



Beyond the Fringe

Jon Opie
Department of Philosophy
University of Adelaide
South Australia 5005
jon.opie@adelaide.edu.au
<http://www.adelaide.edu.au/philosophy/jopie>
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Mangan makes a useful contribution to our understanding of the structure and function of the non-sensory fringe of consciousness. I offer a few friendly amendments and criticisms. In particular, I argue that the fringe/focus structure of experience is considerably more complex than Mangan allows, and that his account of the function of fringe experience doesn't do justice to the emergent nature of the cognitive subject.

1. Introduction

Theorists who seek an adequate naturalistic account of phenomenal consciousness must undertake two tasks: 1) delineate the structure of consciousness, and 2) develop conjectures about the physical basis and functional significance of that structure. Bruce Mangan (2001) makes a useful contribution to both of these tasks. Mangan's particular interest is the non-sensory fringe of consciousness: its phenomenology, its function, and its relationship to the neural basis of experience. One challenge he faces, as does everyone working in this area, is to convincingly demonstrate the existence of fringe experience. This is usually achieved via a method of contrast: subjects are asked to consider situations that differ only in fringe phenomenology.¹ Using a number of examples, some familiar, others of his own invention, Mangan admirably succeeds in ostending the non-sensory fringe and unpacking some of its structure. He also provides a compelling metaphor for the role of fringe experience in cognition.

¹ My favourite example is due to Galen Strawson (1994, pp.5-6). Consider Jack (a monoglot Englishman) and Jacques (a monoglot Frenchman) as they listen to the news in French. Although there is a sense in which Jacques and Jack have the same auditory experience, their experiences are utterly different in another respect: Jacques *understands* what he hears, while Jack does not. This difference is not simply a matter of Jacques' capacity to respond to what he hears, it is a difference *within* phenomenal experience—a difference to be made out largely in terms of the non-sensory fringe.

Obviously, I am on side.² The purpose of this commentary is not to dispute the existence of the non-sensory fringe. Instead, I will question some aspects of Mangan's account. In particular, I will argue that the fringe/focus structure of consciousness is considerably more complex than Mangan allows, and that his account of the function of the fringe doesn't do full justice to the emergent nature of the cognitive subject.

2. One Fringe or Many?

It is a matter of orthodoxy that consciousness is quite limited in its information carrying capacity. Clearly, the contents of consciousness are vastly outnumbered by those (potentially conscious) contents stored in memory. More significantly, it is widely held that human cognitive and perceptual processes rely on a great deal of information that is causally active but entirely unconscious (both in the sense that it is unreportable, and that it is not reflected in our phenomenal experience). (See, e.g., Baars 1988, Kihlstrom 1987.) Included among this class of contents are those that, for example, provide an unconscious context for language processing, such that we are able to effortlessly navigate linguistic ambiguities at many levels.

Mangan's lovely metaphor for the fringe of experience is the menus and status bars that provide an interface for modern software. These alert the user to options and data without taking up much screen space. Likewise, according to Mangan, the role of the fringe is to indicate the availability of further information, or present information in summary form, while placing limited demands on available resources. In the non-sensory fringe we thus get feelings of imminence, of familiarity, and of rightness, and a whole host of context dependent feelings of relation, all of which act as "low resolution" markers or guides, directing the flow of cognition. In this way, claims Mangan, the capacity limitations of consciousness can be circumvented. By trading off resolution for scope, the non-sensory fringe adumbrates the wider context of our current project(s) without chewing up the resources required for detailed elaboration of focal contents.

This account of the *function* of the fringe immediately raises a number of questions about the relationship between conscious contents (whether fringe or focal) and the cognitive subject. On Mangan's story it sounds as though the non-sensory fringe is providing material for an internal observer, who responds to or is guided by that material. But who (or what) is pushing whom around? And what conception of the subject is being presupposed here? I will return to these questions in the next section. First I want to consider Mangan's account of the *structure* of the fringe, and of consciousness more generally. The two issues turn out to be related.

A long-standing tradition has identified consciousness with attention, that is, has taken the contents of consciousness to be co-extensive with the contents of the attentional focus (see, e.g., Mandler 1975). Hand in hand with this tradition goes the view that consciousness is in some sense unitary: either in terms of its contents, or in terms of its physical realisation (see O'Brien & Opie 1998 for further discussion). Mangan clearly eschews both of these views. Advocates of the fringe rightly point out that the contents of focal attention do not exhaust phenomenal experience. Moreover, if we distinguish between sensory and non-sensory contributions to total experience, and within each of these, a focus/fringe structure, then it is hard to maintain that moment by moment consciousness is unitary (at least at the level of its contents).

