Attention and Conscious Perception

by

Adrienne Prettyman

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Department of Philosophy
University of Toronto

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Abstract

Are we conscious of more than what's in the “spotlight” of attention, or is consciousness limited to the content of attention? Recently several authors (DeBrigard & Prinz 2011; Prinz 2010; Dennett & Cohen 2012) have defended the view that attention to some object is necessary for conscious perception of that object. For each of these authors, attention acts like more than just a “spotlight on a stage.” But none of them provides a robust account of this new way of attending. My project offers a new theory of diffuse attention that explains the apparent richness of experience. Accepting that there is a diffuse way of attending requires us to abandon the notion of attention as a spotlight. On the view that I offer, attention has degrees. For example, when looking at a landscape, your attention is spread over a broad spatial area and details are more difficult to remember or describe than when you focus attention in greater depth on some object within that landscape. A broad and shallow diffusion of attention nonetheless makes its object available for guiding thought and action, and so should be considered a way of attending rather than merely being conscious.

After defending a theory of diffuse attention, I offer a new argument for the view that attention is necessary for conscious perception. My argument is motivated by the phenomenological observation
that ordinary perceptual experience has a structure: some objects are in the foreground of experience, while others are in the background. I motivate the claim that this foreground/background structure is necessary for perceptual experience, and argue that focal and diffuse attention provide the foreground/background structure. I conclude that attention is necessary for perceptual experience, since it provides a necessary structure of experience. In making this argument, I draw on phenomenological insight into the structure of consciousness from James (1890), Gurwitsch (1964; 1966) and C.O. Evans (1970). For each of these authors, attention structures the foreground – but not the background – of consciousness. My novel contribution is to provide an account of how attention structures the conscious background. By enriching the concept of attention to include diffuse attention, my account is poised to explain the structure of conscious experience from foreground to background.
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Chapter 1

Introduction

Are we conscious of more than what's in the “spotlight” of attention, or is consciousness limited to the content of attention? I'll defend the view that attention is necessary for consciousness, but that attention is a much richer phenomenon than the focal “spotlight.” The best way to introduce what I mean by 'attention' and 'consciousness' is with an example. Suppose that you are bird-watching in the woods. As you walk along the path, you may stop and shift your attention across the scene, from one tree branch to another, until your attention lands on a bird perched among the leaves. As attention shifts from branch to bird, there's a change in what it's like for you to perceive the scene. I'll use the term 'phenomenally conscious state' or simply 'experience' interchangeably to mean a state that there's something it's like to be in. So, shifts of attention are accompanied by a change in experience.

But that's not all that changes. There's also a change in which objects are accessible to you for guiding thought and action. By 'object' I mean the things, events, or properties that a mental state is about. Only once you've attended to the bird are you able to describe it to your fellow bird-watcher, or remember that you saw that bird in order to check it off your bird-watching list. It's not merely that your gaze has landed on the bird that brings about these effects. To see why, suppose your gaze was directed at the bird, but you were attending to a leaf directly beside it. In this case, you wouldn't be able to remember or describe the bird. It's only once you've attended to the bird that your perception of the bird can guide activities like providing a description. Shifting attention to an object thus has two effects: it changes what it's like to perceive a scene, and it makes the attended object accessible in a
way that unattended objects are not.

My aim is to defend the view that attention is necessary for consciousness, and the bird-watching example shows why this claim is contentious. When you attend to the branch or the bird, the surrounding world is not in darkness. You seem to have rich experiences of the scene beyond the object of attention. If this were the right way to describe your experience, then the bird-watching example would show that my central thesis – that attention is necessary for consciousness – must be false. The way that I handle experiences outside the focus of attention is to argue that attention is much more than just a focal spotlight. I'll provide evidence that there are ways of attending that are non-focal, which I'll call diffuse attention. To illustrate the concept of diffuse attention, consider again bird-watching on a wooded path. Rather than attend to any bird or branch in particular, you could spread your attention across the woodland scene as a whole, taking in the forest and sky all at once. This broad distribution of attention is roughly what I mean by diffuse attention. On my view, while you attend focally to the bird, the surrounding world is not in darkness because at the same time you attend to the whole scene in a diffuse way.

My project takes its starting point in cognitive science. I'll defend the view that we attend diffusely to objects in the background by an appeal to both empirical and phenomenological evidence. On the view that I'll defend, attention and consciousness are conceptually distinct, but attention is necessary for consciousness in the actual world. The necessity claim that I'll defend is a natural necessity: it's true in all worlds that have the same laws of nature as our own (Fine 2002). I won't defend the claim that attention is logically or conceptually necessary for consciousness.

Drawing on the cognitive understanding of the mind, I construe attention as a mechanism that makes an object accessible to higher cognitive functions like working memory (a short term memory store) and verbal report. Attended objects are able to guide rational thought and action because attention makes its object accessible to the cognitive mechanisms that subserve rational thought and
action. In the bird-watching example, attending to the bird enables you to hold a representation of that
bird in working memory, identify its type, think about whether it's a rare bird or a common one, or
describe it to a friend. I'll focus on the role of attention in perceptual experience. By 'perceptual
experience' I mean an experience that is intentional (Brentano 1874), has a sensory qualia, and presents
its object as occurring here and now (Matthen in progress). The central claim that I'll defend is that
attention to some object is necessary for perceptual experience of that object.

Recently several authors working at the intersection of philosophy and cognitive science (Prinz
2012; 2005; DeBrigard & Prinz 2010; Dennett & Cohen 2011) have defended the view that attention is
necessary for conscious perception. For each of these authors, attention acts as more than just a focal
spotlight. Each appeals to diffuse attention in order to defend the claim that attention is necessary for
consciousness. But none provides a robust account of this non-focal way of attending.

My project fills that gap. Accepting that there is a diffuse way of attending requires us to
abandon the notion of attention as essentially a spotlight. On the view that I offer, attention is better
characterized as a landscape. Visual attention can be distributed across a scene in a broad and shallow
way (as when we attend diffusely to the scene as a whole), or a narrow and deep way (as when we
attend to the bird). As I'll argue, a broad and shallow diffusion of attention nonetheless makes its object
available for guiding thought and action, and so should be considered a way of attending rather than of
being merely conscious.

The enriched concept of attention not only enables us to defend the view that attention is
necessary for consciousness against empirical counterexamples; it also paves the way for understanding
and studying the structure of conscious experience. The structure of consciousness has been extensively
studied in the Phenomenological\(^1\) tradition, and I'll show how this literature can be used articulate new
research questions for the fledgling study of diffuse attention. In bringing together the cognitive science

\(^1\)I'll use the term 'Phenomenological' with an upper-case 'P' to refer to discussion in the philosophical tradition beginning
with Husserl; a lower-case 'p' indicates discussion of structures of experience more generally.
of attention and Phenomenological literature on the structure of consciousness, my goal is two-fold. First, I'll show that cognitive science can inform the phenomenological account of conscious structure by providing an account of that structure in terms of attention. At the same time, the phenomenological discussion of varieties of background consciousness points to a gap in the empirical literature. The phenomenological discussion shows that many aspects of consciousness occur outside focal selective attention, and thus demonstrates the need for a theory of diffuse attention. By enriching attention to include diffuse attention, my account is poised to explain the structure of conscious experience from foreground to background.

In the next chapter, I'll survey the empirical literature on attention and consciousness in order to show that the debate over whether attention is necessary for consciousness cannot be resolved until we have an account of non-focal ways of attending. I argue that the advocate of the view that attention is necessary for consciousness cannot adequately explain away alleged counterexamples until she has a robust account of diffuse attention – an account that is currently missing from the literature. In chapter 3, I offer the beginnings of a theory of diffuse attention, a first step toward filling the gap in the literature. I outline five options for a theory of diffuse attention, and show that only two of these options could do the work required to defend the view that consciousness is necessary for attention. I then consider and respond to the objection that diffuse states are better conceptualized as states of mere consciousness, rather than states of attention. In brief, the worry is that appealing to diffuse attention to explain away counterexamples is ad hoc. We shouldn't invent new ways of attending simply to explain away counterexamples to the view that attention is necessary for consciousness. I agree that we can't invent ways of attending simply to explain away counterexamples. By surveying the empirical evidence and phenomenological descriptions of diffuse experience, I'll show that the theory of diffuse attention is motivated by much more than just a need to explain away counterexamples. Regardless of whether we accept the view that attention is necessary for consciousness, the evidence suggests that
focus is only one way that subjects can access an object for guiding thought and action; they can also
access objects diffusely. As I hope to show, diffuse attention is a real phenomenon deserving of
systematic study.

In the final two chapters I'll show how an enriched concept of attention puts us in a position to
better understand consciousness from foreground to background. I'll present a new phenomenological
argument that attention is nomically necessary for consciousness that draws on the theory of focal and
diffuse attention outlined in Chapter 3. I call this argument the *phenomenological* argument because it
begins from a claim about the nature of experience: that consciousness is structured. Chapter 4 focuses
on establishing the phenomenological claim that consciousness is structured into foreground and
background, and that this structure is necessary for ordinary perceptual experience. In exploring the
structure of consciousness I draw on phenomenological discussions of structure in James (1890),
Gurwitsch (1964/66), and C.O. Evans (1970), as well as more contemporary discussion of the margins
of awareness (Thompson 2007; Legrand 2006). I show that if perceptual experience has the structure
described by Gurwitsch, then it has it necessarily. That is, Gurwitsch's account of the structure of
consciousness entails that consciousness is always structured, as a matter of logical necessity.

In Chapter 5, I use the phenomenological claim that perceptual experience is necessarily
structured to argue that attention is necessary for consciousness. Attention provides the
foreground/background structure of consciousness; since structure is necessary for consciousness,
attention is necessary, too. My novel contribution is to provide an account on which attention structures
consciousness from foreground to background. That is, while other authors have argued that attention
structures consciousness (C.O. Evans 1970; Arvidson 2006; Watzl 2010; Dicey-Jennings 2012), in
restricting attention to focal attention these authors leave out an account of the structure of the
conscious background. In contrast, my enriched concept of attention as focal and diffuse is poised to
provide an account of background consciousness.
Investigating the relation between the conscious background and diffuse attention presents unique methodological challenges, which we don't encounter when investigating the foreground of consciousness or focal attention. In the final section of Chapter 5 I discuss these methodological challenges and offer some ways forward. Developing a robust theory of diffuse attention will require new experimental paradigms in cognitive psychology and cognitive neuroscience, which don't rely on manipulating focal task performance. Meeting this challenge is critical for a scientific understanding of the relationship between attention and consciousness that is both empirically rigorous and phenomenologically adequate. But this is a challenge that anyone interested in the relationship between attention and consciousness should embrace; meeting it promises to generate new insight into the relation between cognition and the conscious mind, by enabling a more robust picture of how diffuse and focal attention interact to bring about the structure of conscious perception.
Chapter 2

Attention and Consciousness

Abstract: I argue that the debate over whether attention is necessary for consciousness cannot be resolved until we have an account of non-focal ways of attending. I review evidence for the thesis that attention is necessary for consciousness (Thesis N) and show that this evidence establishes a more modest claim: under experimental conditions, subjects sometimes fail to see some objects to which they are not attending. To build the case for Thesis N, we need to explain away alleged counterexamples from partial report and dual-task studies. I argue that the advocate of Thesis N cannot adequately explain this evidence until she has a robust account of diffuse attention.

1. Introduction

In this chapter, I'll provide support for the claim that attention is necessary for perceptual experience while illuminating a crucial gap in the current literature: we don't have a robust account of attention beyond the focus. Until we develop such an account, we cannot determine whether consciousness outside the focus necessarily involves attention. I'll review the evidence that attention is necessary and sufficient for consciousness, and argue that this evidence supports the view that how we attend to the world partly determines which objects, properties or events we consciously perceive. That is, I'll argue that the evidence suggests a view on which attention is necessary but not sufficient for consciousness. There is reason for caution, however, since we cannot adequately defend this view until we have a better account of non-focal ways of attending. In the chapters that follow, I will explore and defend an enriched concept of attention that can fill this gap.

Although we cannot determine whether attention is necessary for consciousness on the basis of the current evidence, the research I survey in this chapter supports a more modest conclusion: that how we perceive the world often depends on how we attend. This more modest claim has significant implications for a theory of perception. The evidence shows that the content of conscious perception is determined by more than the world and a subject’s sensory systems. It is also determined in part by the
activity of the subject's ongoing mental life, in particular the direction of her attention. A theory of perceptual consciousness will be incomplete without an account of the nature and dynamics of attention (see also Watzl 2010; Dicey-Jennings 2012; Prinz 2012).

2. Necessity and Sufficiency

One of the central questions in the philosophical discussion of attention is whether attention is necessary for consciousness. Those who answer ‘yes’ accept a view that I’ll call Thesis N (for Necessity):

**Thesis N**

Attention to some object is necessary for perceptual experience of that object.

As I'll understand it, Thesis N involves natural necessity (Fine 2002). In all worlds with the same laws of nature as our own, a subject is conscious of only those objects to which she is attending. This leaves open whether attention is logically or conceptually necessary for perceptual experience. I am using the term 'object' to mean the things, events or properties presented in perceptual experience. Thesis N tells us that in the actual world, whenever a subject experiences some object, she also attends to it. We might also think that if a subject were to shift attention to a new object, she would experience. That is, attending to some object is sufficient for perceptually experiencing it. I'll call this Thesis S (for Sufficiency):

**Thesis S**

Attention to some object is sufficient for perceptual experience of that object.
Thesis S tells us that in all worlds with the same laws of nature as our own, whenever we are attending to some object, we are conscious of that object. If I visually attend to a weed in my garden, then I'm visually conscious of the weed. If I shift visual attention from the weed to the bird, then my visual experience also shifts from the weed to the bird. In the following sections, I will argue that we should tentatively accept Thesis N (but not Thesis S) on the basis of the current empirical evidence. Attention is necessary for conscious experience, but it is not sufficient, because there is evidence for unconscious attention – a possibility that Thesis S rules out.

Before turning to the empirical evidence, I will first clarify what I mean by 'attention' and 'perceptual experience'. The question of how to conceptualize attention is a contentious one. I will argue that we need to enrich the concept of attention to include new ways of attending that aren't well-developed in the current literature. For the present discussion, however, my aim is to motivate the need to enrich the concept of attention by showing the limitations of the current concept of attention. For this reason, in this chapter I will adopt a standard way of conceptualizing attention in cognitive psychology.

In the empirical literature, perceptual attention is modality-specific. Psychologists distinguish among visual attention, auditory attention, gustatory attention, and so on for each of the five senses (Cohen et al. 20112). Since most of the evidence that I will discuss involves visual attention, I will focus on vision while bearing in mind a caveat: the lessons we learn from visual attention may not apply in other modalities (for example, see O’Callaghan 2012). When I use the word 'attention' in this chapter, I will mean 'visual selective attention' unless otherwise noted.

Visual selective attention is typically understood as the effortful direction of attention to some task or goal to the exclusion of other task-irrelevant distractors. It involves focusing on a relatively small number of objects or properties, or a small spatial region, for enhanced processing. Processing of selected objects is “enhanced” because selected objects are processed more rapidly and deeply. By
“deep” processing, I mean that the mechanism of visual selective attention “guards the gate” to visual working memory and reportability (Lamme 2004, p. 12), selecting certain objects over others for access to higher cognitive mechanisms. Selectively attending to some object makes representations of that object accessible to working memory and the mechanisms of reportability, and thus poised to have an impact on rational thought, action, and verbal reports. For the time being, I will follow the convention of using 'focal attention' and 'selective attention' interchangeably (though in later chapters, I will argue that selective attention is not always focal).

With this understanding of attention in mind, we can make Thesis N and Thesis S more precise to rule out a potentially problematic consequence. As it stands, both theses are framed in modality-neutral terms. To illustrate why this is a problem, consider a case in which I auditorily attend to a bird in my garden. Thesis S would enable us to conclude that I perceptually experience the bird, but it doesn't specify which modality my perceptual experience is in. Auditorily attending to the bird could suffice for experiencing it visually. This is a consequence that I'd like to rule out by adding a further claim: the way that we attend (visually, auditorily, and so on) determines the way that we perceptually experience the object of attention. To incorporate this claim, Thesis N and Thesis S can be rewritten for each modality-specific subsystem of attention. For example, Thesis N for vision tells us that visual attention to some object is necessary for visual perceptual experience of that object.

A second clarification concerns perceptual experience. As I'll understand it, a perceptual experience is a mental state that meets three conditions: (1) it is intentional, (2) it has sensory qualia, and (3) it is presents its object as occurring here and now. By 'intentional', I mean that perceptual experiences are about or directed toward an object (Brentano 1874). When I use the term 'object,' I will mean the things, events, or properties that a mental state is about. Perceptual experience is a type of intentional experience. Just as in “presentation something is present, in judgment something is affirmed or denied,” (Brentano 1874, p. 88) in perception some object is perceived.
In order to be a perceptual experience, a state must meet the further condition of being phenomenally conscious. I'll use the term “phenomenally conscious state” and “experience” interchangeably. A mental state is phenomenally conscious just in case there’s “something it’s like” to be in that state (in the sense of Nagel 1974). Phenomenally conscious states are individuated by the particular qualia present. By 'qualia', I mean the phenomenal properties of an experience. For example, the quale present when you see a red thing will differ from the quale present when you see a blue thing. A visual experience of red and a visual experience of blue are both experiences, but they are different experiences because they have different qualia.

So far, I've said what it means for an experience to be intentional. But consider the following cases: A thought about the contents of a closed book sitting on the desk in front of me is intentional and phenomenally conscious, but is not a perceptual experience of the content of the book. Nor do I intend for a memory to count as a perceptual experience. Perceptual experiences are phenomenally conscious intentional states that satisfy two further conditions: they have sensory qualia (to distinguish perceptual experiences from other intentional states, like thoughts), and they present an object as occurring here and now (to distinguish perceptual experience from memory. See Matthen in progress).

To motivate the claim that perceptual experiences have sensory qualia, consider the difference between seeing a rough surface and feeling it with your hands. Though the intentional object – the roughness of the surface – stays the same, what it's like to experience that object will differ. Looking at the rough surface feels different from touching it with your hands. One way of accounting for this difference is in terms of sensory qualia. While the same object is presented in visual or tactile experience, the experience differs because there is a change in sensory qualia (for an account of what makes a mental content sensory rather than non-sensory, see Grice 1962). Returning to my example of

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2 I will treat intentionality and consciousness as distinct conditions; I'll leave open the nature of the relationship between consciousness and intentionality. That is, I won't assume that intentionality suffices for consciousness. See Brentano 1874, Block 1995, 1996.

3 I will leave open the issue of whether qualia are intrinsic properties of a mental state, or whether they imply sense-data.
the closed book, we can appeal to the concept of sensory qualia to explain why thinking about the first page of a closed book is not a perceptual experience, while looking at the first page is a perceptual experience. The reason is that a thought about the page lacks sensory qualia.

In defining ‘perceptual experience’ in terms of phenomenal state consciousness, I take Thesis N and Thesis S to be expressing claims about the relationship between phenomenality and cognition. We could also state Thesis N or S as a claim about consciousness understood as introspective awareness or reflective awareness. This would make the theses easier to defend, since attention likely plays some role in making us aware of our own mental states to form introspective judgments or reflecting on our own mental states. I will be concerned with the more challenging version of the thesis, understood as a claim about the relationship between the psychological process of attending and perceptual experience understood as a type of phenomenal consciousness.

My aim is not to reduce consciousness to attention. If it could be shown that attention is necessary and sufficient for consciousness, we might conclude that they are not distinct phenomena: consciousness just is attention. Though I don't think that we can reduce consciousness to attention, the empirical research that I'll survey in this chapter establishes the importance of attention for a theory of perceptual experience. Any theory of perceptual experience will need to take account of the role of attention in determining how we experience the world in conscious perception.

3. Evidence for Unconscious Attention

In this section I'll provide some reason to think that Thesis S isn't supported by the research on attention. My central argument does not depend on Thesis S being false; my central argument concerns Thesis N. Nevertheless, in this section I'll show that we have prima facie reason to reject Thesis S, since it is not consistent with empirical evidence for unconscious attention.\(^4\) Thesis S tells us that

\(^4\) While the evidence that I'll discuss in this section are counterexamples to Thesis S as I've construed it, they may not raise a problem for other versions of the view that attention is sufficient for consciousness. Prinz (2012), for example,
attention is sufficient for consciousness, so it entails that there can be no unconscious attention. I'll provide reason to think that this entailment is empirically false.

The first reason to think that some attended objects are unconscious is that there is evidence that how we consciously direct attention modulates processing of unconsciously perceived stimuli. For example, Naccache, Blandin and Dehaene (2002) found that priming using masks depends on temporal attention. In visual priming, a subject's behavior is affected by a briefly presented stimulus which she claims not to have seen. Naccache and colleagues found that this effect requires attention to the prime. When subjects are prevented from attending to the prime, the unconscious prime does not affect subsequent behavior. That is, in order for a prime to affect behavior, it is not enough that it be presented within the field of vision; a subject must attend to the prime. But in masked priming the prime is unconscious, and so we have evidence for attention to an unconscious object. This is the phenomenon that I will call “unconscious attention.”

Further evidence for unconscious attention comes from Kanai, Tsuchiya and Verstraten (2006) who found that top-down attention affects the unconscious processing of features. That is, feature-based attention “spreads” from a consciously attended feature to features that are not consciously perceived. In Kanai and colleagues’ study, they examined the “tilt aftereffect” (TAE), in which viewing a slightly tilted adapting stimulus causes subjects to perceive subsequent stimuli as tilted in the opposite direction. Attention increases the response to the adapting stimulus, leading to greater TAE. As they reasoned, if attention is limited to conscious features, then there should be no TAE effect for a masked adaptor. That is, if the adaptor is unconscious, and attended objects are always conscious, then subjects shouldn't be able to attend to the adaptor; as a result, there should be little to no TAE relative to conscious adaptors.

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holds that attention to intermediate level representations is necessary and sufficient for consciousness. Since the evidence that I discuss involves attention in early rather than intermediate level vision, this evidence wouldn't raise a problem for his view.
Surprisingly, this is not what the researchers found: their study shows that subjects do exhibit TAE for some unconscious adaptors, which in turn implies that they have attended to an unconsciously perceived feature. In Kanai and colleagues’ study, subjects were presented with a Gabor contrast patch at a 15 degree tilt in the left field of the left eye, rendered invisible by a mask presented in the right eye (see figure 1). The experimenters refer to this invisible stimulus as the “adaptor.” At the same time, subjects were asked to attend to two visible Gabor patches presented in the right field of the left eye. One of the targets had the same tilt as the adaptor, while the other had the opposite tilt. After 5 seconds, subjects were presented with a brief (120 ms) blank slide and followed by the test stimulus. In the test, a visible target was presented at the same place as the adapter, tilted either to the left or right. The experimenters found evidence of a TAE effect for the invisible adaptor, which was only slightly reduced relative to the effect of a visible adaptor. They conclude that attention to features can modulate processing of unconscious stimuli.

The evidence from Naccache et al. (2002) and Kanai et al. (2006) both support the view that attention modulates the processing of some unconscious stimuli, which in turn shows that attention to a
stimulus doesn't always result in its becoming visible. In related research, Kunde et al. (2004) have found that perception of masked primes depends on a subjects' conscious task strategy. That is, subjects' conscious strategy modulates the processing of unconscious stimuli. This finding suggests that how a subject consciously attends modulates not only the processing of consciously perceived stimuli, but also stimuli that are not consciously perceived (see also Lachter et al. 2004). Taken together the research on masked priming supports a view on which subjects can attend to objects that are not consciously perceived.

A second body of evidence that supports unconscious attention is work on blindsight. In blindsight, subjects with damage isolated in the ventral region of the visual pathway are able to perform tasks on the basis of visual information, even though their visual experience is effectively blind. That is, although blindsight subjects claim not to see anything at all, they are able to perform some simple tasks on the basis of vision. Kentridge and colleagues (1999) have shown that this ability depends on a blindsight subject attending to visual stimuli – even though they claim to have no conscious experience of those stimuli.

In Kentridge and colleagues (2004) study of blindsight subject GY, Kentridge found that GY was able to perform a visual task faster and more accurately when he was cued to the region of presentation in the blindfield. For GY, the blindfield does not encompass the entire visual field. Kentridge presented GY with an a visible arrow (the cue) which either pointed to the correct location of the target in GY’s blindfield, or to a different location. When cued to the correct location, GY was able to perform a task involving the “invisible” target faster and more accurately than when he was cued for the wrong location. This suggests that GY’s ability to use the target to perform the task depends on where he attends. Attending to the correct location makes GY better able to perform a task involving the target. Kentridge's findings with GY provide evidence for unconscious attention: GY is able to attend to regions or objects in his blindfield, but he doesn't report conscious visual experience of
regions or objects in the blindfield (Kentridge et al. 1999, 2004).

It is possible (though I think implausible) to interpret the research on GY as cuing gaze, but not visual attention. For example, it is possible that GY performs the cued task faster simply because his eyes are directed to the stimulus, but his attention is not directed – because there is no visual attention to unconscious objects. This interpretation may be plausible when we consider the case of GY in isolation, but when we consider it in light of the evidence for unconscious priming, the more plausible interpretation is that GY’s improvement in performance is due to unconscious attention. Studies on masked priming show that presenting an object in the subject's visual field is not enough to produce priming effects; the effectiveness of a prime, even an unconscious prime, depends on the subject attending to that prime (Naccache, Blandin and Dehaene 2002). Attention, not just direction of gaze, determines whether an unconsciously perceived prime will effect subsequent behavior. This finding from masked priming makes it more plausible that in the case of GY, attention to the unconscious stimulus provides the best explanation of his improved performance on cued trials.

Interpreting the findings from experiments on blindsight subjects is further complicated by the possibility that some of GY’s experiences might not be reportable, or might be very difficult to report. While a verbal report about a stimulus gives us good reason to think a subject is conscious of that stimulus, the absence of such a report doesn't show that a subject isn't conscious of the stimulus. GY may have experiences that he can't access, or experiences that are so unusual he doesn't describe them as having seen the target. This final possibility is suggested by a closer look at blindsighters' reports. Weiskrantz and colleagues (1974) presented blindsight subject DB with a visual discrimination task, and recorded his verbal reports. DB was presented with an 'X' or an 'O' in the blindfield; though he denied having visual experience, he also claimed that the 'O' felt “smooth” and the 'X' felt “jagged” (see a review by Overgaard 2011). As Overgaard has pointed out, DB's claim to have “feelings” about the nature of the stimulus is open to interpretation. It's unclear whether the feelings he reports could be
visual experiences, even though he claims not to see the stimulus.

Neither blindsight nor evidence for attention's effect on unconscious primes in normal subjects provides a decisive argument that attention is not sufficient for consciousness. But they give us a prima facie reason to think that Thesis S is not supported by the current evidence. Disentangling attention and conscious perception is difficult work, but the evidence suggests (though does not entail) that attention plays an important role in unconscious perception. Whether we unconsciously perceive an object depends in part on the direction of attention; this supports the view that we can attend to objects that we don't consciously perceive. Since Thesis S rules out the possibility of unconscious attention, these empirical examples provide prima facie reason think that Thesis S is false.

4. Evidence for Thesis N

My main aim in this chapter concerns Thesis N. I'll argue that we can't settle the question of whether the empirical evidence supports Thesis N until we have a more robust account of non-selective attention. Nevertheless, I think that given the strong theoretical and empirical motivation for Thesis N, we should take it as the default view. My argument involves shifting the burden of proof to those who would deny Thesis N. I discuss three phenomena in the empirical literature that support the view that attention is necessary for consciousness: (1) Inattentional Blindness, (2) Change Blindness, and (3) Inattentional Inflation. These three phenomena establish that sometimes subjects are not conscious of some objects outside focal attention.

While the evidence that I survey demonstrates a connection between attention and consciousness, it does not yet provide sufficient reason to accept Thesis N. Thesis N rules out any conscious experience in the absence of attention. What these three phenomena show is that we sometimes are not conscious of some object or event to which we aren’t attending. What they don’t establish is that we can never be conscious of something without attending to it. For example, even if a
subject is not conscious of some objects or events outside the focus of her attention, it may still be the case that other conscious experiences do occur without attention – for example, proprioception or background experiences. The evidence in support of Thesis N does not rule out this possibility.

Mole (2008) has voiced a similar criticism. As he has pointed out, evidence cited in support of the view that attention is necessary for consciousness in fact establishes a weaker claim: that attention is necessary for providing a report in response to an experimenter’s probe under the constraints of the experimental conditions. These experiments show that attention is necessary for detecting and reporting some specific object or event, under the specific conditions of the experimental scenario. They don’t show that attention is necessary in all cases.

