THE UNIVERSITY *of* EDINBURGH

Action and Experience

Tom Roberts

Submitted for the Degree of PhD,

The University of Edinburgh, 2007.

I have read and understood the University of Edinburgh guidelines on plagiarism and declare that this dissertation is all my own work except where I indicate otherwise by proper use of quotes and references. The thesis has not been submitted for any other degree or professional qualification.

Abstract.

The project examines the relationship between perception and action, and is divided into two parts. The first establishes a detailed philosophical critique of recent sensorimotor or enactive approaches to perception, targeting in particular the work of Alva Noë. In the second part I defend what may be called an 'action-space' account, according to which conscious experience is constituted by an agent's representing his surroundings in such a way as to enable a certain suite of actions.

The enactive approach, I argue, misconstrues the relationship between perception and action and fails in its aim to provide an explanation of consciousness. It faces difficulties, too, when it comes to illusion, hallucination and non-visual perception. The action-space model, by contrast, drawing upon work by Andy Clark, Daniel Dennett and Philip Pettit, has the resources to provide a reductive, functionalist account of phenomenal consciousness; an account that locates consciousness where we want it - in the service of fluid world-engagement by embodied, active perceivers.

Thus the perception/action interface is taken to be less direct than on the sensorimotor interpretation, but is nonetheless deep and important. The approach I endorse, furthermore, is consistent with and informed by empirical results from the cognitive sciences, including work on embodied, situated cognition and dual-streams analyses of visual processing.

Acknowledgements.

I am grateful to my supervisors, Andy Clark and Pepa Toribio, whose advice and expertise made this research possible; to members of the Edinburgh philosophy community for helpful comments on talks and earlier drafts, especially Dave Ward, Jesper Kallestrup and Julian Kiverstein; and for the support of the AHRC (doctoral award 2004/110348) and the Edinburgh University Shaw Fellowship. Special thanks, in addition, to original and extended comrades of the Rankeillor St Soviet, without whose continual support and good humour this project was nonetheless completed.

Chapter 1: Introduction.

To be a perceiver is to be an actor. This is the claim of a recent movement[1] towards analysing conscious experience in terms of an agent's possession and exercise of particular suites of bodily and sensory skills. These action-oriented views aim to answer certain fundamental questions in the philosophy of mind - questions concerning the content and character of conscious experiences - by emphasising that perceivers are not passive receptors of sensory information but are active creatures who engage in exploratory, inquisitive movements within their environments. Perception, on *enactive* or *sensorimotor* versions of this approach, involves the employment of sequences of dynamic interaction with the world and the ability to understand, in some suitable sense, the sensory significance of one's actions. Rather than conceiving of visual experience, for example, as the delivery of a neutral description of objects and surfaces by one's sensory systems, it is to be understood as essentially bound up with one's ability to move one's eyes, head and body, and to keep track of the systematic ways in which the appearance of the world changes as one exercises these skills. With this shift in emphasis come philosophical implications that challenge traditional views on perceptual consciousness: the role of the brain - in isolation from the active body - is diminished; representational content in experience is constrained by whole-animal activity; novel explanations of phenomenal properties are entailed.

It is my task in this project to critically assess competing action-oriented interpretations of perception, and their consequences, before proposing a positive account that captures the importance to conscious experience of active interaction between agent and world without having to accept certain negative consequences of full-blown enactive analyses.

Ultimately, I endorse a particular species of the action-oriented approach that we might call an 'action-space' account. On this model, the action-oriented flavour comes in at the level of the contents of experience: the contents of perceptual representations concern possibilities for action and intervention. In becoming consciously aware of her environment the perceiver is presented with a space of opportunities for acting; a suite of actions and responses that are suitable for the accomplishment of her ongoing goals and plans, and for integration into reasoning and rational action-guidance. The world *appears* a certain way to her when it confronts her in this way as an arena for goal-satisfaction, exploration and reward.

The aim is for this proposal to provide a satisfying functionalist explanation of what it takes for conscious experience to arise that is not only consistent with those features that

traditionally govern philosophical theories of perception - that it is a personal-level phenomenon, that the possibility of misperception must be accommodated, and so on - but that takes steps towards a dissolution of the Hard Problem of consciousness. Roughly, my treatment is designed to motivate a deflationary account of phenomenal consciousness, claiming that a convincing story of what it is for a portion of the world to *appear* a certain way to an agent would be an exhaustive one as far as 'phenomenal properties' are concerned.

My first undertaking is to distinguish among alternative interpretations of the relationship between action and perception, and I begin (chapter **2**) by surveying the space of options available to advocates of a *sensorimotor* or *enactive* view. This kind of approach maintains that perception is tied fundamentally to, and perhaps constituted by, active exploration of the environment. Being a perceiver involves a creature's moving around her environment and understanding the ways in which it impinges upon her; the contents of her experiences are said to be determined by the ways in which such movements are performed and the understanding that the agent has of how these lead to changes in the way things appear to her. As such, the paradigm sensory modality is that of touch rather than vision, which has been the traditional focus of enquiry into perception. Tactile perception takes place when the agent moves part of her body into contact with objects and surfaces; when she brings into play her implicitly-known bodily skills and keeps track of the sensory feedback she receives in response. Imagine, for example, an octopus enveloping its prey with multiple, writhing exploratory tentacles. Sensorimotor views generalise this kind of explanation - the other modalities, too, operate by way of skilful investigative probing rather than the passive reception of information. Eyes and ears, say, are tools to be transported to where they can be employed effectively to gather sensory information; indeed, the transportation itself is a skilful sensory activity. The contribution of action to perception, on views of this kind, is a deep and important one: actions allow us to ask perceptual questions of the world.

This enactive approach, I argue, can be carved up in a number of ways that depend upon how certain of its key components are to be interpreted. Importantly, *Sensorimotor Contingencies*, the patterns of dependence that hold between perceptual inputs and the relative motion of object and perceiver, can be cashed-out in multiple ways. They can be construed as the effects that an agent's movements have on stimulation of her sensory systems at the subpersonal level, or on perceptual contents themselves, or on non-representational, qualitative properties. In the visual case, it could be the dynamics that hold between movements and patterns of retinal or visual-cortical activity, or movements and 'how things look from here', or movements and visual sensations of some sort.

Similarly, the form of sensorimotor *understanding* the exercise of which is said to be a requirement for perception can be analysed in a variety of ways - as bodily, as conceptual, as implicit and so on.

Each of these options entails distinctive consequences for further features of the enactive approach and, more generally, for its explanatory power. What the theory says about these details affects what it must say about wider issues concerning perceptual content and the nature of phenomenal properties, both issues about which the approach aims to make bold claims.