But exactly what structure does Mangan have in mind? Mangan is careful to distinguish between the fringe proper (which is non-sensory) and peripheral sensory experience. Even so, at times he speaks as if consciousness has a *single* fringe/focus structure into which are fed sensory and non-sensory contributions (e.g., Section 5.1, par.5). I don't really think this is what Mangan intends, but I raise this possibility just to highlight the issue. For suppose we accept that the

² For my own contribution to the exploration of the non-sensory fringe see Opie 1998, Ch.3.

sensory and non-sensory domains have their own, relatively independent, fringe/focus structures. Is that an end of it (i.e., do we count *two* such structures), or are there more to be added to the list? Presumably, there is a fringe/focus structure within each sensory modality. At a party, for example, my visual cortex processes the face in front of me at high resolution while reserving only a few resources for the guy approaching from my right; meanwhile, my auditory cortex tracks one or two conversations, while giving only a vague impression of concurrent voices and chatter. The point is that the two systems *simultaneously* engage in differential processing of distal stimuli, such that each has its own centre and periphery.³ And we might expect something similar across the whole range of sensory modalities.

One might also raise questions about the boundary between sensory and non-sensory experience. Mangan accepts that “at the phenomenological level, non-sensory experience is often impossible to isolate completely” (Sect.2, par.10). Even so he offers a rough take on non-sensory experiences: they are the bearers of meaning in consciousness; the element of experience that distinguishes perception from (more or less) naked sensations (Sect.2). The situation is somewhat more complex than this analysis suggests. Consider the processing of written language, for example. It is not at all obvious that there is a *single* level at which sensation becomes perception, and thereby acquires meaning. To begin with, the initial processing of text is visual. The visual system identifies letter and word forms more or less independently of linguistic meanings (even if word meanings can sometimes help to disambiguate degraded text). Processing of written text thus begins with a level of visual “meaning”—the visual gestalts associated with letters and words.

When we turn to the more purely linguistic aspects of this process it again appears that we can distinguish multiple layers of meaning. Consider the two nonsense phrases below. Both contain nonsense words, but the experience of 2) is richer than 1) because the words ‘all’, ‘were’ and ‘the’ create a grammatical (and experiential) structure in which a limited kind of meaning is embedded (we know that all of the “borogoves” were “mimsy”, whatever *that* means).

- 1) ilfaren noc eltranen
- 2) all mimsy were the borogoves⁴

Compare now 3), which generates rich traces of meaning, even though these aren’t securely locked in place by syntax. No nonsense words here, just nonsense grammar.

- 3) shuffling elephant slowly hence

Sentences 4) (made famous by Chomsky) and 5) below are both grammatical, but the former conveys nothing coherent—there is a failure of fit among the concepts it triggers. The latter, with the same grammatical form, generates additional phenomenology.

- 4) Colourless green ideas sleep furiously.
- 5) Odourless green frogs sleep quietly.

³ See Anderson 1995 (pp.103-4) for discussion of *multiple resource theory*, which rejects the view that attention is a single factor or resource. This theory fits well with my account of the structure of sensory experience.

⁴ From Lewis Carroll’s “Jabberwocky” in *Through the Looking-Glass*.

What these examples demonstrate is that linguistic understanding encompasses a rich variety of abstract experiences: experiences of grammatical structure, feelings of grammatical rightness, the phenomenology of individual words, and feelings of semantic relation that bind words and phrases into meaning gestalts. We move by subtle degrees from the “naked” word forms of 1), through 2), which generates a partial meaning gestalt, to 4), which has both a feeling of grammatical rightness and lots of free-floating phenomenology, and 5), which is most complete.

The interpretation of text is thus governed by numerous perceptual/cognitive mechanisms, each of which contributes distinctive elements to experience. It bears repeating that this process begins with the production of visually meaningful forms, and typically leads to further visual phenomenology in the form of imagery. Visual processes are, in general, rich with layers of meaning, from our appreciation of simple spatial and part-whole relations, through to the complex and dynamic imagery that, say, a mechanical engineer uses to understand and design machinery. Sensations are not clothed with meaning in a single step, or at a single interface. Various kinds of subordinate and superordinate “meanings” emerge in multiple processing streams: visual, auditory, bodily/kinaesthetic, linguistic, and so on.

Mangan identifies some highly abstract kinds of fringe phenomenology as paradigms of the non-sensory fringe, in particular, feelings of familiarity and feelings of “rightness” (feelings of knowing). What recommends these to us as non-sensory is their seemingly amodal character. However, my point above is that such feelings (rightness and familiarity) emerge at many stages in the ascent from the sensory periphery. Moreover, they are characteristic of numerous, relatively independent, processing streams. A focus/fringe structure looks to be a quite general feature of consciousness across many channels and at many scales. On these grounds, the fringe is not best portrayed as a two room apartment (sensory and non-sensory), but as a labyrinth, in which even the most abstract forms of experience divide and turn back on themselves.

I don’t have strong convictions about how this is going to turn out. The moral here is supposed to be cautionary: I simply want to warn against supposing that there is a simple sensory/non-sensory divide, or that the more abstract parts of experience are singular or unitary in any obvious way.