To make a stronger case for Thesis N, I will discuss the most compelling putative examples of consciousness in the absence of attention. As I will argue, this evidence is consistent with Thesis N so long as we accept that there are non-focal ways of attending. In particular, I’ll argue that making the case for Thesis N requires us to commit to the view that there is a diffuse way of attending that can operate in parallel to focal selective attention. But it is an open question whether there is a diffuse way of attending, and whether it can explain away the alleged counterexamples to Thesis N. Whether or not we should accept Thesis N hinges on whether or not there is empirical evidence for diffuse attention. This discussion highlights a crucial gap in the literature on attention and consciousness. Without a more robust understanding of non-selective modes of attention, we cannot yet answer the question as to whether attention is necessary for consciousness.

4.1 Inattentional Blindness

Some of the most striking evidence in support of Thesis N comes from the phenomenon of inattentional blindness. Thesis N states that we consciously perceive only those objects to which we’re attending. One way of arguing for Thesis N would be to show that without attention, we don’t perceive
objects at all. If attention is necessary for perception of objects, then it’s also necessary for conscious perception of objects.

Psychologists Mack and Rock think that evidence for inattentinal blindness supports the claim that attention is necessary for object perception. They found that when subjects are distracted by an attention-demanding central task, they fail to notice even large and surprising objects introduced into a visual scene. Mack and Rock take this evidence to show that subjects are radically mistaken about the content of their own perceptual experiences. When we open our eyes and look at the world, we are not presented with all of the objects in our field of view, to which we might direct attention. Rather, attention plays a role in binding perceived properties and spatial regions into objects. According to Mack and Rock, when we aren’t attending, we don’t perceive objects at all.

Mack and Rock’s conclusion seems at first to have the force of logic against it. Consider the following line of reasoning. As Mack and Rock (as well as Treisman 1982) point out, attention is always directed at something. To use their phrase, attention is “inherently intentional”: a subject can attend only if there is something to which she attends (Mack & Rock 1998, P. 4). This implies that object perception must precede attending to that object. The object must exist prior to attending in order to “activate” or “attract” attention. Though Mack and Rock acknowledge that this line of thinking is persuasive, they think it must be wrong. Mack and Rock have pointed out that there is reason to doubt that subjects perceive objects preattentively, and accruing evidence that attention plays a constructive role in perception of objects.

Against the evidence for preattentive object perception, Mack and Rock have argued that attempts to demonstrate preattentive object perception don’t in fact dissociate attention from object awareness. Paradigms used to investigate whether some objects are perceived without attention actually require attention to the target in order to perform the task. For example, the phenomenon of visual pop-out in visual search paradigms has been used to argue that some stimuli are processed “preattentively;”
while other stimuli require attention in order to be perceived. In a typical visual search paradigm, subjects are presented with a visual array consisting of a variable number of distractor elements (e.g. green circles) and a target element (e.g. a single red circle). Subjects are asked to report as quickly as they can whether a target is present in the array, and researchers infer the role of attention in object perception on the basis of response time relative to the number of distractors. Their reasoning is that if the number of distractor elements does not affect subjects' response time, then that object was perceived preattentively – subjects are able to identify the target without a serial search. On the other hand, if the response time varies as a function of the number of distractors, then researchers infer that attention is necessary for perceiving that object. Subjects need to search serially through the array, until the target object is identified. This research has been used to argue that there is a set of basic features which can be perceived without attention. Attention, on this view, serves to combine the basic preattentive features into complex objects (Treisman 1985).

The problem with this approach, as Mack and Rock have pointed out, is that a visual search task depends on attending to the task regardless of which stimulus is the target. Demonstrating that some objects are identified quickly regardless of the number of distractors does not show that these objects are identified in the absence of attention, since the subject was attending to the target stimulus. Rather, it shows that some stimuli can be quickly noticed and reported, whereas other stimuli require a serial search in order for the subject to notice that stimulus. This could be explained in ways that don't posit preattentive object perception. For example, objects that are noticed quickly may have features that attract attention regardless of the number of distractors.

In response to this experimental shortcoming, Mack and Rock developed a paradigm that enables researchers to test whether attention and object perception could be dissociated. In their paradigm, subjects are not asked to search for the target. Instead, their attention is engaged in an attention-demanding distractor task, like reporting the longer arm of a cross briefly presented on a
screen (Mack & Rock 1998). While subjects attend to the distractor task, the target stimulus is briefly presented near to the point of fixation. The surprising result is that after presentation, subjects frequently fail to report the target – even when the target stimulus is presented close to where they are attending. They called this phenomenon inattentional blindness (IB).

Since their early work on IB, the phenomenon discovered by Mack and Rock has been widely replicated (Chabris et al. 2001, 2011; Boss et al. 2010; Carpenter 2001). Another striking example of the effect of inattentional blindness effect comes from a now famous study by Simons and Chabris' (1999). In their study, subjects were shown a video of two teams trading basketball passes and asked to count the number of passes between team members wearing black shirts, while ignoring the passes between team members wearing white shirts. What they were not told, however, is that while they were performing this attention-demanding task, a man in a gorilla suit would walk to center screen, pause to beat his chest, and walk off. Surprisingly, in most trials approximately 50 percent of the subjects did not report seeing the gorilla. If we trust subjects to be good at remembering and reporting the content of their visual experiences, then this evidence seems to show that nearly half of the subjects failed to see the gorilla when they were attending elsewhere. That is, when attention is absorbed in a task, subjects sometimes fail to see some objects in a visual scene – even large and surprising objects that we would expect them to see.

One point to note is that in none of the paradigms discussed did the experimenters ask subjects to reflect carefully on or describe the content of their visual experience. Simons and Chabris, for example, take subjects' failure to report the gorilla as indicating that they failed to see it. Without a more careful investigation of subjects' visual experience, this conclusion is premature. If we ask subjects about their visual experience, they may say that they saw the entire scene and absolutely did not see a gorilla, thus supporting Simons and Chabris' analysis. Without asking subjects, however, it is difficult to draw a conclusion about the nature of their experience. For example, some subjects might...
say that they aren't sure whether they saw a gorilla, since there were too many shadowy players moving across the screen; or they might say that in retrospect they saw something gorilla-like, though it didn't seem odd or relevant at the time. They might say that they didn't see the whole of the visual scene, since they were absorbed in counting basketball passes; or they might insist that they saw the complete visual scene. Without asking subjects to report on their visual experience, we cannot know whether the results of Simons and Chabris' study conflict with subjects' beliefs about their experience.

Yet there is still something surprising about Simons and Chabris' results. Although Simons and Chabris did not ask subjects whether they had an experience of the entire visual scene, their results are surprising because they conflict with a plausible belief about perceptual experience: that we experience a visual background outside the focus of visual attention. When we're attending to something, the rest of the world does not seem to fade away. Evidence for inattentional blindness calls this belief into question by showing that we sometimes fail to notice even large and surprising objects that fall outside the focus of attention.

One worry – which I think the advocate of Thesis N can meet – is that the evidence for inattentional blindness indicates only a failure to notice that we’re experiencing the target, not a failure to see it. As I will use the terms, ‘seeing’ refers to what Dretske (1993) has called “thing-awareness,” while ‘noticing’ refers to fact-awareness. To borrow Dretske’s example, a mouse may be thing-aware of a piano playing a Mozart concerto even though it is incapable of becoming aware of this fact, and so without noticing that it’s hearing a concerto. A mouse doesn't possess the concepts PIANO or MOZART, or at least does not possess these concepts in the relevant way for becoming aware of the fact. But it is nonetheless thing-aware of the concerto. Likewise, when looking at a complex visual scene, I may be thing-aware of many objects without being aware of the fact that those objects are presented to me visually.

The worry is that Thesis N is a claim about the necessary conditions for seeing: we must attend
to an object to consciously see it. But inattentional blindness forces us only to a weaker claim: we must attend to an object to consciously notice it. The evidence presented by Mack and Rock and Simon and Chabris offers compelling evidence that attention is necessary for a subject to notice that she is seeing some object and to verbally report that experience to an experimenter. But the further inference from a failure to notice to a failure to see is unwarranted, since some unnoticed objects could nevertheless be seen. To establish that attention is necessary for seeing some object, we need to provide evidence that a subject has not only failed to notice the target stimulus, but that she hasn’t noticed it because she hasn’t seen it.

This is a challenge that the advocate of Thesis N can meet. There are three reasons to suspect that a failure to notice the target stimulus in inattentional blindness paradigms indicates a failure to see that object in the inattentional blindness paradigm. The first is that we have reason to be suspicious of the belief that we typically see all of the objects in a visual scene. The second is that we have evidence that seeing a scene doesn't imply seeing each of the objects in that scene. The third, and strongest, reason is that subjects fail to show priming effects for the target stimulus in inattentional blindness paradigms, which supports the view that they failed to report it because they did not see it.

The first reason to doubt that subjects experience more than they notice in the inattentional blindness paradigm is that we have some reason to be suspicious of reports of unnoticed experiences more generally. Decades of research in psychology have established that subjects are not infallible guides to the nature of their own minds. Perhaps we shouldn't attempt to discover an explanation that makes all of a subject's reports true; instead, we might explain away some of their reports by explaining how it is that they come to believe (falsely) that they have experiences they cannot notice or report (Dennett 1993; Cohen & Dennett 2011). The impression that we experience much more than we notice may be the result of a “refrigerator light illusion” (Naccache and Dehaene 2007). Whenever I open the refrigerator, the light is on – but I'd be mistaken to think that the light is always on in the refrigerator.
Likewise, whenever I attend to some region in my visual field, I notice objects in that region. But it would be a mistake to infer that I have visual experience of objects in unattended regions.

This faulty inference could explain subjects' belief that they have visual experience outside the focus of attention. Of course, since the inattentional blindness studies don't examine subjects' beliefs about their experience, we can't say for certain that subjects really do believe they have experiences outside the focus of attention. Neither Mack and Rock nor Simons and Chabris asked subjects whether they had seen the entire visual scene, the attention-demanding task only, or perhaps some middle ground between the two options. Nevertheless, when subjects’ beliefs about their experience conflict with experimental results, we might be satisfied by explaining why subjects hold those beliefs about their experience – even if the best explanation entails that subjects are wrong about their own experiences. For example, the best explanation of inattentional blindness might be that perceptual experience is limited to the content of focal attention, and subjects who think that experience exceeds the objects of focal attention are simply wrong about the nature of their own experiences.

The second reason to doubt that subjects in inattentional blindness studies see the target stimulus is that seeing the target isn't implied by seeing the scene. Suppose that when questioned, subjects who failed to report the gorilla in Simons and Chabris' experiment said that they experienced the whole scene. This claim is perfectly consistent with Simons and Chabris' interpretation of the evidence from inattentional blindness, so long as we accept that seeing the scene does not imply seeing all objects in that scene. Subjects could see the scene as a whole, even while failing to see the target (the gorilla). In support of this claim, consider Treisman's (2006) discussion of a subject with Balint's syndrome. In Balint's syndrome, subjects are incapable of consciously perceiving more than one object at a time. For example, if shown a group of colored dots, they can't make judgements that require a comparison of two dots or more, such as determining whether the dots are all the same color. The standard explanation is that subjects can't compare the dots in an array because they can't consciously
perceive more than one dot at a time. The Balint's syndrome subject in Treisman's study made a surprising and illuminating remark that complicates this interpretation of Balint's syndrome. He claimed to only be able to see one or two dots in the "whole bunch." This suggests that the subject could consciously perceive the array as a whole -- the "bunch" -- but did not thereby consciously perceive each dot the bunch comprised. The surprising consequence of this claim is that attending to the bunch doesn't entail conscious perception of each object in the bunch. The claim that subjects have background experiences of the whole scene conflicts with their performance on the inattentional blindness paradigm only if we assume that cases like this one aren't possible for normal subjects. Treisman's study gives us some reason to think that even in the normal case, it's possible to consciously perceive a whole scene without thereby being conscious of each element in that scene (see also Sperling 1960). If we reject the assumption that seeing an array or a scene in its entirety involves seeing all of the objects in that array or scene, then background experiences are consistent with the findings from studies on inattentional blindness. We can see a scene as a whole, even while failing to see some objects within that scene.

The third and strongest reason to suspect that subjects did not consciously perceive the target is an absence of priming effects. Using a revised inattentional blindness paradigm, experimenters can look for indications that a subject has perceived the target stimulus that don't rely on a subject noticing or reporting on her experiences. If these indicators of perception are absent, we can be more certain that the subject did not consciously perceive the stimulus. In visual priming, for example, subjects' behavior is affected by a perceived stimulus, even when they don't report having seen that stimulus. This provides grounds for attributing perception of the stimulus to the subject, even though they didn't notice it. Mack and Rock (1997) used this fact about priming to test whether there is reason to attribute perception of the target stimulus to subjects in inattentional blindness studies. They reasoned that if subjects who failed to report the stimulus merely had not noticed it, then their subsequent behavior
should be affected by the stimulus. We should find priming effects of the unnoticed stimulus. For example, subjects should be above chance at picking that stimulus out of a line-up. To test this, Mack and Rock ran a standard inattentential blindness paradigm and then asked subjects to select the target from a row of figures, even if they did not report seeing that target. What they found was that subjects who had not reported seeing the target were at chance when selecting that stimulus from the row of figures. The absence of a priming effect detracts from the plausibility of an interpretation on which subjects had seen the stimulus. Instead, the evidence supports the view that some objects outside the focus of attention aren't reported because they aren't consciously seen.

The upshot is that evidence for inattentional blindness complicates our view of the relation between attention and the objects of perception. The simple story presented at the outset, on which objects precede and are selected by attention, seems to be wrong. Rather, the evidence from inattentional blindness shows that how we attend partly determines which objects we see. When attention is engaged by a demanding task, subjects will fail to see some objects outside the focus. This offers some support for Thesis N, since it shows that the world is not passively given to us in perception just by opening our eyes. Instead, attention plays an important role in determining which objects within the field of vision are consciously perceived.

4.2 Change Blindness

A second area of research that supports Thesis N involves change blindness. As Simons and Levin have pointed out, vision science operated for many years under what now appears to be a false assumption: that visual perception requires precise, rich, and temporally persistent representations of the visual world. In their 1997 review of the literature, Simons and Levin argue that evidence for change blindness tells against this assumption, showing instead that we do not have a detailed representation of the visual environment that we retain over time. Although our experience seems
continuous through time, we don’t remember many objects or object properties. Simon and Levin draw a compelling moral from this literature, eloquently anticipated by William James: a visual system that retained too many details of the visual world would be nothing but a “blooming, buzzing confusion” (James 1890). In retaining fewer objects and properties in memory over time, the visual system enables us to achieve an impression of stability by ignoring unreliable or irrelevant properties or objects, and by focusing on the objects or properties most relevant to the subject's needs (Simon & Levin 1997). What we perceive through time depends on what we attend to at a time. If we're not attending at some earlier time, we may fail to notice a later change.

Early studies on change blindness involved a change that takes place during saccades, or the rapid movement of the eyes from one object to the next. For example, Grimes and colleagues (1996) asked subjects to carefully examine a picture on a computer screen and to tell the experimenter when they saw something change. Using an eye tracker, Grimes identified when a subject's eyes were shifting from one object to another, and induced a change in the picture during the saccade. Even though subjects had been carefully examining the picture, they nevertheless failed to detect almost 70% of the changes that occurred while they were viewing the picture – including, in one instance, when two people in the picture exchanged heads. Grimes concluded that during saccades, we lose a surprising amount of information about the objects and properties previously in view.

Blinks and masks – e.g. a flashed blank screen inserted between the original picture and the changed picture – also have been shown to prevent subjects from identifying changes that would otherwise be easily detected. One way of interpreting this evidence is that the eye movement, blink, or mask hides the change, an event that would typically capture a subject’s attention due to bottom-up salience. For example, in Grimes' study, the change event is the swapping of heads across figures. In Grimes’ paradigm, as well as in studies on blink and mask paradigms, the change is not visible to the subject. The subjects' eyes were moving when the heads swapped, so that subjects did not see the
change. In other studies, a change occurred when the eyes were closed or involved a blank screen that obscured the change. The fact that the change is not visible could explain why subjects fail to notice that a change has occurred. That is, an alternate explanation of change blindness is this: Although subjects retain a detailed representation of the world over time, they fail to compare these representations when the event of change isn't visible.

To test this interpretation, O'Regan, Rensink and Clark (1996) designed a paradigm for inducing change blindness without obscuring the change. Rather than mask the change, they flashed a set of arbitrary dots on screen – much like a splatter of mud – while the change occurred. Unlike in previous studies of change blindness, the change was in full view of the subject. Using this paradigm, O'Regan and colleagues demonstrated that subjects still had difficulty detecting changes to a visual scene even when that change was in full view, though the effect was less strong than in studies that used masking, saccades, or blinks. The upshot is that subjects failed to notice a change even though there was evidence for perception of the change in early visual processing, for example, local retinal transients. Though the change was in full view, subjects frequently failed to identify that a change had occurred. This suggests that the alternate explanation of change blindness is wrong: subjects do not fail to compare representations only when a change is invisible. Instead, even visible changes sometimes go unnoticed. The reason may be that subjects don't retain sufficient information over time to notice the change.

The phenomenon of change blindness raises two points relevant to the discussion of attention and perceptual experience. The first is to raise a challenge for the ordinary view of the continuity of perceptual experience over time. The second is that perceptual memory is surprisingly sparse, a claim which raises a methodological challenge for interpreting empirical evidence in consciousness studies.

Although we seem to perceive a rich and stable world over time, the evidence for change blindness suggests that we in fact retain far less information about the world from moment to moment
than we realize. Attention plays an important role in determining which objects are retained through time. In their discussion of the literature, Simons and Levin (1997) point out that whether subjects notice changes or not is mediated by whether they were attending to the object that changed. Objects that fell within subjects' reported “center of interest” in the visual scene were detected more frequently than changes that fell outside a subject’s center of interest, even when changes were of roughly the same magnitude. Simons and Levin suggest that subjects attend more frequently and in a more focused manner to objects that fall within their center of interest, leading to better recall and sensitivity to changes. As they point out, changes are not automatically seen just because they fall within a subject's field of view. Rather, seeing a change requires attention.

Simons and Levin's discussion of change blindness motivates a compelling suggestion for a theory of perception more generally. As they have interpreted it, evidence from change blindness supports the view that perceptual experience is active. The world is not passively presented to a perceiver. Instead, a subject actively structures perceptual experience by attending to objects in the center of interest, enabling her to make faster change detection in virtue of retaining more information through time. This fact points to an important role for attention in explaining the felt continuity of perceptual experience: how we attend at a time partly determines how we perceive the world through time.

The second point introduces a methodological complication for the study of attention and perceptual experience. Change blindness provides empirical support for the claim that we frequently see without remembering what we see. In challenging our assumptions about the richness of perceptual memory, these studies cast doubt on any methodology that attempts to assess what we have perceptually experienced based on what we remember or report. Consider again Grimes' eye-tracking experiment. Subjects are asked to scrutinize a picture presented on the screen. As their eyes move from one object to another, we have good reason to think that they are having visual perceptual experiences
of each element of the scene. They are, after all, attentively examining the picture and its elements. Yet they do not remember many of the properties of each object they perceived, as evidenced by the fact that they do not notice when those properties change during their saccades. The fact that subjects cannot remember or report the properties of the objects in the picture, however, doesn't give us a compelling reason to think that they didn't experience those properties while they inspected the scene. In these studies, a failure to notice or report an object or property does not warrant the inference that an object or property was not seen.

As we saw in the discussion of inattentional blindness, looking beyond a single study or paradigm helps to reveal the reason for a subject's failure to verbally report some stimulus. As we've seen, there are many reasons why a subject might fail to report a target. In my discussion of change and inattentional blindness, I've discussed two: a subject might fail to notice that she's had an experience of the target, or she might fail to remember it. Mack and Rock addressed this worry by combining their inattentional blindness paradigm with a visual priming paradigm. This enabled them to provide evidence that subjects hadn't reported the target because they hadn't seen it. We could use a similar method to investigate whether subjects perceive visual properties in change blindness studies, even though they don't notice when those properties change. If subjects show priming effects for those properties, then we have some evidence that they saw those properties (though primes can also be invisible, so we can't yet say whether those properties were consciously perceived. See Naccache, Blandin, & Dehaene 2002). By looking at a range of evidence from cognitive psychology, cognitive neuroscience, and first-person report, we can make progress on investigating the nature of a subject's experience beyond the focus, to determine when a failure to report an object really does indicate a failure to perceptually experience that object (see also Block 2007; Cohen et al.2012; Dicey-Jennings 2012).

Inattentional and change blindness support a conclusion that is in the spirit of Thesis N. How
we perceive the world is not as rich as we may naively believe it to be. That is, while we may seem to experience many objects outside the focus, research on inattentional and change blindness suggests that this is not the case. Instead, many objects that are present in the visual field aren't perceptually experienced by the subject or retained over time. Attention plays a crucial role in determining which objects are experienced and retained, and which aren't.

4.3 Inattentional Inflation

The final piece of evidence that I'll discuss supports the view that we are frequently overconfident about the richness of experience. While inattentional and change blindness show that experience is surprisingly sparse, the phenomenon of inattentional inflation might explain why subjects claim to experience more than what they attend to. Lau (2011) has shown that subjects overestimate how much information about the world is consciously perceived outside the focus of selective attention. As Lau has noted, subjects are frequently surprised by how poorly they perform on tasks outside focal attention. Rather than indicate conscious experience outside attention, Lau thinks that this indicates an inflated impression of the vividness of perceptual experience outside the focus. In Lau's experiment, subjects were presented with stimuli that were just barely consciously visible, and were asked to indicate when they had seen a stimulus by pushing a button. Lau took subjects' accuracy at stimulus detection to indicate the amount of information captured by their perceptual system. A high accuracy rate indicates that subjects are receiving a lot of information about that stimulus from the perceptual system, and a low score indicates less information. He could then compare this behavioral measure of the information contained in subjects' perceptual states with their reports of perceptual certainty.

The natural expectation is that the high-information perceptual states would correlate with perceptual certainty, but in fact Lau found several ways of dissociating perceptual certainty from the
amount of information detected. For example, using transcranial magnetic stimulation, Lau and Passingham (2006) were able to disrupt activity in the prefrontal cortex, which lowered perceptual certainty but did not affect subjects' ability to detect a stimulus behaviorally. In another study, Lau altered his paradigm by providing spatial cues to control the direction of a subject's attention. Lau found that when a stimulus was presented outside a selectively attended region, subjects were more likely to indicate that they saw a target stimulus mistakenly (when no stimulus was in fact present), and reported greater certainty in their mistaken “detection” of stimuli. Lau calls this tendency to overestimate the content and certainty in unattended regions inattentional inflation. When making judgments about an unattended region, subjects make more errors and are more certain about their erroneous judgments than when making judgments about an attended region. If Lau is right that information level provides a better measure of the nature of a subjects' perceptual state than their judgment of certainty, then this shows a dissociation between the information-richness of experience and subjects' perceptual judgments. In short, it suggests that we are systematically wrong in our beliefs about experience outside the focus of attention.

5. Empirical Challenges to Thesis N

In spite of the accruing evidence, there is something deeply counter-intuitive about the view that attention to some object is necessary for perceptual experience of that object. The worry is that although we can selectively attend to just a few objects or events at any given time, we seem to perceptually experience much more. For example, when I attend to the page of a book, the rest of the world does not altogether fade away. Rather, I seem to perceptually experience the desk and the room around me, sounds drifting through my window from the street, feelings in my body, and the smell of
coffee from the kitchen. These objects and events are presented to me as background experiences. A *background experience* is an experience of some object or event that is not focally attended. If Thesis N is understood as a claim about focal attention, then it rules out the possibility of background experiences.

One option for the advocate of Thesis N is to deny that we have phenomenally conscious background experiences. As we will see, this response runs aground of an empirical challenge (the dual-task paradigm), which the advocate of Thesis N will not be able to meet unless she abandons the view that attention is always focal. A better strategy, I will argue, is to modify Thesis N to involve an enriched account of attention beyond focal attention.

Even if we expand our account of attention beyond selection, background experiences might motivate a rejection of Thesis N. I’ll call the contradictory claim Thesis O (for *Overflow*:)

**Thesis O**

It is possible for a subject to perceptually experience some object without attending to that object.

Thesis O commits us to the natural possibility of perceptual experience without attention. That is, Thesis O and Thesis N are contradictory – only one of them can be true. Showing that either claim is true would suffice to show that the other claim is false. Establishing Thesis O would require an empirical example in which a subject is phenomenally conscious of some object even though she isn’t attending to it in any way.

Block has given us one reason to embrace Thesis O. He thinks we should take reports of background experiences seriously, and favor a rich over a sparse phenomenology. A *rich phenomenology* is one in which some conscious mental states are not available to attention, working
memory, and verbal report, that is, to the mechanisms of cognitive access. On the rich view, phenomenal consciousness overflows cognitive access. A sparse phenomenology is one in which only mental states available to the mechanisms of cognitive access are conscious. According to Block, a view like Thesis N is contentious because it motivates a sparse phenomenology.

In his discussion of the evidence for Thesis O, or what he calls phenomenal overflow, Block argues that the best explanation of a wide array of evidence drawn from psychology, cognitive neuroscience, and subjective report is that phenomenology is rich. According to him, the evidence overall supports the view that phenomenality overflows cognitive access. In this section, I'll review some of the strongest evidence that leads Block to accept phenomenal overflow, and argue that it should not lead us to accept Thesis O. Whether we should accept or reject Thesis O depends on whether we can find compelling empirical evidence for perceptual experience without attention. And this, in turn, depends on whether there are non-focal ways of attending, which can explain away the alleged counterexamples consistent with Thesis N. The concept of attention beyond selection has not yet been explored in the philosophical and empirical literature, and so it is not yet clear whether the enriched account of attention can do the work required to defend Thesis N. As I will show, such an account is required in order to determine whether attention is necessary for consciousness.

5.1 Partial Report

One of the first studies that Block cites in support of this view is an early study on “iconic” visual memory from Sperling (1960). Sperling briefly presented subjects with an alphanumeric array of three rows of four characters each. Although subjects claimed to see all (or “almost all”) of the characters, they were able to report less than half of them. At first, this finding looks similar to the puzzling reports of subjects in inattentional or change blindness studies. As in change and inattentinal blindness, subjects claim to see more than they can back up with verbal report.
Sperling then devised a way of determining whether subjects were correct when they claimed to have seen more than they could report. After presenting subjects with the three-by-four alphanumeric characters for 50 msec, Sperling presented them with a mask, and then a cue indicating either the first, second or third row. No matter which row Sperling indicated, subjects could report the alphanumeric sequence in that row with an accuracy better than chance. This result is surprising because the cue was presented after the sequences had disappeared from the screen. If subjects had visually experienced only four of the characters on the screen, cuing them after the stimulus has disappeared from the screen should have no impact on their performance. If they had happened to attend to the cued row during stimulus presentation then they would report it accurately, and if not they would be at chance. But this is not what Sperling found. Instead, subjects were well above chance when cued after the stimulus had disappeared. This finding suggests that subjects were right when they claimed that they had visually experienced all of the characters, even though they could report only four. As Block writes:

Why are the subjects able to gain access to so few of the items they see in the first condition...? I am suggesting that the explanation is that the 'capacity' of phenomenology, or at least the visual phenomenal memory system, is greater than that of the working memory buffer that governs reporting (Block 2007 489).

In other words, according to Block, subjects' visual phenomenology includes more than what they can cognitively access. While reporting requires attending to a row and storing it in working memory, Block thinks that experiencing an object doesn't require access to the mechanisms of reportability. The best explanation of subjects’ reports and their pattern of behavior under experimental conditions is that they did indeed experience the full visual array, and that access to the mechanisms of verbal report are
not necessary for conscious experience of some object in a visual scene.

In discussing Sperling's experiment, Block makes a compelling case that we have some conscious visual experiences that we don't report. But so far, this does not show that there is conscious visual experience outside attention. Although attending to some object of visual experience may be necessary for providing a verbal report about it, it isn't sufficient. We sometimes attend to more than what we verbally report. For example, in order to read a book, the reader must attend to each of the sentences on the page. But if asked to provide a verbal report of the sentences, she will likely be at a loss. Although she will be able to report the content of the sentences in her own words, she won't be able to report the sentences. Yet she must have attended to the sentences – otherwise, she couldn't have grasped their content. If this is right, it shows that attending to some object isn't sufficient for being able to report it. As a measure of conscious experience outside attention, the partial report task suffers from a similar shortcoming to the visual search task discussed by Mack and Rock (1998). Subjects are instructed to attend to the stimulus. So, even if it turns out that they are conscious of more than they can specifically report, this does not show that they are conscious in the absence of attention. Rather, it shows that attending to some object is sometimes not sufficient for being able to verbally report that object.