Having made these consequences explicit, I proceed in chapters **3** and **4** to highlight a series of flaws that I perceive to exist within the sensorimotor account, both generally and for the individual construals. There are problems, I suggest, whichever option is taken up. Briefly, the enactive theorist is faced with a dilemma: either he pitches sensorimotor understanding at the subpersonal level - in which case there are difficulties when it comes to describing what it is for a person or animal to have experiences - or he takes it be a personal-level capacity, in which case it becomes unclear quite what it is that is supposed to be kept track of in experience (quite what it is that forms each side of a sensorimotor contingency). It is the description of the *content* of experience that comes out of the enactive view that is problematic - it fails on phenomenological grounds and it doesn't satisfy the epistemological role required of it. Experiential states must provide a justification for the beliefs they ground, and content that simply specifies how appearance properties change in response to movements leaves such states justificatorily powerless.

My concern, too, is that the contribution of active movement to perception is overplayed by the sensorimotor story, especially when it comes to perception that is neither visual nor tactile. While it is true that at least some experiences from these two modalities are naturally described as the products of exploratory probings, or as being constituted by them, the same does not obviously hold when it comes to hearing or, especially, taste or smell. The active-exploratory nature that is characteristic of the cases that are dealt with comparatively successfully by the sensorimotor view appears to be missing here. The content of experiences of this nature, then, appears not to rely on the direct relationship with action that is put forth by enactive theorists.

Ultimately, I take it that the enactive model does not do enough to secure a plausible account of perception that extends across perceptual contents and modalities, or which does any more than touch upon the problems associated with the explanation of phenomenal consciousness. The alternative action-space model, while taking on board a number of

lessons from the enactive standpoint including its focus on the perceiver as embodied, embedded agent, offers a viable competitor on both of these aims.

Chapters **5, 6** and **7** develop this alternative in the context both of traditional philosophical debates and of emerging cognitive-scientific evidence. Whereas the enactive view stresses *sensori*motor understanding - the grasp of how perceptual inputs are affected by movement - the action-space story takes the contribution of action to perception to be rather less direct, and specifies a rather different *kind* of action as being the important contributor. To summarise the view defended here, a perceiver is someone who is not only capable of behaving in a way that is appropriate to some encountered piece of the environment - that is, of responding in ways that are sensitive to available objects and properties - but who is additionally capable of integrating spaces of possible and appropriate actions into his ongoing powers of planning and reasoning. It is thus a grasp of *what* one can do that determines the contents of one's experiences, and not the character of the movement-input loop. The aim is thus to tread a sustainable line between purely behaviourist views on the one hand and full-conceptualist views on the other. The nature of the *understanding* or *grasp* that the account takes to be fundamental to perception is to be spelled-out in nonconceptual terms; it is to be the sort of grasp of the environment and its possibilities that we take to be at the disposal of at least some non-linguistic animals and children[2]. It allows us to ascribe consciousness to these individuals, as is in line with our intuitions, without thereby having to ascribe it to mere processors of information.

The space of actions with which an agent is confronted in experience is not limited to those that are bodily or movement-oriented, but is to be extended - along the lines of Philip Pettit's 2003 treatment - to those that we might call cognitive or epistemic. Part of what it is for an agent to be a perceiver of *colour*, for example, is for her to understand the ways in which she can sift, sort and track particular objects and surfaces on the basis of their visual similarity and difference; to categorise and discriminate, compare and contrast and so on, where these are mental 'actions' that do not require the exercise of physical skills. Once we give a rich enough account of these abilities, my proposal continues, we make headway in the explanation of both perceptual content and qualitative character. The account here shares similarities with the central features of the theory of perception developed by Rick Grush (1998, following Evans, 1985), although I develop more fully a treatment of both the relevant action-types and their accessibility to the agent.

Here (chapter **6**) is where the second strand of the overall project comes in: to defend the

claim that the action-space account would, if successful, provide a fully exhaustive explanation of the phenomenal properties of experience by resisting the challenge from those who maintain the existence of qualia. A qualia-*conservative* position, as I shall use the term, is one that ascribes to experiences intrinsically-phenomenal, private, irreducible features that determine how the experience feels to its subject. Such views abound in the literature (varieties can be found in Block, Chalmers, Jackson), and are notoriously difficult to undermine. Both the sensorimotor and action-space views, however, employ similar resources in an attempt to do so. These take Dennett as their starting point, and central to the strategy is an argument from conceivability[3]: once the relevant skills and their integration are in place - whether sensorimotor or action-space in nature - it becomes impossible to conceive of the absence of qualitative awareness. The presence of phenomenal consciousness (or, perhaps more appropriately, the *apparent* presence of qualia or the tendency to *think* that there are qualia) is, in Andy Clark's phrase, *implied* by the exercise of a particular body of understanding.

The qualia-conservative goes wrong in thinking that the effects of a perceptual episode - as my view has it, suites of enabled actions and their grasp by the agent - can be separated from the way that the episode feels from the point of the view of the subject, and in considering it sensible to take there to be further phenomenal facts over and above what it takes for the world to appear a certain way to the agent. We cannot imagine a case in which a perceiver has an experience with a red quale, say, but who cannot discriminate its object, sift, sort and track it in a range of relevant ways and so on, *or* who can perform all of these actions at will but whose experience lacks such a phenomenal character, and this motivates the claim that the one constitutes the other. There are no qualia traditionally conceived - nothing could match the proposed criteria of effect-independence, intrinsic phenomenality and third-person inaccessibility. Their 'nearest real-world correlate'[4], however, can be accounted for in terms of what it takes for the world to look (hear, feel, taste etc) to the perceiver - namely for her to confront a space of enabled actions. Provided we can offer a description of this 'confrontation' that does not itself rely upon sensory or qualitative properties (as I think we *can*; this involves filling-out what Pettit has called the constraint of *manifestness*), then there is hope for a non-circular explanation of perception.

The action-space story is given an essentially representationalist treatment (chapter **7**): experience is constituted by an agent's possession of various content-bearing mental states that present the world as an environment providing particular opportunities for action, where this content features in transactions enabling ongoing engagement with that environment.

This is a form of representationalism, of course, that diverges from traditional versions in emphasising the action-oriented nature of perceptual content rather than taking that content to be action-neutral or objective, and it has a precedent in the work of Ruth Millikan (1989; 1996) and of Andy Clark (1997). Such a move carries with it both advantages and potential pitfalls. In the plus column goes its ability to give a natural interpretation of certain facts about the role of experience in the lives of creatures who must get by in their environmental niches in real-time. Being directly presented with opportunities for goal-fulfilling action is conducive to efficient and appropriate behavioural response. The goals of catching food and avoiding predators, for instance, are well served by systems with few computational steps.

