

## SENSORIMOTOR KNOWLEDGE AND NAÏVE REALISM

BY JOHN CAMPBELL

It is a pleasure to be commenting on Alva Noë's *Action in Perception*. The book is easy to read, stylish, and sweeps through a fresh set of ideas on a fundamental topic. It seems to me that the emphasis on the sensorimotor and the embeddedness of perception are entirely correct, and that they find their natural home in a broadly naïve realist view of perception. I shall focus, though, on my reservations, which have to do with a reductionist thread running through Noë's discussion.

### 1. Sensorimotor Knowledge

Suppose we begin with an old friend, the circular coin that looks elliptical when viewed from an angle. There is, of course, a sense in which the penny looks circular, even when viewed from an angle: the perceiver has no tendency whatever to judge that it's anything other than circular, when reaching for it she will prehend her hand appropriately for a circular object, and so on. It's in this sense that there is 'experience of shape'. But there is also the 'experience of aspects': the sense in which the coin is experienced as elliptical. Indeed, the elliptical appearance of the coin varies systematically when it's viewed from different positions.

What is it to experience shape – to experience the penny as circular? According to Noë, it is having a grasp of the way in which the appearance of the penny – as elliptical in one way or another - will shift systematically as the perceiver moves around it, or as the penny itself moves. On his approach, we have to take perception of an ‘aspect’ of the object – such as the elliptical aspect of the penny - as the primitive notion, and we explain perception of the constant, objective property – such as circularity - whether it’s shape or color or any other perceptible property, in terms of the perceiver’s grasp of the way the aspect presented will vary with shifts in the perceiver’s position, in the conditions of perception, or in the position of the object. Thus he writes:

The experience of shape depends on our implicit grasp of the way perspectival shape varies as we move in respect to an object. We don’t have names for every aspect we encounter, but we have a grip on the way aspects vary. This grip is, in effect, our grasp of what it is for something to be *presented* as cubical, or spherical. It is much harder to make out what our grasp on the form of a shoulder, or a human jaw, or a hip, consists in. But there is no reason, in principle, why it cannot consist in something very much like this .... Similar kinds of considerations ... go for color: Our grasp of color depends on our implicit mastery of the way appearances change as color critical conditions change.

(pp. 198-199)

I think that the issues here are the core of Noë’s book. He does suggest various ways that this line of thought might be extended, to provide analyses of, for example, the

generation of conscious experience from non-conscious states, or Molyneux's Question, and I will look at these extensions in a moment. But the problem at the center of all the discussion is the relation between the sense in which the penny looks circular and the sense in which the penny looks elliptical.

The main problem with the analysis proposed, it seems to me, is the danger that the content of perception will simply collapse into a set of counterfactual implications for sensorimotor activity. If what we are being given, as our analysis of the content of experience, is a set of counterfactuals about the upshot of various types of exploratory activity, then what more can there be to the content of experience than a set of expectations as to what we would perceive if we positioned ourselves in various ways? The ordinary world, there independently of us, there for us to explore, has simply disappeared.

Intuitively, the problem is that the analysis seems to characterize perceivers as being highly skilled in negotiating their way around the various perceived aspects of the world, without characterizing the grasp perceivers have of what is in the world that they are negotiating. I think the reason for the gap here is that on the face of it, it looks as though filling this gap will mean appealing to exactly the representationalist picture of experience that Noë is resisting. I think Noë is right to resist; but we can fill the gap without falling into representationalism.

On a Naïve Realist view, the content of perceptual experience is actually constituted by the objects and properties around us. So it is not, for example, that a square object causes you to have a particular kind of experience, or that a red object

causes you to have a particular kind of experience. Rather, the squareness or redness of the object itself is a constituent of the content of your experience.

This view has to acknowledge that there is such thing as the perspective from which the scene is viewed, in ordinary perception. The objects and properties that are there to be viewed are not the only determinants of the content of the experience. Mountain trails sometimes have signs saying things like ‘This way to View Point’, and the sign may be showing the way to a famous view, the view over the valley from the mountain peak, or whatever. The content of a ‘view’ in this sense is partly constituted by the objects and properties that are there to be seen. It is not a private collection of sense-impressions; two people can take in the very same view. But it is also constituted by the viewpoint from which the objects and properties are seen. A naïve realist should think of the content of perceptual experience as being given by a ‘view’ in that sense: the content of perceptual experience is constituted partly by the objects and properties which are there anyway, and partly by the viewpoint from which they are perceived.

On this way of characterizing the content of perception, a lot of weight goes on the notion of ‘viewpoint’ or ‘perspective’ from which the scene is viewed. How are we to characterize that? One central element will simply be the location of the observer. But evidently that is only the beginning. We need to know something about what the observer is able to make of the scene being viewed, in order to characterize her viewpoint on it. And it is here, I think, that we find a natural role for the notion of sensorimotor skills: in describing the viewpoint from which the scene is being observed. This is not a reduction, but it will indeed give sensorimotor skills the role that Noë envisages for them,

as one of the constituents of experience; and it fits very well with his emphasis on the embedded nature of experience.

