

John Campbell, *Reference and Consciousness*  
Oxford: Clarendon Press, 2002, 267p.

John Campbell's philosophical work is, admittedly, in tune with empirical discoveries in the cognitive sciences. His research on the relationship between attention, reference, consciousness and spatial representations has followed contemporary trends in experimental psychology and is largely devoted to a reflexion on the complicated theoretical issues raised by empirical work.

*Reference and Consciousness* sums up Campbell's philosophical investigations on attention by providing a bold attempt to ground the explanation of our ability to refer to things in perceptual and cognitive capabilities.

The problem of understanding how we select salient information and individuate objects through attentional mechanisms and how such mechanisms relate to conscious experience has been a leading topic of study and debate in recent cognitive sciences [1]: the originality of Campbell's book lies in the attempt to bridge this debate with traditional philosophical issues concerning the nature of reference.

### **Summary of the book**

The main thesis of the book (the central role conscious attention plays in providing knowledge of reference) is introduced in the first two chapters and further developed in chapters 6 and 7. **Chapter 1** and **2** delimit the scope of this thesis by defining what the author considers the nature of attention and knowledge of reference respectively. **Chapter 3** focuses on the role of spatial location in understanding demonstrative propositions: in particular, it is discussed why spatial location is taken as a fundamental parameter in object identification at the level of conscious experience and why location has usually been considered the most important "binding parameter". **Chapter 4** is entirely devoted to a criticism of a conceptualist approach according to which grasp of reference requires the possession of sortal concepts: in this chapter, Campbell argues that various available styles of conscious attention do not need to rely on the use of

sortal concepts and that before a sortal can be applied conscious attention must already have selected the relevant information from the visual system. **Chapter 5** addresses some traditional issues concerning the relationship between sense and reference, focusing in particular on problems of identity. The aim of this chapter is to show that once we acknowledge that conscious attention can be used to verify propositions involving demonstratives and to act on the basis of demonstratives, the notion of sense has to be restated in terms of how conscious experience singles out relevant information processing. **Chapters 6 and 7** develop the philosophical framework in which the main thesis about the role of conscious attention must be understood: the Relational view of experience. Arguments are provided showing why experience of objects plays an explanatory role that cannot be accounted for in traditional representational views. **Chapters 8 and 9** are devoted to specific extensions of the theory of reference by an account comprising conscious attention: the phenomenon of joint attention (how we come to understand someone else's use of perceptual demonstratives and how we manage to corefer to objects) and the case of memory demonstratives (i.e. how experiential memory involving demonstratives is embedded in ordinary memory). The three final chapters address some major philosophical criticisms that could be raised against the core thesis of the book. In particular, **chapter 10** counters anti-realism arguments according to which knowledge of reference can not play any explanatory role and the *use* of demonstratives is sufficient to explain how we make sense of them. **Chapter 11** is a defense against quinean skepticism about the inscrutability of terms and the indeterminacy of the common sense notion of reference. In **chapter 12**, Campbell takes a stance against dispositionalist arguments according to which objects and their properties can only be conceived in terms of bundles of dispositions: the theory of reference by conscious attention defended in his book endorses a view in which experience needs to be considered as experience of the categorical, hence categorical properties are irreducible to complexes of dispositional properties.

Of all the questions raised in this book, the most primitive (and probably most crucial) concerns the characterization of conscious attention as the condition required for explaining our understanding of observational propositions and perceptual demonstratives. In what follows, I will address Campbell's main thesis, on whose validity relies the rest of the book.

## **The need for an attentional link**

In earlier works [2] Campbell already sketched some arguments about the alleged role of attentional processes in providing grasp of reference. In a first proposal, the need of mechanisms of selective attention was mainly motivated by the analysis of how we understand observational sentences and perceptual demonstratives. In order to relate the propositional content of an observational sentence to the "*imagistic content*" of one's actual perceptual experience some kind of attentional link is required. Selective attention is then described as the necessary condition allowing matching of two distinct kinds of content, propositional and non-propositional.

