that Simons and Chabris highlight is the surprise evinced by the participants themselves, when the presence of the unnoticed 'gorilla' was made apparent to them:

“... observers in our study were consistently surprised when they viewed the display a second time, some even exclaiming, ‘I missed that?!’”<sup>234</sup>

Simons and Chabris argue that the subjects’ surprise is evidence that favours inattentional *blindness* rather than a rival explanation of inattentional *amnesia*, suggested by Jeremy Wolfe (Wolfe (1999)). Wolfe’s explanation is that attention plays a role in visual experience entering memory, and that in the experimental conditions used by Mack and Rock, subjects had to report whether or not they saw the critical stimulus *after* the trial, leaving open the possibility that they just forgot seeing it.<sup>235</sup> In response, Simons and Chabris say

“It seems more parsimonious to assume that observers were never aware of the unexpected object than to assume that they saw a gorilla, then forgot about it, and then were shocked to see it when told to look for it.”<sup>236</sup>

Declan Smithies (Smithies (2011a)), whose Rational Access view of visual attention we came across in the last chapter (§3) has argued for a more general hypothesis, according to which attention is “... necessary for information to be accessible for use in the control of action, reasoning and verbal report...”<sup>237</sup> on the grounds that that is all that is required to explain subjects’ failure to report the unexpected object. Smithies’ *inaccessibility* hypothesis is sufficient to account for the inattentional evidence without committing itself to any more

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<sup>234</sup> Simons and Chabris (1999) p. 1072.

<sup>235</sup> Wolfe (1999) p. 74.

<sup>236</sup> Simons and Chabris (1999) p. 1072.

<sup>237</sup> Smithies (2011) p. 256.

specific claims (such as blindness or amnesia) regarding why subjects fail to report the unexpected object; it is also consistent with subjects' awareness of the unexpected object.<sup>238</sup>

John Campbell (Campbell (2011)) whose Relational View we came across in the last chapter (§4) puts forward a similar hypothesis to Smithies' as part of his distinction between selection and access. According to Campbell, we are conscious of selected objects though we may not access (e.g. be able to report) all the objects we are conscious of. Subjects in Simons and Chabris' experiments could, therefore, have been visually aware of the gorilla, but simply failed to access that information.

I regard it as plainly evident that when we are not concentrating on something, in thought or in perception, we can be visually aware of more than just the object we happen to be visually attending to. I can visually pick out a book from the shelf full of books opposite me while remaining visually aware of the other books. My visual awareness of the other books may not be as distinct as my awareness of the book I am attending to, but I am, nevertheless, aware of them. We don't need to appeal to blindness, amnesia or inaccessibility to explain exceptions to this default condition. When we are engaged in a taxing task, such as trying to perform a difficult mental calculation, or searching for an empty seat in a crowded cinema, we need to concentrate on the task, and avoid distractions. It can be surprising that

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<sup>238</sup> Smithies qualifies his inaccessibility hypothesis by distinguishing between rational and non-rational notions of accessibility, and attributes the influence of priming effects to non-rational accessibility.

when we are engaged in a visual search, like finding a seat in a crowded cinema, we can miss something we would normally be visually aware of, such as a friend waving at us.<sup>239</sup> That surprise ought to be attenuated by the realisation that, in terms of the task we set ourselves, the thing we missed – the friend waving at us – was *just another distraction*. There is no mystery here – we ignored them, albeit without first noticing them. Any residual surprise is explained by taking the evidence from introspection at face value – we *are* frequently visually aware of more than we are visually attending to. On the infrequent occasions when we notice that, as a result of concentrating on what we are looking at, we have missed something in full view we otherwise would not have, we tend to be surprised.

In the next section, I outline some empirical findings based on the same experimental paradigm as used by Mack and Rock. The findings support the evidence from introspection – concentrating on a task limits awareness of task-irrelevant stimuli.

### **3. Perceptual Load Theory**

Nilli Lavie has put forward and provided experimental evidence for a hypothesis that supports my claim that visual attention is not necessary for awareness. According to the Perceptual Load hypothesis,

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<sup>239</sup> The example is from Simons and Chabris (1999).