A further benefit of the action-oriented content interpretation is its ability to allow for a level of nonconceptual content in experience by setting only moderate demands on the cognitive resources of experiencers. Alternative accounts that rely on an agent's understanding in the determination of content may be forced to say that fully conceptual resources are required to grasp objective, action-neutral features.

One possible entry in a negative column is the suggestion that it gives an unnatural account of what the contents of experience are but this can, I argue, be given a satisfactory rebuttal. The worry might be that telling an action-space story of perceptual content is still too action- or movement-centred; that what perceivers are really presented with in experience are agent-independent properties of objects. I propose that in some cases, at least, it is advantageous to resist this model of content and that in others the action-space picture is consistent with intuitive commitments to perceptual content's world-directed nature.

The account is consistent, too, with certain neurophysiological and neuropsychological results that threaten other theories of perception. It squares nicely, for example, with the division of visual labour into two functionally-separable streams of processing[5]. We can take the role of the conscious visual stream to be one of presenting the agent with types-of and targets-for actions[6] and that of the unconscious stream to be one of regulating the fine details of their performance. The indirect contribution of action to perception on this view, in contrast to the claims of the enactive approach, means that this separation can be made unproblematically.

Secondly, the action-space model avoids what Susan Hurley has called the 'Classical Sandwich'[7]. This includes the assumption that there are three distinct layers of subpersonal processing - input, central cognition and output - and that input and output map neatly onto personal-level perception and action respectively. The sandwich picture is a prevalent one in the history of philosophical treatments of perception, argues Hurley, but it fails to respect the

deeply integrated, feedback-involving nature of biologically-grounded channels of input and output. No clear functional separation can be identified here, and the contents of both perceptual and intentional states, we must conclude, may be a function of either. The contents of action-oriented perceptual representations, I maintain, are determined by the wide role (defined in broadly teleolofunctional terms) they play in an agent's cognitive economy, and this may be fixed by either input or output, both, or the relations between them. Thus the account faces no particular threat on these grounds.

Two final features are argued for that help to determine the place of the action-space story within traditional constraints. The possibility of *mis*perception - both illusion and hallucination - is given a straightforward treatment, characteristic of representationalist stories. An experience counts as an illusion or a hallucination just when what its content describes comes apart from the way the world really is - so, where the agent is presented with a space of actions that fails to track those opportunities that the current environment really presents. When the two parallel lines of a Mueller-Lyer diagram appear to be different lengths, for example, this is constituted by the perceiver's taking them to present different action-spaces (for one to be sifted apart from the other on the grounds of length; for them to be picked-up using grips of different width and so on) when in fact such differences are not appropriate to the lines' real properties.

Secondly, the action-space model gives us interesting resources to draw upon when it comes to explaining the *function* of consciousness and how it arose in living systems. To overcome the challenges from epiphenomenalism and conscious-inessentialism we must show, respectively, that phenomenal consciousness plays some causal role in the lives of those who possess it and that it is necessary for this role. Qualia-conservative theories deal with such challenges badly; they have separated by definition the qualitative component of an experience from its effects, and so find it problematic to demonstrate what qualia are supposed to do, or how they came about. Functionalist / deflationary treatments, on the other hand, can simply appeal to the roles played by whatever functional attributes are to be identified with phenomenal properties or appearances (here, fast and fluent engagement with the world in ways appropriate to present the opportunities for goal-satisfaction). It is no mystery why capacities such as these should have developed over the course of creatures' evolutionary history.

The general approach that the action-space view takes towards answering questions about the nature of consciousness is consistent with a widespread recent trend that focuses on whole, physically-embodied, environmentally-embedded systems[8] and that has anti-

Cartesian sympathies. This wide-ranging perspective on the place of experience and cognition, and the action-space theory's views on perception, should be taken to be mutually supportive.

The action-space perspective places appropriate demands on what it is to be a conscious perceiver. Genuine experiencers must have reached a certain level of cognitive sophistication; they must be able not only to respond in an input-then-output way, even if the output *suits* the input in some sense, but to behave in ways that are flexibly dependent upon both their current and ongoing goals *and* the opportunities that the environment presents. Conscious perceivers confront, in experience, suites of options for action, and this confrontation takes place at the animal-level. The operation of particular neural mechanisms of detection, then, is not sufficient. Consciousness is not something that emerges in isolation from its effects on the perceiver as an integrated whole, for it just is those effects. There are no 'islands' of consciousness built up from unused phenomenal properties; no mental tapestries of qualia.

At the same time, though, the bar for consciousness has not been raised too high by the current proposal - it is not that any creature must be able to pause and deliberate upon what he can do in a given situation in order to be a perceiver, but rather that the space of options feeds directly into his capacities for intentional, world-engaging action. The implications that the action-space story has for which kinds of systems are conscious and which are not are thus in line with our intuitions.

There are four central explanatory strands to the project: Action (first strand) is an important contributor to perception, but in an indirect way (second strand); experience involves transactions among representational states (third strand), rather than the possession of intrinsically-qualitative properties (fourth strand). If any progress is to be made on the problems of consciousness - if, that is, we reject the possibility that it is simply beyond the realm of naturalistic explanation - then this is the direction from which it is likely to occur.

Chapter 1 Notes.

Footnote 1: Central proponents of which include Alva Noë (especially 2004, 2006b, forthcoming), J.Kevin OôRegan (OôRegan & Noë, 2001) and Susan Hurley (1998, 2005).

Footnote 2: Where, of course, this attempt is shared by the enactive viewpoint.

Footnote 3: We find this in section 7.2 of OôRegan & Noë (2001), and developed more fully in Clark (2000a).

Footnote 4: As Andy Clark has put it, in conversation.

Footnote 5: A division that has been made plausible by, especially, David Milner & Mel Goodale (1995).

Footnote 6: Along the lines of the ñtele-assistanceò model proposed by Goodale (1998) and endorsed by Clark (2001).

Footnote 7: I focus on certain central features of the Sandwich model, as Hurley (1998) presents it, and remain silent on others with which I need not take issue.

Footnote 8: See, for example, Clark (1997; 1999a), Clark & Chalmers (1998).

Chapter 2. The Sensorimotor Approach to Perception.

This section charts the space of options available to the sensorimotor theorist. The main claims of the sensorimotor approach, as we shall see below, can be interpreted in a variety of ways, each with differing implications for the scope of the explanation provided and for its plausibility. I will identify three such competing interpretations in order to fully demarcate the available possibilities for further discussion. This chapter is not concerned with providing a detailed critical analysis of each option, but only to clarify the proposals that each is required to make. The remarks in section 1 are designed to give a flavour of the general commitments of the sensorimotor approach, and issues raised here will be the focus of more detailed examination in following chapters.