## **2. Agency**

We saw how Noë applies his sensorimotor account to experience of shape. We explain perception of shape as a matter of perceiving an aspect of the object, in the context of a practical grasp of the systematic variation in the aspects the object will present in various conditions of perception. What is it to perceive an aspect of the object? What is it to perceive the penny as elliptical? So far as I can see, Noë does not explicitly address this question. He does not give a sensorimotor account of what it is to experience the penny as elliptical.

There is, indeed, a natural way in which one might try to explain what it is to perceive the penny as elliptical, that you might think resonant of the sensorimotor approach's emphasis on agency and embeddedness in the environment. That is, you might propose that the sense in which you perceive the penny as an ellipsoid with a particular elongation and orientation has to do with your capacities for action on the penny. In effect, you experience one edge as closer than another, and the elongation and orientation of the ellipsoid have to do with which edge you will be able to reach first, how you will be most easily able to grip the coin, and so on.

On this view, the goal of perceptual experience is to exhibit to the subject the right ways in which to act on the objects around her. The trouble is there are two visual systems in the brain, one serving the demands of action, the other underpinning conscious

experience of the world. The subject's dispositions to action, served by one neural system, could be appropriate to one type of external shape – the shape and relation to the observer that the object actually has – while the other neural system, underpinning conscious experience of the object, has been taken in by an illusion, so that the experience is not veridical. Successful action is possible despite conscious illusion (Milner and Goodale 1996).

Noë says: 'In fact, Milner and Goodale's two visual systems hypothesis is, at best, orthogonal to the basic claims of the enactive approach. The enactive approach is not committed to the idea that vision is for the guidance of action...' (p. 19). When the enactive approach appeals to 'sensorimotor knowledge' possessed by the subject, this has to do merely with grasping the dependence of the aspect presented by the object on the circumstances of perception. There is no attempt here to explain what it is to perceive an aspect, in terms of the subject's dispositions to action. In fact, there is no attempt at all to explain what it is to perceive an aspect of an object.

I think, though, that it is possible to go further here, and to say something about the relation of experience of an aspect of an object to the capacity for action on that object. Even if we accept the existence of two visual systems, characterized as bluntly as I have characterized them above, they are not two independent visual systems. In particular, there is the problem of binding across visual systems. It has to be possible for the visuomotor system to be mobilized in order to act on an object that has been identified in the conscious life. If you consciously see a penny and want to reach for it, the action system, though remote from consciousness, has to be capable of coming into play to let you reach the coin. So at the level of the conscious life, the penny has to be

identified in a way that will allow the action system to find the right object to reach. One hypothesis is that it is experience of the aspect of the penny – as at a particular egocentric location, tilted towards you in a particular way – that provides the index for the object that the visuomotor system needs so that it can engage with the right thing. The binding is achieved via perception of aspect. This line of thought connects experience of an aspect with agency, without insisting that experience has to set the parameters for one's action on objects.

### **3. Consciousness**

So far I have spoken as though perception of an aspect of an object is experiential; this is, I think, consistent with the bulk of Noë's usage in the book. Towards the end of the book, though, he mentions a further line of thought. Suppose you did manage to reduce perception of shape to grasp of systematic variation in perception of aspects. Could we not in turn give a physicalist reduction of perception of aspects, so that experience of shape is now explained as a matter of a practical grasp of systematic variation in one's own pattern of physical stimulation (pp. 228-229)?

There are some gaps in this argument, as Noë disarmingly acknowledges (p. 230). Even if we grant the reduction of perception of shape to perception of aspects, there seems to be no particular reason why increasing sensorimotor complexity – increasing 'sensitivity to the way its own movements change the way the environment stimulates it' (p. 230) – should have anything to do with the emergence of consciousness. Suppose that, a few thousand years from now, biological organisms have evolved which are

parasites on human society. These organisms do nothing more than suck up dust from the surfaces of the houses in which human beings live. To do this efficiently, given the complex and dynamic nature of the houses, they need great sensorimotor sophistication. So they are functionally of great simplicity in anything corresponding to motivation or belief, for instance. Nonetheless, their sensorimotor apparatus is second to none. Would that of itself make it plausible that they are conscious? To put it round the other way, suppose we find a species which seems to have absolutely rudimentary sensorimotor skills, so they have genuine difficulty in navigating around the world, but compensate by having highly evolved social and motivational structures (they cope perceptually just well enough to keep each other in focus). It seems to me entirely possible that we would find it compelling to ascribe consciousness to such animals. But this would not be because of their sensorimotor abilities.

The more fundamental problem is that a reduction of perception of shape to perception of aspects is anyway not convincing. The reduction claims that all it comes to, that you experience the circularity of the penny, is that you have a grasp of the way in which its appearance as elliptical will vary systematically with changes in your relation to it. But your perception of shape has implications for your grasp of the causal relations between the penny and other objects: how its being bent will affect whether it will fit into this slot in the machine, whether it can be used to turn that screw, and so on. The reduction loses the fact that shape is a property that affects an object's relations to other objects, independently of any perceiver.