“... focusing attention on a current task can prevent the perception of task-irrelevant stimuli (i.e., early selection) when the task-relevant processing involves a high level of perceptual load which consumes all available capacity. By contrast, when the processing of task-relevant stimuli involves only low perceptual load, any spare capacity spills over involuntarily to the perception of irrelevant stimuli (i.e., late selection).”<sup>240</sup>

Examples of conditions with a high perceptual load are a search task involving several items, or a subtle length-discrimination task; examples of conditions with a low perceptual load are a search task involving few items, or a simple colour discrimination task. In Cartwright-Finch and Lavie (2007), the authors use the same experimental paradigm as Mack and Rock, to ensure their results provide evidence of what subjects are visually aware of. A task-irrelevant distractor might influence the time it takes for a subject to complete an experimental task (e.g. report the identity of the target stimulus), but that fact alone is not sufficient to show the subject is visually aware of the distractor. If, however, the subject verbally reports the presence of the distractor, that is pretty firm evidence they are visually aware of it.

Cartwright-Finch and Lavie note that the results of Simons and Chabris (1999) also suggest that a harder task is more likely to result in subjects failing to become aware of a task-irrelevant stimulus (the gorilla or the tall woman), but question whether the nature of the hard condition (keeping separate counts of bounced and aerial passes) required subjects to make more eye movements to keep track of the different trajectories of the ball,

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<sup>240</sup> Cartwright-Finch and Lavie (2007) p. 322.

and therefore made it harder for the subjects to notice the task-irrelevant stimulus. By using the same experimental paradigm as that used by Mack and Rock, Cartwright-Finch and Lavie did not have to worry about eye movements or saccades (the distraction task is presented too briefly for saccadic eye movement).

Overall, the results for the four experiments, involving judging line-length (high load) or colour (low load), and visual search involving similar distractors (high load) or dissimilar distractors (low load) showed a clear difference between the conditions. The first experiment produced the lowest results for visual awareness of the critical stimulus in both high and low load conditions, 10% and around 55% respectively, but the other three experiments had results between 40 and 50% (high load), and 80 to 90% (low load).

What is of interest in terms of supporting the evidence from introspection is the very marked difference between the results for the different load conditions. In low perceptual load conditions there were a considerably higher proportion of subjects who noticed the task-irrelevant stimulus, suggesting that in such conditions we are much more likely (roughly twice as likely based on the last three experiments) to become aware of something we are not attending to, despite being engaged in a visual task. If we are frequently able to notice objects other than those we are attending to, that explains why we might be surprised when, on the less frequent occasions when we are engaged in a visual task demanding concentration, we are not able to notice unattended objects.

The results reported by Cartwright-Finch and Lavie are, it must be said, consistent with another construal than the one I have been urging.<sup>241</sup> It is possible to think of attention as being paid to different degrees across the visual field. On this construal, subjects were paying *most* attention to the task they were instructed to complete (e.g. judging line length), but were still paying *some* attention to the unexpected task-irrelevant stimulus, on the occasions when they noticed it. Therefore attention is, according to this construal, still necessary for awareness. I have a couple of things to say in response. Firstly, even on this construal, there will be a significant difference between the amount of attention paid to the experimental task, and the attention paid to the task-irrelevant stimulus. Secondly, the relevance of the perceptual load experiments for the kind of pre-theoretical conception of visual attention I described at the beginning of this thesis, it seems to me, is that the perceptual load conditions resemble the kind of situations we come across in day-to-day life. Looking for a seat in a crowded cinema resembles one of the high perceptual load conditions, and visually attending to a book in a small pile of books resembles one of the low perceptual load conditions. If the comparison is acceptable, the characterisation I gave, of visually attending to one book in a small pile of books, while remaining aware of the other books in the pile, should also apply to the low perceptual load condition. My strategy here is the same as it was in relation to the question of whether the Posner task measures the effects of visual attention. What

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<sup>241</sup> Something like this alternative construal seems to be the conclusion Cartwright-Finch and Lavie draw. They think their experiments provide "... strong and unequivocal evidence for the critical role of attention in inattentional blindness." Cartwright-Finch and Lavie (2007) p. 338.