2.1: What are the central claims of the sensorimotor account of perception?

The central claim of the sensorimotor thesis is that perceiving is a form of acting. To perceive the world, agents must be capable of taking part in its active exploration, using their bodies to probe the environment in which they are embedded. This is in contrast to a passive construal of perception, on which agents undergo perceptual input simply in virtue of making themselves receptive to it - for example in opening their eyes and being confronted with a rich and sensuous visual experience. The sensorimotor (or 'enactive') theorist proposes not only that exploratory skills are instrumentally *necessary* for perception, but rather that their being brought to bear is *constitutive* of perception. Once we interpret experience as an act and not as an inert registration of sensory stimulation, this account proposes, we can see that it is an agent's mastery of certain sensorimotor skills that yields the perceptual content and character of his experiences.

At a first approximation, an agent has a 'mastery of sensorimotor skills' when she has an understanding of the ways in which the appearances of objects change in response to her movements; when she exercises her ability to partially control her sensory inputs. According to the enactive view, it is by grasping these *sensorimotor contingencies* that the agent is capable of experiencing the world and its constituents. It is with the different possible ways of interpreting the means by which perceiving agents get in touch with these appearances - and with the nature of these appearances themselves - that this chapter is concerned. There is a certain lack of clarity in the recent literature over how best to construe the relation that holds between perceivers and appearances - whether it is itself a perceptual relation, say, or a

subpersonal one - and my aim here is to illuminate the larger-scale differences that emerge with the theory from local differences in the interpretation of this relation.

To start with, though, it will be helpful to sketch the general thrust of the enactive account prior to examining its finer points in detail. Considering some hypothetical creatures who possess more or less sophisticated 'sensorimotor' skills will allow us to gain a basic understanding of what is being proposed here. These cases are purely for illustrative purposes, it must be noted, and any underlying philosophical commitments that may be detected here should not be taken too seriously - it is these very assumptions that will be investigated in the following chapters. First, then, consider the case of a primitive insect creature who is capable of responding to the presence of a fixed light source in an automatic, input-output fashion. Here, the incoming light triggers a motor response that directs that insect towards the source with no awareness or sensation involved in the process; the light source is not represented by the insect. This creature, it seems clear, has no experience of the light: it is a zombie insect.

Secondly, a somewhat more sophisticated insect that undergoes a sensation of brightness when in the presence of the light source, under some suitable intuitive interpretation of 'sensation' on which they resemble, perhaps, our own visual afterimages. However, he has no knowledge - either conscious or implicit - of the ways in which the occurrence of this sensation varies with his own movements - he merely swims around and is occasionally confronted with a feeling of brightness that is more or less intense. It is intuitive, argues the sensorimotor account, to suppose that this creature has no awareness of the light *qua* part of the world located in space and so, while it may be legitimate to say that he has a 'brightness experience' of some sort, the enactive model denies that he possesses a truly contentful experience.

Thirdly, an insect that undergoes a sensation of brightness when the light is present, and who has mastered the ways in which the presence and intensity of this sensation is dependent upon his movement. He knows (in an implicit, skilful sense) that the brightness increases when he moves in one direction and decreases when he moves in the other, and likewise the changes in intensity that come with movement in all other directions. He knows that when he moves from right to left, say, the intensity of the brightness rises to a peak and then recedes. The knowledge that he possesses takes the form of *expectancies*: he knows which sensations to expect with any of the movements he is capable of producing. In mastering these sensorimotor contingencies, he is able to get a sense of the fact that the light source is external to himself, and that it is located in space - he has an experience with genuine content.

Externality and location in space, then, are the hallmarks of perceptual content on the enactive account - perception involves an awareness of objects as situated out in the world, independently from the agent. This 'over-againstness', furthermore, is possible only for agents who have integrated the patterns of input that they receive with their own movement, and thus who can understand that they are interacting with and exploring an external world. Again roughly, the idea is that the second creature above fails to register that the sensations that he undergoes - which may be identical to those undergone by the third creature - are caused by an external body, while the third insect does understand that this is the case through his mastery of the contingencies that hold between movement and sensation[1]. Furthermore, a sensorimotor interaction with the world - as opposed to a passive reception of sensory input - is a necessary condition on being able to take objects to be external and independent in this way.

The illustrative cases above have been set up in such a way that the changing states of which perceiving agents gain understanding are those that have so-called phenomenal properties, those that there is 'something it is like' to have. Here, it is only the creature who successfully integrates his movements with 'sensations of brightness' who is capable of contentful experience. This crude construal of the situation belies the alternatives that are available to the sensorimotor theorist, though. While in this case the sensorimotor contingencies hold between sensations and movements, the enactive account gets its strength and scope through working with contingencies that hold between movements and *appearances*, where the latter are interpreted as follows.

J. Kevin O'Regan and Alva Noë (O'Regan & Noë 2001; Noë 2004) locate appearances "firmly on the world side of the mind/world divide" (Noë, 2004, p176). That is, appearances are real, objective albeit relational, properties that hold between objects and spatial locations. The visual appearances of objects, for example, are those properties that an object presents to any visually-sensitive agent located at a point external to the object. The object presents a different visual appearance to each discrete spatial point located around it. For instance, a flat square surface presents a square appearance to a point that is located directly in front of it, but a diamond-shaped appearance to a point located off to its side, while a circular object presents an elliptical appearance to any agent who is located at a point that is tangential to it. There is an objective way that the whole environment in which an agent is situated visually appears to him from his current location, then, and there is a different way that the same environment appears from every other location. Some of these differences will be the result of the relative locations of the objects that are present, rather than of their intrinsic

properties. That is, it may be that one object occludes another object when observed from *this* location, but that the reverse is true when they are observed from *that* location. So the appearance presented to a point by the whole environment is dependent upon the properties of its objects and their relative locations with respect to that point and to one another.

Similarly, objects present non-visual appearances to the other sensory modalities. Solid objects present tactile appearances, for example, that alter as the observer moves a part of his body over the object's surface. An object whose 3D shape is a cube presents a different set of tactile appearances from one that is a sphere.

In locating appearances out in the world the sensorimotor theory's interpretation does, it must be conceded, differ from a natural reading of "appearance" on which these properties are mind-dependent and qualitative. In the insect cases, for example, it does not offend the language of sensations to say that they 'appear bright', or that there is a 'bright appearance'. Likewise, traditional secondary properties such as colour are often said to be mere 'appearances', where this is supposed to threaten their objectivity. So the objective-relational construal of appearances of the enactive view is a departure from this ordinary-language interpretation, and one that can lead to confusion. Even Noë's recent work tends to elide this distinction on occasion, as he talks in the early chapters of 'Action in Perception' as though appearances are sensations or patterns of sensory input.

