Attention: Philosophical and Psychological Essays, edited by Christopher Mole, Declan Smithies, and Wayne Wu. New York: Oxford University Press, 2011, Pp. xx + 347. H/b 45.00. [Final version in *Mind* 2014]

This is an important anthology which presents the latest thinking on attention from the philosophers and psychologists who work at the intersection between these two disciplines. It brings together different perspectives by many well-known philosophers and psychologists who specialize on the topic. It is highly interdisciplinary and explores attention through the fields of neuroscience, cognitive psychology, and philosophy of mind. Its fourteen chapters contain detailed arguments about the mechanisms of attention, the relationship between attention and consciousness, the role of attention in explaining reference and the control of action, and details about the way that attention is implemented in the brain. Although attention was perhaps neglected in philosophy until fairly recently, it has now been recognized by philosophers of mind as having an important role to play in theories of consciousness and cognition.

In addition to a useful introductory chapter by Mole, Smithies, and Wu, the chapters are organized around the following three areas: the *mechanisms* of attention (chapters 1-6), *consciousness* and attention (chapters 7-11) and *cognition* and attention, especially on demonstrative thought and reference (chapters 12-14). In the discussion below, I will focus my attention (pun intended!) on the essays on consciousness and attention, although all chapters touch on the topic of consciousness is some way. It would be impossible in this short review to delve deeply into the numerous interesting experiments discussed in the book.

 Regarding the mechanisms of attention, a number of important background issues and disagreements are featured. For example, chapters one (‘A Systems-Neuroscience View of Attention’ by Christian Ruff) and two (‘Attention and Integration’ by Alan Allport) spell out important disputes on the co-called ‘bottleneck view’ of attention influenced by Donald Broadbent's picture of attention as corresponding to a bottleneck in information processing capacity resulting from the interconnection of two separate perceptual processing systems. This gave rise to various theories in which the *selectivity* of attention is the central focus and characterized by different claims as to the (psychological and neurophysiological) location of the bottleneck, such ‘early’ versus ‘late’ selection theories. The basic idea overall is that attention is what selects information to pass through limited-capacity bottlenecks. Both Ruff and Allport critique the traditional bottleneck view but in different ways.

 In chapter three, Mole (‘The Metaphysics of Attention’) goes further and argues that we need a full reconception of attention such that facts about the nature of attention must be facts about the ways in which those *processes* are interrelated. Armstrong (chapter four), in ‘Covert Spatial Attention and Saccade Planning,’ explains how her vision research shows that directing one’s attention shares a neural basis with mechanisms that are responsible for saccadic eye movements, which we obviously do not always direct voluntarily. In chapter five, Wu (‘Attention as Selection for Action’) argues that attention is a selection required for an organism to navigate through the environment which allows for numerous possible behaviors. In chapter six, Tripathy, Ogmen, and Narasimhan (‘Multiple Object-Tracking: A Serial Attentional Process?’) present ‘multiple-object-tracking’ experiments which they argue shows, contrary to Pylyshyn and others, that attention may not simultaneously directly select a small set of objects in a visual scene but rather involves a serial process.

 With regard to consciousness and attention (chapters 7-11), Watzl (‘Attention as Structuring the Stream of Consciousness’) first argues for what he calls ‘structuralism,’ that is, ‘consciously attending to something consists of the conscious mental process of structuring one’s stream of consciousness so that some parts of it are more central than others’ (p. 145), analogous to the way that setting a personal goal organizes one’s activities around that goal. In chapter eight, Prinz (‘Is Attention Necessary and Sufficient for Consciousness?’) draws an extremely tight connection between attention and consciousness, answering yes to the chapter title question (more on this theme below).