legitimises an experimental task as a measure of the effects of attention is its similarity to a pre-theoretically recognisable exercise of attention. In the case of the Posner task, the comparison was with directing someone's attention by pointing. In the case of the perceptual load conditions, the comparison is with situations like looking for a seat in a cinema, or attending to one among a group of objects. Given the comparison, and the characterisation I gave of looking for a seat in a cinema and attending to one among a pile of books, the data from the perceptual load experiments supports the view I have been defending, that visual attention to an object is not necessary for visual awareness of it. I have already made a case for my characterisation of visually attending to one among a pile of books. It seems to me that, in general, I know what I am visually attending to. It also seems to me that I can attend to one among a small pile of books, while remaining visually aware of the rest of the pile. I have just argued that the same kind of characterisation should be given of the low perceptual load conditions.

I'm going to end this chapter by first looking briefly at an explanation of the surprise of subjects in inattentive blindness experiments offered by Daniel Dennett, and second by looking – even more briefly – at the phenomenon of multifocal attention.

Daniel Dennett has suggested an alternative explanation to the one I have given of the surprise that we are liable to feel on realising that we have failed to notice something in full view. Dennett has suggested that we think of our visual experiences as being uniformly detailed throughout, from centre to

periphery. Though many of the experiments I have described in this thesis make use of covertly deployed attention, in general we fixate – look directly at – what we are visually attending to. We do that precisely because it provides us with a much more detailed view. If Dennett is right that we think of our visual experiences as uniformly detailed throughout, that could provide a different explanation of the surprise expressed by subjects in inattentional blindness experiments, and people in analogous situations in day-to-day life. In this Dennett-inspired alternative, the surprise would be explained by our expectation that our visual experience is uniformly detailed throughout, rather than, as I have suggested, that we don't usually expect awareness to be limited by concentration. This is what Dennett says:

“Suppose you walk into a room and notice the wallpaper is a regular array of hundreds of identical sailboats, or – let's pay homage to Andy Warhol – identical photographic portraits of Marilyn Monroe. In order to identify a picture as a portrait of Marilyn Monroe, you have to foveate the picture: the image has to fall on the high-resolution foveae of your eyes. As we saw... your parafoveal vision (served by the rest of the retina) does not have very good resolution; you can't even identify a jack of diamonds held at arm's length. Yet we know that if you were to enter a room whose walls were papered with identical photos of Marilyn Monroe, you would 'instantly' see that this was the case. You would see in a fraction of a second that there were 'lots and lots of identical, detailed, focused portraits of Marilyn Monroe'. Since your eyes saccade four or five times a second at most, you could foveate only one or two Marilyns in the time it takes you to jump to the conclusion and thereupon to see hundreds of identical Marilyns. We know that parafoveal vision could not distinguish Marilyn from various Marilyn-shaped blobs, but nevertheless, what you see is

not wallpaper of Marilyn-in-the-middle surrounded by various indistinct Marilyn-shaped blobs... It seems to you as if you are actually seeing hundreds of identical Marylins.”<sup>242</sup>

I am myopic, so perhaps I am more aware than people lucky enough to have unimpaired vision of the limitations to what I can see. Even while wearing my corrective spectacles, however, I am quite aware that I do not visually experience the world in the uniformly focused and detailed way that Dennett claims I do. We are certainly able to pick up the ‘gist’ of a scene very quickly. Mack and Rock noticed this phenomenon in the course of their inattentional blindness experiments.<sup>243</sup> But it doesn’t follow from the fact that I can get an overall sense of the scene before me very rapidly, that I visually experience it in detail, or even (as Dennett claims) that I *think* I visually experience it in detail. Getting an overall sense of something is quite consistent with a lack of detail. I have said visual attention to an object is not necessary for visual awareness of it, but that claim is quite consistent with the claim that we experience peripheral, unattended objects in a much less detailed way than the way we experience foveated attended objects. As Alva Noë has pointed out (Noë (2002) p. 4), the fact that we think of our visual experience as providing us with access to detailed visual information does not mean we think of ourselves as actually experiencing the world in uniform detail from the centre to the periphery of our visual field. I have endeavoured to provide a more plausible explanation of the surprise we may feel when we realise we have failed to notice something in full view.