It must be taken seriously, then, that on the sensorimotor account appearances really are out there in the world rather than being internal or phenomenal properties. For the visual case this is a relatively simple proposition; we can understand visual appearances as being mind-independent and external, and nonetheless possessing determinate and mathematically-specifiable geometric properties, for instance. For the tactile case this becomes more difficult, and the situation is more problematic still for the modalities of smell and taste. The discussion below will clarify the options that are available to the sensorimotor theorist when it comes to specifying the nature of these appearances - where they differ according to which enactive account is being evaluated - but for present purposes it is enough to construe tactile appearances as just those parts and properties of objects that are available to the sense of touch, and which change in response to the movement of a body-part over the object. As before, they are not to be identified with tactile sensations of hardness or coldness or smoothness or similar, they are relational properties of external objects. Similarly, if we are to take O'Regan & Noëôs 'world-side of the divide' claim to hold consistently across the sensory modalities, olfactory-appearances and gustatory-appearances (associated with how things smell and taste, respectively) should be taken to be relational properties that hold

between agent and object too, properties which are likely to change along the dimension of intensity, clarity and so on in response to the agent's movement.

So, sensorimotor contingencies are those that hold between an agent's movements - of his eyes, limbs and so on and of his whole body through space - and the appearances of the objects in his environment which change in accordance with these movements. The enactive thesis, to reiterate, states that only agents who are capable of understanding the changes in appearance that come with exploratory bodily movements can possess contentful experiences, and that such understanding is constitutive of perceptual ability: to bring to bear this understanding *is* to perceive. Sensorimotor skills are what enable agents to get a perceptual grasp of the real, invariant properties of objects in spite of only ever being in touch with their appearances at any given instant. For example, it is knowledge of the ways in which a circular object's elliptical appearances change as the agent moves around it that provides him with a perceptual grasp of the object's real shape - it is only through mastery of these contingencies that he takes the object to be round rather than elliptical. So we can think of sensorimotor skill as performing a role of ambiguity-resolution. An individual elliptical visual appearance may be presented by either an elliptical object *or* a circular one, so appearances do not unambiguously correspond to real properties. However, a *changing* set of appearances does unambiguously fix an invariant property, in the sense that there is a unique shape (say) that presents any given changing set. Only a circular object presents just *this* set of elliptical appearances in response to a movement from one location to another. An elliptical object, meanwhile, presents a different set of visual appearances with the same movement. The characteristic set of appearances that belongs to a property according to a given movement is its 'sensorimotor profile'. For example, a smooth transition from position A to position B, where these lie above a circular object and to its left and right respectively, results in a unique sensorimotor profile made up of a certain set of elliptical appearances. The same movement performed over an elliptical object yields a different sensorimotor profile, a different set of elliptical appearances. Strictly speaking, the sensorimotor profile of an object or property is the full set of appearances that it presents in response to *any* movement around it (this is true in the case of vision; the set of tactile appearances it presents in response to any movement over its surface is the object's tactile s-m profile and so on).

This notion echoes the observations of J.J. Gibson (1966; 1979), whose theory of perception proposes that information about the invariant properties of objects is contained in the 'ambient optic array' - the way in which the space around an object is filled with light[2].

While in almost all scenarios this array undergoes constant change and flow - as the objects in the environment move, or as an agent situated among those objects moves - the ways in which these changes progress are fixed by the unchanging properties of the environment and its constituents. The patterns of light projected to a point by a circular object may alter as the object moves from left to right, but the character of the change in pattern is uniquely specified by the circular shape of the object. There are mathematically-specifiable *constancies* within the changing optical array and perception, for Gibson, is a matter of picking up this information about constancies by exploring the world with one's body.

On the enactive account, such constancies are the real, invariant properties of objects such as their shapes, sizes, textures and so on. Sensorimotor skill is said to provide creatures with the ability to perceive constant properties in addition to, or in spite of, having immediate access only to appearances. For example, for a creature to have a tactile experience of the shape of a sphere, say, in spite of only immediately accessing those parts of the object's surface that are in contact with his hands, he must understand the ways in which the tactile appearance of the sphere changes as he moves his hands over its surface. Such exploratory movements reveal the constant property of being a sphere from the changing profile of appearances[3].

Some sensorimotor contingencies, in addition, hold not between changes in appearance and the *agent's* movements, but between appearance changes and the movements of the object itself with respect to the observer. A moving object - either one that is in transition across a plane, or one that is rotating on its axis - presents a series of changing visual appearances (in the majority of cases - perhaps a smooth rotating sphere is an exception) to a suitably located observer; a changing series of tactile appearances if the object is in contact with the observer's body and so on. As before, the structure of these changes is determined by the invariant properties of the object - the appearance of a moving circular object, say, changes in a way that is unique to circular objects and likewise *mutatis mutandis* for a square object, a triangular object etc.

In fact, characteristically *motor* contingencies are a subset of a larger range of contingencies that hold between the appearances of objects and the conditions of observation more generally. Conditions of illumination, for example, affect the visual appearances that are presented by a coloured object. An object presents a different visual appearance with respect to colour when it is lit by red light than when it is lit by green light, and its appearance depends, too, on the relative intensity of the light by which it is illuminated and on the location of the source of the light in relation to both object and observer. While this

adds a non-motor constraint to the ways in which the visual appearances of an object change in response to changes in viewing conditions, these contingencies are themselves law-like in the same way as before. The visual appearance of a red object, for instance, changes in a unique way in response to a change in lighting conditions. The perception of the real colour of an object, according to the sensorimotor account, involves understanding these law-like relationships in such a way that allows the detection of the invariant property amid the changing appearances, just as was the case with motor contingencies. Colour *constancies* are perceived in spite of a surface's looking different with respect to colour in different situations.

Unless otherwise stated, I shall use 'sensorimotor contingencies' to encompass all contingencies that hold between the appearances of objects and alterations in the conditions of observation, be they the result of movements of the agent, movements of the object or changes in relevant environmental conditions. This is standard practice in the literature. Where necessary, though, I will discuss the non-motor cases individually as they present issues that are important for the overall success of the sensorimotor project.

Of course, it is not plausible for any theory of perception to require that any agent who has an experience must actually perform an exploratory movement of the sort proposed by the sensorimotor account. This condition would rule out the possibility of an agent's remaining motionless and yet still being capable of perceiving his environment. With the possible exception of tactile perception, it is clear that one can undergo experiences without moving; it is obvious that one can see one's surroundings without moving even one's eyes, can hear noises without moving relative to their sources, can smell and taste items while remaining in the same position. It is somewhat more plausible to demand that every tactile perception involves a movement - even if limited to slight pressure against a surface - but even here this is far removed from sophisticated exploration.