Consider the example of two persons engaged in a conversation while looking at a landscape. Without some mechanisms for selecting the relevant content in my perceptual experience of the landscape, I would not be able to understand the reference of "*that brown cat*" or to verify that "*there is a brown cat on the roof*".

The argument has a transcendental flavour: there *must* be some attentional link between language and perception in order for a mapping of singular terms and predicates onto perceived objects and features to occur. Without such a link, grasp of the meaning of observational sentences and demonstratives (construed as a correspondence between units of propositional level and units of non-propositional level) cannot be explained.

Campbell's notion of attention in this earlier formulation denotes in a very broad sense whatever mechanism enables "*selection of information for further processing*"; examples are given of distinct kinds of attention as possible candidates for linking perceptual content to other nonperceptual contents. Even the simplest tasks of object manipulation demand some mastery of focused attention, since they require implicit knowledge of what an object is, what properties belong to it and what properties are relevant for coordinating motor interaction with it.

Campbell's examples are intended to show that requiring some mechanism of selective attention as a "bottleneck" for parsing appropriate perceptual content is justified by a large class of phenomena, ranging from the level of motor interaction to that of reasoning and speaking.

In the book under review, the same arguments are fleshed out more thoroughly in terms of cognitive processing. The discrepancy between propositional content and imagistic content is dropped in favour of more fine-grained considerations on the nature of visual processing. The new formulation of the argument also introduces some intriguing new theses that make his claim much stronger; these concern the role of binding, the causal role of conscious attention, the critique of sortalism.

Campbell's main claim is that in order to grasp the meaning of a sentence such as "*That candle is white*" we need to be able to single out salient information from the visual array (an object, *the candle*, and its properties, such as *being white*) and that consciousness is playing a causal role in enabling us to do so. This is the Causal Hypothesis, which reads:

*"When, on the basis of vision, you answer the question, 'Is that thing F?', what causes the selection of the relevant information to control your verbal response is your conscious attention to the thing referred to". (p.13)*

To understand what is original in this new formulation of the attentional link argument, it is important to split the Causal Hypothesis into three parts:

1. In order to understand the question "*Is that thing F?*" one needs to be able to understand reference to the intended object and to its features.
2. Selective attention of relevant information is needed for picking up just the right object and features from the visual stimuli.
3. By driving selective attention, consciousness causally explains how the appropriate information is extracted from underlying visual processing.

The main difference between Campbell's earlier formulations and his new position lies

in point 3.

It is by consciously attending to the object that the appropriate stream of visual processing is highlighted. From being a condition required by a general distinction of representational formats (perceptual vs. propositional), conscious attention acquires now an explanatory role in terms of cognitive architecture.

### **Conscious attention and information processing**

Cognitive approaches to the study of consciousness have traditionally addressed the question of how states that can be defined 'conscious' emerge from the underlying level of information processing and to what extent attentional mechanisms modulate conscious states: such approaches can be defined bottom-up theories of how information processing *produces* (or *underlies*) conscious states.

Campbell inverts the direction of investigation by raising a completely different problem. He starts by assuming there *is* (or better, there *must* be, given our grasp of reference) something like conscious attention and claims that only in virtue of this *conscious* state some phenomena at the level of information processing can be causally explained. The argument is as follows:

1. Knowledge of the sense of demonstratives requires a subject to be *consciously* experiencing what is referred to by the demonstratives.
2. Nothing in visual processing *per se* allows the subject to pick out the appropriate content that must be associated to the demonstratives.
3. Then, consciousness must have a causal role in explaining how appropriate visual processing is selected.

The crucial question becomes then what does it mean for conscious attention to drive the selection of relevant information.