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<sup>242</sup> Dennett (1991) pp. 354-355.

<sup>243</sup> E.g. Mack and Rock (1998) pp. 165-168.

Finally, I want – very briefly – to consider the phenomenon of multifocal attention. Patrick Cavanagh (e.g. Cavanagh and Alvarez (2005)) has investigated divided visual attention, building on work by Zenon Pylyshyn. A typical task involves subjects simultaneously tracking the location of multiple moving objects (multiple object tracking, or MOT). The kind of single focus visual attention I have confined discussion in this thesis to cannot explain subjects' abilities to keep track of multiple randomly moving objects, but MOT does not constitute a problem for my defence of visual attention as sufficient but not necessary for awareness. I have said that, in general, we know what we visually attend to, and that in at least some cases, we know we are visually attending to one object while remaining visually aware of surrounding objects. This characterisation of visual experience seems to me to accurately reflect the phenomenology of visual experience, and broadly similar characterisations are offered by Campbell and Smithies (§2 above). For all I have said, visual attention may, on occasion, have multiple simultaneous foci, or attention may be switched from one location to another discontinuously. The thesis I have been defending is that visual attention to an object is sufficient but not necessary for visual awareness of it, and as far as I can see that is quite compatible with MOT and the possibility of divided attention.

In this chapter I have argued against an interpretation of experimental evidence purporting to show that a phenomenological description of the relation between visual attention and visual awareness is wrong. The interpretation I have argued against claims that visual attention to an object

is necessary for visual awareness of it. As evidence against this claim, I have pointed to the phenomenology of visual experience. I have assumed that we *do* know what we are attending to, and that we can (and frequently do) visually attend to single objects, like a book on a shelf of books, or a pen on a table. This assumption follows naturally from the account of visual attention I gave in the last chapter, according to which visual attention to an object enables us to demonstratively refer to it, and prioritises it for visually based intentional actions. I visually attend to the book before drawing my companion's attention to it using a visual demonstrative; I visually attend to the book before removing it from the shelf. Given that I know that I am visually attending to one book on the shelf, and that I am simultaneously aware and can report the presence of other books on the shelf, it follows that I am visually aware of objects I am not visually attending to.

It is certainly the case, however, that there are occasions when we do not notice things in plain view. The natural explanation is that on those occasions, we are engaged in a task demanding concentration. I have pointed out that in order to concentrate on a task, we need to ignore distractions. In the experiments I have described (Mack and Rock (1998), Simons and Chabris (1999)), subjects had to concentrate on visual tasks, so would have needed to ignore task-irrelevant distractions like the gorilla. Findings from experiments using Mack and Rock's inattention blindness paradigm carried out by Ula Cartwright-Finch and Nilli Lavie (Cartwright-Finch and Lavie (2007)) provide independent support for this explanation. Whether subjects were able to report task-irrelevant stimuli depended on the

degree to which they had to concentrate on their tasks: awareness depended on perceptual load.

To explain the surprise that subjects in these experiments and in analogous situations in everyday life have expressed, I have argued that if we are frequently visually aware of objects we are not visually attending to, we may be surprised by the occasions on which this is not the case. According to Dennett, we think of visual experience as uniformly detailed from the centre of the visual field to its periphery. If he is right, the surprise can be explained by our expectation that we are aware, in a uniformly detailed way, of *all* objects in full view. I think a moment's careful reflection on our own experience shows us that is not the case: we visually experience the world in less detail towards the periphery of our visual field. But we don't need to explain our surprise at not noticing things in full view by thinking of ourselves as all-seeing observers. We have a perfectly adequate explanation to hand. When we are concentrating on one thing, we are liable to miss other things. We so infrequently realise that, as a result of our concentration, we have not noticed something in full view that we otherwise would have, that the realisation is liable to surprise us.

## Chapter 5: Concluding Remarks

In this chapter I revisit the key points of the previous chapters to give an overview of the arguments in this thesis.