In light of this, the sensorimotor account must provide an explanation of how inert perception is possible - perception, that is, where there are no actual changes to appearances that can be understood and no movements performed. Again, sensorimotor skills and the exercise of enactive knowledge are said to play the key role. The agent must bring to bear a *predictive* knowledge of the ways in which appearances *would* change *were* he to move in a certain way. In this manner, the ambiguity inherent in any individual appearance can be resolved as before: the agent is confronted with a single appearance (say, a single ellipse), but by bringing to bear his knowledge of the ways in which the appearance would change as he moves around the object (his knowledge of which set of elliptical appearances would be presented to him during his movement) he perceives its invariant properties.

This is, once again, merely an initial characterisation of a central claim of the enactive proposal, and there is much more to be said about the nature of 'predictive knowledge' and about how it yields the perception of real properties. This issue highlights, however, the importance of developing an acceptable understanding of what it is to possess and to exercise sensorimotor mastery. Sensorimotor skills must be the kinds of thing that can be performed in the absence of movement[4].

So far the proposal that appearances are relational properties that alter in response to a change in the observer's location is silent on the question of how observers access, register or acknowledge these appearances and their properties, and so it is silent on how perceivers come to understand those changes that are brought about by movements. The enactive proposal is that sensorimotor skills involve an understanding of the contingencies that hold between appearances and movements. In order for this understanding to be manifested, however, perceivers must have some access to the appearances that change as they explore the environment. The sensorimotor theorist must tell a story about this relation in light of the way that appearances have been set up.

As I read O'Regan & Noë, the appearances employed within their enactive account are not the same as Gibsonian properties of the ambient array, which are properties of the structure of the light itself, but relational properties that hold between objects and points in space that may be inhabited by an observer (Noë is explicit about this in his recent work: "[Appearances] do not depend on sensations or feelings... [They] depend on relations between the perceiver's body and the perceived object." (2004, p176)). As such, appearances change (by definition, as it were) in response to a change in the observer's location - because this change is a result of an alteration in the relationship between the object and agent. On the definition of 'appearance' currently under discussion, it makes sense to say that there is a set of visual appearances that the objects in my environment present to me, *even when my eyes are shut.* Appearances are not dependent, that is, on my access to them or on my status as a potential observer, but simply on the relation between my location and the object presenting the appearance.

In addition, visual appearances require the presence of illumination; auditory appearances the presence of a medium of sound-transmission (air, say); olfactory appearances the presence of a medium through which smells can travel and so on. It is only when such conditions are present that the object can 'present' an appearance of the relevant nature.

With closed eyes, of course, I cannot access visual appearances. What the enactive view

needs is an account of what happens when my eyes are open ï of what it takes for there to be a perceptual encounter with appearances themselves. Only then will we able to articulate and assess the contribution of sensorimotor skills and their exercise to perceptual content and character.

2.2: Version 1 – A Subpersonal Treatment:

The first interpretation of the relation that holds between perceivers and appearances proposes that a creature's access to appearances is a subpersonal matter. The account proposed in the original O'Regan & Noë article is an example of this first version, although Noë's recent work suggests a move away from this interpretation. Many of the claims set out in this section are mentioned explicitly by O'Regan & Noë (O&N), although I hope to have clarified some issues in a form that makes a comparison of this version of the theory to the others more achievable. This section, too, is purely expository - objections to and criticisms of this model will be deferred until the next chapter.

On a Version 1 sensorimotor theory, changes in external appearances are tracked by way of tracking changes in patterns of subpersonal stimulation. Images on the retina, for example[5], are (under suitable conditions of illumination and when the early visual system is functioning correctly) causally dependent upon properties of visual appearances. The elliptical appearance of a circular object, for example, will result in an elliptical pattern of stimulation on a suitably receptive and located retina. The retinal image covaries with the changing visual appearance as the agent moves around the object. So alterations in appearance that come with the agent's movements show up in the changing patterns of stimulation.

Note that on this interpretation it is not the case that there are mental, sensational objects being integrated with movements, so this model is unlike the basic insects case I identified above. In visual perception, the current version states, the agent does not keep track of 'sensations of brightness' or similar - instead it is input to the visual system that varies in intensity, structure and so on that forms the sensory side of the sensorimotor contingencies. Similarly, it is not the case on this account that the agent's relation to the appearances of objects is itself a perceptual one, at least not necessarily. That is, the properties of appearances - apparent shapes and colours and so on, in Noë's terminology - needn't form any part of the content of experience. It is the invariant properties of objects (their real shapes, locations, textures etc) revealed in the changing patterns of stimulation that are

specified in the content of an experience.

Just as the changes in the appearances that an object presents to a moving observer are constrained by the object's real properties, so the changes in patterns of stimulation that are undergone by a suitably located agent are uniquely determined by these constancies. The agent keeps track of changes to appearances by keeping track of how these show up in perceptual input. The patterns of visual stimuli that are presented to an observer who is moving around a circular object, for example, *change* in a way that is characteristic of circular objects, even if any individual time-slice of stimulation-pattern is ambiguous with respect to the object's properties (for example, an elliptical object may result in an identical pattern of stimulus on the retina - so this individual pattern is ambiguous over whether the object is circular or elliptical). This point is just the familiar issue about the difficulty of inferring or calculating the real nature of the environment from the properties of retinal patterns - the problem is, famously, *ill-posed*. A static retinal pattern does not contain enough information to uniquely specify the properties of the external world. A nearby object, for instance, may yield a pattern of identical size and structure to that which is caused by a distant object. This sensorimotor theory recognises this difficulty and places its focus upon stimulus patterns that evolve continuously over time: sensorimotor skill involves detecting constancies in changing patterns of stimulation, which correspond to constancies in changing appearances, which correspond to the invariant properties of objects.

In fact, on O'Regan & Noëôs original treatment, these constancies may be the only properties that are shared by appearances and patterns of stimulation. Retinal patterns, for example, need not share any structural properties with the appearances by which they were caused - an elliptical appearance need not result in an elliptical pattern of visual stimuli. In such a case, though, visual perception will be possible as a result of (visual perception will be *constituted by)* the agent's picking up on the constancies that exist within the evolving stimulus patterns. On the perception of a straight line, O&N state:

> "Even if the optic nerve had been scrambled arbitrarily, or if the retina were corrugated instead of spherical, thereby causing the image of the line to be wiggly instead of straight, or if the eye's optics gave rise to horrendous distortions, movement of the eye along the line would still not change the pattern of cortical stimulation. We see that this particular law of sensorimotor invariance is therefore an intrinsic property of straight lines, and is independent of the code used to represent them." (O'Regan & Noë, 2001; section 2.2.).