In chapter nine, Phillips (‘Attention and Iconic Memory’) presents a very interesting critical analysis of Sperling’s (1960) well-known work on ‘iconic memory’. The main experiment begins by showing subjects an array of letters in the center of one’s visual field for fifty milliseconds, such as an array composed of three rows of four letters each. A visual image of the stimulus was found to persist for 150 milliseconds after removing the stimulus. Subjects were then asked to report what they saw under two different conditions. In condition one, subjects were asked to identify as many letters as possible. In condition two, subjects were asked to identify letters in a single row, albeit after the offset of the stimulus. Sperling found that in condition one, subjects could identify only about one-third of the twelve letters, but in condition two they could still typically report correctly on at least three out of four letters. Some conclude from this that one’s sensory memory (which does fade quickly) still preserves information about the letter shapes in all rows although subjects cannot report on all the information. In condition one, it may be that the act of reporting just takes too long and the sensory memories have faded. In condition two, the sensory memory is still available enough to be able to report on most or all letters in a single row. Phillips argues that those who take these experiments to show that we are conscious of more than we attend to rely on false assumptions and an implausible view of attention.

 Kentridge, in chapter ten (‘Attention Without Awareness: A Brief Review’) argues that, in contrast to Prinz, consciousness is not necessary for attention. For example, blindsight subjects show that attention to an object can occur without conscious experience of that object. In chapter eleven, Smithies (‘Attention is Rational-Access Consciousness’) agrees with Prinz to some extent and argues that attention’s role is the *rational control* of action which involves a personal-level perspective, as opposed to a sub-personal level of informational processing. According to Smithies, no accessing of unconscious information can even count as ‘rational’ in the way that he means. (Wu, in chapter five, also defends a version of Kentridge’s conclusion that there are unconscious forms of attention.) To anticipate the forthcoming chapters, Smithies also argues that consciousness is necessary for explaining demonstrative thought, that is, thought directed at particular things such as ‘that table’ or ‘this book’.

 Finally, on the topic of cognition and attention, especially on demonstrative thought and reference (chapters 12-14), Roessler argues in chapter twelve (‘Perceptual Attention and the Space of Reasons’) that attention not only enables one to know truths about objects but also to know *how* one knows. In chapter thirteen, Dickie (‘Visual Attention Fixes Demonstrative Reference By Eliminating Referential Luck’) argues that cognitive psychology provides us with a theory of the role played by attention in tracking objects over time, a theory which can be used to account for the way in which attending to an object removes any knowledge-defeating component of luck from our inferences. Campbell, in the final chapter fourteen (‘Visual Attention and the Epistemic Role of Consciousness’), holds that the notion of conscious attention to an object explains how it is that we have knowledge of the reference of a demonstrative. For Campbell, attention and reference stand in a very intimate relationship such that knowledge of the reference of a demonstrative is provided by conscious attention to the object.

There are numerous interesting experiments described and analyzed throughout the book. From the point of view of a philosopher of mind and consciousness, it is perhaps no surprise that I find the most interesting issue to be the relationship between attention and consciousness. Is attention *necessary* for having a conscious experience? If one answers yes, then the claim is that:

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Now, it might seem that CRA is true. However, consciousness seems to be a broader category than attention due, for example, to the existence of peripheral (conscious) awareness. Conscious peripheral vision, for example, seems to be a case of consciousness without attention. I seem to have some degree of conscious peripheral vision even though I am now consciously attending to my computer screen. It is not as if everything else becomes ‘dark’ or ‘black’. Much the same seems true of auditory perception, such as focusing on a guitar solo in a song while peripherally conscious of the drums and bass. So it does not seem that attention is *always* necessary for consciousness. There seem to be many cases of conscious perception where we only have focal awareness of a small portion of our conscious visual field or a limited attentional focus in an auditory experience. In the visual case, this is supported by experiments showing that it is only the center of the retina that has a high density of cones with high acuity. This contrasts with the periphery (or parafovea) of the retina, which allows for much lower resolution. Indeed, it seems to me that the terms ‘focal’ and ‘peripheral’ with respect to one’s visual field at least often functions the same as ‘attentive’ and ‘inattentive’ respectively. Yet, one does not actually attend to one’s peripheral visual field. CRA therefore seems much too strong.

Some might also urge that inattentional blindness also shows that attention is required for conscious perception (Mack and Rock 1998, Simons and Chabdris, 1999 ). For example, even when one is paying close attention to something (passing the basketball) within one’s focal consciousness, many subjects are not conscious of other objects within that awareness (the man in the gorilla suit). But one problem is that some subjects do become consciously aware of the gorilla and so CRA is again too strong. Further, even if someone doesn’t *notice* or *remember* some *specific* object or feature in one’s peripheral visual field, it doesn’t automatically follow that it is not part of one’s conscious visual experience in some more general sense.