3. Attention and the Fringe

According to Mangan the function of the non-sensory fringe is to provide the conscious subject with “low-resolution” guidance concerning available cognitive resources. Just as a computer user can access an article or document by clicking an icon, or determine system status by inspecting a single on-screen number, so a conscious subject has access to vast cognitive resources that are summarised or marked by non-sensory fringe phenomenology. The fringe “provides a target toward which attention can be focused” (Sect. 7), and the act of attempting to focus on the fringe brings further information into consciousness.

A common reaction to this sort of account is that its appeal to a homunculus—the inner observer for whom fringe contents operate as targets of attention—threatens a regress, and covers for a lack of fundamental explanation. However, even if volition must ultimately be unpacked in terms of non-voluntary processes, executive control does play a legitimate role in explaining some aspects of cognition. Visual attention, for example, which results in the differential processing of stimuli in both early and late visual cortex, is subject to top-down biasing by both posterior parietal cortex, and dorsolateral prefrontal cortex (Farah 2000, pp.193-205). Prefrontal cortex is usually described as the “executive” system of the brain (see, e.g., Thompson 2000 p.363), because of its role in regulating complex, memory-hungry tasks. Biasing of visual attention by this brain region therefore amounts to a fairly unproblematic instance of executive control.

Mangan is, in fact, keen to pursue an analogy between the non-sensory fringe and peripheral visual experience (Sects. 4.3 & 5.2). Both are clearly “low resolution”—peripheral vision trades off spatial resolution for increased sensitivity to light. Overt visual attention is a matter of orienting the eye so that peripheral targets fall across the high-density resources of the fovea. And covert visual attention can be made out as an internalised version of this process, a “reorienting” of low-level visual processes by “higher” brain regions. Likewise, claims Mangan, attempting to focus on the non-sensory fringe brings further cognitive resources to bear on the material it represents.

But while there are evident phenomenological similarities between the non-sensory fringe and peripheral vision, when it comes to the control of attention I think one needs to be a little cautious. As indicated above, in the case of visual attention it is possible to establish a reasonably clear-cut distinction, both functional and neurological, between the controlling executive and those (sensori-motor) systems that are the objects of control. This is not obviously true of non-sensory experience, and those aspects of cognition governed by non-sensory contents. Here, the very neural systems most readily identified with executive processes—including pre-frontal cortex and language centres in the temporal cortices—are prime candidates for sites in which the non-sensory fringe is generated. We must therefore seriously consider the possibility that the cognitive subject, qua controlling executive, is *constituted* by the system of non-sensory contents, both focal and fringe. That is, no individual fringe experience (such as a TOT state) is clearly separable from the activity of the subject. Neither does such an experience exhaust the phenomenal character of the subject. The subject is a complex emergent, composed, in part, of multiple layers of phenomenal elements which interact in tight loops of reciprocal causation. For this reason it isn’t possible to identify some element of *non-sensory* experience as a “target” of attention. An element of experience can’t be a target of the cognitive subject if it partly constitutes the causal powers of that subject.

I suppose what I am offering is an alternative account of the causal role of the non-sensory fringe in cognition. Mangan favours an observer/target model, which presupposes a subject who actively selects from the material thrown up by the fringe while maintaining a fairly autonomous phenomenal and volitional structure. I propose instead that the subject is not distinct from the non-sensory fringe, but emerges in a process of competitive interaction among the various neural systems responsible for both focal and fringe experience. The mechanisms that govern the distribution of resources (i.e., the allocation of attention) among the various possible contents of experience are the very fabric of the subject, and incorporate those conscious states which are the moment by moment phenomenal aspect of the self.⁵

While I’m not in a position to develop this account in detail here, it does I think cohere with the organisation and dynamics of the non-sensory fringe. As I described above, experience has a complex, multi-layered fringe/focus structure. At any moment there are numerous phenomenal “forces” pulling in different directions. In particular, there are often concurrent but countervailing fringe feelings: the feeling of familiarity associated with a friend’s figure and hair-style is at odds with their gait (they were recently injured playing football) and vocal quality (they have a cold); the feeling of knowing that one can solve a certain logic problem doesn’t gel with that nagging sense that it hasn’t been properly formulated. Such conflicts resolve themselves, on my account, via dynamic, reciprocal processes that don’t naturally lend themselves to description in terms of observer and target.

⁵ This account is consistent with the work of Desimone & Duncan (1995) who treat attention, in general, as competitive interaction in a distributed neural system. My claim is that such mechanisms, where they concern non-sensory contents, are not properly distinct from the cognitive subject.

Mangan might well argue that I have simply put a different gloss on his account, without adding anything substantive or novel. Or he may claim that I've actually sacrificed some of the distinctive explanatory advantages of his story. In either case, let me conclude by applauding Mangan for the progress he has made on this difficult topic, and for his creativity in delineating the structure and function of the non-sensory fringe. While some of the details remain to be put in place, this is certainly a step in the right direction.

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