In this concluding chapter I will revisit the key points of the preceding chapters in order. In the first chapter I began by setting out what I take to be a recognisable pre-theoretical way we think about attention and awareness in visual experience. Those of us with normally functioning vision are able to think about and act with respect to our immediate physical environment on the basis of seeing it. We are also able to think about and act with respect to particular objects in our immediate environment on the basis of visually picking them out: someone may draw my attention to the book I am looking for, allowing me to visually pick it out from the pile of books surrounding it. Conversely, our visually picking out or attending to a particular object becomes intelligible when it is for the purpose of thought or action. Visually attending to one object needn't, however, mean losing sight of surrounding objects. I can attend to a particular book among a pile of books for the purpose of thinking about it, or acting with respect to it, while remaining aware of the other books surrounding it. When you draw my attention to a book in front of me, or when my attention is caught by an unexpected face at the window and I am sufficiently startled to altogether cease paying attention to what is on the television, not only am I aware of what my attention is

drawn to, caught by, or paid to, but I know that I am attending to it. Visual attention is, in short, sufficient but not necessary for visual awareness.

In Chapter Two, using examples, I introduce the idea of visually based object-directed actions and thoughts. When I see a particular object, such as a coin, and as a result of seeing it I reach out and grab it, my action is visually based and object-directed. If, instead, I had closed my eyes and spun around on the spot till I had become disorientated and then reached out and grabbed the first object that came to hand, my action of grabbing that object would have been neither visually based, nor directed towards that particular object, since which object I ended up grabbing would have been a matter of chance. Similarly, if by chance the word 'raccoon' enters my thoughts, the presence of a racoon in my vicinity does not make my thoughts either visually based, or about that racoon. If, instead, on the basis of seeing the racoon, I think 'Raccoon!' then my thought is both visually based and object-directed. These examples suggest that visually based object-directed thoughts and actions require the thinker or agent to be visually aware of the relevant object because it is by being aware of the object that the visually based thoughts and actions are about the object. Thinking about, or acting with respect to a particular object also requires that object to be visually picked out, and this is what happens when my attention is drawn to an object, and when I pay attention to an object; I visually pick the object out. Moreover, what we usually mean when we talk of drawing someone's attention to something, or of them paying attention to that thing, is that they

are aware of it. So it seems that visually based object-directed thoughts and actions require visual attention conceived of as conscious.

However, as I go on to describe, evidence from subjects with blindsight shows that visually based object-directed thoughts and actions are possible in the absence of any visual awareness of the relevant objects. When blindseers are required to make 'guesses' about the objects and properties presented to their blind field, usually from a limited range of options, their responses indicate they can visually detect and identify the objects and some of their properties. So the thoughts expressed by their 'guesses', and their actions (such as pointing in the direction of the object), seem to be visually based and object-directed. This prompts the question: Is visual attention to an object possible in the absence of any awareness of it?

Robert Kentridge and colleagues have interpreted the evidence from blindsight as showing that visual attention to an object *is* possible in the absence of any awareness of it. This certainly isn't how we generally think of visual attention – in general, we think of visual attention as sufficient for awareness. It is plausible that we think of visual attention as a way of being aware: William James spoke of attention as being a 'concentration of consciousness'. I consider the possibility that thinking of attention in this way could simply be the result of our ignorance of the possibility of attention without awareness.

Christopher Mole attempts to defend the sufficiency of attention for awareness by arguing that blindseers attend to *and are also aware of* the regions of space occupied by the objects they detect. I show that Mole's defence of sufficiency depends on understanding attention and awareness non-visually, and that what he takes the blindseer to be attending to is 'part of the space in which the blindseer experiences himself as oriented'.

Kentridge and colleagues are making a claim exclusively about visual attention, and visual awareness, which leads me to conclude that the two parties, Mole on one hand, and Kentridge and colleagues on the other, are talking at cross-purposes.