Block does not base his argument on Sperling's results alone. He thinks that we will arrive at the rich view of experience by looking at a large number of studies as well as first-person report, and drawing an inference to the best explanation. So far, the evidence I've surveyed – with the exception of Sperling's study – seems to lean in the direction of a sparse view of consciousness, on which we are not conscious of unattended objects or events. I've argued that we can explain this difference by a difference in the role of attention to the target stimulus between partial report and inattentional blindness tasks. Whereas in Sperling's experiment, subjects claim to have seen all of the characters, in the case of inattentional blindness, subjects are not so specific about the nature of their experience.
They don't claim to have seen \textit{all of the elements of the scene}; subjects were not asked to provide reports on their experiences at all. I suspect that no amount of clever post-task cuing will enable subjects in Mack and Rock's experiment to report the gorilla (though to my knowledge, this has not been tested). The difference between these two cases is in the way that subjects are attending to the task. In the partial report task, subjects are instructed to attend to the target stimulus. In inattentional blindness studies, they are not instructed to attend to the target – rather, they are specifically distracted by an attention-demanding task during stimulus presentation. This difference suggests that subjects' performance on the partial report task is possible only because they attended to the target stimulus. The surprising result is not that we are conscious of more than that to which we attend, but rather more than we can verbally report.

If we accept that some ways of attending don't make their object reportable, then there is a way for the proponent of Thesis N to respond to Sperling. Subjects may be attending to all of the characters in Sperling's experiment, even though they report only a single row. Block anticipates this response. He distinguishes between two types of attentional selection: narrow and broad. Narrow selection is necessary for working memory and verbal report. In Sperling's experiment, the reported row has been narrowly selected. In contrast, broad selection makes an object merely \textit{accessible} for working memory and reportability. An object can be broadly accessible without being narrowly accessed. Block thinks that phenomenal consciousness corresponds with narrow and broad selection, rather than narrow selection alone. That is, we are phenomenally conscious of more than just what we access at any given time. We are also conscious of those objects that are broadly accessible. Block's distinction between narrow and broad attention points toward a way of enriching the concept of attention, which I will explore in more detail in the next chapter. I agree with Block that phenomenal consciousness overflows narrow access, but maintain that it doesn't overflow attention. Rather, I will argue that accounting for evidence like Sperling's requires us to enrich the notion of attention to account for non-
focal ways of accessing an object.

5.2 The Dual-Task Paradigm

In addition to tasks that follow Sperling's design and subjects' reports on the nature of their own experience, some of the strongest evidence that we are conscious of objects outside the focus of attention comes from studies using a dual-task paradigm. This research shows that subjects are able to perform some tasks in the near absence of focal selective attention, lending support to the claim that subjects also experience more than the objects of focal attention. That is, even when focal attention is “exhausted” by a central task, subjects are surprisingly good at performing a task in the periphery.

The dual-task paradigm has two tasks and three conditions (Li et al. 2002; Koch & Tsuchiya 2007). The first task is the “central” attention-demanding task, presented in the center of the screen – discriminating rotated T's and F's. The second task is a peripheral task, which is presented in the corner rather than the center of the screen. In Li and colleagues' study, the peripheral task involved natural scene discrimination: subjects had to indicate by pressing a button whether a scene flashed briefly in the periphery contained an animal or not. In the first condition, subjects performed the central task alone; in the second, they performed the peripheral task alone; and in the third (dual) condition, they performed both tasks simultaneously. The obvious expectation is that when subjects perform both tasks simultaneously, their accuracy and speed will suffer. That is, we would expect that in the dual condition, subjects would make more errors and perform the tasks more slowly. But this is not what Li and colleagues found. They found that with training, subjects could perform both tasks simultaneously just as well as they could perform either task singly. Li and colleagues' study has been replicated using different types of peripheral tasks, such as discriminating between male and female faces (Reddy et al. 2004), animals and vehicles (Li et al. 2002) or famous and non-famous faces (Reddy et al. 2006). Each of these peripheral tasks involves making judgments about a complex natural scene, which suggests
that we can perceive natural scenes even when we're focally attending elsewhere. How do we make sense of this surprising pattern of results?

The standard interpretation, and what Koch and Tsuchiya take this experiment to show, is that subjects can perform equally well on the peripheral task in single and dual conditions because they don’t use selective attention to perform that task. Rather, in both single and dual conditions, they are able to perform the peripheral task in the near absence of attention. This comes to bear on the question of whether attention is necessary for consciousness because it seems to motivate a counterexample to the necessity claim. Subjects not only say that they saw the stimulus when they’re attending to the central task – they’re also able to back up this claim by performing the task well. So, it seems plausible to say that they are conscious of it. But this means we can be conscious of something in the “near absence” of attention. Of course, “near absence” is not the same as absence, so logically speaking, the necessity claim is untouched; nevertheless, the results challenge the empirical basis of the necessity claim. Though we can make the results consistent with Thesis N, the results from the dual-task paradigm suggest a different view of the relation between attention and consciousness than that suggested by inattentional and change blindness or inattentional inflation: we can be aware of objects outside the focus, even when performing a demanding task. In this way, the dual-task can be taken to pose a challenge to Thesis N.

6. Defending the Necessity of Attention

In this section I'll argue that we aren’t forced to accept Li's and colleagues' claim that the dual-task shows perceptual experience of objects in the near absence of attention. The most obvious response is that subjects attend to the peripheral task to some degree, dividing attention between the two tasks. Li and colleagues (2002) anticipated this response, and they think that they've ruled out the possibility that subjects divide attention. In this section, I'll show why we shouldn't be convinced that
the subjects perform the peripheral task in the near absence of attention.

The possibility that subjects attend to the peripheral task to some small degree is suggested by Li and colleagues' conclusion. As they note, the dual-task paradigm provides evidence for consciousness in the near absence of attention. But this doesn’t demonstrate consciousness without attention. Rather, it may show that there can be different degrees of attention to a stimulus. The peripheral task may just require a small degree of attention – so small that subjects can perform both tasks in parallel. This way of interpreting performance on the dual-task paradigm has some precedent in the literature on split attention. Some theorists (Friedman et al 1982) have posited that there are one or more pools of processing resources that can be divided among tasks. Multiple tasks can be performed in parallel, but the efficiency of task performance is proportional to the amount of processing resources allocated to that task. So, in the dual-task condition, it may be that the central task requires only a small degree of attention, leaving plenty of resources in the “pool” for performing the central task.

Li and colleagues anticipated this response, and they have two arguments against it. First, they point out that subjects perform just as well on the peripheral task whether in the single or dual condition. Combining the two tasks in the dual condition does not lead to an increased rate of error or reaction time. This finding suggests that when the peripheral task is added in the dual condition, it does not deplete the subject's attentional resources at all. On the degrees interpretation, a subject's task performance should vary according to the amount of processing resources allocated to that task. In order to make sense of dual-task performance in terms of degrees of attention, we need an account that explains why performance on both tasks remains just as efficient in the dual task as in the single task conditions.

There is an explanation available, one that is consistent with the degrees interpretation. A proponent of the degrees interpretation could argue that even in the single task condition, the central task wasn’t taking up the subject’s full attentional resources. On this view, performance on the dual-
task paradigm shows that even while a subject is performing the attention-demanding central task, she
nevertheless keeps a bank of attentional resources free to deal with other tasks that might pop up in the
periphery.

While this seems initially promising, Li and colleagues think that it won’t work either. They
attempt to block this objection by normalizing each subjects’ rate of error through numerous training
trials. As each subject performed the central task, they increased the difficulty, until they had made the
central task as difficult as possible for each subject. Subjects’ rate of error when performing the central
task alone at maximum difficulty was taken to represent the rate of error when subjects fully attend to
the central task. A subject fully attends to a task when that task exhausts her selective attention
resources. Li and colleagues reasoned as follows: even if subjects typically reserve a pool of attentional
resources to deal with unexpected tasks that may pop up in the periphery, when the central task is
increased to maximum difficulty for a particular subject, that subject will draw on the reserve pool to
continue performing the central task well.

Once a subject was “fully” attending – that is, once Li and colleagues were satisfied that the
task was so difficult, subjects would recruit any leftover attentional resources to perform that task –
they added the peripheral task. They reasoned that if subjects solved the peripheral task by switching
attention to it, this would be reflected in an increased rate of error in the central task relative to their
performance on the central task alone. Surprisingly, and in support of Li and colleague's hypothesis,
they found that subjects could perform the peripheral task without suffering an increase in errors in the
central task – even when the rate of error for the central task was at the most difficult level for each
subject.

Whether degrees of attention is ruled out by the experimental findings depends on whether Li
and colleagues are right that attention is “exhausted” in the single task condition. This reasoning relies
on the assumption that an experimental paradigm can exhaust attention – an assumption which we'll see
reason to reject in the next chapter. If an experimental paradigm can't exhaust a subjects' attentional resources (as suggested by Cohen and Dennett 2011), then no matter how hard Li and colleagues make the central task, they can't conclude that subjects have exhausted attention. But even if we concede that Li and colleagues did exhaust subjects' attention, I think we have another response to the dual-task paradigm that doesn't pose a challenge to Thesis N. If we acknowledge that there are ways of attending beyond focal selective attention, then a new option opens up: subjects may simultaneously attend to the central task using focal attention, while attending non-focally to the peripheral task. The fact that subjects’ central task performance does not decline when the peripheral task is added may suggest that focal attention can never exhaust the subjects' attention, or alternatively that focal and non-focal attention are not in competition for the same resource pools.

One problem for my interpretation is that it is in tension with existing research on divided attention. Research on divided attention challenges the view that different attentional mechanisms can operate simultaneously because it seems to show that dividing attention comes at a performance cost. Typically when a subject tries to attend to more than one task simultaneously, she meets with difficulty, resulting in poor task performance on one or both tasks. One of the most pronounced types of interference in dual-task performance is the Psychological Refractory Period. The PRP effect robustly shows that for a short duration after the primary stimulus is presented, a subject does not respond to a secondary stimulus (Pashler 1994). The upshot is that although a subject can perform two tasks in parallel, her performance in at least one of the tasks is hindered by the refractory period. This finding makes the claim that subjects simultaneously attend to the central and peripheral task using different ways of attending seem less plausible. Attending to the central task should result in a refractory period, during which time the subject could not attend to the peripheral task. And this should slow down her performance on one or both tasks.

While research on divided attention is in tension with the view that subjects simultaneously
attend to both central and peripheral tasks, it does not rule out this possibility. It may not be right to
describe my suggestion as a case of divided attention, since on the view I've suggested, the subject
would be attending to each task in a different way. Divided attention research has focused on divided
focal attention. My suggestions is that we simultaneously attend to central and peripheral tasks using
different ways of attending, focal and non-focal. The evidence for performance costs of divided
attention does not directly speak to the question of whether we can attend simultaneously in focal and
non-focal ways.

My point in this section is to show that without a better understanding of whether there are non-
focal ways of attending, we cannot know whether subjects in the dual-task experiments are performing
the peripheral task in the absence of attention. As a result, we cannot assess Thesis N until we have a
better understanding of whether there is a non-focal way of attending, and how it interacts with focal
attention in perceptual experience.

7. The Need for a Theory of Diffuse Attention

Increasingly, researchers have invoked the concept of non-focal attention, called diffuse or
distributed attention, in defending the view that attention is necessary for consciousness (DeBrigard &
Prinz 2010; Prinz 2005, 2012; Cohen & Dennett 2011). For example, Cohen and Dennett write that:

“The world beyond focal attention is not in darkness because when attention is not entirely
engaged by a primary task, and it is unclear if attention can ever be entirely engaged using
psychophysical techniques, excess attentional resources are automatically deployed elsewhere.
Thus, certain items are processed through focal attention, whereas others are processed via
distributed attention.” (8)
The problem with appealing to diffuse attention to explain away counterexamples to Thesis N is that the concept of diffuse attention is not well established in the empirical or philosophical literature. The concept of diffuse attention, its relation to focal attention, and the mechanisms that underlie it have not been studied empirically. It is an open question whether a diffuse mode of attention exists, and whether it can operate in parallel with focal selective attention to explain away counterexamples like evidence from the dual-task paradigm.

Responding to the proposed counterexamples to Thesis N hinges on developing a robust notion of non-selective diffuse attention, as well as determining whether diffuse attention can do the theoretical work needed to defend Thesis N. In the next chapter, I aim to make progress on developing an empirically useful theory of diffuse attention. Only once we have an understanding of non-selective forms of attention and their interaction with selective attention will we be in a position to answer the question of whether attention is necessary for perceptual experience.
Chapter 3

Diffuse Attention

Abstract: Research on attention has focused largely on visual selective attention, but the debate over whether consciousness requires attention can be settled only once we have a better understanding of ways of attending beyond visual focal selection. In this chapter I focus on the distinction between focal and diffuse attention. Although a diffuse or distributed mode of attention is mentioned frequently in the literature on consciousness and attention, we presently lack a robust theory of diffuse attention. I outline four options for a theory of diffuse attention, and show that only two of these options could do the work required to defend the view that consciousness is necessary for attention. I then consider and respond to the objection that diffuse states are better conceptualized as states of mere consciousness, rather than states of attention.

1. Introduction

Although attention has been studied widely in psychology and cognitive neuroscience, research has focused primarily on visual selective attention, and less on non-selective attention or attention in modalities other than vision. Yet the debate over whether consciousness requires attention can be settled only once we have a better understanding of ways of attending outside visual focal attention. In particular, resolving the debate depends on whether attention can sometimes be diffuse rather than focal. In this chapter, I argue that the empirical evidence supports the view that there is a diffuse mode of visual attention. I then turn to some empirical questions concerning the nature and limits of diffuse attention, and the implications of these questions for the view that attention is necessary for consciousness.

I call the view that attention is necessary for consciousness Thesis N (for Necessity). More specifically, Thesis N states that attending to some object, property or event is necessary for phenomenal consciousness of that object, property or event. Defending Thesis N requires an enriched notion of cognitive access, on which there are non-selective ways of attending to objects or events in the world (see chapter 2, as well as DeBrigard & Prinz 2010, Cohen & Dennett 2011). Since any
plausible version of Thesis N commits its advocate to the view that there is a diffuse way of attending, this chapter can be seen as an indirect defense of Thesis N. If it were to turn out that there is no robust evidence for diffuse attention, this finding would show that Thesis N should be rejected because the thesis entails something that is empirically false. By showing that there is evidence for diffuse attention, I'm helping to build the case for Thesis N.

In this chapter I'll outline five models of diffuse attention. As I'll argue, only two of the models can do the work needed to explain away the counterexamples to Thesis N. I'll show that more empirical work is needed before our philosophical theories can invoke diffuse attention to explain away counterexamples to the view that attention is necessary for consciousness. Nevertheless, I think the research provides reason for optimism. The evidence for non-focal ways of attending should make us cautiously optimistic that a robust theory of diffuse attention will put us in the position to explain away the counterexamples to Thesis N, and to provide a more complete theory of ways of attending and their role in structuring experience.

I'll begin my discussion with the strongest evidence against thesis N – evidence from the dual-task paradigm. I'll then explain what I mean by “enriching” the notion of attention, and summarize some of the early work on attention beyond the focus. Drawing on the contemporary notion of diffuse attention in cognitive science, I'll articulate four models of diffuse attention understood as a type of selective attention, before turning to non-selective ways of diffusely attending. I'll show that only two of these models of diffuse attention put us in a position to explain away evidence from the dual-task paradigm in a way that is consistent with Thesis N. The moral of this section is that we can't gesture to diffuse attention to explain away counterexamples to Thesis N – determining whether or not attention is necessary for consciousness requires a more robust theory of the nature and limits of diffuse attention.

Finally, I'll raise a worry for any advocate of Thesis N who defends her view by enriching the concept of attention to include diffuse attention. The worry is that positing a diffuse mode of attention...
is ad hoc: the only reason to posit diffuse attention is to save Thesis N from counterexamples. The advocate of Thesis N shouldn't invent new ways of attending whenever a counterexample arises. Rather than posit a new way of attending, she should admit that there are diffuse states of consciousness that don't involve attention at all. I call this objection the diffuse consciousness objection. I'll respond to the objection by showing that the concept of diffuse attention is well motivated in the empirical and philosophical literature, and I'll provide an argument that diffuse states are not states of mere consciousness. The evidence that I survey in this chapter motivates the view that attention is sometimes diffuse, and identifies research questions for determining the limits of diffuse attention, its relation to focal attention, and how focal and diffuse attention structure consciousness.

2. Consciousness Beyond the Focus

Thesis N implies that we cannot be conscious of an object or event without attending to it. But there is evidence that subjects do have conscious experience of objects or events outside the focus of attention. The most influential evidence for consciousness in the absence of attention comes from experiments involving a dual-task paradigm. In the last chapter, I described an experiment performed by Li and colleagues in 2002 and reported by Koch and Tsuchiya (2007) in their review article as evidence that attention and consciousness are “distinct processes.” Li and colleagues found that for some types of tasks, subjects could perform two tasks simultaneously without suffering an increase in reaction time or rate of error compared to their performance singly. More surprisingly still, Li and colleagues had attempted to make the central task so difficult that it would exhaust selective attention even in the single task condition. They then added a peripheral task. In Li and colleagues' study, the peripheral task involved distinguishing complex scenes that contain animals from scenes that don't. The surprising finding from Li and colleagues' study is that subjects were just as quick and accurate at task performance on both tasks in the dual as in the single conditions. That is, they could perform both tasks
Li and colleagues' initial study has been replicated using different peripheral stimuli including discriminating animals from vehicles (Li et al. 2002), male faces from female (Reddy et al. 2004), and famous faces from non-famous (Reddy et al. 2006). As we saw in the last chapter, the standard interpretation of these results is that subjects can perform equally well on the peripheral task in single and dual conditions because they don’t use selective attention to perform the peripheral task. Rather, in both single and dual conditions, they are able to perform the peripheral task in the near absence of attention. This interpretation of the findings seems to motivate a counterexample to the necessity claim. Subjects not only say that they saw the stimulus when they’re attending to the central task – they’re also able to back up this claim by performing the task well. So, it seems plausible to say that they are conscious of the peripheral stimulus. But this means we can be conscious of something in the “near absence” of attention.

As Cohen and colleagues (2012) have pointed out, assessing the implications of Li and colleagues' findings requires us to look beyond a single study or experimental paradigm. In modifications of the dual-task paradigm, we have evidence that subjects' awareness of the peripheral task is mediated by their attention. This evidence may, in turn, cause us to question Li and colleagues' conclusion that the peripheral task is performed in the absence or near absence of attention. For example, Stein and colleagues (2009) combined the dual-task paradigm with an attentional blink paradigm, and found that peripheral task performance was subject to the attentional blink. Similar studies suggest that subjects' performance of the peripheral task crucially depends on attention, even in the dual-task paradigm (see also Slagter et al. 2011; Cohen et al. 2011; Mack & Clarke 2012). Evidence from modifications of the dual-task paradigm should make us skeptical that Li and colleagues have fully exhausted attention with their central task. Though they found no evidence of attentional interference in their paradigm, modifications of the paradigm reveal that subjects' performance does
dependence on attention.

Although we have evidence that the dual-task performance involves attention, we still stand in need of an explanation of the evidence from Li and colleagues' dual-task experiment and the studies that have replicated their findings (Reddy et al. 2004, 2006). That is, we still need to explain how subjects in the dual-task paradigm are able to perform a task in the periphery while simultaneously performing a demanding central task, without an increase in reaction time or errors. I agree with Cohen and colleagues that once we enrich the concept of attention, we can handle the alleged counterexamples while retaining a view on which attention is necessary for consciousness.

3. Enriching the Concept of Attention

The evidence from the dual-task paradigm challenges Thesis N only if 'attention' refers to visual focal attention. But the most charitable interpretation of Thesis N is as a claim about attention more generally. Attention is a much broader phenomenon than visual focus, and is widely thought to comprise multiple sub-systems that interact. For example, there are specific but interacting subsystems of attention for each sensory modality, as well as for objects, properties, and spatial locations (Cohen et al. 2012; Spence 2001). More recently, some researchers (Treisman 2006; Demeyere and Humphreys, 2007; Srinivasan et al 2009; Alvarez 2011) have distinguished between selective and diffuse attention. What this taxonomy highlights is that attention is a much more varied phenomenon than visual focal attention. I'll first briefly summarize some of the evidence for enriching attention beyond visual focus, before turning to a more in-depth investigation of the nascent concept of diffuse attention.

In order for Thesis N to be plausible, we must accept that subjects attend to the world in multiple ways at the same time. Consider an example of ordinary perceptual experience. Imagine that you are attending to a cup of tea in your hand. You see the cup, smell the tea, and feel the warmth. Like most objects that we encounter in the world, you seem to perceive the cup using multiple sensory
modalities at the same time. As I've understood ‘object’, the object of your perceptual experience includes ordinary material objects (like cups) as well as features (like warmth, white, or sweet). So, according to Thesis N, if you are consciously aware of the cup’s warmth, color, and sweet aroma, then you are attending to the cup’s features using multiple subsystems of attention. You tactiley attend to its warmth, visually attend to its color and shape, and gustatorily attend to the sweetness of the tea.

Assuming that you are simultaneously aware of features across several modalities, Thesis N further implies that attentional subsystems for each modality can be employed in parallel. At any given time, we are attending to the world around us in many different ways, using multiple subsystems of attention – for objects and features across multiple modalities.

The claim that we frequently attend to an object across multiple modalities is consistent with research on cross-modal attention, which suggests that attending to one modality frequently has no (or very little) effect on attention to another modality. This shows that it's possible for multiple subsystems of attention to operate in parallel in ordinary perceptual experience. In one study, Alais et al. (2006) found that there was only a small decrease in perceptual sensitivity, as judged by a discrimination task, when participants were presented with stimuli in two modalities rather than one. They showed that subjects were able to simultaneously attend to stimuli in two modalities – audition and vision – with little to no effect on performance. Attending simultaneously to multiple modalities can even enhance attentional effects. When information presented across modalities is in agreement, attending to both modalities simultaneously improves task performance. For example, Larsen et al. (2003) found that when subjects are presented with the same degraded letter auditorily and visually, they are faster at identifying the letter than if it were presented in either modality alone. Attending to multiple sense modalities at a time, far from incurring a cost in reaction time, can actually enhance speed of processing when there is cross-modal agreement. While dividing attention sometimes involves performance costs, research on perceptual attention across modalities supports a more nuanced view.
The performance costs or enhancement that occur when subjects attend simultaneously is a function of the type of task as well as the specific types of attention involved.

Once we expand the study of attention beyond vision, we already see that there are many ways of attending depending on the specific pressures of the environment and the subject's task or goal, and that some of these ways of attending can occur in parallel without (or with minimal) performance costs. In the next section, I'll turn to a more recent distinction between focal and distributed or diffuse attention (Treisman 2006; Demeyere and Humphreys, 2007; Srinivasan et al 2009; Alvarez 2011). As I'll understand it, both focal and diffuse attention are a form of selective attention: the effortful selection of an object that is relevant to a task or personal goal for enhanced processing. While selective attention is sometimes implicitly equated with focal attention, I'll show that selective attention can sometimes be diffuse. The question of whether there is a diffuse mode of attention and if so, what is its nature, is critical for understanding the relation between attention and consciousness. A theory of diffuse attention would provide a much-needed step toward enriching the notion of cognitive access to account for the many varieties of conscious experience.

4. Diffuse Attention

Imagine watching the sky on a starless night. Although sometimes we attend to the night sky by scanning the visible celestial bodies and clouds, other times we might attend to the sky as a whole, without focusing on any particular star or cloud. This is an example of diffuse attention. Next, try to attend to your body as a whole – not jumping from part to part, but rather becoming aware of your entire body all at once. Attending to the body as a whole is an attention-demanding task. It doesn't demand less effort than focusing and holding attention on, say, your left hand. Instead, it requires a different kind of attentional skill than focusing. It requires you to suppress the urge to select any one body part as the object of your focus, and instead direct your attention to the body without attending to
any part in particular. There are numerous examples that point to the phenomenon of diffuse attention in vision and across modalities – watching a landscape, feeling the whole body, listening to the sound of a noisy room. Yet diffuse attention is difficult to operationally define, and it is not clear that it should be considered a way of attending at all, rather than a way of being diffusely aware.

One of the earliest philosophical discussions of diffuse attention is found in C.O. Evans (1970) *The Subject of Consciousness*. Evans construes diffuse attention as a lesser degree of attention than focal, resulting in a fuzzy rather than a sharpened spotlight. According to Evans, the extreme of focal attention involves attending to the maximal degree, and the extreme of diffuse attention involves attending to the minimal degree. Evans thinks that in ordinary life we rarely attend to the maximal degree, but are always attending to some degree. As we'll see in more detail in Chapter 4, Evans provides a rich taxonomy for thinking about the varieties of attention and their role in structuring conscious experience; but as a theory of diffuse attention, we can already see that the degrees model will be inadequate for defending thesis N. The reason is that if subjects are allocating some attention to the peripheral task – even attention of a lesser degree – it is difficult to explain why they don't make more errors or have longer reaction times in the dual relative to the single task condition. This surprising finding is precisely what the advocate of Thesis N needs to explain away. If our goal is to defend Thesis N, Evans' concept of diffuse and focal as degrees of attention won't suffice.

A more promising strategy comes from early empirical work on diffuse attention, which points not to degrees of attention, but rather to parallel versus serial attentional strategies. Eriksen and Yeh (1985) suggested that diffuse attention involves “parallel processing of multiple stimuli,” whereas focal attention does not allow for parallel processing. Jonides (1980; 1983) held that there are two “modes” of attention in vision, corresponding to two ways of distributing attention across a visual scene. On his view, visual attention can be either distributed across an entire scene, processing multiple scene “elements” in parallel, or concentrated on one location in the scene – though it cannot be both at once.
This early work on parallel processing in vision holds more promise for explaining the dual task results. Subjects may employ a different mode of attention in the single as compared to the dual condition. In the single condition they need only attend to a single task, and so recruit the concentrated focal mode of attention. In the dual task, they must perform two tasks in parallel, and so recruit the diffuse mode. The worry with this strategy is that we still won't be in a position to explain why the subjects perform just as well in the dual as in the single task condition. Simultaneously dividing attention between two tasks typically has costs in terms of accuracy and speed of response (Pashler 1994); but in the dual-task paradigm, we don't find evidence of these costs. So, it seems that subjects aren't dividing attention among multiple tasks in parallel.

In the contemporary philosophical and empirical discussion of diffuse attention, the concept of diffuse attention is often invoked to explain away counterexamples to a view like Thesis N (Cohen & Dennett 2011; DeBrigard and Prinz 2010; Prinz 2012). But what these authors mean by 'diffuse attention' remains unclear; this unclarity is a problem because only some ways of conceptualizing diffuse attention will put us in a position to defend Thesis N. DeBrigard and Prinz (2010) seems to have a similar view of diffuse attention to Jonides' (1980) when they write, “In some cases attention is focal, as when we track an object, and in other cases, it is diffuse, as when we monitor our surroundings” (p. 52). While DeBrigard and Prinz leave the concept of diffuse attention relatively open, from this quotation it sounds as though they are adopting a view on which attention has two modes, focal and diffuse. The focal mode is used for concentrating on a single object, as in object tracking; the diffuse mode serves us better when we need to attend to many objects in parallel, as in monitoring a scene. This view of diffuse attention doesn't provide an obvious strategy for handling the dual-task results, for the reasons noted above. In brief, this way of conceptualizing diffuse attention doesn't allow for a subject to attend diffusely and focally at the same time; when subjects switch to a diffuse strategy in the dual condition, we would expect them to make more mistakes or have slower reaction times relative to
the single condition in which focal attention alone is recruited. Yet DeBrigard and Prinz intend for the concept of diffuse attention to explain away counterexamples to the view that attention is necessary for consciousness, like evidence from the dual-task paradigm.