Consider also Dennett’s case of the Marilyn Monroe wallpaper, where you walk into a room with wallpaper containing hundreds of her portraits (Dennett 1991, pp. 354–355). Your initial sense might convince you that you are seeing hundreds of identical Marilyns. But Dennett persuasively argues that the real detail is not in your head but in the world. We simply assume that all the pictures are of Marilyn Monroe, that is, our brains ‘fill in’ the rest of the scene. We thus mistakenly assume that all of the Marilyns are consciously represented in our experience. This likely occurs often when we experience a number of similar-looking objects at the same time unless one object is so different as to ‘pop out’ in the experience. But even though you obviously do not attend to or focus in on each and every portrait, it seems to me that there is still *some* form of conscious awareness of the peripheral visual field.

With regard to ARC, the problem is that there also seem to be cases of attention without conscious awareness, such as when a subject’s attention is attracted by a stimulus without conscious awareness (Jiang et al. 2006). Subjects are, for example, presented with attention-grabbing stimuli (such as erotic photographs) to just one eye which are shown to be unconsciously processed. The more vivid stimulus presented to the other eye, however, draws conscious attention. So one might conclude that the erotic pictures capture the subject’s attention even though the subject is not conscious of them. Thus, ARC is also too strong and attention does not always require consciousness. Similar conclusions might be drawn from blindsight cases, where patients often successfully guess at some characteristics of a stimulus that is not consciously seen. It would seem that the blindsighted subject has no conscious perception of an object O but is still attending to O in some sense, albeit prompted by a questioner. Some of the above experiments and scenarios are explained in chapter ten, ‘Attention Without Awareness: A Brief Review’ by Robert Kentridge, among other places in the book.

Despite these considerations, as noted above, Prinz argues that attention is indeed necessary and sufficient for consciousness, that is, both ARC and CRA are true. For example, Prinz and others might reply that some of the above lines of evidence do not enable us to distinguish between attention to a *thing* and attention that is merely directed to a part of *space*, and so do not really demonstrate the presence of attention to a thing in the absence of consciousness. Attention also plays a central role in Prinz’s ‘AIR’ theory of consciousness which says that ‘consciousness arises when and only when intermediate-level representations are modulated by attention’ (p. 182). ‘AIR’ stands for attended intermediate-level representations. Although I am somewhat sympathetic with Prinz’s overall approach, I disagree with his theory of consciousness for reasons I cannot pursue here (see Gennaro 2012). To be fair, however, Prinz also elaborates further on his view elsewhere (Prinz 2012).

I find myself wondering at times if part of the problem often has more to do with the use of terminology or overlooked distinctions. For example, we should at minimum distinguish between (mental) state and creature consciousness, voluntary and involuntary behavior, and personal and sub-personal awareness. Although these last two distinctions are used frequently throughout the book, we might more directly say, for example, that the blindsighter is generally creature conscious (i.e. awake) but not state conscious of the object in the blind field (i.e. not having a conscious visual perception of the object). Further, if we wish to hold that something has captured a subject’s attention without state consciousness (as in the erotic photographs mentioned earlier), then the notion of attention at work is clearly some sort of involuntary creature consciousness such as occurs with involuntary eye saccades. In this sense, it is possible for one, on a sub-personal level, to attend to things of which one is not state conscious.

 In any case, I am not suggesting that the authors entirely ignore the distinctions above or that all of the disagreements come down to mere semantics. However, some authors seem to overlook these distinctions at times which might result in unnecessary disputes. Further, it would be best if all of the authors were more explicit about whether or not they think that there is but one ‘real’ or ‘true’ meaning of ‘attention’, as opposed to a term with multiple equally plausible senses.

Overall, though, this anthology has much to recommend it. It is a very nice statement of the current landscape of attention research from many of the main writers in the field. I highly recommend it to anyone interested in consciousness, attention, and human cognition.

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