When Campbell speaks of information processing in the case of vision, he refers explicitly to the traditional framework of feature integration theories [3]. Even if he is not committed to the specific claims made by the endorsers of these theories (in

particular, claims about the role of location), he retains the idea that early visual processing consists in encoding in spatial maps featural information about objects. Feature integration theories have stressed the role of selective attention in mediating object awareness: attention is the process in virtue of which correct featural information is bound together so as to enable singling-out of an object from distinct feature maps. Campbell refers to these theories when he claims that there is no cue in visual processing *per se* allowing a subject to pick up the item referred to by a single term and distinguish it from the rest of visual information: what the visual system can autonomously provide is only a set of organization principles (or '*binding parameters*') of featural information. But in order to pick up the correct object that corresponds to the reference of a demonstrative, conscious attention is required: what is needed in order to parse correctly the scene into units relevant for referential use is an active exercise of focused attention that selects objects by *highlighting* their features as encoded in primary visual processing.

*"If you are asked the question, 'what colour is that block?', you must, to understand the question, consciously attend to the block [...] Your verbal response 'That block is blue' has to be caused by just the right cell-firings; it has to be caused by exactly the cells which are firing as a consequence of that particular block having the colour it does. So these particular cells have to be selected and used to affect the verbal response. What causes there to be that connection? I want to propose that what causes there to be that connection, between verbal response and the cell-firing, is your conscious attention to the object"* (p.12).

As a general remark, it is surprising that nowhere in his book Campbell makes reference to current mainstream alternatives to feature integration theories, namely theories of visual indexicality ([5], [6]). A central claim of such theories is that the traditional appeal to attentional processes is not necessary to explain how we single out objects in visual processing: object individuation can be explained in terms of low level indexical mechanisms that occur *preattentively*. Theories of visual indexicality are supported by

large empirical evidence and are progressively undermining the central role played by conscious attention in classical theories of visual processing.

Campbell's neglect of these theories is possibly one of the major omissions of the book, since they might directly threaten one of his basic assumptions, namely the alleged explanatory role of conscious attention in singling-out visual objects.

Moreover, there are two theoretical problems that are raised by Campbell's thesis.

The first problem concerns the idea of 'neural content' that has to be selected by conscious attention. The fact that certain cell-firings selectively *correlate* with certain featural information of the percept (say, a particular hue) allegedly plays (under a loaded set of assumptions) an explanatory role in understanding how a subject comes to perceive that particular hue at a specific location. In no way such firing causally explains *per se* one's conscious perception of that hue at that location.

Campbell seems to take a simple *correlation* between neural activity and content of conscious experience as a causal *explanation* of the latter: perceiving a blue block in one's visual field is causally explained by there being a subset of cell-firings in V4 that "*are firing as a consequence of that particular block having the colour it does*". This amounts to considering neural content (a specific firing patterns of a neural population) as a kind of content that can be directly matched with phenomenal content. In this sense Campbell assumes that the following two explanations are '*plainly compatible*':

- A. I say it's blue, because it looks blue
- B. B. I say it's blue, because the cell-firing in V4 is registering blue at that location

However, some authors [4] have recently argued that the fact of taking a correlation between 'neural content' and specific aspects of phenomenal content as an explanation of the latter is a common fallacy in the study of neural correlates of conscious phenomena (they call it *matching content doctrine*). This is certainly a problem for traditional cross-level theories such as Feature Integration theories and represents a possible threat to Campbell's formulation of the causal hypothesis. There is no a priori reason to assume that the way in which features of objects are perceived at a phenomenal level is causally underwritten by specific firing patterns at the level of

visual processing nor that there actually is some neural pattern of activation causally explaining *per se* my experience of blueness at a given location of the visual field. Hence, the idea that conscious attention *highlights* the appropriate informational content cannot be grounded until an account is provided of how neural patterns selectively explain specific phenomenal contents.