Dennett and Cohen appeal to diffuse attention for a similar reason to DeBrigard and Prinz: they think that attention is necessary for consciousness, and that diffuse attention can explain away apparent counterexamples. What they mean by 'diffuse attention' is also left open to interpretation. As they write, “...when attention is not entirely engaged by a primary task... excess attentional resources are automatically deployed elsewhere. Thus, certain items are processed through focal attention, whereas others are processed via distributed attention” (2011, p. 8). From this quotation, Dennett and Cohen seem to think that diffuse attention just is excess attentional resources, which aren't engaged by the object of focal attention. If they are right, then diffuse attention isn't a different way of attending from focal; instead, diffuse attention is the excess attentional resources that are leftover when we perform a demanding task. As I hope to show in the following sections, diffuse attention provides a different way of accessing an object from focal attention – it is not merely the excess attentional resources leftover from central task performance.

Dennett and Cohen also rely on a problematic assumption in their appeal to diffuse attention. They assume that focal attention can never exhaust all of a subject's attentional resources, at least using techniques employed in a psychology lab. As I'll argue, this assumption – that focal attention always has a halo of diffuse attention – is crucial to the argument for Thesis N, but remains untested.

Aside from these brief gestures toward diffuse attention, the concept has yet to receive systematic scrutiny in the contemporary literature. As a result, the contemporary discussion of diffuse attention suffers from a lack of clarity, and this unclarity makes it difficult to assess the status of the claim that attention is necessary for consciousness. In the next section, I'll outline four models of diffuse attention, each of which has some support in the literature and the way that researchers
implicitly conceptualize diffuse attention. I will show that only two of these models can be used to explain away the counterexample to Thesis N, and each of these models stands in need of empirical justification. The overall moral is that we cannot simply gesture toward diffuse attention to defend Thesis N. Instead, more research is needed to understand the nature of diffuse attention, and its relation to selective attention and conscious experience.

4.1 Selective Models of Diffuse Attention

In this section I'll present four models of diffuse attention understood as a form of selective attention. My aim is not to defend any of these models as the right view. I think that arriving at an adequate theory of diffuse attention will require considerably more empirical research than has been done. Instead, my aim is more preliminary. I think that these models help to make explicit some of the assumptions that researchers make about diffuse attention and its relation to selection, so that these assumptions can be more clearly articulated and subjected to empirical scrutiny.

One way of conceptualizing diffuse attention is anticipated by Block in his discussion of Sperling's studies on iconic memory (Block 2007) when he suggests that selection for cognitive access can be narrow or broad. I'll argue that Block's distinction between narrow and broad access is on the right track for enriching the concept of attention, but that it is not a model that an advocate of Thesis N should embrace. If we accept Block's way of enriching the concept of attention, we won't be able to explain empirical counterexamples like the dual-task paradigm.

In support of the claim that phenomenal consciousness overflows access consciousness, Block discusses Sperling's (1960) experiment in which subjects claimed that they had seen more of a visual array than they could remember or report (see also Chapter 2). Subjects' reports were vindicated when it was found that they could accurately report the content of any part of the visual array, provided that they were cued shortly after the stimulus had disappeared from the screen. This suggests that they
really had seen the array in its entirety, even though they can only remember and report a small subset of what they claim to consciously see. Block interprets this evidence as showing that “the 'capacity' of phenomenology, or at least the visual phenomenal memory system, is greater than that of the working memory buffer that governs reporting” (Block 2007 489). He goes on to suggest a distinction between narrow access and broad accessibility. Narrow selection is necessary for working memory and verbal report – it is the “buffer that governs reporting.” In Sperling’s experiment, the reported row has been narrowly selected. In contrast, broad selection makes an object accessible for working memory and reportability. Block thinks that phenomenal consciousness corresponds with narrow and broad selection, rather than narrow selection alone.

As a first pass, we can use Block's distinction to conceptualize diffuse and focal attention. Diffuse attention makes a broader range of objects available to the subject than selective attention. One way to understand diffuse attention is in terms of making objects accessible to the subject, rather than selecting them for access. On this view, diffuse attention is the mechanism that determines the range of objects to which we might selectively attend at any given time. We can understand diffuse attention as providing a set of available objects. Focal attention selects objects from this range of diffusely attended objects for access to working memory and report.

**Accessibility First Model**

Diffuse attention determines the set of objects cognitively accessible to a subject at a time; selective attention determines the subset of objects that are cognitively accessed at a time.

The accessibility first model leaves open what it means for an object to be accessible or accessed. We can further cash out the concepts of access and accessibility in terms of the depth and breadth of
cognitive processing. We can hold that attention has two dimensions: depth and breadth. Access involves narrow, deep processing. That is, access involves deep processing of a small subset of accessible objects, which enter working memory and the mechanisms of verbal report. In contrast, accessibility involves broad but comparatively shallow processing. Merely accessible objects do not enter working memory or mechanisms of verbal report. Instead, accessible objects are merely poised to enter such higher cognitive systems. On this way of cashing out the accessibility first model, diffuse attention involves greater breadth of distribution and less depth of processing than focal attention.

The problem with this view is that it doesn't put us in a position to defend Thesis N, because it doesn't put us in a position to explain the evidence from studies using a dual-task paradigm. According to the accessibility first model, subjects performing in the dual condition attend selectively to the central task, selecting it for access to working memory and verbal report, while attending diffusely to the peripheral task, making it merely accessible. A merely accessible object is by definition not selected for guidance of task performance. Only those diffusely attended objects that are selected would be exploited for performance of some task or personal goal. So if the peripheral stimuli in Li et al.'s experiment are merely diffusely attended, then the present model predicts that subjects would be unable to perform the task. Although the peripheral stimuli would be available for selection, they would not be selected. This is in tension with the empirical facts, and so we should reject the accessibility first model as an account of diffuse attention. It makes a prediction that is empirically false.

A second option for conceptualizing diffuse attention is as a form of spatial selective attention. Consider the example of gazing at the night sky as a whole, without focusing on any star or cloud in particular. I said at the outset that this is an example of diffuse attention; what distinguishes it from focal attention is the size of the region selected. While focal attention involves a small spatial region,

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5 I owe this way of putting the point to Felipe DeBrigard.
diffuse attention involves a broad spatial region; “lantern” attention, as opposed to the “spotlight” traditionally equated with selective attention. I'll call this the lantern view of diffuse attention. If we accept the lantern view, then we should not contrast diffuse attention with selective attention, as has sometimes been done in the literature (e.g. Cohen et al 2012). Instead, diffuse attention is a form of visual selective spatial attention. This way of distinguishing subsystems of attention has some precedent in the empirical literature. As we saw in the previous section, researchers typically divide subsystems of attention by their object, distinguishing among different subsystems of attending for different sensory modalities, features, objects, and spatial regions (Cohen et al. 2012). Likewise, my first-pass definition aims to distinguish diffuse attention by its object. When the spatial region that is selected is all or most of the visual field, visual diffuse attention is at work.

With this first-pass definition in mind, we can articulate a second model of visual attention that includes diffuse attention. I'll call this model the lantern/spotlight model. Visual attention involves a single resource that can be spread diffusely over a large spatial region or object, or focused selectively on a smaller spatial region or object. Another illustrative analogy is with a garden hose. Attention directs a single resource that can be distributed differently depending on which “nozzle” the subject chooses to use. A focused stream has the advantage of increased power, but covers only a small space. A diffuse stream covers a broader spatial region but has reduced power. “Power” in the case of selective attention should be understood as the degree of attentional enhancement. Selective attention enhances cognitive processing by increasing the speed at which stimuli are processed and increasing perceptual sensitivity within the attended region. Taken together, my first pass at providing a model of diffuse attention combines the following:

**The Lantern/Spotlight Model**

Visual selective spatial attention is a single resource that can be distributed across the visual
field in either a focused or a diffuse way. Diffusing attention results in weak attentional enhancement to a larger spatial region (slower processing speeds and less perceptual sensitivity) as compared to focusing attention.

Support for the lantern/spotlight model is found throughout the literature on selective attention, though to my knowledge such a model has not been explicitly articulated and tested. This model captures Jonides' claim that attention has a focal mode for concentrating on a relatively small location, and a diffuse mode for broadening attention to many objects in a scene simultaneously.

Though the lantern/spotlight model posits a single attentional resource that can be used for focused or diffuse attention, this doesn't imply that the maximum amount of attentional focus is fixed. The amount of attentional “power” available to be distributed over a spatial region will vary across subjects and within subjects over time, depending their perceptual load, motivation, mood and level of arousal (Lavie 2005, Velmans 1991). The maximum limit defined by the available attentional resources is flexible, and will vary over time. This fact about the variability of attentional resources within a single subject over time complicates the predictions that the lantern/spotlight model makes regarding task performance. For example, if a subject is awake and highly motivated, she may have ample attentional resources to diffuse over a broad spatial region of the visual field. There might be no noticeable difference between the processing speed or perceptual sensitivity when a subject diffusely attends while awake and alert compared to when she focuses while sleepy or bored.

The lantern/spotlight model also predicts that the difference in task performance using diffuse versus focused ways of attending will be most prominent when attentional resources are limited, for example when the subject is unmotivated, sleepy, or under a high perceptual load. Consider an analogy with painting. If I have only a drop of paint, I can either darken one small spot on my canvas, or dilute the paint and tint the canvas as a whole. But if I have a full can of paint, I can either darken a small spot
or darken the entire canvas. Like the painting, we should expect diffuse attention to produce only weaker attentional “paint” than focused when attentional resources are scarce. If a subject is awake and motivated, then she may be like the painter with a full bucket of paint. So the lantern/spotlight model predicts that differences in the processing speed and attentional enhancement of diffuse versus focal attention will be most noticeable when a subject has a high perceptual load or is sleepy, bored or unmotivated. This is an empirical prediction that the lantern/spotlight model makes regarding the effect of diffuse versus focused visual spatial attention on task performance. Assessing the lantern/spotlight model would require testing these predictions empirically.

The lantern/spotlight model of diffuse attention has precedent in the literature. But this theory of diffuse attention is not what the proponent of Thesis N requires to explain away the counterexamples involving consciousness without attention. The reason is that the lantern/spotlight model cannot explain away the evidence for consciousness without attention. If the lantern/spotlight model is correct, then diffuse attention will not save Thesis N.

The lantern/spotlight model predicts that when spatial attention is focused on a small area, the speed of processing will be faster and the subject will have greater sensitivity for that region as compared to when attention is spread over a larger spatial region. Spatial attention is a single resource that can be distributed over a broad region or focused on a small region depending on how the subjects adjusts her attentional “nozzle.” So diffuse and focal attention are in competition for the same resource, and we should expect to find attentional interference when task performance requires both focal and diffuse modes of attention. Further, a nozzle can be turned only to one setting at a time. On the lantern/spotlight model, attention can be diffuse (lantern) or focused (spotlight), but it can't be focused in one region, and diffuse in another. Understood as distinct modes of attention, diffuse and focal attention can't operate in parallel. The spotlight can be set to a focal or diffuse beam; but it can't be set to both at once.
Given this feature of the lantern/spotlight model, it is difficult to see how this model can explain the findings from Li et al.’s (2002) study using the dual-task paradigm. In Li and colleague's study, subjects were able to perform a peripheral task while simultaneously performing a central task with no decrease in task performance relative to the single task condition. That is, they performed both tasks simultaneously just as quickly and accurately as they could perform either task alone. If we consider just the dual task condition, it seems that the lantern/spotlight model of diffuse attention cannot explain this result. Although attention can be diffuse or focused, it cannot be a mixture of diffused and focused. In order to perform the two tasks simultaneously subjects would need to shift selective attention between tasks, using either focal or diffuse attention. And this shifting should incur a cost in response time or accuracy.

A quick fix is to modify the lantern/spotlight model to allow for a mixture of diffuse and focused attention at any given time. The analogy with a garden hose breaks down when we consider that attention can be diffuse in one part of the visual field and focused in another. A better analogy is of a changing landscape. In one moment attention can be spread evenly across a broad area of the visual field (like a wide plateau), in the next focused on a small spatial region (like a single steep mountain). So far the lantern/spotlight model can also account for these possibilities. But the landscape model further allows that attention can be distributed with a mixture of diffuse and focused attention (like a range of mountains, interspersed with plateaus and valleys). This is a possibility that the lantern/spotlight model cannot accommodate. I’ll call this the landscape model. On this view, a spatial region is focally attended when there is a higher concentration of attentional resources directed to that region, and diffusely attended when there is a lower concentration of attentional resources directed to that spatial region.

The Landscape Model
Visual selective attention is a single resource which can be distributed across objects in the visual field in varying degrees of strength – from focal (strong selection) to diffuse (weak selection).

Unlike the lantern/spotlight model, the landscape model allows for diffuse and focal attention to operate simultaneously even though they both draw on the same cognitive resources. The landscape model also implies that diffuse and focal attention are not categorical concepts, but rather come in degrees. On this model, diffuse attention is not a mode of attending that can be switched on or off. Instead, a region is attended more diffusely when fewer attentional resources are allocated to it, and in a more focused manner when more attentional resources are allocated. Those regions of the visual field that receive a high distribution of attention have faster processing speeds and greater perceptual sensitivity than those that receive a lower concentration of attentional resources; but both focal and diffuse attention enhance processing and perceptual sensitivity as compared with unattended regions. Finally, the landscape model differs from the lantern/spotlight model by making the size of the spatial region less important for distinguishing diffuse from focal attention. The difference between focal and diffuse is not the size of the spatial region attended. Instead, it is the relative distribution of attentional resources. Diffuse attention can be to a small region or object and focal attention to a large region or object.

If we accept the landscape model, we can redefine diffuse attention in a way that does not make the size of the spatial region essential to it. Instead, what is essential to diffuse attention is that fewer attentional resources are distributed to a region, object or feature than focally attended regions. Since diffuse attention, by definition, involves fewer attentional resources than focal attention to cover the same area of the visual field, it could distribute the same resources over a broader area than focused attention. But the subject need not use diffuse attention in this way. She can also diffusely attend to
small spatial regions. The advantage of this definition is that it explains the intuitive association between diffuse attention and broad or large objects of attention, without making the size of the object essential to diffuse attention. Diffuse attention corresponds to the “low” regions of the attentional landscape, or the regions where attentional enhancement is weaker. To say that diffuse attention is “weaker” just means that it involves less attentional enhancement than focal attention, where “enhancement” is understood as speed of processing and perceptual sensitivity.

The landscape model, unlike the lantern/spotlight model, can explain how subjects are able to perform a central and peripheral task simultaneously in the dual-task condition of Li et al.'s study. There are at least two possibilities, though I think only the second is consistent with the empirical data. First, subjects' attentional landscape might be characterized by a high distribution of attention to both the central and peripheral tasks, and low (or no) attentional resources elsewhere. In other words, subjects may be dividing focal attention between the two tasks. Divided attention tasks typically incur a cost in terms of reaction time or accuracy, however. Li et al.'s study is thought to show that subjects are not dividing their attention to perform the peripheral task.

Fortunately, the landscape view also allows for a more plausible analysis. Subjects distribute their attention focally on the central task and diffusely on the peripheral task. Since the landscape model allows for a combination of focal and diffuse attention to operate in parallel, it can accommodate a possibility that the lantern/spotlight model cannot. Subjects do not need to switch between tasks or divide focal attention between tasks. Instead, they are able to focally attend to the central task while simultaneously attending in a diffuse way to the peripheral task.

The difficulty for this second interpretation is explaining why there is no cost in terms of speed or accuracy in the dual relative to the single task condition. I think that the landscape model can explain this result, though it requires a further claim about the landscape of attention during the single task condition, namely, that even the most focused attention task involves a halo of diffuse attention.
Whether the landscape model gives a satisfying analysis of Li and colleagues' study will hinge on whether there is empirical support for this further claim.

On the landscape model, focal and diffuse attention draw on a common attentional resource, so they should be competing for access to the resources needed for quick and accurate task performance. One assumption in Li et al.'s study is that the central task exhausts (or nearly exhausts) selective attention in the single task condition. In making the central task maximally difficult for each subject in the single condition, Li and colleagues aimed to establish that subjects must exhaust selective attention in order to perform the central task in either condition. That is, Li and colleagues wanted to make the task so difficult that there were no selective attention resources left over for performing peripheral tasks. Suppose that Li and colleagues were successful in getting subjects to exhaust selective attention on the central task in the single task condition. On the landscape model, this would mean that all of the subjects' attentional resources are distributed to the central task. Once the peripheral task is introduced, there would be no attentional resources left over for performing it. It would follow that subjects are not using selective attention to solve the peripheral task – whether focal or diffuse.

The response is to reject the assumption that selective attention can be exhausted by a central task. Instead, the landscape of attention always involves some attentional spread, even when a subject is focused intently on an experimental task or personal goal. No matter how demanding the experimental task, the attentional landscape will always involve some distribution of attention outside of the focus. This assumption is shared by Cohen and Dennett (2011) when they claim that it is unclear whether an experimental paradigm can ever exhaust selective attention. If we accept this assumption, than we are in a position to explain the dual-task results. In Li and colleagues' study, subjects exploit the diffuse halo of attention to perform the peripheral task. But this does not detract from their central task performance, since the halo of diffuse attention is also present during the single task condition. While the landscape view may have the resources to explain Li and colleagues’ results, doing so rests
on an empirical claim for which we currently have little evidence: that the focus of attention never exhausts a task, but is always surrounded by a halo of diffuse attention.

The landscape view provides a good starting point for investigating the nature of diffuse attention, but it is also incomplete. On the landscape model, diffuse attention is a form of visual attention. The metaphorical landscape is formed by the distribution of attention across the visual field, which has peaks (the objects of focal attention) and valleys (the objects of diffuse attention), as well as degrees of attention between focal and diffuse. In order to move beyond vision, we need a way of understanding the landscape model that doesn't rely on the visual metaphor of a landscape, and that doesn't define diffuse attention in terms of distribution across the visual field.

A second limitation of the landscape model concerns the distinction between diffuse and focal attention in terms of the “strength” of selection. In characterizing diffuse and focal attention on the landscape model, I suggested that diffuse attention is weaker than focal, where weak selection involves slower processing speeds or less perceptual sensitivity than strong selection. But subjects are sometimes quite quick at performing tasks outside the focus of attention, and they are more sensitive to certain perceptible properties when they attend diffusely than when they attend focally. A fourth option is that diffuse attention makes a different kind of object accessible to the subject than does focal attention. Diffuse attention might make a more coarsely grained representation available to the subject, while selective attention makes a more fine-grained representation available; it might make a less determinate object available, rather than a more determinable object; or it might make global objects available, rather than local objects. There is some evidence that diffuse and focal attention are sensitive to global and local properties respectively; for this reason, I'll focus on the global-local distinction in characterizing the fourth model:

Global-Local Model
Diffuse and Focal attention each make a different type of object available to the subject. Diffuse attention makes a global object available; focal attention makes a local object available.

Psychologists define a “global” object as the overall configuration, and the “local” object as the elements that global object comprises. To illustrate the global-local distinction, consider the following figures drawn from Caparos et al (2013):

![Figure 2]

In the figures above, the global object on the left – an 'X' – is consistent with the local objects it comprises – 'O's. The global object on the right – an 'O' – is inconsistent with the local objects it comprises.

On the global-local model, focal attention selects local objects, and diffuse attention selects global objects. It may seem, then, that diffuse attention is attention to a greater number of local objects than focal attention, rather than a different type of object. That is, we might be tempted to say that attending to the global object (like overall configuration) entails that a subject has attended to all of the objects that figure comprises. How else, we might wonder, would the subject attend to the overall configuration, if not in virtue of attending to its components? This is an instance where commonsense is in tension with the empirical evidence, particularly with an experiment described by Treisman and
colleagues (2006) involving a subject with Balint's syndrome (see discussion in Chapter 2). Subjects with Balint's syndrome are incapable of consciously perceiving more than one object at a time. For example, if shown a group of colored dots, they cannot say whether the dots are heterogeneous or homogenous colors, since they can't consciously perceive more than one dot at a time in order to compare them. Treisman reports a puzzling comment from a Balint's syndrome subject who was attempting to perform a task in which he must report whether an array of colored dots were the same color or different colors. As Treisman writes, “He (the subject) said 'You know I can only see 1 or 2 of the whole bunch of them'. Now where was that 'bunch' that he knew about but allegedly could not see?’” Treisman's answer is that when Balint's subjects attend globally, they are able to select the “bunch” as a single object. That is, she thinks that attention can be focal or distributed, and that distributed attention selects a different kind of object than does focal attention– the global bunch rather than the local objects that make up the bunch. The surprising consequence of this answer is that attending to the global object doesn't entail that a subject has attended to each object in the bunch, and so they can't answer basic questions about those objects – questions like 'Are the dots in the bunch the same color?'. Focal and diffuse attention select different types of objects, local and global respectively.

Selection of global rather than local objects provides demonstrable advantage in some types of tasks. For example, attending diffusely to a global object enables subjects to detect abnormal lighting or orientation of an object (Enns & Rensink, 1990), identify the overall configuration of an object (Navon 1977), enable subjects to better identify simple statistical properties of sets of objects, and may provide the subject with a “gist” of a natural scene (Treisman 2006).

One problem for the global-local model in defending Thesis N is that it runs into a now familiar problem: global and local attentional strategies are in competition for the same resources, and it is unclear whether they can operate in parallel. While there is some evidence that attention to global and attention to specific properties are subserved by different mechanisms, and so could operate in parallel,
according to Srinivasan and colleagues, “the distributed [diffuse] attention mechanisms are recruited when focused attention fails to benefit perception” (Srinivasan et al 2009 p. 88). Though Srinivasan and colleagues don't cite evidence for the claim that global and local attention cannot operate in parallel, their claim highlights an assumption implicit in the literature on global-local attention: while there may be distinct mechanisms underlying diffuse and focal attention, they are in competition for the same resources and are mutually exclusive. Attending to a global property prevents a subject from attending to local properties, and vice versa.

Even if we accept that a subject can attend simultaneously to global and local properties at once, it is still far from clear that the global-local model can give an account of the dual-task results that is consistent with Thesis N. The reason is that dividing attention between a local and a global object should result in more errors and slower reaction times than attending to a local object alone. If a task involving focal attention to a local object exhausts attentional resources (as in the dual-task paradigm), subjects should struggle to diffusely attend to the global scene while performing that task. As in the case of the landscape model, in order to handle the counterexamples to Thesis N from studies using the dual-task paradigm, an advocate of the global-local model would have to commit to the claim that focal attention never exhausts a subject's attentional resources. The same reasoning applies here as in the landscape model: if the central task did exhaust the subject's resources in the single conditions, then the subject would not be able to perform both tasks just as well in the dual as in the single conditions. The dual-task studies show that subjects can perform some tasks just as well singly as simultaneously; so, it can't be that the central task exhausts the subjects' attentional resources in the single condition. Either diffuse and focal attention don't compete for the same resources, or focally attending is always accompanied by a halo of diffuse attention. This means that if we are to defend Thesis N by appealing to diffuse attention using the global-local or landscape model, we must make the case for the diffuse attentional halo.
What this discussion show is that attempts to handle the empirical counterexamples to Thesis N by pointing to diffuse attention are glossing over difficult territory. There are many ways of conceptualizing diffuse attention and its relation to focal attention, and at present there is not enough empirical evidence to decide between them. Some ways of defining diffuse attention and modelling its relation to focal attention actually do not put us in a position to defend the view that attention is necessary for consciousness. An investigation of the nature and dynamics of diffuse and focal attention is required before we can decide whether attention is necessary for consciousness.

4.2 Non-Selective Diffuse Attention

So far I've outlined four possibilities for thinking of diffuse attention in terms of a type of diffuse selection, each of which has some precedent in the literature. While I've assumed so far that diffuse attention is a form of selective attention, some researchers think that diffuse attention should be contrasted with selective attention. On such a view, diffuse attention is a non-selective mode of attention, rather than selection that is broader or weaker than focal attention (Cohen et al. 2011). Although I think there is a way of diffusely attending that is a type of selective attention, we have reason to think that we need a theory of non-selective diffuse attention, too. Imagine entering a deep state of meditation. The state which you enter is effortless and does not have a particular object; yet you are also awake and alert. This is an example of non-selective diffuse attention (see also Lutz et al. 2008 for a discussion of “open monitoring” meditation). Another example comes from creative problem-solving. Suppose you are presented with a task that involves finding a novel solution to a problem. You might try focusing on the problem, but the solution eludes you. When you let your focus broaden, a novel solution occurs to you. You are able to make a creative connection by allowing seemingly task-irrelevant information to drift into your thoughts (see Ansburg & Hill 2003). These examples involve attentiveness that is not characterized by focus or selection. Instead, these examples are characterized
by a way of attending that makes a broader range of possible objects of attention available to the subject, whether by effortfully suppressing the urge to focus, entering an effortless and objectless meditative state, or allowing thoughts to drift in creative problem solving.

The examples of non-selective diffuse attention cannot be characterized by any of the selective models of diffuse attention that I've outlined in this chapter. The models that I've outlined in the previous section each imply that diffuse attention is a type of selection, but the examples of objectless meditation and creative problem-solving arguably do not involve selection at all. Instead, these examples illustrate the limits of the selective model of diffuse attention, and point to the need for a further model that contrasts diffuse attention with selective. Combined with the discussion of selective models of diffuse attention, this discussion shows that the concept of diffuse attention at work in the literature may point not to a single phenomenon, but to a cluster of diffuse attentional strategies, some of which are selective and some non-selective.

4.3 Summary: What is Diffuse Attention?

In this section I've outlined five ways of conceptualizing diffuse attention. My main aim in this section is not to argue for any particular theory of diffuse attention, but rather to articulate the different models implicitly at work in the literature, so that they can be explicitly tested. I've also shown that the outcome of the investigation into the nature of diffuse attention has implications for Thesis N. Only some of the models put us in a position to defend Thesis N, and they must be supplemented by an untested assumption that attention is never – or at least rarely – exhausted by the focus.

Although more research is needed to investigate the nature and limits of diffuse attention, the research that I've surveyed in this section suggests two conclusions. The first is that some objects that are not focally attended are nonetheless accessed by the subject for performing certain kinds of tasks (see Treisman 2006 discussion of Balint's syndrome; Sperling 1970; Jonides 1985). The second
conclusion is that some types of tasks will be hindered by focusing on detail, and are better served by distributing attention more broadly. As Treisman (2006) summarizes, distributed attention may enable subjects to better recognize global boundaries or the global shape of an object (Treisman & Gelade, 1980; Navon 1977), the illumination or orientation of an object (Enns & Rensink, 1990), the gist of a scene, or simple statistical properties of a group of objects, like their mean size or frequencies (Treisman 2006).

These two conclusions favor two of the models of diffuse attention that I've laid out. The landscape model captures the insight that focal and diffuse attention can be recruited in parallel, such that subjects may access more than just the object of focal attention. On the landscape model attention is distributed across objects in the perceptual “landscape” in degrees from more focal to more diffuse. The global-local model captures the second conclusion that some tasks require a more broad and coarse representation of an object, rather than a precise representation. Jointly, these two views provide an empirically motivated starting point for conceptualizing diffuse attention.

I think the landscape and the global-local model are better supported than the alternative selective models that I've outline. The present evidence favors the landscape and the global-local models over the accessibility first model, because accessibility first is not empirically adequate: diffusely attended objects are accessed, and can be used to perform tasks like identifying the simple statistical properties of a scene or making gist discriminations. This is inconsistent with a view on which diffuse attention is a mere precursor to access, which is precisely what the accessibility first model tells us. Instead, it shows that diffuse attention is a different way of accessing objects than focal. The landscape model is favored over the lantern/spotlight model because the latter can't account for instances of simultaneous focal and diffuse attention. There is some suggestive evidence from first-person report that focal and diffuse attention can operate simultaneously. For example, Sperling's subjects claim to see the “whole array” of numbers and letters, even though they can report only a
small subsection of them. Likewise, Treisman's Balint's syndrome subject claimed to only see one or
two of a “whole bunch” of dots presented to him on the screen. Although far from conclusive, these
reports suggest that subjects can attend at once diffusely to the whole array and focally to a smaller
subset of objects. If this claim stands up to further empirical scrutiny, it would rule out the
lantern/spotlight model, since that model commits us to the claim that focal and diffuse attention are
distinct modes that cannot be recruited simultaneously. In contrast, the finding that subjects attend
focally and diffusely at the same time would not rule out the landscape or the global-local model. The
landscape model predicts that subjects attend in more focal and more diffuse ways simultaneously;
while the global-local model doesn't predict this finding, it is consistent with it.