The contingency in question is that which holds between the pattern of retinal stimulation and the movement of the eye along the straight line. With this movement, there is no change

in the stimulus activity. With a different movement however, say a shift from looking-up to looking-down, a different contingency will be in place. During such a transition there will be a change in stimulus activity, in contrast to the case of the first eye-movement. This change in input, too, will behave in a law-like way that is characteristic of a straight line - the straightness of the line determines a whole suite or profile of contingencies. Again, though, none of the properties of the line need to be recapitulated by the pattern of stimulus - that is, the shape of the retinal pattern needn't itself be straight.

It is easy to lose sight of this point in the case of the visual experience of shape and size and so on, because it is easy to conceive of the role of images on the retina as that of constructing an inner picture of the outside world - to imagine, say, a square retinal pattern as the result of confrontation with a square object. However, when it comes to properties like colour we can see that such a proposal is obviously mistaken - it isn't the case that the retinal image of a blue surface is itself blue, for example. Any underlying commitment of this version of the sensorimotor theory to the claim that patterns of stimulation share properties of appearances is misguided. The perception of colour, like the perception of other visual properties, is here a matter of picking up on constancies in the ways that patterns of stimulation change. Colour properties are invariant features just as shape and size are; the visual appearance of a red object changes in regular and characteristic ways just like that of any other visually-relevant property. Colour perception, then, involves sensitivity to these changes, and we do not have to ascribe colour properties to the patterns of stimulation themselves, as we might be tempted to do in the shape case. Likewise, non-visual perception involves understanding the law-like relationships that exist between changing patterns of input and movements of parts of the body, where these patterns do not share properties with the entities or characteristics that are being perceived.

Even in a situation in which the properties of the input pattern *do* match those of the property of the appearance under investigation - say, where the shape of the retinal image is the same as that of the perceived object's appearance - this will not form a relevant part of the sensorimotor contingencies that are in play. It is the constancies in changes alone which are important. This means that there are no *privileged* patterns of stimulus when it comes to fixing the content of an experience. Consider the visual perception of an equilateral triangle: it may be the case that the images that are projected onto an agent's retina as he moves around the figure are the same shape as the appearances that the object presents, and thus that when the observer is located directly in front of the object his retinal image is triangular. Yet this pattern does not hold a privileged position as far as the agent's seeing the shape of the object is concerned; again, it is his knowledge of the sensorimotor contingencies

characteristic of triangle, as they show up in dynamic patterns of input, that does this work.

It is the changes in patterns of stimuli in response to an agent's movements that fix the sensory modality to which a neural region belongs, according to O'Regan & Noë. The activity of the visual system is responsive to movements of the body, head and eyes but not to those of the hands, for example, while systems responsible for audition are those whose inputs alter in response to variations in the position of the ears.

Some of the changes in activity that take place within a sensory system, furthermore, are constrained by the physical makeup of that system rather than the properties of the objects in the environment, as in the case mentioned in the quote above - the shape of the retina itself constrains the patterns of stimuli in which constancies are embodied. This observation yields a distinction, argue O&N, between sensorimotor contingencies that are induced by visual apparatus and those attached to visual attributes, and similarly for the other sensory modalities (O&N, 2001; section 2.3). That is, it yields a distinction between those contingencies that hold between movements and patterns of stimuli as a result of the nature of a creature's perceptual systems and those that hold as a result of the properties of objects and appearances themselves. Each sensory modality will involve sensorimotor contingencies that differ along both of these dimensions - the physical constitution of each sensory system is different, and the appearances that are accessed by way of each modality are different.

A subpersonal mechanism that is sensitive to sensorimotor contingencies will keep track of the changing patterns of stimulation, and in doing so will keep track of those contingencies that are the result of the properties of appearances by way of keeping track of the contingencies that are the result of the physical constitution of the sensory apparatus. On this version, that is, sensorimotor knowledge is embodied in a system that is capable of recognising changes in patterns of input that correspond to invariant properties of external objects, in spite of the character of these patterns being determined by the perceptual systems' physiology. O&N contend that this division maintains something of the spirit (at least) of the traditional distinction between sensation and perception - the correlates of 'sensations' here are the patterns of stimuli, while perception proper is something more: the understanding of sensorimotor contingencies that yields awareness of constant properties. I'm not sure that this analogy (which is presented as more than an analogy (O&N, 2001; section 2.3)) is entirely helpful, as 'sensation' has connotations of mentality and qualitative character to which this account is not congenial.

The sensorimotor contingencies that hold between the appearance of an object and any two

discrete movements are, typically, different. Correspondingly, the contingencies between patterns of stimuli and any two non-identical movements are different, as the straight-line example shows. A movement of the eyes from the left to the right results in an unchanging pattern of stimulus, while a movement of the eyes (or the head) from top to bottom results in a varying pattern of visual input. Every other movement of visually-relevant parts of the body will yield a different pattern. It cannot be the case, given limited neural resources, that knowledge of each and every possible contingency is individually encoded. Instead, the proposal is that there are law-like relationships that are abstracted from the infinite set of possible sensorimotor contingencies (O&N, 2001, section 2.2).

Being in possession of sensorimotor skills, understanding how patterns of stimulation change in response to movements, is not a matter of having explicit mastery of a body of propositional knowledge. It is not that a perceiving agent must be able to report or reflect upon the relationships that hold among movements and sensory inputs; indeed it is typically the case that the agent has no conscious access to subpersonal dealings of this nature. Sensorimotor knowledge is not *knowledge-that* it is, up to a point at least, *knowledge-how*. It is knowledge of how to explore the changing appearances of the environment actively in such a way that allows the agent to be in touch with its invariant properties. Again we must note, though, that the actual performance of a movement that yields changes in input patterns is not a necessary requirement for any particular episode of perceiving. It is not the case, for instance, that an agent must move his hands over the surface of an object in order to undergo a tactile experience of its shape. Instead, his implicit understanding of sensorimotor contingencies is brought to bear on the current, 'instantaneous' pattern of stimulation - the subpersonal mechanism that embodies this knowledge is capable of recognising the changes that this pattern *would* undergo *were* the agent to move, and it is capable of detecting the constancies that exist within these changes as before. So sensorimotor mastery is not a purely skilful activity in the way that mastery of karate, say, is. There is a recognitional or detective element involved too - it is not enough to perform an exploratory movement, an agent must have an understanding of the changes to input that is the result of this exploration, an understanding that it embodies a law-like relationship that corresponds to an invariant property of the world[6].

On this first version of the enactive account, the *content* of a perceptual experience is determined by the agent's grasp of the constancies that exist within changing patterns of input. In addition to this, though, the account aims to dissolve the Explanatory Gap - it aims to establish why and how there is 'something it is like' to undergo an experience, even though

the experience can be explained in purely physical terms.