The dialectic at this point is in danger of fossilising into a polarised disagreement between those who think there is clear experimental proof of visual attention without visual awareness and those who insist, dogmatically, that attention is sufficient for awareness. To continue with a defence of the sufficiency of attention, an obvious option at this point would be to deny that attention is possible in the absence of awareness on the grounds that what we mean by attention implies awareness of what is attended to. This would be a mistake for two reasons. One I have already mentioned – on the basis of the evidence from blindsight, there are grounds for investigating our initial conception of attention. Secondly, the blindseer GY, who was the subject of the experiments carried out by Kentridge and colleagues described in Kentridge et al. (1999), and in Chapter Two of this thesis, described what he was doing during one set of experiments as 'trying to pay attention higher up

in his blind field'. Some account of what GY was trying to do, if not visually attend to the target stimulus, seems to be in order.

I focus on the experimental task, the Posner spatial cueing task, used by Kentridge and his colleagues to demonstrate that the blindseer GY was visually attending to the target stimulus without being visually aware of it. I argue that the only grounds for thinking that the Posner task measured the effects of visual attention is that the task resembles drawing someone's attention to an object by pointing at it. Drawing someone's attention to an object by pointing at it is an activity we reserve for people who are capable of being visually aware of the object we are drawing their attention to. So it is at least questionable whether when a blindseer undertakes the Posner task, what is being measured is the effects of visual attention. That is to say, we should not accept without further investigation the assumption that the Posner task measures the effects of visual attention *whether or not the subject undertaking the task is visually aware of the target stimulus*.

This changes the dialectic somewhat. Now, instead of being faced with the two poles of the debate, for and against sufficiency, we are instead faced with a challenge. The challenge is to identify how visual attention, conceived as sufficient for awareness, explains our visually based object-directed thoughts and actions in a way that the selective enhancement the blindseer is capable of does not. This, I say, is a distinctively *philosophical* challenge.

I endeavour to explain GY's description of himself as 'trying to attend to a portion of his blind field' by returning to Mole's attempt to defend sufficiency. I suggest that GY was attending *in thought* to a portion of his blind field. If we understand GY, and blindseers more generally, to altogether lack visual sensations in their blind field, we need to think of their intact visual field as *reduced in size*, rather than as occluded in some way. I end Chapter Two by arguing that, if that is how we understand the blind field of blindseers, it doesn't make sense to think of them as able to *select* parts of their blind field to visually attend to: we can't select something we have no awareness of.

In Chapter Three, I begin by reiterating one of the key conclusions of the previous chapter. The sufficiency of visual attention for visual awareness cannot be defended by appealing to the necessity of visual attention for having visually based object-directed thoughts and performing visually based object-directed actions, since blindseers are capable of both. We need to identify another explanatory role for visual attention, a way in which visual attention explains our visually based object-directed thoughts and actions, an explanatory role that the selective enhancement blindseers are capable of does not make available to them.

The first proposal I consider is that visual attention makes visual information spontaneously accessible for the purpose of visually based object-directed thoughts and actions. The cases of Helen the monkey, and TN the bilaterally blindsighted human show that visual attention is not necessary for visual information to be spontaneously accessible for the purpose of visually based

object-directed actions: both Helen and TN were capable of using visual information, spontaneously (i.e. without prompting), for the purpose of visually based object-directed action. I then look at an influential explanation of this apparent divergence between visually based thoughts and actions, David Milner and Melvyn Goodale's two visual systems hypothesis. I describe some of the evidence for their hypothesis, and accept that the evidence is decisively in favour of visual awareness dissociating from visually based actions in both directions: visually based object-directed actions can be performed in the absence of visual awareness of the relevant objects, and visual awareness of objects is possible without a commensurate capacity to act on those objects. Milner and Goodale conclude that attention also comes in two varieties, one conscious and one unconscious. I reject their conclusion, but concede that the explanatory role of visual attention is not to make visual information spontaneously accessible for the purpose of visually based object-directed thoughts *and* actions.

The second proposal for the explanatory role of visual attention I consider in Chapter Three is Declan Smithies' Rational Access View. Smithies argues that attention makes visual information fully accessible for the rational control of thought and action. However, the kind of reasons visual attention provides, according to Smithies, are *justifying* reasons, which must be accessible on the basis of introspection alone. I argue that reasons accessible on the basis of introspection alone might fail to justify our thoughts and actions. For example, if my cognitive abilities are compromised, I might think I am acting on the basis of a visual experience, when in fact I am not, I am acting on the

basis of a guess. I do, however, agree with Smithies that there is something very plausible about the thought that visual experience provides us with reasons.