So far it seems that the landscape model is best supported by the evidence, since it is not only
consistent with the evidence, but makes a prediction which we have good reason to think is true.
Nevertheless, the landscape model does not provide a way of interpreting the second conclusion: the
finding that the representations involved in diffuse attention are sometimes different in type than the
representations involved in focal attention. I've borrowed the terminology of “global” and “local”
objects of attention to characterize this difference. The landscape model does not distinguish between
different types of objects; on the landscape model, diffuse attention just is a weaker form of selective
attention than focal, understood in terms of speed of perceptual processing and perceptual sensitivity.
The distinction between global and local objects of attention can't be characterized in terms of
perceptual sensitivity; a global object is not merely more coarsely grained than a local object. Instead, it
is a different kind of object: the “overall configuration” rather than the local elements that configuration
comprises. To accommodate this finding, we need the global-local model.

A worry for the global-local model is that we may run into trouble in characterizing diffuse and
focal attention in terms of global and local properties, because being global or being local are relative
properties. For most objects of attention, we could describe the overall context so as to make that object
global or local. Consider the following analogy with another kind of relative properties: determinates and determinables. Red is a determinate of colored, but a determinable relative to a specific shade, like scarlet. Likewise, an ordinary object – like a book – is a local object relative to the overall scene of my office, but a global object relative to its constituent elements. Attending to the book involves attending to the “overall configuration” of the cover and pages it comprises. So described, attending to the book is a case of global attention, rather than local. We can describe attention to an object as global or local depending on the context that we choose; there may be no fact of the matter as to whether a subject is attending to a global or local object. Yet it is still useful to use this terminology to characterize subjects’ ability to attend to the same visual scene in different ways, depending on whether they select a more global or more local object – an ability that has been widely demonstrated (Treisman 2006).

Since both the landscape model and the global local model are favored by the evidence, and they are not mutually exclusive, we should take both models as our starting point for conceptualizing diffuse attention and its role in perceptual experience. This should give the proponent of Thesis N reason for optimism, since as we've seen, the landscape and global-local models are the two options that put us in a good position to defend Thesis N against counterexamples.

5. Objections

I'll now turn to a worry for any advocate of Thesis N who defends her view by enriching the concept of attention. The worry is that diffuse attention is not a form of attention at all, but rather mere diffuse consciousness. I'll call this the Diffuse Consciousness Objection. This objection has not been raised in the literature thus far, and addressing it is required in order to defend Thesis N. After presenting the objection, I will then suggest a way that the objection can be met.
5.1 Diffuse Consciousness

Some conscious experiences don't involve selective focus – experiences such as seeing the night sky, feeling the body as a whole, or being in a deep state of “open monitoring” meditation. So far I've been calling these states of diffuse attention; in this section I'll tackle the question of why we should think of them as involving attention at all. To adopt a neutral terminology, let us call these *diffuse states*. Diffuse states are characterized by a lack of focus, and in some cases even a lack of selectivity.

Thesis N commits us to the view that if we're conscious of some object, then we're attending to that object. So, as we've seen, defending Thesis N requires an account of attending that does not involve focus. An opponent could argue that absent a precommitment to Thesis N, positing a new non-selective way of attending is unmotivated. Unless we're already committed to the claim that attention is required for consciousness, we'd have no reason to construct a theory of diffuse attention. Instead, we'd settle for a theory of diffuse consciousness that accounts for the evidence. I agree with the spirit of this objection: we shouldn't posit new ways of attending simply to explain away the evidence against Thesis N. Instead, we need an independent reason to believe that 'diffuse attention' really refers to a way of attending, rather than a way of being merely diffusely aware.⁶ Nevertheless, as I'll argue, it's wrong to characterize the motivation for diffuse attention as an ad hoc stipulation that merely serves to explain away counterexamples. As the evidence I've surveyed in this chapter should make clear, there is ample empirical motivation for exploring a theory of diffuse attention, independent of a commitment to Thesis N.

A second way of putting the argument against a diffuse mode of attention is motivated by William James' observations on the nature of attention. James (1890) claimed that focalization is “the essence” of attention (p. 404). Taking inspiration from this claim, an opponent could argue that a mental activity that does not involve focus shouldn't be considered a way of attending. Diffuse states

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⁶ I owe thanks to Dave Chalmers for discussion of this point.
aren't focal; so, they're not attentive. Instead, diffuse states are merely conscious states. On this view, we should reserve the term 'attention' for states that involve focus. On such an understanding of attention, diffuse states can't be states of attention.

I think that both versions of the diffuse consciousness objection can be met. The way to meet them is to recognize the empirical link between diffuse states and cognitive access: diffuse states make their object cognitively accessible to a subject, though in a different way than focal attention does. I'll argue that the empirical connection between diffuse states and cognitive accessibility supports the view that diffuse states are not merely conscious, but involve a way of attending.

5.2 A Response: Diffuse Attention and Cognitive Access

My first response to the diffuse consciousness objection takes the Jamesian argument as its target. If we start from the assumption that attention necessarily involves focus, then it will follow that diffuse states are not states of attention – but we shouldn't accept this starting assumption, since it begs the question against non-focal attention. In defining 'attention', we should leave open the possibility that some ways of attending don't involve focus. To define 'attention' in terms of focus is to stipulate the limits of attention based on our intuitions; but the question of whether attention is always focal is better settled empirically. Rather than start with a definition of attention in terms of focus, we should instead adopt a neutral definition so as to investigate whether attention always involves focus or not. As I've defined it, attention makes its object accessible for guiding thought and action. This way of defining attention leaves open whether all attention involves focus, or whether focusing is just one way of many for making an object accessible to a subject.

Do the diffuse states that I've discussed satisfy my definition of 'attention'? To answer this question, we need to determine whether diffuse states have an object, and whether they make that object available. That is, we need to determine whether diffuse states satisfy the following two
conditions:

**Intentionality**

As in states of focal attention, diffuse states are typically about some object (the night sky, the landscape, the gist of a problem...)

**Accessibility**

Diffuse states make their object accessible for guiding thought and action.

Do diffuse states meet the first condition: are they intentional? By 'intentional', I mean that a state is about or directed toward some other thing (Brentano 1874). The diffuse states that I discussed in the selective models of diffuse attention all involve selection of an object, and so are intentional in the relevant sense. The more difficult cases involve non-selective diffuse states, in which a subject suspends selection. Are diffuse states of the non-selective type always intentional? Before we answer this question, we must first restrict our discussion to the class of states involved in perceptual attention and perceptual experience. I've defined a perceptual state in terms of intentionality. As I understand it, a perceptual state must meet the following conditions: (1) it is intentional, (2) it has sensory qualia, and (3) it presents its object as occurring here and now. An example of a perceptual diffuse state is watching the night sky for meteors. When watching for meteors, you need to inhibit selection of any part of the night sky in particular, and you need to diffuse your attention across the sky as a whole. Your mental state is about an object in the world – the sky – even though it is characterized by an inhibition of selection, rather than selectivity. It also meets the further two conditions: the sky is visually presented in experience, and it is presented as being here now.

In contrast, a deep state of meditation in which there is no object presented in experience would
fail the first condition – it is a diffuse state that is not intentional. If it is possible to enter a state of objectless awareness, then such states may be a case of diffuse consciousness that is not intentional, and so cannot make an object accessible to a subject. It is not obvious that such an experience is possible in the actual world, or whether even a state of seemingly “objectless” experience would have some intentional content, however difficult to describe (see also Lutz, Dunne & Davidson 2007). If it is possible, however, then such an objectless state would provide a case of mere diffuse consciousness.

The objectless state is not a problem for someone who is interested in defending Thesis N as a perceptual thesis, however. Since an objectless state is not intentional, it is not perceptual. This point has implications for whether a state of mere diffuse consciousness poses a problem for Thesis N. Recall that Thesis N is the view that attention to some object is necessary for perceptual experience of that object. Thesis N rules out any perceptual experiences without attention; but it is neutral as to whether some non-perceptual experiences can occur in the absence of attention. For our present purposes, we are concerned with diffuse states that meet the first condition, and so can be considered perceptual. An advocate of a stronger version of Thesis N – on which consciousness of all varieties can be reduced to attention, or on which all consciousness is perceptual (Prinz 2012) – will need to provide an account that explains away the apparent possibility of non-intentional diffuse states. One way would be to deny that conscious states can be non-intentional, and thus deny that objectless states like those described by practiced meditators in certain traditions are in fact non-intentional (Lutz, Dunne & Davidson 2007). Since my aim is to defend Thesis N as a claim about perceptual experience, I won't try to meet this challenge here. I'll leave open whether there can be non-perceptual experiences that don't have an object.

Since all perceptual states are intentional, the crucial condition for a diffuse state to count as a way of perceptually attending is that it makes its object accessible for guiding thought and action. Plenty of intentional mental states fail to be accessible to a subject – for example, states that are
involved in unconscious perceptual or cognitive processing. The crucial question is whether diffuse perceptual states make their object accessible for guiding thought and action. The evidence that I've surveyed in this chapter, particularly in support of the landscape and global-local models, should make it clear that diffuse states do indeed make their object accessible to a subject, though in a different way from the way that focal attention does.

Non-selective perceptual states also play a particular cognitive function – monitoring. Consider the example of watching the night sky for meteors. The night sky is available to the subject for guiding thought and action, but not in virtue of being selected for anything. Instead, the subject is poised to attend focally should a meteor appear in any part of the sky. The diffuse state makes this monitoring function possible – if she were to focus attention on some particular part of the sky, she would likely miss a meteor that appears elsewhere. Likewise, she would likely miss the meteor if she was not able to sustain a diffuse state that takes the sky as its object. It is only in virtue of being in a diffuse state about the sky that the subject is able to monitor the sky for meteors. While the diffuse state makes the sky accessible to the subject for performing her task, it does so in a different way from the way that focal attention does. The subject may not be able to describe the sky in detail; she may be unable to say whether Cassiopeia was above or below the north star, or whether a cloud had obscured Orion's belt. Instead, the diffuse state makes the sky accessible to the subject in less detail, but with a greater sensitivity to the appearance of her target: the flash of a meteor somewhere in the sky. Non-selective diffuse states make their object accessible to the subject in a different way from the way that focal states do.

Defending the claim that perceptual diffuse states make their object accessible is all we need to provide an argument that defends Thesis N against the Diffuse Consciousness objection. Before I turn to that argument, it's worth noting that the examples of non-perceptual diffuse states that I've discussed also meet the intentionality and accessibility conditions – with the exception of objectless states of
consciousness. Since it is unclear whether such objectless states of consciousness are possible, we should focus on other non-perceptual examples of diffuse states, like creative problem-solving and mind-wandering. In the literature on creative problem-solving, diffuse states render seemingly task-irrelevant objects available for performing a task (Finke et al. 1992; Martindale 1995). Likewise, in mind-wandering subjects are occupied with “task-irrelevant” thoughts. They are thus directed toward an object, which is available to them for thought and action. In mind-wandering, the object that is accessible to the subject may not be conducive to fulfilling the transient task demands – but that object is nonetheless accessible. In many cases, the object of mind-wandering is relevant to standing goals or interests of the subject which persist through transient tasks given in the lab. Mind-wandering makes an object accessible to the subject for thought and action, though it may not be relevant to the action demanded by a transient task.

Relying on the empirical evidence for the claim that diffuse states make their object accessible to the subject, I can now summarize my argument in response to the diffuse consciousness objection. Through a look at the literature on diffuse states, we've discovered that diffuse states always make their object accessible for guiding thought and action. This is an empirical claim. We next face a conceptual question: what is the best way to conceptualize diffuse states? Should we consider them states of attention, or states of mere consciousness? I've argued that diffuse states meet my definition of 'attention'; this should persuade you that diffuse states are states of attention if you accept my definition. But we can also give an argument that doesn't rely on accepting my definition. Rather than argue that diffuse states are states of attention, we can show that they are not states of mere consciousness:

1. If diffuse states were states of mere consciousness, then some diffuse states would not make their object accessible.
2. All diffuse states make their object accessible.

3. So, diffuse states aren't states of mere consciousness.

The first premise requires a substantive commitment about the nature of consciousness and cognitive accessibility. The commitment is to the claim that conscious states are essentially states with a qualitative character, and that there is no in principle demand that such states are cognitively accessible. Suppose diffuse states were states of mere consciousness. A merely conscious state has qualitative character but is not accessible to the subject. If we think some diffuse states are merely conscious states, then we need to provide an example of a diffuse state of perceptual consciousness that is inaccessible to a subject. As I've argued, we don't have such an example (except the state of objectless meditation – which is not a perceptual state, on my view). Instead, all diffuse states that we've encountered in this chapter make their object accessible for guiding thought and action. We can inductively infer that, as a matter of empirical fact, diffuse states make their object accessible. This claim could, of course, be shown to be wrong if we had evidence for a diffuse state that didn't make its object accessible. But given the examples that we've discussed in this chapter, we have reason to think that diffuse states make their object accessible. If we accept these premises, then it follows that diffuse states aren't mere conscious states.

Is meeting the accessibility condition sufficient for calling diffuse states a way of attending? I think that it is, but this hinges on my definition of 'attention.' If I've convinced you up to this point, the debate reaches a linguistic quibble over which ways of accessing an object should be called 'attending' to that object. Whichever way we decide to use the word 'attention,' the substantive point that I've established in this chapter is that diffuse states make an object accessible to a subject, and that they do so in a way that is distinct from focal attention. I've argued that we should reject the view that diffuse states are merely conscious states, in virtue of the fact that all diffuse states make their object
accessible. Given my definition of 'attention', these arguments show that diffuse states are best conceptualized as diffuse attention.

8. Conclusion

In this chapter, I hope to have made some progress toward articulating research questions that will aid in developing a robust theory of diffuse attention. A theory of diffuse attention is necessary to determine whether attention is necessary for consciousness, and this project in turn has implications for how we understand the place of consciousness in the natural world. As I have argued, a theory of diffuse attention rests on determining the nature of the phenomenon empirically, to assess which model best describes how diffuse and focal attention interact and whether diffuse attention provides the resources to explain away counterexamples to Thesis N. Further, it requires a philosophical defense of diffuse attention as a form of attention rather than mere awareness. I have argued for one avenue of defense: diffuse attention, like focal attention, is intentional and makes its object accessible to the subject for guiding thought and action. For this reason, it is best conceptualized as a way of attending rather than a way of being merely aware. Better empirical understanding of diffuse attention will be instrumental in developing an account of how focal and diffuse attention interact to create the world as experienced by a subject. In the next two chapters, I'll show that the enriched concept of attention that I've defended in this chapter can help to investigate the structure of conscious experience, and motivates a new argument for Thesis N.
Chapter 4

The Structure of Consciousness

Abstract: The enriched view of attention for which I've argued in chapters 2 and 3 not only enables us to defend Thesis N against empirical counterexamples, but also motivates a new argument for the view that attention is necessary for consciousness. I call this the phenomenological argument, since the argument begins from a claim about the nature of experience. The phenomenological argument requires us to accept that consciousness has a foreground/background structure, and that such a structure is necessary for conscious perception. In this chapter, I survey phenomenological discussion of the structure of consciousness in James, Gurwitsch, and C.O. Evans, and argue that consciousness has a foreground/background structure that is necessary for perceptual experience. In the next chapter, I use these claims to argue that attention is necessary for consciousness.

1. Introduction

Consciousness is structured. Take the paradigmatic case of visual experience. When you look at a scene, you are not confronted with the “blooming, buzzing confusion” of sensory information that hits the retina (James 1890 pp. 462). Visual experience has a foreground and background, with some objects highlighted and others absent from consciousness altogether. In this chapter I'll survey the philosophical exploration of the structure of consciousness with roots in James (1890), Gurwitsch (1964, 1966), and C.O. Evans (1970), and show that research on attention can inform the philosophical account of the structure of consciousness. If we accept an enriched notion of attention, on which attention can be diffuse as well as focal, then the study of attention provides insight into the structure of consciousness from foreground to background. In addition, exploring phenomenological accounts of the structure of consciousness can help us to articulate new research questions for the fledgling study of diffuse attention.

The phenomenological literature motivates a new argument for the claim that attention is
necessary for consciousness. In his study of the conscious field, Phenomenologist Aron Gurwitsch claimed that every consciousness is structured. Whereas Gurwitsch thought that attention is limited to focus alone, I'll argue that focal and diffuse attention provide the structure of consciousness from foreground to background, or (to use Gurwitsch's terminology) from theme to margin. If we can show that all perceptual consciousness is structured – that structure is necessary for perceptual consciousness – then we can conclude that attention is necessary for perceptual consciousness on phenomenological grounds. I'll call this the phenomenological argument.

In this chapter, I'll present the first two steps in the phenomenological argument. I'll survey the philosophical study of the structure of consciousness from phenomenological perspectives, focusing on William James (1890) and Aron Gurwitsch (1964, 1966), who builds on Edmund Husserl’s (1900, 1901, 1913) account of conscious structure. I'll then turn to the question of whether consciousness is necessarily structured, drawing on an arguments from C. O. Evans (1970), Gurwitsch (1964, 1966) and Husserl (1900, 1901, 1913), and argue that we should tentatively accept this premise. In chapter 5, I'll provide the final step of the phenomenological argument: an account of how diffuse and focal attention provide the structure of consciousness.

2. Conscious Structure

An intuitive example of the structure of consciousness comes from vision. Suppose I am looking for a cardinal in my garden. As I visually attend first to the tree branch, then to the flower, then to the cardinal, different objects are highlighted in my experience relative to the background of sun, sky and surrounding backyards. By an 'object,' I mean the things that conscious mental states purport to be about. My notion of an object is intended to be liberal enough to encompass the many different things that can be presented to a subject in experience. These include material objects like a cardinal or a flower, as well as thoughts, abstract objects, bodily sensations, or moods. In this example, the tree
branch, the flower and the cardinal are objects. As I go about my visual search, selecting each object in turn, the selected object stands out relative to the background.

At other times, objects may stand out in an effortless or distracting way, like a blinking light in the periphery of vision or the piercing sound of a car alarm. Unlike in visual search, in these cases the foreground/background structure of consciousness is brought about **effortlessly**. An example of a conscious visual experience with an effortlessly produced structure is the phenomenon of visual pop-out. When you look at the visual array in figure 3, you are likely to be drawn to the 'O' effortlessly. You don't need to search serially for the 'O' among the X's. Instead, it simply “pops out” at you from the visual array.

![Figure 3](image.png)

While the 'O' is in the foreground of your experience, the 'X's have not disappeared – rather, they occupy a less prominent role in your experience. They become part of the background, along with your visual experiences of the borders of the page, the room around you, and so on. The example of effortful visual search and effortless pop-out provide two paradigmatic examples of the structure of consciousness.

Although these examples provide an intuitive grasp of what I mean by the structure of
consciousness, they are limited. Not all experience is visual, and not all vision involves scanning a scene or visual pop-out. Furthermore, it is unclear how the example of structure in vision, which involves segmenting a figure from a ground, can be extended to non-visual experiences such as hearing and tasting, or non-perceptual experiences such as conscious thought or moods. To develop a more adequate philosophical account of the structure of consciousness, we can draw on the detailed exploration of the structure of consciousness in the early history of psychology and phenomenology.

2.1 William James and the Fringe

One of the earliest attempts to systematically study the structure of consciousness comes from William James. According to James, awareness has two domains: the nucleus and the fringe. The nucleus corresponds to the object of focal selective attention, the “definite images” of visual experience. The fringe, in contrast, is not focally attended and is “vague,” framing the nucleus like a penumbra, halo, or water rushing around a rock (James 1890, p. 254-255)

James criticized the psychology of his day for studying the nucleus of awareness divorced from the fringe. For James, a psychology of human awareness requires an investigation of the halo that surrounds the object of focal attention. James provides two motivations for a psychological investigation of the fringe. First, he thinks that any psychology of the nucleus will be incomplete without a psychology of the fringe, because the meaning of the nucleus depends in part on the fringe context in which it is presented. As he wrote, “finite images of our traditional psychology form but the very smallest part of our minds as they actually live... The significance, the value, of the image is all in this halo or penumbra that surrounds and escorts it...” (1890, p. 254-255). According to James, the meaning of an object in the nucleus is not intrinsic to the object itself, but depends in part on the context provided by the fringe (p. 275). If James is right, then an understanding of the object of focal awareness – the “nucleus” – requires an account of the context in which it is apprehended by the
subject – the fringe.

In my discussion of James, I'm using the term 'object' to mean an intentional object. James suggests that this is a misleading way of speaking, because a full characterization of the object of thought includes the intentional object and the context in which it is presented. As he writes, the intentional object:

“...is at most your 'fractional object'; or you may call it the 'topic' of your thought, or the 'subject of your discourse.' But the Object of your thought is really its entire content or deliverance, nothing more or less. It is a vicious use of speech to take out a substantive kernel from its content and call that its object...” (1890, p.275)

I disagree with James that this is a vicious use of language, though I agree with him that an account of the intentional object is an incomplete account of the object of thought. For our purposes, it is useful to use the word 'object' to mean intentional object, and 'fringe' to mean the context in which that intentional object is presented. This way of speaking allows us to articulate questions about the relation between the fringe and the intentional object, questions that wouldn't be possible to pose if we used one word to refer to both aspects of experience.

The second motivation is that fringe experiences are an important object of study in their own right. Many of the psychological phenomena that James placed in the fringe have since become areas of interest for psychological research. These include expectancy or anticipation (250), feelings of knowing as in the “tip-of-the-tongue” experience (251), feelings of familiarity (252), feelings of intention for action (253), and feelings of “being on the right track,” which guide thought (259).

Although many of James' fringe experiences have been the target of psychological study in recent years (for some examples, see Lau 2006 or Libet, 1993), James' early criticism remains apt. The
current methods that cognitive psychologists use for investigating subjective experience rely heavily on verbal or behavioural report. But reporting a stimulus typically involves bringing it into the focus of awareness, drawing it from the fringe to the nucleus. It is more difficult to investigate fringe experiences as fringe. For James, this is crucial. An object as presented in the fringe is qualitatively different from the same object presented in the nucleus. It would be a mistake to think of the fringe as mere preliminary objects, fleeting impressions poised for nucleus awareness. Instead, the fringe and nucleus are qualitatively different aspects of awareness. James' way of cashing out this qualitative difference is in terms of vagueness and definiteness: the nucleus is definite, and the fringe is vague. A psychological investigation of the fringe requires a psychology of vague experiences as vague and outside the nucleus or focus of attention. To accomplish this task, psychologists would need to develop methods for investigating aspects of background consciousness that don't involve focusing on the fringe or drawing the fringe object into the nucleus of awareness (I'll return to strategies for meeting this methodological challenge in chapter 5).

One virtue of James' account of fringe experiences is that it points the way toward an account of the structure of consciousness that moves beyond my preliminary examples. Each of my examples of the structure of consciousness was visual, and involved segmenting a figure from a background – a cardinal from the background of the garden, or a red line from the background of green lines. James' account of background experience in the fringe illustrates varieties of background experiences that do not involve separating a visual figure from a visual ground.

Moving beyond the visual examples is critical. An account of the structure of consciousness may be motivated by the structure of visual consciousness, but most theorists (James, Gurwitsch, Husserl) intend it to apply to consciousness more generally. Once we step beyond visual examples, however, it is less clear what we mean by the structure of experience. One way of putting the worry is that visual experience may appear structured because vision is organized spatially, but other sense
modalities may not be organized spatially, at least not in the same way. As a result, we cannot extend our account of visual structure to consciousness more generally.

Spatial relations can go some way toward characterizing the structure of visual consciousness. For example, suppose a subject's gaze settles on a cardinal in her garden. The cardinal is in the center of vision, while the garden is in the periphery. But this spatial structure does not exhaustively characterize the structure of consciousness (even visual consciousness), because some structures of consciousness cannot be characterized in terms of spatial relations of spatial centrality and peripherality. For example, I could keep my eyes focused on the cardinal while attending covertly to a flower nearby. A covert shift of visual attention is a shift of attention that occurs while the gaze is held fixed. For example, subjects may be asked to hold their gaze on a central point and shift attention among different objects in a visual scene. Many covert shifts of attention are accompanied by a change in what it’s like to have a perceptual experience, even though the direction of gaze – and thus the spatial relations among objects in the visual field – doesn't change.

In our case, a subject keeps her gaze fixed on the cardinal but attends covertly to a flower nearby. As she shifts covert attention from the cardinal the flower, the structure of her visual experience changes, but the spatial relations among objects within her visual field do not – the cardinal is still at the center of vision, even though her attention is focused on the flower in the periphery. The worry is even more acute once we leave the visual case. Many examples of conscious experience – like feeling depressed or immersing oneself in a piece of music – don't have an obvious spatial structure.

James provides an attempt at characterizing the structure of consciousness in non-spatial terms. According to James, the nucleus is characterized by “definite” objects, while the fringe is characterized by “vague” objects. In the next section, I'll explain how James' appeal to definiteness and vagueness helps us move beyond the visual examples to provide a non-spatial account of the structure of consciousness. I'll suggest that one attractive way to interpret James' claim is in terms of relations of
determinacy: the nucleus is more determinate, and the fringe is less determinate. If we accept this interpretation, however, James' organizing principle for the structure of consciousness runs into trouble. In brief, the problem is that we can find empirical counterexamples in which objects in the fringe are no less determinate than objects in the focal nucleus. James' attempt to characterize the structure of consciousness in terms of definiteness and vagueness leaves crucial questions unanswered – questions which we'll take up in the discussion of Gurwitsch's field theory.

2.2 Definite and Vague Objects

Consider the case of being immersed in music. When listening to a violin concerto, I can draw the violins into the nucleus of my awareness. The sound of the violins becomes more definite, framed by the instrumental sounds of the symphony. These sounds of the symphony affect how I hear the violins – if the violins are discordant with respect to the symphony, this affects my nuclear awareness. In James' language, the fringe awareness of the symphony provides the context for the nuclear awareness of the violins, which determines their meaning for me. Whether the sound of the violins is discordant and spooky or melodic and jubilant will depend on the relation between the violins and the rest of the symphony. But the violins and the symphony are presented to me in qualitatively different ways. The violin is definite in my auditory awareness, and the oboe, bassoon and cello are each vaguely presented in awareness. One virtue of the Jamesean nucleus/fringe account of conscious structure is that it provides a way of speaking about structure outside of visual experience.

The concepts of “definiteness” and “vagueness” stands in need of clarification. There is an intuitive way in which the object of focus is more “definite” than objects in the fringe – for example, in vision the focal object looks sharper, clearer and more detailed than objects in the periphery. But “sharp” and “clear” can be applied at best metaphorically to experiences beyond vision. The challenge is to analyze what it means for some object to be “definite” or “vague” in a way that can apply beyond
One way to interpret James is as making a claim about the determinacy of experience. Objects in the nucleus are “definite” in that they appear to have more detail or more determinate properties. In contrast, objects in the fringe are less detailed and have more determinable properties. The determinate-determinable relation is a relation that holds between properties. To borrow the classic example, red is a determinate of the determinable colored; scarlet is a determinate of the determinable red. A property's being a determinate or a determinable is relative – the same property (e.g. red) can be the determinate of another (colored), and the determinable of yet another (scarlet). Superdeterminates are those determinates that are not determinables for any property.

Suppose you are focusing on a single red strawberry in a strawberry patch. On the determinacy reading of James, we would analyze the structure of your experience in the following way. The strawberry in the nucleus has determinate properties – it is a specific shade of fire-engine red. Strawberries in the fringe are not a specific determinate shade, but rather the determinable red. The strawberries in the fringe appear to you in a way that leaves open which particular determinates are present. Your fringe experience leaves open whether the red strawberries are fire-engine red or persimmon or scarlet. The fringe strawberries are vague because their properties are determinable: the properties that appear in your experience leave open which of the many determinates that fall under that determinable are present.

Color provides a clear case of a determinacy-determinable relation, but the relation is not restricted to visual properties such as color. Consider a case involving auditory properties of pitch. On the Jamesean determinacy view, a chord in the fringe of awareness would be heard as an undifferentiated sound, without an awareness of the component pitches. The chord's determinable properties leave open which determinate pitches are present, much as the determinable red leaves open which determinate shades are present. In contrast, a chord presented in the nucleus of awareness would
be more determinate. As in the example of color, the structure of auditory experience can be characterized in terms of relations of determinacy among apparent properties. A full defense of determinacy as the organizing principle of the structure of consciousness would require us to explore determinacy relations across modalities and in non-perceptual objects of consciousness, like conscious thought. Nevertheless, I will argue that determinacy fails on other grounds. Even in the visual case, it is empirically false that attended objects are more determinate than unattended ones.

My argument against determinacy as the organizing principle of consciousness draws on Carrasco, Ling and Read's (2004) research on attention and perceived contrast. Carrasco and colleagues have demonstrated that shifts of visual attention change perceptual phenomenology independent of the direction of gaze. The problem for the Jamesean determinacy view is that their result is inconsistent with the claim that objects in the nucleus are more determinate than objects in the fringe.