The second problem concerns the causal explanatory role of consciousness. The fact that when Campbell asserts that '*conscious attention selects relevant neural firing*' he is not speaking metaphorically is evident in his criticisms of the epiphenomenalist view of conscious attention. According to a strong epiphenomenalist view, conscious access has no causal role *at all* in the explanation of cognitive processing. Campbell rejects not only strong phenomenalism, but also a weaker version according to which if conscious access has a causal role, then this causal role is effective only at the level of thought, or on the "space of reasons", but *not* on visual processing. What makes Campbell's position provocative is the fact that the causal role he assigns to conscious access *reaches down* to visual processing itself: we should not think of conscious attention as a later intervention on sensory processing, but as the very exercise of a personal-level mechanism modulating visual low-level information processing. But although very suggestive and intuitively plausible, this assertion can hardly have any explanatory power unless the causal role of conscious attention in selecting appropriate firing is spelled out in terms of information processing – i.e. exactly what Campbell seems to exclude.

*"[...] an appeal to the agent's demonstrative intentions requires us to appeal to the agent's conscious attention to objects; we cannot acknowledge a role for intention, in the control of mental operations, without thereby acknowledging a role for conscious attention. We may have to appeal to the deepest aspects of an agent's personal life in explaining why his conscious attention has just the focus that it does, and we have no way of recasting this causal-explanatory work in information-processing terms"* (p.14)

Taken literally, Campbell's thesis suggests that since we need conscious attention to grasp the reference of a perceptual demonstrative, and given that this grasp cannot be explained in terms of mere information processing, then we have to assume that conscious attention is what causally enables the selection of relevant information processing. I suggested that this thesis suffers of some theoretical weaknesses, mainly due to how the notion of relevant information processing is defined and to how the causal-explanatory role of consciousness is assessed in absence of a full-fledged theory of attention in information processing terms.

### **Conscious attention, visual processing and conceptual knowledge**

A large part of Campbell's arguments aim at fixing an upper and lower boundary to factors driving conscious attention in understanding reference. On the one hand, he argues that possession of sortal concepts cannot influence the way in which conscious attention selects the relevant perceptual information: attention must intervene on perceptual processing *before* any conceptual distinction is available (ch. 4).

On the other hand, he assumes that whatever binding parameter the visual systems might use to build objects out of available features and their distribution in the visual field, attention is not constrained by such parameters. Attention acts *after* possible binding parameters have been specified by the visual system: it is not in virtue of the low-level organisation mechanisms mediating visual processing that we are able to select the relevant reference of a demonstrative; we do it, by actively exercising our conscious attention.

Conscious attention appears thus to enter the picture at an intermediate level, bounded by conceptual structures at the upper level and by visual processing at the lower level. It remains unclear in Campbell's account how a phenomenon at personal level like conscious attention can hold a causal-explanatory role on visual processing without being spelled out in terms of information processing. It seems that what Campbell is explicitly avoiding to take into account (what I called *bottom-up* approaches to the study of conscious attention) is a necessary precondition for making his causal hypothesis defensible.

## Conclusions

By formulating his causal hypothesis about the role of conscious attention, Campbell is introducing an intriguing *a priori* condition on the explanation of how reference is grasped.

Instead of suggesting possible research directions about the way in which conscious attention might emerge from information processing, he takes it as a formal condition required by any possible explanation of our knowledge of demonstratives. In order to be able to associate the reference of a perceptual demonstrative to an actually perceived object, conscious attention need to have a causal role on visual processing.

Although Campbell's reflexion is based on experimental results and a specific theoretical framework (that of feature integration theories) upon which there is no general agreement, his book opens two stimulating theoretical enterprises, both for philosophers and for philosophically oriented cognitive scientists.

The first challenge is to imagine whether knowledge of reference is possible without appealing to conscious attention. By providing strong arguments in support of the necessity of conscious access to objects that are referred to by demonstratives, Campbell formulates a thesis that is open to validation by further psychological research.

The second challenge concerns the alleged causal role of consciousness on selection mechanisms of low level visual processing. By arguing that conscious attention is causally driving selection of neural content, Campbell not only provides a conceptual framework apt to structure current empirical results in the study of attention and object cognition, but suggests possible directions for epistemological work on how to build sound cross-level explanations of cognitive phenomena.

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