The third proposal I consider in Chapter Three is John Campbell's view, according to which visual attention to objects grounds our ability to refer to them demonstratively, and justifies us in thinking of them as mind-independent (i.e. as existing unperceived, as possessing the physical properties that determine their behaviour, and as public objects). To be entitled to think of visual attention as grounding demonstrative reference to objects, and justifying our thinking of them as mind-independent, we need to think of visual experience Relationally. That is, we need to think of the objects we visually experience as constituents of our experience. This carries with it the commitment that we cannot, in principle, know the phenomenal character of our hallucinatory experiences, and I confess myself unable to accept this commitment. In the hypothetical case I describe, where without my knowledge my iniquitous neighbour implants a virtual reality device in me, it seems to me self-evident that I know the phenomenal character of my resulting hallucinatory visual experiences. Moreover, I outline an alternative explanation of why blindseers cannot use visual demonstratives in the way we do, and an alternative account of our inclination to think of objects as existing unperceived. I end the chapter by proposing an explanatory role for visual attention according to which it provides us with reasons for thinking and acting, accessible on the basis of introspection, that integrate our thoughts with our actions. I believe attention is related to intentional action,

and as part of my characterisation of visual attention I describe visual attention to an object as putting us in a position to intentionally respond to it, where that response takes precedence over other intentional visually based responses we might be in a position to make.

In Chapter Four, I defend a phenomenologically motivated conception of visual attention according to which it is not necessary for visual awareness. I can be visually aware of objects in the immediate vicinity of the object I am visually attending to. Psychologists including Arien Mack and Daniel Simons have claimed that we are only visually aware of what we are visually attending to. The results of experiments on so-called inattention blindness have been interpreted to show that the unexpected stimulus many subjects failed to report when they were engaged in a task demanding their concentration was not reported because the subjects were not attending to it. I suggest that a better explanation of the experimental results is that we are liable not to notice things in full view, objects which in other circumstances we would notice, when we are concentrating on a task. Unless the object is relevant to the task we are engaged in, it makes perfect sense that we *ignore* it. We can find it surprising when we realise that we have failed to notice something in full view in circumstances like this, I go on to say, because the occasions when we do realise this are relatively rare. For my primary evidence against the claim that visual attention is necessary for visual awareness, I point to the phenomenology of visual experience. I assume that we *do* know what we are attending to, and that we can (and frequently do) visually attend to single objects, like a book on a shelf of books, or a pen on

a table. This assumption follows naturally from the account of visual attention I give in Chapter Three, according to which visual attention to an object enables us to demonstratively refer to it, and prioritises it for visually based intentional actions. I visually attend to the book before drawing my companion's attention to it using a visual demonstrative; I visually attend to the book before removing it from the shelf. Given that I know that I am visually attending to one book on the shelf, and that I am simultaneously aware and can report the presence of other books on the shelf, it follows that I am visually aware of objects I am not visually attending to. To support this phenomenological evidence, I briefly describe the results of experiments by Ula Cartwright-Finch and Nilli Lavie, which show a marked difference in the ability of subjects to notice task-irrelevant stimuli depending on how demanding the task they were engaged in was. In less demanding conditions ('low perceptual load conditions'), there were a considerably higher proportion of subjects who noticed the task-irrelevant stimulus, suggesting that in such conditions we are much more likely (roughly twice as likely) to become aware of something we are not attending to, despite being engaged in a visual task.

It is possible to read into this thesis a battle between the two disciplinary approaches of philosophy and experimental psychology. Staging such an encounter has not been my intention. As I understand the two disciplines, they both have different starting points; philosophy starts with experience, psychology with behaviour. Experience and behaviour are intimately connected; either on its own is only part of the story. What I have argued

against in this thesis is *misunderstandings*, primarily the misunderstanding of the role visual attention plays in our conscious lives. Once we understand that visual attention, conceived of in the recognisable pre-theoretical and phenomenological ways described, integrates our visually based reasons for thinking about and acting with respect to objects in our environment, and prioritises our intentional visually based responses to them, we can place the important discoveries of experimental psychology in their proper context.

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