In Carrasco’s study, subjects were asked to fix their gaze on a central point, and were presented with two contrast patches (or Gabor patches) on either side of the fixation point (see figure 2). They were then instructed to attend to one of the Gabor patches covertly, without moving their eyes. Carrasco and colleagues found that attending resulted in a contrast “boost” to the object of attention. Specifically, covertly attending to a Gabor patch seemed to result in a 3 to 6% increase in apparent contrast. We can interpret this finding as evidence that attention affects what it’s like to perceive a visual scene.
Fixing your gaze on the central point, covertly shift attention to the Gabor patch on the left. It should seem to you as though both Gabor patches are of the same contrast.

At first glance, the Jamesean determinacy view seems to have the resources to accommodate this result. When subjects covertly attend to the Gabor patch on the left, it becomes the nucleus of awareness. Properties in the nucleus are more determinate than properties in the fringe, so the left Gabor patch should be more determinate than the patch on the right. This seems to provide a way of explaining the boost in apparent contrast. The Gabor patch in the nucleus is “boosted” in that it is more determinate; the left Gabor patch is comparatively determinable and vague.

The problem is that this interpretation is at odds with subjects' reports that the two patches appear *the same*. That is, the attended 22% and unattended 28% contrasts were perceptually indistinguishable to the subject. The subject could not distinguish between the contrasts on the basis of their appearance. The finding that the attended and unattended contrasts are perceptually indistinguishable implies that they are represented at the same level of determinacy. A property represented at the determinable level should appear different to the perceiver than a property represented at a more determinate level. For example, if something appears *colored* without appearing any particular color, this should be perceptually distinguishable from something appearing *red*. More generally, whenever there is a difference in level of determinacy between two apparent properties, those properties do not appear the same to the perceiver. But the attended contrast in Carrasco's experiment appears the same as the unattended. When the contrast is brought to the focus of awareness, this boosts the amount of perceived contrast of the attended patch, making it look indistinguishable from the unattended patch. So, the change in appearance is at the same level of determinacy, not across levels.

This finding shows that relations of determinacy cannot be used to characterize the structure of
consciousness. Determinacy fails as an organizing principle in the visual case. In attempting to provide an analysis of James' claim that the nucleus is definite and the fringe is vague, we've found that one attractive option – relations of determinacy – is not empirically adequate.

James' account of the structure of consciousness is also limited in another way. In motivating James' account of the nucleus and fringe of awareness, I gave the example of listening to a violin concerto. Some of my fringe experiences – like the sound of the oboe, bassoon and cello – affect my awareness of the violins in the nucleus. They provide the context for my awareness of the violins. If the violins are discordant with respect to the symphonic background, the violins may sound spooky to me; if they are in harmony, the violins may sound jubilant. This example also highlights a limitation of James' account – there are different types of background experiences, and not all of them are part of the context. When I'm listening to a violin concerto, some fringe experiences arguably don't affect my awareness of the violins at all. The symphonic background provides a context for my nucleus awareness of the violins, but I may also have visual experiences of the concert hall, tactile experiences of my body in the seat, and olfactory experiences of my neighbour’s perfume. Some of these fringe experiences affect the nucleus, others do not.

This observation suggests that there may be different types of fringe experience, depending on their relevancy to the nucleus. James' dichotic account of the structure of consciousness may be leaving something out: the structure of the fringe. To explore the varieties of fringe experience – and an alternative organizing principle for the structure of consciousness – I'll next turn to Aron Gurwitsch's tripartite account of the conscious field.

2.3 Gurwitsch and Field Theory

Expanding on James and influenced by Husserl, Aron Gurwitsch developed a rich account of the structure and dynamics of conscious experience in his theory of the conscious field. By a “field of
consciousness,” Gurwitsch means an organized pattern of objects co-presented in consciousness. For Gurwitsch, an object is anything that can be presented in consciousness, including material objects, memory, imagination, and abstract thought (Gurwitsch 1966 p.4). Like James, Gurwitsch thought that a theory of consciousness should not start from the objects of focal awareness and attempt to build up to the field, but rather should begin with a theory of conscious fields as primary. He sets out to provide an account of how objects are organized in consciousness. Part of the motivation for this shift in emphasis is a resistance to atomism: the view that there is nothing more to understanding a conscious field than understanding the conjunction of conscious objects. For Gurwitsch, understanding object consciousness requires a theory of the conscious field, its structure, and the various places that objects can occupy within that structure as well as how objects co-vary across the structure.

Whereas James divided consciousness into two parts, Gurwitsch thought that the field of consciousness is organized into three domains. The first domain is the theme. The theme corresponds to the object of focal attention, or the Jamesean nucleus. A theme is a focal point around which other objects in the field are organized, and which have prominence in the field. The theme is prominent because it is presented as detached from a background, as a coherent and organized whole. As Gurwitsch writes:

“The appearance of a theme must be described as emergence from a field in which the theme is located occupying the center so that the field forms a background with respect to the theme. The theme carries a field along with it so as not to appear to and be present to consciousness except as being in, and pointing to, the field” (Gurwitsch 1964, p. 319).

Gurwitsch claims that a theme can appear only if it emerges from a field. Prominence requires a contrast between the theme and its context. James made a similar claim in motivating the fringe of
consciousness. An account of the theme, nucleus, or object of focal attention is incomplete without an account of the context in which that thematic object is presented to the subject. This leads to Gurwitsch's second domain: the thematic field. Objects in the thematic field are relevant to the theme, but distinct from it. They are not part of the theme, but they do influence the way in which the theme is presented. Much like the Jamesean fringe, the thematic field is a conscious background that provides the context for the theme.

The clearest example of what Gurwitsch means by theme and thematic field involves a case of conscious thought. Suppose I am thinking about the philosopher Spinoza. Although Spinoza is the theme of my conscious field, I am conscious of much more – and some of this background consciousness affects the way in which I apprehend the theme. For example, some of my background thoughts provide a context for my thought about Spinoza. I could think of him as one of the great rationalists, as the defender of monism, or as a lensmaker. If I am thinking of Spinoza as the rationalist, this provides the context for my thought about him, which affects the way in which Spinoza is presented to me. If I next think of Spinoza as a lensmaker, the context in which he is presented to me changes, and this, in turn, affects the way that Spinoza is presented as theme.

The thematic field is in the conscious background, but for Gurwitsch the background is more than just the thematic field. While I'm thinking of Spinoza the lensmaker, other experiences may continue to be present for me, which aren't at all relevant to Spinoza. Gurwitsch calls objects that are conscious but irrelevant to the theme the margin. Marginal consciousness is a domain of “mere-copresence,” containing at minimum a bodily awareness and an awareness of the world. For Gurwitsch, theme, thematic field and margin are each necessary for consciousness – every conscious field has a tripartite structure, and every consciousness is a field. As Gurwitsch writes, “We shall establish and substantiate the thesis that every total field of consciousness consists of three domains, each domain exhibiting a specific type of organization on its own” (Gurwitsch 1964, p. 4). As this quotation
illustrates, Gurwitsch argues for two levels of structure. The conscious field is necessarily structured into theme, thematic field, and margin, and each domain within the field of consciousness has a characteristic organizational structure, too. Marginal consciousness co-presents the body and the world. Theme and thematic field are structured by relations of relevancy that hold among the objects within and across these domains. Gurwitsch’s account of the structure of consciousness surpasses James’ in two ways: he provides a way of distinguishing between two different types of background consciousness, and he provides an account of the structure within each domain of consciousness.

Gurwitsch and James also differ in terms of how they characterize the organizing principle that structures the conscious field. I suggested that one virtue of James’ account is that it is not tied to a visual metaphor (though I also argued that his account runs into other problems). James distinguished the nucleus from the fringe by reference to definiteness and vagueness, and these concepts apply to experiences beyond vision, too. Vision can be definite or vague, but so too can sound, touch, smell or taste. In contrast, Gurwitsch seems to rely on a visual metaphor when articulating the notion of theme and thematic field. He claims that the theme is prominent because it is “located occupying the center” of a field that “forms the background” relative to the theme (1964 p. 319). This characterization is intuitive in the visual case, but less clear in the case of taste, smell, or sound where an object can “occupy the center” at best metaphorically. When I’m focusing on the violins in a violin concerto, we can draw a visual metaphor – just as I bring a figure to the center of my vision by moving my eyes, so too I can “center” the violin’s sound from the “background” of the symphony. But the metaphor leaves open what these terms amount to in the non-visual case. James provides an analysis that applies non-metaphorically: the sound of the violin is definite, while the sound of the rest of the symphony is vague.

Gurwitsch does not limit himself to the visual metaphor. In fact, Gurwitsch thought that the figure/ground structure in vision is actually a special case of a more general organizing principle found
in all theme/thematic field structures (1966, p. 356-357). Gurwitsch calls this organizing principle relevancy. One problem for Gurwitsch's view is that he does not provide a clear definition of relevancy, though it plays a crucial role in his account of the conscious field (Yoshimi 2004). I'll briefly discuss Gurwitsch's use of relevancy and argue that it runs into a worry regarding circularity.

2.4 Relevancy

On Gurwitsch's account, relevancy is a relation among objects in the field of consciousness. Objects are relevant to one another if they are connected or associated to one another. Within the theme, objects will be strongly associated, forming a coherent whole that stands out from a background. As Gurwitsch writes:

“The primary distinction of the theme consists in its peculiar independence with regard to whatever else belongs to the thematic field. Self-sufficient, unitary, and delimited, resting entirely on itself, it stands in the thematic field...” (p. 229).

The thematic field is also “connected” to the theme, but is not a part of the coherent whole. In the case of separating a figure from ground, we can think of the thematic field as the visual background – the objects that spatially surround the theme. In this case, the “connection” between the theme and the thematic field is a spatial connection. The thematic field is spatially organized around the theme: objects near the theme are relevant to it, objects far away are not relevant.

Spatial relations of nearness and farness provide a first pass at understanding Gurwitsch's concept of relevance, but it is clear that this spatial metaphor is inadequate for fully characterizing the organizing principle of consciousness. Gurwitsch wanted to allow for the possibility that objects that aren't spatially near the theme are nonetheless relevant to it:
“When I just look at a thing, taking it merely as one thing among others in front of me, surrounding and thematic field do indeed coincide. But I can also deal thematically with a thing in other ways. For example, I can think of its usefulness in certain situations, or of the role it once played in my life. In that case, the surroundings in which I happen to perceive the thing do not coincide with the thematic field that belongs to my theme; it may be that nothing lying near it belongs to the thematic field” (p. 224).

Suppose I am looking at my running shoes in my shoe rack, which remind me of the time that I ran my first half marathon. The surrounding shoes might not be part of my thematic field at all, even though they are spatially near my running shoes. Instead, my thematic field is made up of my memory of the race and thoughts about using my running shoes to sprint. The memory of the race and thoughts about my shoes' usefulness are more closely connected to my theme than the surrounding pile of shoes. Gurwitsch's notion of relevance should not be understood in spatial terms, even though Gurwitsch sometimes uses spatial metaphors to describe it. Gurwitsch was aware of this worry when he wrote:

“To be sure, terms such as 'nearness and farness' and 'background and foreground' of consciousness are metaphorical, and should not be used without caution” (242).

The trouble for Gurwitsch is that beyond the spatial metaphors, he does not give us a substantive account of what relevance amounts to. Absent such an account, his account of the structure of consciousness is incomplete. Gurwitsch tells us that objects in the conscious field are relevant to each other just if they're connected to each other, but doesn't provide an account of what 'connection' means in the non-spatial case.
Although Gurwitsch does not provide a definition of relevancy, we can follow Yoshimi (2004) in abstracting a definition from his examples. Yoshimi argues that we should understand relevance in terms of covariation with the theme. He suggests the following definition of relevance:

Co-present data \( a \) and \( b \) in a field of consciousness are relevant to one another if and only if varying \( a \) impacts the perspective under which \( b \) is experienced” (Yoshimi 2004).

Yoshimi thinks that covariation allows us to overcome the circularity problem. According to Yoshimi, Gurwitsch thinks that when an object is in the thematic field, it affects the way in which the theme is presented. That is, the way the theme appears to me in consciousness depends on the thematic field. We can understand dependence as a supervenience claim: there can be no change in the thematic field without a change in the perspective on the theme. If this is the right way to understand Gurwitsch, then Yoshimi seems to have provided a substantive account of relevance. An object is in the thematic field just in case changing that object would change the subject's perspective on the theme.

Consider the example of looking at my running shoes and recalling my first half marathon. If someone were to move a pair of shoes sitting nearby, the context in which I experience the running shoes would not change. Using Yoshimi’s terminology, my perspective on the theme does not co-vary with the surrounding shoes. But if I were to stop remembering my race and admonish myself for not running more frequently, my perspective on the running shoes would change. The shoes that in one moment were presented to me as a reminder of a proud moment would become a guilty reminder instead. The change in my thoughts and memories would change my perspective on the shoes, and this is just what it means for an object to be “relevant” to the theme.

My worry regarding Yoshimi’s account is that it simply redescribes the organization of the field, but fails to provide a substantive definition of relevance. According to Yoshimi, relevance just is
dependence. Some objects in the field affect a subject's perspective on the theme, while others do not. When these objects change, the subjects' perspective on the theme changes. This is all that Yoshimi's account tells us. But in virtue of what does a theme depend on this object, rather than that one? Why does my perspective on my running shoes depend on my memories, and not the location of the surrounding shoes? Presumably it is because the memories are more relevant to my theme than the surrounding shoes. But then we are back in the position of explaining what is meant by relevance. We need to provide an account of why dependence relations hold in order to provide a substantive account of relevance. Yoshimi's definition provides a redescription of Gurwitsch's account of the organization of the conscious field, but it doesn't provide a substantive definition of relevance.

I've argued that the main problem for Gurwitsch's concept of relevancy is the circularity worry, and showed that an attempt to define relevance in terms of dependence does not help us to escape this worry. Gurwitsch doesn't give a substantive account of what makes some object in the conscious field relevant to another. Instead, he relies on visual metaphors of centrality and peripherality which apply at best metaphorically to non-visual cases. We stand in need of a substantive account of how the structure of consciousness is organized, which can apply to consciousness beyond vision. In Chapter 5, I'll argue that attention can fulfil this need.

Although Gurwitsch's concept of relevancy doesn't suffice as an organizing principle for consciousness, he nevertheless provides a rich account of the conscious field and the structure of background consciousness into thematic field and margin. In the next section, we'll put Gurwitsch's claim that this tripartite structure is necessary for consciousness to the philosophical test.

3. Consciousness is Necessarily Structured

So far I've motivated the view that consciousness is structured, drawing on James' dichotic and Gurwitsch's tripartite theory of the conscious field. The second claim that I'll defend in this chapter is
that structure is necessary – all perceptual consciousness is structured by the theme, thematic field, and
margin. As I'll understand it, the scope of this claim applies to all possible perceptual experiences in
the actual world. It's not a conceptual claim; rather, the necessity claim is grounded in the
phenomenological exploration of actual conscious experience.

In my preliminary examples illustrating the structure of consciousness, I discussed two
examples where visual experience has a foreground/background structure: visual search and visual pop-
out. I said that we must be careful not to bias our discussion in the direction of vision, in which a
foreground/background structure is more obvious than in auditory, tactile, or olfactory experiences. But
even within vision, we can find examples in which it seems at first that visual consciousness lacks
structure. Defending the claim that all perceptual consciousness is structured requires us to look not just
at cases of ordinary visual experience, but across the span of possible conscious experience throughout
human development, in altered states of consciousness, and in cases of pathology.

My strategy in this section will be to discuss alleged cases of unstructured experience and show
that none present a counterexample to the view that perceptual experience is structured. I'll first
consider the case of “unstructured vision” from the study of the ganzfeld, before turning to two
examples of unstructured consciousness discussed by Evans (1970): “pure sensuous consciousness”
and mind-wandering. Finally, I'll return to Gurwitsch's claim that consciousness has a tripartite
structure. As we'll see, his account of the conscious field entails that structure is necessary for
perceptual experience.

3.1 Experienced Structure and the Structure of Experience

In this section I'll consider and respond to a counterexamples to the view that all perceptual
consciousness is structured. The counterexample is drawn from the experience of a ganzfeld, an
unusual state in which there is uniform visual input across the visual field – “unstructured” vision (see
Wackermann et al.'s 2008 discussion of Metzger 1930). I'll show that we can identify structures of experience in the ganzfeld. As a result, the ganzfeld doesn't present a real challenge to the view that consciousness is always structured into a foreground and background.

The first reason that a ganzfeld seems to show the possibility of an unstructured visual experience is that, in some cases, there is no object of visual experience. The visual field is objectless, and subjects sometimes describe their vision as having “blanked out” or worry that they have gone blind (Wackermann, Putz & Allefeld 2008, p. 1367). It's quick to see why this way of describing the ganzfeld won't pose a problem for the claim that perceptual experience is always structured. If there is no object presented in experience, then the ganzfeld state isn't intentional. As a result, it also won't count as a perceptual experience, since perceptual experience is a type of intentional state. A more challenging example is drawn from subjects' reports of an experience of a uniform property that fills the visual field, like a color that fills the field in uniform luminosity – a “luminous fog” (Wackermann, Putz & Allefeld 2008 p. 1367). In such cases, the ganzfeld experience is directed toward an object, but that object is unstructured. Considering just the visual experience of uniform color (that is, bracketing conscious thoughts, experiences of the body, auditory experiences, etc), it is difficult to say what could constitute the foreground and the background of a ganzfeld visual experience.

I'll consider two ways in which the experience of the ganzfeld is structured: the first rests on a plausible but untested empirical claim, and the second appeals to structure beyond vision, including experiences of the background body and world. One reason to think that the experience of a ganzfeld would be structured, even if the object of experience is not, is due to the effect of attention on apparent brightness and contrast. Even if input to the visual system remains uniform, attention will structure experience because attention provides a boost in apparent brightness (contrast) and saturation (Carrasco, Ling & Read 2004). Research on the effect of feature-based attention in ordinary perception suggests that a uniform color will be structured by attention, with attended regions appearing brighter
and more saturated than unattended regions. While this has not been explicitly tested using induced ganzfeld, it provides some empirical motivation for the claim that an experience of uniform color would have structure. It also fits with one of the earliest descriptions of the ganzfeld from Purkinje (1819), who claimed that when looking at a uniformly luminous object, it appeared to him that light and dark spots occurred spontaneously (see discussion in Wackermann et al. 2008).

The general point is that from the fact that the object of experience is unstructured, it does not follow that the experience is unstructured. Consider an analogy with the ordinary perception of color. Suppose I perceive a red block on the table before me. I am experiencing a red object, but it does not follow that my experience has the property red. Likewise, in the case of a uniform color field, the object of experience is unstructured. But it does not follow that the experience is itself unstructured, just as it does not follow that an experience of a red object is itself red. Confronted with a uniform color field, I can hold my eyes fixed at a single point and shift attention from the left to the right of the color field. As I do, what it's like to perceive that color field changes. In particular, there is a change in how I structure my conscious visual experience. As I attend to the left of a color field, the color in that spatial region stands out relative to the right side, perhaps due to attention's affect on apparent brightness and contrast (as evidenced by Carrasco and colleagues 2004). Though I may perceive a uniform object, my experience is not uniform – even though I may judge that my experience is of something uniform. That is, even when visual experience is of something unstructured, the experience itself may be structured.

A second response is that conscious experience is not just visual experience. Even if a subject's visual experience is not structured, her overall experience may still be structured. Showing that visual experience is unstructured would not show that perceptual experience overall is unstructured. The overall experience could be structured in that vision is more prominent with respect to experiences in other modalities, as well as the experience of the body (a point noted by Merleau-Ponty 1945). For
example, consider a tripartite model of conscious structure like Gurwitsch's conscious field. As a subject experiences a visual ganzfeld, the theme of consciousness may be the uniform color field, while background thoughts (perhaps about the philosophical problem caused by unstructured color experiences) occupy the thematic field. These background thoughts are within the thematic field just if they affect the way in which the theme is presented in consciousness. Beyond the thematic field, Gurwitsch would maintain that we have marginal consciousness of the body and the surrounding world. On Gurwitsch's account, even a unified color experience would be structured into theme, thematic field, and margin.

I've suggested two ways of handling the example of “unstructured” vision in experiences of the ganzfeld. Evidence from research on feature-based attention suggests that the experience of an unstructured object will be given a structure by attention – attended regions of the visual field will appear brighter and more saturated than unattended regions. But even if visual experience is unstructured, we can still appeal to the structure of perceptual experience more broadly, which includes sense experiences in other modalities and experiences of the body.

### 3.2 Mind-Wandering and Pure Sensation

In his argument that consciousness is necessarily structured, C.O. Evans (1970) discusses two counterexamples that are found in ordinary consciousness. Both of Evans' counterexamples – which I'll call pure sensation and mind-wandering – involve a failure of sustained focal attention. His strategy is to show that pure sensation and wandering mind each involve a way of attending that is non-focal, and so each involves a foreground and background structure.

I'll first consider Evans' example of a “state of reverie”, which I'll call mind-wandering. I'll show that we can strengthen Evans' argument that mind-wandering is structured by invoking research in cognitive psychology. Mind-wandering is sometimes characterized as a failure of attention: when
attention lapses, the mind wanders. Evans describes the state of reverie as one in which the subject's train of thought is dominated by an accidental association of ideas, without focus on any idea in particular. This state of reverie or distraction is regarded by James as the “real opposite of attention” (James 1890, p. 404). If mind-wandering is a failure of attention, and if we follow Evans in assuming that attention provides the structure of consciousness, then mind-wandering is not structured.

The mistake lies in the implicit inference from the claim that mind-wandering involves a failure of attention, to the claim that mind-wandering doesn't involve attention at all. As Evans points out, the mistake in this reasoning is to confuse a failure of one kind of attention for a failure of all kinds of attention. Although a subject may fail to attend in a sustained and focus way, she could still attend in some other way. For example, she may attend diffusely, or attend focally but in a “free-wheeling” way rather than a sustained way. In defense of the claim that mind-wandering does involve attention, and so is not the opposite of attention, Evans points out that our ways of speaking about mind-wandering suggest that it is a structured experience. Expressions like “ideas crossing the mind,” or “a train of thought,” (p 88) suggest a succession of focus from one idea to the next. We can strengthen Evans' argument through an appeal to evidence that wasn't available to him – the cognitive psychology of mind-wandering and creative problem-solving.

In the contemporary discussion in cognitive psychology, mind-wandering is understood as a shift of attention rather than the absence of attention. For example, Schooler and Smallwood (2006) have argued that mind-wandering involves shifts of attention to objects that are of interest to the subject, and away from objects that are relevant to some experimental task. In further support of this view, Christoff et al. (2009; Schooler, Luus & Christoff 2006) found evidence at the neural level that mind-wandering involves attention. She and her colleagues distinguished between two types of mind-wandering: with awareness and without. By “without awareness” Christoff means that a subject begins mind-wandering without noticing that her mind has wandered. For example, while performing a boring
task, like sorting a deck of playing cards into piles of red and black, a subject's mind is likely to drift from the task to other things that are more interesting to her. Her mind-wandering is a conscious state of reverie, but it is “without awareness” insofar as the subject does not notice that her mind has wandered. In other cases, a subject may choose to let her mind wander – this would be an instance of mind-wandering “with awareness.” In her research, Christoff found that distinct neural networks subserve mind-wandering with and without awareness respectively, but that both networks overlap with regions involved in selective attention.

This evidence from Christoff's study is suggestive though not conclusive; we can't infer that a subject is attending from the fact that neural regions typically involved in attention are active (see Poldrack 2006 for an argument against such “reverse inference”). Nevertheless it makes this possibility more plausible. If mind-wandering involves attention, then we should find activation in the neural regions that subserve attention during episodes of mind-wandering. This prediction is born out by the evidence. The contemporary evidence from cognitive psychology strengthens Evans' argument that mind-wandering involves attention. In the contemporary discussion, Schooler, Smallwood and Christoff agree that mind-wandering is not the “opposite of attention,” but rather involves a shift of attention away from a subject's current activity. Rather than rely on introspection and an appeal to expressions like the “train of thought”, we can point to the research on mind-wandering as attention-involving to support Evans' conclusion that a conscious state of reverie is structured into foreground and background.

Evans introduces his second counterexample, “pure sensuous experience”, with a description of the mental life of a sunbather. Lying on the beach, a sunbather may seem to have a “blank mind” of pure unstructured sensation. As Evans describes the case,

I might be conscious of the sun burning into me, the lapping of the waves, the light coming
through my eyelids, the indistinct sound of voices, and so on... It is just such a state in which we
give ourselves up to our sensations and allow our minds to go blank that I describe as a state of
pure sensuous consciousness (Evans 1970, p. 80).

Although Evans does not describe the case in this way, I think the most challenging interpretation of
the sunbather is as a case of pure diffuse attention. If the sunbather's mind was truly “blank,” then the
state would not be intentional, and so would fall outside the scope of our concern. Using the landscape
model, we can characterize the sunbather's “blank mind” as a state in which attention is uniformly
distributed across the perceptual landscape. It is far from obvious that the uniform distribution of
attention involved in a case of pure diffuse attention would provide a foreground and background
structure of consciousness. If attention is distributed uniformly across the objects presented in vision,
audition, gustation, and so on, then no object in the field is attended to a greater degree than any other.
It would be reasonable to suspect that in such a case, the structure of consciousness would also be
uniform, with no foreground or background.

Evans thinks that it is implausible that a subject could ever enter a state of pure diffuse
attention. The sunbather's consciousness includes many objects – the feeling of the sun, the sound of
the waves and of voices – and Evans thinks that it is implausible that these remain in the background of
experience. Instead, he thinks that the sunbather's consciousness involves a fluid movement from one
object to the next. At any given moment, one of the many objects in consciousness will be in the
foreground, while others are in the background.

One worry is that this description is at odds with what the sunbather would tell us about his
experience. The sunbather may insist that he is not focusing on anything in particular. Evans thinks we
should be hesitant to trust first-person reports about a state of pure sensuous consciousness for two
reasons. The first reason that we should be wary of the sunbather's first-person reports is that a subject
may mistake a lesser degree of focus for a lack of focus. In the case of the sunbather, Evans thinks that
the foreground would have a small degree of focus. It would be “large and obscure,” like a “badly
focused spot-light” (Evans 81). The subject may not recall this more subtle structure of the foreground,
or may mistakenly believe that he wasn't focusing at all. The second reason is that we cannot introspect
on a state of pure sensuous consciousness directly, because the act of introspecting would disrupt it.
The moment the sunbather introspects, he has lost the state of pure sensuousness. Pure sensation
requires that he doesn't direct his focus to anything in particular, but introspection requires that he
directs his focus to his own mind. Instead, as Evans points out, subjects must rely on memory to make
judgements about an experience of pure sensation.

For these two reasons, the sunbather's descriptions of his experience are suspect. Evans next
turns to an argument for why we should reject the description of pure sensation as unstructured. His
argument is rooted in his view of attention and a subject's interest in the environment. I'll present
Evans' argument, and show that it fails to provide an adequate response to the case of pure sensation.

Evans claims (along with Ribot 1888) that for all animals, the environment is of interest or
concern. As Ribot has noted, all animals are interested in the environment because it is through the
environment that animals find nutrition, defend themselves, and procreate. From this plausible claim,
Evans thinks it follows that any novel, perceptible change in the environment must attract the animal's
attention. According to Evans, this is a different kind of attention from the kind that we deploy when
trying to solve a problem or searching for a seashell in the sand. Novel changes in the environment
cause an involuntary movement in the sense-organs, which brings with it a redirection of attention.
Evans calls this type of attention 'sense-organ attention' (p. 85). From this observation about
involuntary attention, Evans' thinks we can conclude that the sunbather's consciousness is structured.
Even during a state of pure sensuous consciousness, the sunbather will automatically orient sense-organ
attention toward novel changes in his environment.
Let's assume for the sake of argument that Evans is right that any novel perceptible change must attract sense-organ attention. It's not clear how this helps to show that consciousness is always structured. The following two claims might both be true:

1. Whenever there's a novel change in the environment, I attend to it.
2. Sometimes, there are no novel changes in the environment.

Both of these claims may be true in the case of the sunbather. Occasionally there will be a novel change in the environment – someone seems to call the sunbather's name in the distance, or the sun emerges suddenly from behind a passing cloud. But much of the sunbather's time on the beach will involve no novel changes in the environment. If so, then Evans has given us little reason to think that the sunbather is attending during those times. This seem particularly plausible given what Evans says about novelty. A perceptible change will attract attention only if it is novel for the subject, but many startling stimuli will fail to be novel for many subjects. To borrow Evans' example, a baby may startle at a clap of thunder that an adult would ignore (p. 83). Sense-organ attention is driven in part by perceptible changes in the environment, but not just any change will do. The change must be novel for the subject.