#### 4. Molyneux's Question

Noë interprets Molyneux's Question as asking whether vision and touch have the same kinds of spatial contents. He argues that the sensorimotor reduction implies that vision and touch do have the same kinds of spatial contents. The reduction says that there is a notion of a plate 'looking elliptical' which is more primitive than any ascription of an 'objective' shape to the object; it is a kind of 'perspectival' property that the object has. We can explain what it is for a plate to be round in terms of this notion of a perspectival property. To be (objectively) round is to be such as to 'look elliptical', in various degrees of elongation from various particular angles, to 'look round' when viewed from directly above, etc. For someone to be capable of experiencing an object as round is then for that person to have a practical grasp of the way various appearances the object presents from various perspectives. Thus 'our practical grasp on the way it changes as we move is precisely the way we succeed in experiencing its roundness' (p. 172):

We experience not only how things look, but how they look from here. We experience that the plate is round and that it looks elliptical from here. Its elliptical look from here is a genuine property of the plate – we see the shape and we see the perspectival plate from here – but it is also a relational property, one that depends on where 'here' is.... The perspectival shape of the plate changes as we move. Indeed, ... our practical grasp on the way it changes as we move is precisely the way we succeed in experiencing its roundness.

(p. 172)

Suppose we explain in these terms the sensorimotor contingencies involved in shape perception. And suppose the sensorimotor contingencies in tactual shape perception are the very same as those in visual shape perception. Then it would follow that we have the very same shape contents in touch as in vision. The trouble with this line of thought is that if we think of the sensorimotor contingencies in these terms, then the contingencies involved in touch are quite different to the contingencies involved in touch. There is no sense in which tactual exploration of a round plate involves feeling it ‘as elliptical’ or ‘elliptical from here’. If we want to explain what it is for a plate to be round in terms of the tactual appearances it presents, the explanation would have to take a quite different form. And now the problem is not just that touch and vision do not have the same shape contents. The problem is that touch and vision actually deal with quite different properties that we bundle together under the title ‘shape’. Touch deals with tendencies of objects to present various tactual appearances when explored in various ways. Vision deals with tendencies of objects to present various visual appearances when viewed in different ways. And these are simply different sets of properties, not even a single set of properties being presented in different ways.

One response to this point is suggested by the remark: ‘When you learn to represent spatial properties in touch, you come to learn the transmodal sensorimotor profiles of those spatial properties’ (p. 102). The term ‘transmodal’ makes it sound as though Noë has it in mind to take tactual and visual shape perception as each involving grasp of a totality of tactual plus visual sensorimotor contingencies. That is, the contingencies would be ‘transmodal’ in that they would involve both senses from the

outset. This does not provide a way of responding to Molyneux's Question. The whole point of considering a man born blind, who gains the use of his eyes, was to ask whether it could happen that vision and touch, each considered in isolation from the other, could turn out to be dealing with shape properties in the very same way. An emphasis on transmodal sensorimotor profiles does not address that problem.

There is, however, a more fundamental line of response in the text. Noë says the point made above applies only when we characterize the sensorimotor dependencies at a relatively fine-grained level of abstraction:

At an appropriate level of abstraction, ..., these sensorimotor dependencies [in vision and in touch] are isomorphic to each other, and it is *this* fact – rather than any fact about the quality of sensations, or their correlation, that explains how sight and touch can share a common spatial content.

We can illustrate this by means of a simple example. If something looks square, then one would need to move one's eyes or head in characteristic ways to look at each of the corners. One would have to move one's hand *the same way* (at the appropriate level of abstraction) to feel each corner.

(p. 102)

Now I think it is not difficult to see what the 'appropriate level of abstraction' is at which to describe the sensorimotor operations. It is one in which we take the perceived shape itself to define the frame of reference which is being used to describe the movements in

question. That is, we can describe the eye as ‘moving diagonally from the centre of the cube till it can go no further without leaving the cube’, and we can describe the finger as ‘moving diagonally from the center of the cube until it can go no further without leaving the cube’. The shape of the object defines the frame of reference we use to describe the movements on which sensory stimulation depends. At this level of abstraction, it does indeed seem evident that we have the very same sensorimotor dependencies in touch as in vision. This, however, is only because we are taking it for granted that we have sameness of shape across touch and vision; that the tactual and visual contents are exploiting the very same notion of ‘something’s being a cube’ to define the very same frame of reference for touch and vision. So we cannot use this point to explain why it seems so evident that in touch and in vision we perceive shapes in the very same way. It simply presupposes – perhaps correctly - that in touch and in vision we perceive shapes in the very same way.

The more general point here is that we may need the idea of perception of objective shape in order to give an ‘appropriately abstract’ characterization of a perceiver’s sensorimotor skills. This gives up the idea of explaining experience of objective shape in terms of a more primitive notion of a sensorimotor understanding of perception of aspect. The idea of a practical grasp of the implications of movement for experience is nonetheless important. Without succumbing to representationalism, we can, as we saw, locate the importance of sensorimotor skills in the framework of naïve realism, viewing perception as a matter of being successfully embedded in an environment.

## REFERENCES

Milner, A. David and Goodale, Melvyn A. 1995. *The Visual Brain in Action*. Oxford: Oxford University Press.