Returning to Evans' sunbather, let's suppose that for a brief period of time, nothing in the environment is novel for him. If this were possible, then we'd have a case of pure diffuse consciousness: since nothing is novel, nothing attracts sense-organ attention. As a result, the state of the subject remains a state of pure diffuse attention, with no object in the foreground or background. Evans goes on to make a slightly different claim that rules out this possibility. He claims that sense-organ attention will always be directed toward the “most novel stimulus” in the environment (p. 86). Even among familiar stimuli, there will be degrees of novelty such that some stimuli are more novel than others. There is always some stimulus that is most novel, and sense-organ attention will be directed
toward that stimulus. This fact has the consequence that sense-organ attention is always active; since attention provides the foreground of consciousness, it follows that consciousness always has a foreground/background structure.

The problem for this argument is that the trivial claim that some stimulus will always be the most novel stimulus does not provide adequate motivation for thinking that attention will always be captured by it – sometimes the most novel stimulus will be uninteresting to the subject and irrelevant to helping him navigate his environment. In these cases, we shouldn't expect the “most novel” stimulus to capture sense-organ attention.

We also can't explain away Evans' sunbather example by appeal to the arguments from the previous section on the ganzfeld. The ganzfeld involves a uniform visual input; but the sunbather involves a uniform distribution of attention. As a result, we can't appeal to the effect of feature-based attention or overall conscious structure. To say that the subject is attending to a greater degree to some feature or modality than another is to deny the possibility of pure diffuse attention. What is required is an argument for why perceptual consciousness can't be unstructured in the way required for a case of pure sensation. As we'll see in the next section, Gurwitsch provides a way forward.

3.3 Why the Tripartite Structure of Experience is Necessary

In this section, I'll consider some potential counterexamples to Gurwitsch and explain why they don't challenge the tripartite structure of consciousness. In responding to these counterexamples, I'll also develop an argument for the claim that a tripartite structure is necessary for intentional consciousness. Following Gurwitsch, I'll show that if we accept the tripartite model of the conscious field, then we must also accept that perceptual consciousness is structured, as a matter of logical necessity.

Could there be an intentional state of consciousness that lacks a theme, thematic field, or
margin? We can quickly provide an argument for why there couldn't be intentional consciousness without a theme. The reason is that such a state would fail to be object-directed. Gurwitsch defines the 'theme' as the object of focal attention, around which the conscious field is structured. Any conscious field that lacks a theme will thus lack an object, and so fail to be intentional. Take, for example, a state of pure experience. A state of pure experience would be a conscious state that isn't about anything in particular. It may be the state that practiced meditators sometimes describe, in which there is a total dissolution of the self, body and world into an objectless and subjectless state of awareness (Lutz, Dunne & Davidson 2007). If this is the correct way to describe such a state of deep meditation, then it would indeed be a state of consciousness without a theme or thematic field, and perhaps without a margin. But the state would also fail to be intentional, and so it falls outside the scope of Gurwitsch's necessity claim.

Intentional consciousness necessarily has a theme, which is just to say that it is object-directed. Could intentional consciousness lack a thematic field, which sets the context for the theme? We can also quickly dispense with this possibility, so long as we accept Gurwitsch's claim that the theme can only be prominent if it is contrasted with the thematic field. In brief, the argument is as follows: the theme is necessary for intentional consciousness. The thematic field is necessary for the theme. So, the thematic field is necessary for intentional consciousness, too. I've already argued for the claim that the theme is necessary for intentional consciousness. But why should we accept the second premise, that the theme requires a thematic field? On Gurwitsch's account, the thematic field provides the context for presentation of the theme, and it is only in virtue of this context that the theme is prominent. The reason is that prominence is not an intrinsic property of a theme. Instead, prominence is only possible when the theme is contrasted with the thematic field. Prominence is a relative property that the theme has in virtue of standing out from the thematic field, and couldn't have otherwise.

A example helps to make this clear. Consider a loud sound. In a quiet room, the loud sound
stands out – it is prominent. But in a noisy construction site it fades into the ongoing din. If the sound occurs in no context whatsoever – a possibility that I find difficult if not impossible to conceive – there will be no answer to the question of whether it stands out or not. Prominence is not intrinsic to the sound, but rather a property of the sound in contrast to the other noises in the surroundings. Likewise, without a thematic field, no object could be prominent, and so no object could be the theme. This thought motivates Gurwitsch's claim that the theme necessitates a thematic field. To find a counterexample in which an experience lacks a thematic field, we'd need to either reject Gurwitsch's claim that theme requires prominence, or develop an account of intrinsic prominence. Absent such an account, we should accept Gurwitsch's claim that the theme necessitates a thematic field. Given that the theme is necessary for intentional consciousness, the thematic field is also necessary.

So long as we have a theme and thematic field, consciousness is structured. So, if Gurwitsch's account of the theme and thematic field is correct, then we've already shown that intentional consciousness is necessarily structured.

The next question is whether intentional consciousness necessarily includes a marginal awareness of the body and world. An example of theme and thematic field that lacks marginal consciousness does not endanger the claim that structure is necessary for consciousness -- but it would raise a problem for Gurwitsch's claim that all intentional consciousness is structured into a theme, thematic field and margin. I'll raise a criticism drawn from cognitive science, and show how we can respond. The response relies on a distinction between experience of the body understood as an intentional object of perceptual consciousness, and the body-as-subject, through which a perceiver encounters the world. While the body as object is not necessarily present in consciousness, the body-as-subject is.

One reason to doubt that perceptual consciousness always includes an experience of the body and world comes from contemporary cognitive psychology. Research on inattentive blindness shows
that experiences outside the focus of attention are more impoverished than they may seem (see chapter 2 for a more detailed discussion of the literature on inattentional and change blindness). For example, in the now famous gorilla experiment, Simons and Chabris (1999) found that fifty percent of subjects failed to see a gorilla walk across a crowded basketball court while they were engaged in a focal attention task (counting basketball passes between players). When subjects are engaged in an attention-demanding task, they sometimes fail to see large and surprising objects in the world. This motivates a view on which consciousness beyond the focus of attention is surprisingly sparse. It also calls into question whether we are capable of making accurate judgments about the nature of experience outside focal attention, particularly background experiences of the world and body. Taking inspiration from Dennett (1993), we can explain away the belief that the body and world are always present in experience by explaining how we come to wrongly hold that belief (Dennett 1993; Cohen & Dennett 2011). The explanation is given by the “refrigerator light illusion” (Naccache and Dehaene 2007).

Whenever I open the refrigerator, the light is on, but I'd be mistaken to think that the light is *always* on. Likewise, whenever I attend to my body or the world around me, I become conscious of it. This gives the impression that the body and the world are always present in experience – an impression that may be illusory.

The evidence from inattentional blindness should make us skeptical that we have fine-grained perceptual experiences of the world and our own body beyond the theme and thematic field. But this doesn't challenge the claim that the body and world are always present in the margin. As I'll understand it, marginal awareness isn't a perceptual experience of the body or world. Instead, it is a precondition for perceptual experience: the lived and situated body that is implicit in any perceptual experience (Thompson 2007). I'll follow Legrand (2006) and Thompson (2007) in calling this aspect of the conscious field *prereflective body awareness:* tacit bodily experience that accompanies any perceptual experience.
Thompson (2007) provides one argument that the prereflective awareness of the body is a precondition for perceptual experience. The argument, which he traces back to Husserl, begins from the premise that objects in perceptual experience appear perspectival to the subject. In vision, things appear to be a certain distance and orientation relative to you; in audition, the sound of a car zipping past is experienced as moving relative to oneself; and so on. As I've defined it, perceptual experience always presents its object as occurring here and now. Thompson thinks that the body provides the meaning of the indexical “here,” the point of reference relative to which objects appear in perception. As Thompson argues, for something to appear perspectival to a subject, that object must be spatially related to that subject. And in order to be spatially related to that subject, the subject must be embodied. So, in order to account for the perspectival nature of perceptual experience, the subject of that experience must be embodied.

Not only must she be embodied, but the body must be implicitly experienced, since it is only through the body that a subject perceives the world from a particular perspective. In support of this claim, consider Merleau Ponty's (1964) description of touching one's right hand with one's left hand. I can feel my left hand as an object of perceptual experience; but my right hand also feels, sensing the touch of the left. This example illustrates the difference between experiencing one's body as an object of perceptual experience, which requires attention to the body, and the tacit bodily awareness that accompanies perceptual experience. As Thompson puts it, “Most of the time one's body is not present as an intentional object but is experienced in an implicit, tacit, and prereflective way” (2007 p.251). It is this tacit, prereflective bodily awareness that provides the margin of consciousness. So understood, marginal awareness isn't a perceptual experience of the body or world. Instead, it makes perceptual experience possible. Only through prereflective bodily experience can the world be encountered in perception.

In this section I've given one argument that perceptual consciousness is necessarily structured
into theme, thematic field and margin. Perceptual consciousness requires a theme, which is simply to say that there must be an object of consciousness. A theme can gain prominence only relative to a thematic field; so perceptual consciousness is necessarily structured into theme and thematic field. As we saw, this step in the argument relies on the assumption that the theme of intentional consciousness must be prominent, standing out relative to a background. In making this step of the argument, I've followed Gurwitsch in assuming that prominence cannot be intrinsic to the theme. Finally we saw reason to accept Gurwitsch's view that the margin, understood as a prereflective bodily awareness (Thompson 2007, Legrand 2006), is a precondition for perceptual experience, grounded in the perspectival nature of experience.

4. Summary

In this chapter, I've defended the first two steps of the phenomenological argument. I argued that we should favor an account of the conscious field like Gurwitsch's on which there can be different kinds of background experiences, only some of which are relevant to the theme or focus of consciousness. For my argument in the next chapter, I need to establish that the conscious field is structured. I've summarized arguments from the literature in support of a tripartite structure, but nothing in my argument depends on the structure being tripartite rather than dichotic. Further, since prereflective bodily awareness is not directed toward the body as an object, it isn't a perceptual experience as I've defined it. If we look at the structure of perceptual experience – understood as an intentional state that has sensory qualia and presents its object as occurring here and now – we will find that margin only implicitly, as a precondition for the theme and thematic field, or foreground and background. For this reason, in the next chapter I will adopt James' language of foreground and background.

The main problem for the phenomenological account of the structure of consciousness is that
neither James nor Gurwitsch provides an adequate account of the organizing principle for the conscious field. James' concept of definiteness and vagueness was found to be lacking because it is vulnerable to empirical counterexamples – some objects in the nucleus are no more definite than objects in the fringe. Gurwitsch's organizing principle, *relevancy*, was found to be circular. Gurwitsch never provides a substantive account of what determines which objects are relevant to other objects in the field.

Without such an account, the concept of relevance remains incomplete, and relies heavily on visual metaphors. It remains unclear how we can characterize the organizing principle of structure in modalities beyond vision, and in non-perceptual modalities such as thought. In the next chapter, I'll argue that attention fills this need. Attention provides the structure of consciousness, from foreground to background.
Chapter 5

Attention Structures Consciousness

Abstract: This chapter defends the final premise of the phenomenological argument: that attention provides the structure of consciousness. I'll survey phenomenological arguments for the view that attention structures consciousness, and show that my view differs in that I think attention structures consciousness from foreground to background. I offer some ways forward for studying the background through a study of diffuse attention using the techniques of Neurophenomenology. I conclude that the phenomenological argument is sound: attention provides a necessary structure of experience, and so attention is necessary for consciousness.

1. Introduction

In this chapter, I'll argue that focal and diffuse attention provide the structure of consciousness. So far, I've argued that attention can be focal and diffuse, and that consciousness is necessarily structured into a foreground and background. If the landscape of attention provides this necessary structure of consciousness, then attention is necessary for consciousness. The view that attention provides the structure of consciousness is found in the philosophical literature in James (1890), Gurwitsch (1964/66) and Evans (1970). Each of these authors thinks that attended objects form the foreground only – background objects are unattended (Evans 1970 p. 92; James 1890 p. 402; Gurwitsch 1966, p. 267-268). In contrast, I will argue that attention structures the conscious field from foreground to background.

In bringing together the cognitive science of attention and phenomenological literature on the structure of consciousness, my goal is two-fold. First, I'll show that cognitive science can inform the phenomenological account of conscious structure by providing an account of that structure in terms of attention. At the same time, the phenomenological discussion of varieties of background consciousness points to a gap in the empirical literature. The phenomenological discussion shows that many aspects of
consciousness occur outside focal selective attention, but the methodological techniques of cognitive science rely heavily on a subject attending to and reporting on a stimulus. I'll show that the phenomenological literature can help us to articulate new research questions for studying diffuse attention and find ways to overcome some of the current methodological limitations. In the final section, I'll point to research questions for the study of diffuse attention that arise from the phenomenological exploration of consciousness outside the focus of attention, and suggest some ways forward.

2. How Attention Structures Consciousness

I'll argue that we should adopt a view on which focal attention structures the foreground, and diffuse attention structures the background of consciousness. For my purposes in this chapter, I'll focus on the landscape model of diffuse attention (defended in chapter 3). According to the landscape model:

**The Landscape Model**

Visual selective attention is a single resource which can be distributed across objects in the visual field in varying degrees of strength – from focal (strong selection) to diffuse (weak selection).

Of the models that I've outlined, the landscape model is the only option that is both empirically motivated and entails that subjects can attend to a scene using focal and diffuse attention simultaneously. Since the landscape model is a model of visual attention, my claim in this section will be restricted to visual perceptual experience. To move beyond an account of visual perception, we would need to develop an adequate account of attention in each modality, a project that I won't undertake here. In this chapter I'll argue that the landscape of attention provides the structure of visual
What does it mean to provide a structure for consciousness? I'll understand this in terms of *supervenience* and *isomorphism*. The supervenience claim is that the structure of the conscious field supervenes on the landscape of attention. There can be no change in the structure of the conscious field without a change in the landscape of attention. This claim leaves open whether the structure of consciousness *just is* the structure of attention. I won't argue that we should equate conscious structure with attentional structure. One reason to prefer a supervenience claim to a stronger claim (such as identity) is that not all changes in the landscape of attention are accompanied by a change in conscious structure. For example, suppose I'm focally attending to a purple rose. As I sustain visual attention to the rose, my eyes rapidly saccade, shifting overt attention to different regions or features. In a case of sustained visual attention, there may be no change in the conscious structure of my experience as attention shifts rapidly over the attended object. In contrast, if my experience changes such that the rose is no longer in the foreground, then it must be the case that attention has shifted away from the rose. It is a natural or empirical necessity that changes in conscious structure are accompanied by changes in attention.

My claim that attention provides the structure of consciousness is stronger than mere supervenience, since I'll also argue for an isomorphism between conscious structure and attentional structure. Suppose we accepted supervenience and not isomorphism. Any change in conscious structure must be accompanied by a change in the attentional landscape. A change in the background is a change in the conscious field, and so must be accompanied by a change in attention (if supervenience holds). But this need not be a change in attention to objects *in the background*. Any change in the attentional landscape would satisfy supervenience – including a change in how we attend to the foreground.

I will defend a stronger claim than mere supervenience. On my view, changes in conscious structure mirror changes in attentional structure. A change to the conscious background entails a change
in how the subject diffusely attends to the background. Many authors have accepted supervenience (James 1890, Gurwitsch 1964/66, Evans 1970), but to my knowledge none has argued for isomorphism understood as a claim about the structure of consciousness and the structure of attention. I'll show that a view on which conscious structure both supervenes on and is isomorphic to the attentional landscape provides a better explanation of conscious structure than supervenience alone.

A few clarificatory marks are in order regarding my use of 'isomorphism'. The isomorphism between attention and consciousness is not a neural isomorphism (of the sort endorsed by the Gestalt psychologist Koehler 1947). I won't defend the claim that the structure of consciousness mirrors the structure of neural representations in the brain. On my view, there is an isomorphism between the phenomenal mind (visual experience) and the cognitive mind (attention). Attention provides a cognitive structure: a landscape defined by the degree of depth of processing to each region within that landscape (see chapter 3 for more discussion of what is meant by processing depth.). The field of consciousness is isomorphic to that landscape of attention. That is, focal attention provides the foreground, and diffuse attention provides the background of consciousness. It is an independent question whether the attentional landscape is isomorphic to neural structures in the brain. I am fine to accept that there is no isomorphism between the attentional landscape and how representational structures are instantiated in the brain, and thus no isomorphism between perceptual experience and neural realization (see Pessoa, Thompson & Noe 1998).

I've argued that we can give an empirically motivated account of focal and diffuse attention, and that there is some evidence that these two ways of attending can work in tandem. I've also argued that consciousness is structured into a foreground and background. My claim is that focal and diffuse attention provide the best explanation of the structure of consciousness. There are three reasons why I think that my account provides the best explanation of the structure of consciousness. First, the enriched notion of attention makes it unsurprising that consciousness has a foreground/background
structure. In contrast, an account on which consciousness outside the focus is unattended doesn't anticipate this structure. Second, it is a more parsimonious explanation, because it doesn't require structures of consciousness in addition to structures of attention. Third, it has greater explanatory power – the landscape model can explain the structure of foreground and background consciousness in terms of attention, whereas Phenomenological accounts haven't provided a substantive organizing principle for the background, as we saw in our examination of Gurwitsch.

3. Attention and the Conscious Background

The view that attention structures consciousness has ample precedent in the philosophical literature on attention (James 1890; Gurwitsch 1964/66; Watzl 2010; Dicey-Jennings 2012), but the view that we attend to objects in the conscious background has received less philosophical study (c.f. Arvidson 2006). The reason may be that background experiences aren't focally attended. Only once we accept an enriched notion of attention that includes diffuse attention can we claim that we attend to objects in the background. There is a worry concerning whether the view that attention structures the field of consciousness merely redescribes diffuse awareness in terms of diffuse attention. After all, if background consciousness doesn't provide an example of consciousness without attention, it's unclear what could. Although I've already argued for the claim that attention extends beyond the focus (see Chapter 3), in this chapter I'll briefly summarize the empirical evidence for the claim that we attend to objects in the background. I'll then contrast my account with two rival accounts of how attention structures consciousness, and argue that we should prefer a view on which attention structures the conscious field from foreground to background.

3.1 Empirical Evidence for Attention to the Background

We are all familiar with how difficult it can be to divide attention. A child watching television
while she does her homework is likely to make more mistakes or slower progress than a child who focuses on homework alone. When I prepare my afternoon coffee, it's best if I don't think about the article that I was reading unless I want to end up with burnt espresso. We have ample anecdotal evidence that dividing attention incurs costs in time and accuracy for one or both activities. Yet on the view that I've proposed, we are always attending simultaneously in focal and diffuse ways. The fact that dividing attention is difficult makes this suggestion seem implausible.

One way of responding to this worry is to point out that diffuse attention and focal attention are two different kinds of attention employed at the same time, and so research on divided attention may not apply. Another way is to point out that dividing attention is not always difficult, and does not always incur costs in terms of time and error. Dividing attention can even speed task performance, and some types of tasks can be performed simultaneously without time or accuracy costs. The empirical evidence supports a more nuanced story on which different types of attention can be engaged simultaneously, depending on the type of attention and the type of activity or task. This in turn makes the view that focal and diffuse attention provide the structure of consciousness more plausible.

In previous chapters, we saw that subjects can perform some types of peripheral tasks even when focal attention is engaged in a central attention-demanding task. For example, in the dual-task experiments from Li et al. (2002) -- an experiment that is typically raised as a counterexample to the claim that attention is necessary for consciousness -- subjects could perform a scene discrimination task in the periphery of vision, even while they perform a central attention-demanding task. In chapter 3, I argued that the landscape model of diffuse attention gives us the resources to explain this result in terms of different ways of attending. I claimed that even while a subject attends to an attention-demanding task, she simultaneously attends to the background in a diffuse way. I called this diffuse attention to the background the halo, and pointed out that we don't have enough evidence to determine whether the assumption that there is a halo of diffuse attention is correct. In order to provide evidence
for the halo of diffuse attention, we'd need to show that subjects continue to attend diffusely to the background even when focal attention is exhausted by a demanding task. That is, we'd need to show precisely what Li and colleagues dual-task study *does* show: that even when focal attention is engaged in a demanding task, subjects can still access objects in the periphery for guiding thought and action. Rather than construe the dual-task studies as evidence for consciousness without attention, we can instead interpret these studies as showing that subjects are able to select objects outside focal attention for guiding thought and action. Notice that this is just to say that they attend to those objects.

The dual-task experiments don't show consciousness in the absence of attention. Rather, they show that there are other ways of accessing objects for thought and action besides focally attending to them. If we interpret the dual-task paradigm in this way, we are in a position to use the findings from this body of literature to learn about diffuse attention's nature and limits. Only some tasks can be performed in the periphery in the dual-condition. Subjects are good at peripheral tasks involving natural scenes and faces; but they can't perform a peripheral task that involves simple geometric figures. In other words, subjects are good at tasks that approximate the visual background in ordinary experience. This suggests that subjects are able to exploit the way that they typically attend to the background in ordinary experience to perform a discrimination task. It also provides some support for the view that diffuse attention is to global configurations of objects, like the gist of the scene or a large-scale pattern, rather than local elements that makes up those objects, like the type of tree in the scene or the individual letters and numbers that make up an alphanumeric array. That is, it suggests that we should accept the landscape view as well as the global-local view of diffuse attention.

There is also evidence that attention to the background is not divided focal attention. In the dual-task paradigm, it's crucial that the task is presented in the periphery and as peripheral. If a subject switched focal attention to the periphery, her performance on the central task would suffer. If the task was presented near the point of foveation, the subject may not see it due to inattentional blindness.
(Mack & Rock 1997), or she may attempt to divide focal attention between the two tasks. Instead, subjects seem to draw on an attentional resource to the periphery as peripheral, which is not in competition with focal attention. By “not in competition,” I mean that neither way of attending requires that the other be suppressed.

There is a worry for my interpretation which I’d like to address. The worry is that making discriminations in the periphery while simultaneously performing a central task takes training. But on my view, we always diffusely attend to the visual periphery. This suggests that performing a peripheral task should be easy. So why does it take training to perform the two tasks simultaneously? I think the response to this worry is to point to the unusual nature of the task involved in the dual-task paradigm. Typically we don't simultaneously perform tasks in the background and the foreground. If I am right, then the reason is not that focal and diffuse attention are in competition. Rather, the reason is that attention is typically structured to give coherence to the subject's experience. Typically it benefits the subject to structure her attention around a common theme, or toward achieving a common goal. But the dual-task shows that we can learn to recruit attention to the background as background, and use this attention to perform tasks.

The dual-task results support the view that the landscape of visual attention extends beyond the focus, into a diffusely attended background. But we don't experience the world only visually. We also seem to have concurrent experiences in other modalities. Imagine attending to a cup of tea: feeling its warmth, smelling its aroma, seeing the white cup and the amber tea. When attending to the cup, many of its properties across modalities are perceptually enhanced. If attention provides the structure of consciousness, then we must be capable of attending to multiple modalities simultaneously to account for cross-modal experiences like this one, which are ubiquitous in ordinary experience.

Research on multi-modal attention supports the claim that we attend to multiple sense modalities simultaneously. While dividing attention within a modality typically incurs costs in terms of
speed and rate of error, the costs of dividing attention vary depending on the specific modalities involved, the nature of the task, and the nature of the stimulus. Dividing attention across modalities is generally less costly than dividing attention within a modality (Hancock et al. 2007; Lavie 2005; Sarter 2007; Treisman & Davis 1973; Wickens 1992, 2008). To give an intuitive example, when I attend to a conversation with my friend, I can easily divide attention between her face and the sound of her voice – but it would be more difficult to divide attention between two conversations. Performance costs of dividing attention are also specific to the nature of the task and the stimulus. Dividing attention incurs higher costs in visual than auditory discrimination tasks (Alais et al. 2006; Hein et al 2006; Proctor & Proctor 1979), speeded tasks than unspeeded tasks (Spence et al 2001), and discrimination than identification tasks (Hein et al 2006). Subjects also find it more difficult to divide attention in tasks that involve stimulus attributes like semantic identity than tasks that involve stimulus attributes like color or pitch (Treisman & Davies 1973). In some conditions, dividing attention across sense modalities can even make the subject more successful at performing a task (Larsen et al. 2003).

A study from Alais et al. (2006) on perceptual sensitivity in audition and vision illustrates a paradigm for studying divided attention using a discrimination task. In some trials, participants were asked to perform a single discrimination task (visual or auditory; the “focused condition”), while in other trials they were asked to perform both tasks simultaneously (visual and auditory; the “divided condition”). Alais and colleagues found that subjects performed the visual task just as well in the focused and divided conditions – simultaneously performing an auditory task had no effect on the visual discrimination task. Subjects were only slightly worse at performing the auditory task while simultaneously performing the visual task. This finding shows that subjects were able to simultaneously attend to stimuli in two modalities – audition and vision – with little to no effect on performance in either modality.

The results from Alais and colleagues support the view that some ways of attending don't
compete with each other – successfully attending to an auditory discrimination task doesn't require the subject to suppress visual attention to a discrimination task. In studies using an identification task, attending to multiple sense modalities at once can even improve task performance. When the information available across sense modalities is in agreement, subjects are faster and more accurate than in a single task condition. Studies on multi-modal enhancement of task performance focus on identification of degraded or ambiguous stimuli. For example, Larsen et al (2003) asked subjects to report degraded letters which were briefly spoken and presented on a screen at the same time. In the divided condition, participants were able to identify both the spoken and visually presented letters with the same degree of accuracy as in the focused condition, where they were asked to focus on just one modality (vision or audition). Unlike in the discrimination task, there was no increase in error for the auditory task in the divided condition. Even more surprising, when the same letter was presented visually and auditorily, subjects responded faster and maintained the same level of accuracy as in the focal conditions. Far from incurring a cost in reaction time, attending to multiple sense modalities at a time can actually enhance speed of processing when there is cross-modal agreement.

So far, I've reviewed evidence that we frequently attend simultaneously in different ways, but I've said little to support the view that we attend to the background in the way that James and Gurwitsch characterized it: as the context for a focal object. The evidence that I've reviewed so far also does not allow us to distinguish between types of background experiences, like Gurwitsch's distinction between thematic context and margin. Is there empirical evidence for two kinds of background consciousness, or for the view that background provides context?

Arvidson (2006) has attempted to show that there is. He argues that Gurwitsch's field of consciousness is better understood as a field of attention, and that there is empirical evidence for three types of attention corresponding to theme, thematic field, and margin. Arvidson's argument for this point is sometimes question-begging, because he frequently appeals to evidence for awareness outside
the focus of attention to argue that we attend to objects outside the focus. I'll review some of the stronger evidence that he discusses, and argue that the evidence doesn't support a distinction between the thematic context and margin. While Arvidson thinks that cognitive scientists implicitly rely on a distinction between thematic context and marginal attention, I'll argue that the research shows that ways of attending to the background can't be divided in terms of relevancy to a theme. Instead, understanding the structure of the background will require further empirical investigation into the ways of attending outside the focus, and their relation to subjects' experience.

Arvidson presents evidence in support of a marginal way of attending, but the evidence that he presents shouldn't compel us to accept attention to the margin. One line of research that he thinks supports marginal attention is the study of visual cues. He thinks that research on visual cuing supports the view that we attend to objects that are irrelevant to the task, a view that in turn supports the idea of marginal attention. The problem is that Arvidson's line of reasoning will be compelling only if we already accept the view that consciousness in the background requires attention. An obvious alternative is that we are aware of the cue without attending to it, or that the cue is perceived but not consciously perceived. Arvidson does not argue for why we should think that cuing involves attention, or why we should think brief cues are conscious at all.

Another study that Arvidson thinks supports marginal attention is from Downing, Liu and Kanwisher (2001). They show fMRI evidence for attentional effects on task-irrelevant stimuli. Arvidson thinks that this supports the conclusion that focal attention spreads to objects irrelevant to the theme, thus providing evidence for marginal attention. In contrast, I'll argue that these results are better interpreted as evidence for attention to objects in the thematic context, not the margin. Downing and colleagues were interested in investigating location-based selection by measuring the response to an “unattended” stimulus as a function of its distance from the attended stimulus. In the experiment, subjects held their gaze fixed on a central point and were presented with colored ovals to the left and
right of fixation point. Subjects were asked to report the orientation of one oval (the green one, for example) and not the other (the red one). Each oval was also superimposed over a task irrelevant image of either a face or a house. The researchers were interested in whether attending to the target oval would lead to an attentional enhancement of the task-irrelevant image on which the oval was superimposed. They found that attention did spread to task-irrelevant images. For example, if the green oval was placed over an image of a house and the red oval was over an image of a face, they found attentional enhancement in the neural regions associated with perception of houses – the PPA – and not in the region associated with perception of faces – the FFA.

Arvidson thinks that this shows marginal attention because attention spreads to irrelevant objects. But he equivocates on the meaning of 'relevant'. The images are not relevant to the task; but they may still be relevant to the subject's theme. As Gurwitsch noted, the thematic context is sometimes made up of visual objects that surround a visual theme. When a subject is focused on performing a visual task, her conscious field may very well be structured by visual experience, such that the surrounding figure provides the context for her thematic focus. This interpretation fits with the experimental evidence and makes a plausible prediction about the subject's experience. Focal attention selects the green oval, as attention spreads to the image of a house on which it's superimposed; for the subject, the theme is the green oval, and the background context is a gist-like presentation of the house, as well as a background idea of the task and her goals. Arvidson hasn't given us us any reason to think that the image is not the visual context, and so he hasn't motivated the claim that the spread of attention indicates marginal attention rather than attention to thematic context.

Although he doesn't provide adequate evidence for marginal attention, Arvidson does make a good case for what Gurwitsch has called the thematic field of consciousness. The evidence he cites is drawn from research on global scene perception (discussed in Chapter 3, see the “global-local model”). Arvidson takes this evidence to reveal attention to “scene context.” Scene context corresponds roughly
to a thematic field in the perceptual case; recall from Chapter 4 that the thematic field provides the context of the theme, enabling the theme to emerge as prominent and affecting the way that theme is presented. Borrowing Yoshimi's interpretation of Gurwitsch, the theme covaries with the thematic field – a change in the thematic field entails a change in the way the theme is presented to the subject. This notion of covariance is captured in the empirical understanding of scene context from Jiang & Chun (2003). As they define it, 'context' “...refers to the impact of other information, typically co-occurring items, on the processing of the target” (p. 278). That is, research on scene context explores how objects beyond the attended target affect the perception of that target. This aligns closely with Gurwitsch’s view (also found in James 1890) that the presentation of a theme depends on the thematic field to provide context.

The evidence that Arvidson cites suggests that the way a target object is presented in perceptual experience does depend on the scene context. For example, Mathis (2002) found that the scene in which a target object (a word) was presented impacted how subjects subsequently categorized that word. In another study on scene perception, Hollingworth and Henderson (2006) found that subjects were better at remembering a target stimulus when that stimulus was presented in the same scene across trials, rather than a different scene. The evidence does not, however, establish that subjects attend to objects in the thematic field, since it is possible that unattended or unconscious objects impact the way that a target is remembered and categorized. Although we can't rule out the possibility that scene context is unattended or unconscious, other research that Arvidson discusses does help us to rule out thematic field without attention. The evidence discussed in support of the global-local model of attention (chapter 3) shows that selective attention is sometimes directed toward global properties like the gist of a natural scene (Treisman 2006). When we combine this research with the evidence that Arvidson discusses, the interpretation that subjects have attended to the global scene looks more plausible. Attention to the global scene would explain why that scene context affects how the target is
remembered and categorized.

In this section, I've briefly reviewed some of the evidence that we attend to objects outside the focus of attention, as well as Arvidson's argument that the sphere of consciousness is a sphere of attention. The evidence surveyed in this section provides support for my claim that the landscape of attention structures the field of consciousness from foreground to background. It shows that we probably do attend to the background, and so it is possible that supervenience and isomorphism can be met.

A promising way forward for investigating the field of consciousness is to submit phenomenological claims to empirical scrutiny, in order to better understand the structure and dynamics of the conscious field. James and Gurwitsch have given us a rich account of the conscious field; but we can expand on their discussion by using their phenomenological insights to articulate new empirical questions about the nature of the conscious background in relation to the new concept of diffuse attention. In the next two sections, I'll contrast my account of attention's structuring role with two alternative accounts on which attention structures consciousness by structuring the foreground, and show that an enriched concept of attention that extends beyond the foreground puts us in a better position for investigating the conscious field.

3.2 James: Dispersed Attention and the Background

William James was among the first western thinkers to present an account of attention's link to the structure of consciousness. As James noted, there is a connection between the selectivity of attention and the selectivity of consciousness. Consciousness “…is always interested more in one part of its object than in another, and welcomes and rejects, or chooses, all the while it thinks” (1890, 284 – 290). Attention provides a natural explanation of the selectivity of conscious experience. As James writes in his chapter on *Attention* (1890):
“Millions of items of the outward order are present to my senses which never properly enter into my experience. Why? Because they have no interest for me. My experience is what I agree to attend to. Only those items which I notice shape my mind – without selective interest, experience is an utter chaos. Interest alone gives accent and emphasis, light and shade, background and foreground – intelligible perspective, in a word.” (italics James', pp.402—403.)

In this quotation, James claims that attention makes conscious experience *intelligible* to the subject. Intelligibility requires that we leave out irrelevant objects from conscious experience, so that we can accent or emphasize those that are relevant to our interests. James also seems to express the view that focal attention is necessary for consciousness, for example in the claims that “my experience is what I agree to attend to.” He seems to deny that we can be conscious of objects that we don't focally attend to, like the objects of diffuse attention.

On further reading, however, it is clear that we should not attribute this view to James, since the view that focal attention is necessary for consciousness is in tension with the overall picture that James paints in his chapter on attention. There are two ways in which attention is not necessary for consciousness on James' view. First, James thinks that we are conscious of objects in the fringe without attending to them. On James' view, ordinary experience involves a conscious background –the fringe – which provides the context for the object of attention. James takes the object of attention to occupy the foreground or “nucleus” of awareness, whereas the background or “fringe” is unattended. But on James' view, every conscious nucleus implies a conscious fringe. So some objects are conscious without being attended.

Second, James thinks that we sometimes in a conscious state that doesn't involve a foreground or focal attention at all, like a state of distraction. James characterizes distraction as a
conscious state, even though it doesn't involve focal attention. Distraction is the “real opposite” of a state of attention, in which focal attention is “dispersed”:

It (Attention) implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatter-brained state which in French is called *distraction*. Most people probably fall several times a day into a fit of something like this: The eyes are fixed on vacancy, the sounds of the world melt into confused unity, the attention is dispersed so that the whole body is felt, as it were, at once, and the foreground of consciousness is filled, if by anything, by a sort of solemn sense of surrender... (James 404).

James' claim that a dispersal of attention is the “real opposite” of attention is puzzling. The real opposite of attention should be a case in which a subject is not attending to anything – but if a subject's attention is dispersed, then she is still attending, albeit in a different way from when she focuses attention (for a defense of this view, see my discussion of distraction and mind-wandering in chapter 4). The solution to this puzzle is to distinguish between attention and attentional focus. When attention is dispersed it isn't focused; it doesn't involve the “selective interest” that characterizes focal attention. When James writes that attention has a real opposite in distraction, we can interpret him as claiming that distraction is the opposite of *focal* attention. Though James does not develop this suggestion, he allows for the possibility of a non-focal or “dispersed” attention, similar to Evans' “unfocused spotlight.” He also thinks that a state characterized by a lack of focal attention could nevertheless be conscious.

James does not claim that selective focus is necessary for consciousness, but rather that it provides the structure of consciousness: “accent and emphasis, light and shade, background and
foreground.” Attention gives the mind its “shape.” The claim that attention provides the shape of the mind is similar to my claim that attention structures consciousness. The difference is that James' characterization of attention is limited to varieties of focal attention. But James agrees that we are conscious of more than just those objects in the focus of attention, since the shape of the mind includes a background as well as a foreground. As a result, his account is limited – James doesn't explain the “shape” of consciousness outside of attentional focus.

3.3 Evans: Diffuse Attention and the Background

In *The Subject of Consciousness* (1970), C.O. Evans advances an argument very similar to my phenomenological argument. He aims to establish three claims:

1. Consciousness has a foreground/background structure.
2. All normal consciousness is structured.
3. Consciousness is given structure by attention (p. 67).

If these claims are right, then attention is necessary for normal consciousness. Although I agree with Evans on all three claims, I disagree with him on how to understand and justify the third premise. We both think the claim that attention structures consciousness is true, but we mean different things by it.

Evans thinks that attention polarizes consciousness into foreground and background, but that objects in the background are unattended. As he writes:

...what we take to be the presence of attention in consciousness is the polarization of consciousness into elements occupying its foreground relative to others which form its background (Evans 1970, p 67)
The role of attention is to bring objects into the foreground, which in turn implies a background against which those objects are highlighted. Like James, Evans would reject my isomorphism claim: the claim that the structure of the conscious field mirrors the structure of attention. If we accept isomorphism, then any object in experience must also be found in the landscape of attention. Isomorphism implies that all objects in the conscious field are attended in some way, an implication which Evans rejects. As a consequence of this disagreement, Evans and I draw different conclusions about the necessity of attention for consciousness. On Evans' view, attending is necessary for a conscious field, but not all objects in the field are attended. On my view, attention to some object is necessary for consciousness of that object.

I also agree with Evans' insight that attention can come in degrees. The claim that attention can come in degrees enables Evans to diagnose a mistake in introspectionist psychology of attention, and to introduce diffuse attention into the discussion. The mistake should already be familiar: the inference from a failure of maximal attention to a failure of any type of attention. Even if a subject fails to attend maximally, she might still attend to some degree. Evans disagrees with James that attention can be sustained only for a short period of time – but he agrees that a maximal degree of attention cannot be sustained. One way of interpreting Evans' degrees of attention is in terms of the organization of the foreground. When attention is maximal, the foreground will be sharp and focused; when attention is minimal, the foreground will be large and obscure. Evans calls a state of attention characterized by a large, obscure foreground 'diffuse attention'. From the discussion in this section, it should be clear that Evans means something different by “diffuse attention” from what I've defended on the landscape view. He characterizes focal and diffuse attention in terms of the nature of the foreground, using the metaphor of a spotlight. In diffuse attention:
...any element which is in the foreground will possess a poorly differentiated character. The foreground, as in the case of a badly focused spot-light, will be large and obscure, and this means that the element occupying this position will be similarly ill-formed and ill-defined... (p 81).

In contrast, on my landscape view focal and diffuse attention operate in parallel. My usage of “diffuse attention” doesn't imply that the objects are ill-formed or ill-defined, and it doesn't characterize the foreground. Some objects may be better formed at a lesser depth of processing – for example, it may be that global properties, like an overall pattern among elements in a scene, are more well-formed when we attend to a lesser degree. Reducing perceptual sensitivity may allow large scale patterns to emerge, which would be lost when attending more focally to the details. While Evans thinks that attention creates a relative contrast between attended objects in the foreground and unattended objects in the background, I think we should understand the landscape of attention as relative contrasts between focally attended objects and diffusely attended objects.

Even if attention comes in degrees, we might not want to call diffuse attention 'minimal', since there are examples of diffuse attention that don't make minimal demands on attention. For example, suppose I am interested in appreciating a painting. I might attend focally to the brushwork or the details depicted by the painting. But if I am interested in whether the overall composition is static or dynamic, I should not attend focally to the details. Instead, I should attend more diffusely to determine whether the figures form horizontal or diagonal lines across the canvas, or whether the color contrasts throughout the painting are sharp or subdued. Some details of the painting must be lost to make features of the overall composition apparent. Another example involves a state of meditation. During mindfulness meditation, I may attend to the whole body at once. That is, rather than focally attend to my breath or any part of my body in particular, I diffuse attention over the body all at once. For the
novice meditator, this is a difficult activity to sustain (much like “maximal attention”). I think Evans is right that attention comes in degrees from focal to diffuse, but this feature doesn't map neatly onto a maximum or minimum of attention. Some global and weak ways of attending – like examining the composition of a painting or being mindful of the whole body during meditation – might involve “maximum attention”, in spite of being weak in terms of speed of processing and perceptual sensitivity (see Chapter 3 for more details on the concept of weak and strong attention).

3.4 Summary: Structure Beyond the Focus

So far, none of the views that we have seen provides an account of attention to the background, though Arvidson comes the closest. Yet each author acknowledges the importance of background experiences for an account of the structure of consciousness. It remains to show how my account makes progress on the phenomenological discussion by providing an account of the structure of consciousness from foreground to background in terms of attention.

My main aim in this chapter is to defend the claim that attention provides the necessary foreground/background structure of consciousness. At the outset, I said that I would defend the view that the structure of consciousness supervenes on and is isomorphic to the structure of attention. So far we've seen reason to think that focal attention determines the object of the foreground, and any change in how we attend to the object will be reflected in the conscious structure of the foreground. For example, if we attend first to the color of an object, the color will occupy a central place in the foreground of consciousness; if we then attend to the texture, texture will occupy a central place. But does this allow us to meet the supervenience condition: will any change in the structure of the foreground involve a change in the direction of attention?

If Arvidson and Gurwitsch are right, then the answer is 'no'. The structure of the foreground does not supervene on the structure focal attention alone. The reason is that a focal theme of
consciousness requires a context, which affects the way that theme is presented in the foreground, but is not itself an object of focal attention. We saw empirical evidence, provided by Arvidson, for the claim that scene context affects the way objects are presented in the foreground. On his view, the theme depends on the thematic context; so meeting supervenience even for the foreground alone will require an account of attention beyond the focus.

This outcome seems at first to present a problem for my view. On my view, focal attention determines the foreground and diffuse attention determines the background of consciousness. More specifically, the structure of the foreground and the background is isomorphic and supervenes on the structure of focal and diffuse attention. If Gurwitsch and Arvidson are right, then my account of the structure of consciousness in terms of attention faces an empirical challenge. We can change the structure of the foreground simply by changing the background context; and so some changes in the structure of the foreground occur without a change in focal attention, a conclusion that is inconsistent with my isomorphism claim.

Looking more closely at the empirical evidence, it is clear that the research on scene context doesn't motivate a counterexample. Nothing in the empirical evidence rules out that how a subject attends to the background affects how she attends to the foreground. Consider the study from Mathis (2002), who found that scene context affects how a briefly presented word is subsequently categorized. If subjects experience the word differently because of the scene in which it is presented, nothing in Mathis' paradigm rules out that subjects also attended focally to the word in a different way – perhaps with emphasis on one letter rather than another. Likewise, in the study from Hollingworth and Henderson (2006), nothing rules out a change in focal attention. Hollingworth and Henderson found that subjects were better at remembering a target stimulus when that stimulus was presented in the same scene across trials. This doesn't show that how they experience the target varies independent of how they focally attend to it; even if scene context affects the experience of the target, as I think it
does, there is nothing to rule out that this change in experience occurs by way of a change in how the subject focally attends to the target.

Of the views that I've surveyed in this chapter, only my own allows us to provide an account of the structure of consciousness from foreground to background. But I've yet to say much about how the background of consciousness would be organized on my view. The reason is that on my view, the organization of the conscious field is an empirical question to be settled by an investigation into the landscape of attention, both focal and diffuse. Although much work has been done to characterize the nature of focal attention, the concept of diffuse attention is less well studied. Learning about the background requires us to make progress on a scientific study of attention beyond the focus. I take this to be a virtue of my view: we can learn about the structure of the conscious background by studying attention beyond the focus.

4. The Scientific Study of the Background

One promising way of learning about background consciousness is through the study of diffuse attention; but diffuse attention and the background raises methodological problems that we don't encounter in the study of focal attention. Studying diffuse attention will require more self-report descriptions of background states of consciousness, where diffuse attention is likely to be deployed. Diffuse states are arguably more difficult to evoke and sustain than focal states. It's much simpler for a subject to focus on a task than not to focus on anything at all. Studying diffuse attention requires us to develop new experimental paradigms better suited for investigating diffuse rather than focal states, and reliable ways of eliciting reports about the more subtle aspects of conscious experience.

In cognitive science, the main strategy for eliciting data about a subject's experience is an introspective report. The use of introspection does not provide an obvious answer to the methodological challenge raised by a scientific study of the background. Depending on what we mean
by ‘introspection,’ introspecting may amount to just another type of focal attention task. Introspection typically involves focally attending to one’s experience. It therefore seems unlikely that we can study the background by asking subjects to focally attend in introspection.

One possibility is that subjects can introspect in different ways, some of which do not recruit focal attention. Dainton (2000) raises this possibility in his discussion of strategies for investigating the phenomenal background. For Dainton, the *phenomenal background* is constituted by experiences that are unattended. We can modify Dainton's conception of the background to be consistent with Thesis N, while holding onto his methodological insight. The phenomenal background is constituted by experiences that are not *focally* attended, but are instead attended diffusely. Dainton's discussion of the phenomenal background can be used to inform the fledgling study of diffuse attention and its role in perceptual experience.

As characterized by Dainton, the investigation of the phenomenal background reaches a methodological impasse because the standard investigative strategy disrupts the target phenomenon. For example, consider the background experience of the sole of your foot touching your shoe. Though you can focally attend to your sole, you cannot focus on it as a background experience – once focally attended, the experience is now in the foreground, no longer an experience that is part of the phenomenal background. In order to attend to the background as background, we would need to devise a way to keep subjects attending diffusely even while they seek to notice or describe the feel of the sole of their foot – tasks that we typically perform using focal attention.

Dainton’s solution relies on a distinction between active and passive introspection. In active introspection, a subject’s introspective target is also the object of focal attention. In passive introspection, however, a subject deliberately focuses attention away from the experience that she wishes to observe. While her focus of attention is otherwise engaged, she can nonetheless select and make judgments about experiences that are peripherally attended. As Dainton further points out,
however, not all introspective acts involve selective (focal) attention. Both active and passive introspection can also be exploratory. Often, according to Dainton, we attend to some part of our experience with “the intention of merely making ourselves open to whatever is there.” In exploratory introspection, a subject observes experience, but does not focally attend to her mental states in order to form an introspective judgment about them. For this reason, subjects engaged in exploratory introspection could provide data on the activity of the mind as apprehended in the absence of focal attention.

Eliciting first-person reports about the nature of diffuse states is only part of the problem, however. We also need to understand how these experiences correlate with cognitive and neural activity. As Lutz and Thompson (2003) have pointed out, if we take appropriate methodological precautions, first-person reports can be useful for establishing the mental correlates of patterns of brain activity. One such precaution is to use trained subjects. Although we may frequently engage in exploratory introspection in ordinary mental life, this act is rarely deliberate. Employing exploratory introspection as a tool for learning about diffuse attention would require subjects who are able to introspect in a disciplined way, in order to provide reliable data about their experience. The use of trained subjects could also help to study diffuse attention because subjects trained in attention regulation would be more reliable in bringing about and sustaining diffuse states of attention, and suppressing focus (Lutz, Dunne & Davidson 2007; Lutz et al. 2008).

Methods for the systematic training of attention and emotional self-regulation, necessary for engaging in exploratory introspection, already exist in Phenomenology, as well as in Buddhist contemplative traditions (Lutz, Dunne & Davidson 2007; Lutz et al. 2008). Some of these methods have been put to use in experimental paradigms, for example, by recruiting subjects with training in contemplative practices such as mindfulness meditation (Farb et al. 2007). Training a random sample of subjects to engage in exploratory introspection would help avoid a sampling bias, since researchers
would not need to restrict their subject-pool to subjects who have previous training in self-regulating attention and emotion.

As an illustration of this approach, consider a pilot study by Lutz and colleagues (2002), which involves a small sample of trained subjects and an exploratory introspective methodology based on insights from Phenomenology. In this study, Lutz et al. attempted to correlate patterns of ongoing brain activity with phenomenological data obtained in real-time. In particular, they investigated the relationship between a subjects’ ongoing cognitive activity and variation in the perception of a stimulus across trials in a single subject (see also Engel et al 2001; Boly et al 2008). To obtain first-person data, experimenters trained subjects to suspend their ordinary beliefs about experience, in order to redirect their attention from the objects of experience, to the nature of experience itself. Subjects were encouraged to remain receptive to unexpected distinctions or features of their experience. Over the course of several training trials, subjects also developed a set of “phenomenological invariants,” terms which provided a standardized lexicon for describing experience in subsequent trials.

The findings Lutz and colleagues report demonstrate that first-person data about the experience of a visual stimulus is correlated with patterns of pre-stimulus neural activity, as measured by EEG. For example, they found that subjects’ reports of readiness versus unreadiness prior to stimulus presentation were associated with different dynamic categories of neural activity. These states also modulated behavioral and neural response to the stimulus. These findings support the fruitfulness of the Neurophenomenological approach for studying the relationship between the mental activity that reflects experiences outside the focus of attention.

Gathering data from exploratory introspection, and interpreting this data along with behavioral and neurological evidence, will enable researchers to test a new range of hypotheses about diffuse attention and background consciousness. As suggested by Hurlburt and Heavey (2001), researchers can benefit from remaining open to the emergence of unexpected relationships and characteristics in
the first-person data, which may shed light on the nature and limits of diffuse attention.

I have outlined a methodological strategy for expanding the tools of cognitive neuroscience to investigate the conscious background and diffuse attention. The strategy I have presented is aligned with the research method of Neurophenomenology (Lutz and Thompson 2003), and involves training subjects to engage in exploratory introspection. Unlike most introspective methodologies, which involve focally attending to an experience, exploratory introspection may enable subjects to report on their experiences without focusing on those experiences. Although exploratory introspection holds promise as a useful method for investigating diffuse attention, it also faces a host of methodological and theoretical problems, which accompany the use of introspection more generally. One problem is that subjects’ reports are often biased or theory-laden. Subjects have an idea of what a particular stimulus is like, and infer that their experience has the properties one might naively expect such a stimulus to produce (Schwitzgebel 2007). One troublesome variant of this source of error is speculation about the causal mechanism of experience. For example, a subject may claim that she had an intention that caused her to perform some action, or entertained a series of propositions that led to a decision. Ample evidence suggests that when subjects are asked to theorize about the causal processes by which they perform a cognitive activity, the report rarely reflects the mechanisms of cognition (Nisbett & Wilson 1977).

A response to this worry has already been foreshadowed in the discussion of Lutz and Thompson (2003). In their experiment, subjects are asked to suspend their ordinary beliefs about experience, and redirect attention away from the object of experience to features of the experience itself. In giving their descriptions, subjects are trained to describe phenomenal features and not to give causal-explanatory reports. To illustrate this distinction, imagine that you are staring at a wall in front of you, painted white. Before suspension of naive belief and redirection of attention, you may claim to experience the wall as a solid white color, or perhaps give a causal-explanatory report like “the lights
made the wall look a bright white.” Redirecting attention to experience, however, you will probably notice shifting shadows, afterimages from the surrounding light, and an array of colors. Enabling a subject to describe the objects of experience as experienced is one of the primary goals of the epoche.

While training subjects to bracket assumptions about experience and speculation about the causal mechanism of experience improves the reliability of introspective report, there remains a need for caution. Training subjects to engage in exploratory introspection may bias the subject in favor of the metaphysical and epistemological assumptions of the Phenomenological approach. The distinction between experience and the object of experience is one assumption of this approach, as is the claim that the epoche reveals the nature of experience, rather than creates new experiences. An alternative explanation is that in ordinary conscious life, the experiences revealed by the epoche don’t occur unnoticed – rather, they don’t occur at all. Undergoing the training required for exploratory introspection and the epoche might change the nature of subjects’ experiences.

Lutz and Thompson (2003) have responded to this worry by construing it as an advantage rather than a limitation. Subjects trained to introspect on the fine details of experience will develop new concepts and categories for characterizing experience and expressing it in verbal reports. Whenever a subject acquires a new concept, this involves changes in long-term semantic memory. Yet we don’t think that someone who has developed a new skill at tasting wine, discerning the structure of a symphony, or comprehending a language has become unreliable as a guide to the nature of wine, symphonies, or language. Rather, experience is dynamic and plastic. Through training, subjects can learn new concepts and categories necessary for translating awareness of an experience into an introspective report. The development of skilled introspection is a necessary precursor to meeting what Frith has called one of the major scientific projects of our century: “to discover how an experience can be translated into a report, thus enabling our experiences to be shared” (Frith 2002). This project is even more important once we move beyond an investigation of those aspects of experience that are
most readily reportable, to experiences in the background.

5. Conclusions

In this chapter I defended the final premise of the phenomenological argument: that attention provides the structure of consciousness. I surveyed arguments from the phenomenological discussion of conscious structure, and showed that in each of these arguments, attention's role is limited to the foreground. I've suggested that a better view is one on which attention structures both foreground and background, and provided some motivation for this view by showing that we do have evidence for attention to the background. I also pointed to some ways of empirically investigating diffuse attention and the background.

The arguments in this chapter establish that attention plays a role in structuring consciousness. Whether we accept a view on which attention structures the foreground only (like James', Evans' or Gurwitsch's), or a view on which attention structures both foreground and background (like mine or Arvidson's), the phenomenological argument will succeed. Attention provides a necessary structure for conscious perception; so attention is necessary for conscious perception.
Chapter 6

Conclusion

This work is the first systematic study of diffuse attention. I've argued that anyone interested in defending the view that attention is necessary for perceptual consciousness – which I've called Thesis N – should be interested in a theory of diffuse attention, since Thesis N is plausible only under the assumption that attention can be diffuse as well as focal. Although the present empirical literature does not settle the question of whether attention is necessary for perceptual experience, it largely supports Thesis N and the view that attention can be diffuse as well as focal.

I've presented four selective models of diffuse attention, and shown that only two of these models (the landscape model and the global-local model) can do the work needed to explain away counterexamples to Thesis N. According to the landscape model, visual selective attention is a single resource which can be distributed across objects in the visual field in varying degrees of strength – from focal (strong selection) to diffuse (weak selection). The global-local model states that diffuse and focal attention each make a different type of object available to the subject: Diffuse attention makes a global object available, while focal attention makes a local object available. I think a likely outcome of future research is that both of these models will characterize some aspects of diffuse attention. The landscape and the global-local models are not mutually exclusive. These models of diffuse attention and many more are implicit in the current literature. The concept of diffuse attention may point not to a single phenomenon, but to a cluster of diffuse attentional strategies.

More research is needed on diffuse attention and its relation to focal attention before we can determine whether the landscape model and the global-local model adequately characterize diffuse attention, as well as whether diffuse attention saves Thesis N from alleged counterexamples.
Specifically, in order for diffuse attention to provide a defense of Thesis N, we'll need to show that there is always a diffuse attentional halo—that we never (or at least rarely) attend in a purely focal way. This assumption stands in need of empirical justification, and an appeal to diffuse attention to defend Thesis N will be incomplete until we can establish evidence for this assumption.

My enriched account of attention as focal and diffuse also puts us in a position to provide a new argument for Thesis N based on a phenomenological claim about the structure of experience. I called this the phenomenological argument, because it begins from a claim about experience: that perceptual experience is always structured into a foreground and background. An enriched account of attention puts us in a position to explain this structure. As we learn more about diffuse attention, the empirical account of diffuse attention can help us to interpret subject's reports of background experiences. The benefits of drawing together the literature from phenomenology and cognitive science are two-fold: phenomenology can inform cognitive science by helping to articulate new research questions and methods for the systematic study of consciousness beyond the focus. At the same time, a cognitive science account of diffuse attention can inform phenomenological accounts of the background. By using multiple methods in cognitive psychology, neuroscience and phenomenological reflection, we can gain a more robust and empirically informed theory of conscious structure and attention beyond the focus.

One limitation of this project is that I have restricted my claims to visual perceptual experience. As many of my examples have emphasized, perceptual experience is far more than just visual experience. It remains to be seen whether the lessons that we learn from the study of visual attention and perception can be extended to other modalities. For example, the metaphor of a landscape of focal and diffuse attention works well for vision, but it may work less well in other sense modalities like gustation or olfaction, where the similarities between perceptual attention and a landscape are less clear. Yet we can also imagine examples that illustrate a distinction between focal and diffuse attention
beyond vision. Imagine listening to a symphony. You can attend focally to the cellos or the flutes, but when you do, the rest of the symphony is not silenced; rather, you have background auditory experiences of the symphony beyond the focus. You could also attend to the symphony as a whole, without attending to any particular instrument. This is a case of auditory diffuse attention. One question that my project raises is whether there are diffuse and focal ways of attending for each sense modality.

Developing a theory of diffuse attention is crucial for assessing whether attention is necessary for perceptual consciousness. A robust account of diffuse attention promises to advance our understanding of attention, perceptual experience, and the relationship between them.
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