The solution to (or dissolution of) the Gap offered by OôRegan & Noë relies, first of all, on an interpretation of the problem that differs from standard views. The Explanatory Gap, they argue, is not the conceptual divide between descriptions of qualitative properties of experiences and physical properties of their neural substrates, because phenomenal properties do not, on the enactive view, supervene on brain states alone. They can concede that *of course* it would be mysterious to explain the feel of a visual experience of colour, for example, in terms of the brain states that subserve it, but maintain that this is not the appropriate kind of explanation to advance. What needs to be explained, instead, is how active exploration of the environment, mediated by a knowledge of sensorimotor contingencies, gives rise to qualitative character in experience. According to OôRegan & Noë, there is no Gap here - once we see what is involved in enactive perception there is no further question as to how or why experiences should *feel* a particular way to their subjects.

Recall that the account locates the properties that are experienced, including colours and other so-called secondary qualities, out in the world as properties of appearances. Colours (etc) are not features of experiences, they are features that are experienced; there is, argue O&N, "nothing answering to the theorist's notion of qualia" (2001, section 6.8). This is not to deny, they are keen to stress, that there are genuinely qualitative aspects of experience; it is just that these are associated with the skills and mastery of sensorimotor contingencies and not with mysterious, intrinsic phenomenal properties. Their strategy, then, is to offer an alternative explanation of phenomenal character that does not rely on any conception of brain states as the generators or building blocks of consciousness; perception is something that is done by the whole animal rather than by the brain.

O&N propose that the phenomenal qualities of experience can be modelled on what it feels like to drive a Porsche (2001, sections 6.4, 6.6 and 6.8). There is, they suggest, a qualitative character associated with driving a Porsche, but it is not the case that what is needed to explain this feeling is an explanation of its basis in the brain. Instead, there is nothing more to the qualitative character than one's knowledge of the sensorimotor contingencies involved in this activity - mastery of the ways in which the car responds to one's commands and so on. "There are characteristic ways in which the vehicle accelerates in response to pressure on the gas pedal. There are definite features of the way the car handles in turns, how smoothly one can change gears, and so on." (section 6.4). Mastery of these contingencies is said to be a skilful or practical matter, an active interaction between agent and machine. To master the sensorimotor contingencies of Porsche-driving is to be able to successfully manipulate the

behaviour of the car, and to anticipate and respond to its feedback.

To object that there remains the further question of how *such knowledge* yields phenomenal character - that is, to reintroduce the Explanatory Gap question at the level of sensorimotor mastery - is, according to O&N, to miss the point of the enactive project. It is to misunderstand the nature of the current proposal. They give the following example as further illustration of their point: you hold a bottle in your hand and you feel the whole bottle in spite of being in direct contact with only a limited part of its surface. Your feeling of the presence of the whole bottle is part of the qualitative character of your experience, and it is *constituted* by your knowledge of how to move your hand over the object; how to keep track of the sensorimotor contingencies associated with tactile exploration of solid objects:

> "[P]henomenologically speaking, the feeling of presence of the bottle is not a *conjecture* or an *inference*. The feeling you have is the knowledge that movements of the hand open up and reveal new aspects of bottle surface. It feels to you as if there is stuff there to be touched by movements of the hand. That's what the feeling of the presence of the bottle consists in. But the basis of the feeling, then, is not something occurring now. The basis rather is one's knowledge *now* as to what one can do." (O&N, 2001; section 6.8).

The same is true, the argument proceeds, for all other cases of qualitative feel. The phenomenal character of an experience of a red surface is nothing more than the knowledge of how the appearances presented by a red surface change in response movements of agent or object.

> "It consists in the (implicit) knowledge associated with seeing redness: the knowledge that if you were to move your eyes, there would be changes in the incoming information that are typical of sampling with the eye; typical of the nonhomogeneous way the retina samples colour..." (*op cit*. section 6.4).

This version of the sensorimotor view, then, is ambitious. Its aim is to account for the central features of conscious experiences by making essential reference to skilful activity and the exercise of sensorimotor understanding. Perception is taken to involve an agent's employing bodies of implicit knowledge of how sensory inputs change systematically in response to her movements, and in response to certain other modality-specific conditions of observation, and this is to explain both the content and the character of experience.

2.3: Version 2 – A Perceptual Treatment:

Recall that the relevant differences between possible sensorimotor accounts are presently taken to be grounded in their respective claims concerning what it takes to be in touch with the *appearances* of objects, where these have been defined as external rather than mental properties. The second interpretation of the sensorimotor theory holds that the relation that exists between perceivers and appearances is a perceptual one. Sensorimotor skill, on this version, is said to bridge the gap between how things appear and how they really are, and we can talk of *two levels* of perceptual content, one for each of these sets of properties. This version of the enactive account is, as I read it, the one to be found in Noë's recent work, and is especially evident in 'On What We See' and 'Action In Perception'. Again, my characterisation of Version-2 theories is built around this work but makes explicit the differences between this and competing versions of the enactive approach.

The second interpretation of the enactive view shares the same central structure as the first; perceiving is again construed as a form of active exploration of the environment. As an agent moves around, the appearances that are presented to him by the objects in his environment change and, given that he stands in a perceptual relation to these appearances, his experience of them undergoes corresponding changes too. There are changes to what we can call the first level of his perceptual content, that which specifies the appearances of objects. Sensorimotor skills allow the agent to perceive constancies amid these changes, to understand the changes as corresponding to certain real properties. It is these observer-independent properties that enter into the second level of perceptual content.

We can use several cases discussed by Peacocke in 'Sense and Content' (1983) to determine the contents of the first level, although there are two possible readings of these examples that result in different implications for this version of the enactive account. Consider the case of the perception of two trees located at different distances away from the observer (Peacocke, 1983, p12; and discussed in Noë, 2002, p59 and following). The first reading of this situation, which Noë attributes to Peacocke, is that while the experience represents the sizes of the trees as being identical to one another, the experience possesses additional sensational, non-representational properties according to which the 'image' of the nearer tree is larger than that of the further tree. That is, the nearer tree presents a larger 'size in the visual field' than the further tree. Such sensational properties can be specified by determining the character of the image that objects in the environment would project onto a perspex screen located perpendicular to the line of sight. Holding such a screen up in front of

the two trees and drawing around their respective profiles would result in a bigger image for the closer tree (as Noë puts it, you would need a bigger 'patch' to occlude the image of the first tree). Similarly, drawing around the projected profile of a circular object would yield an elliptical image, the profile of a square object would yield a diamond-shaped image and so on. These properties too are said to belong to the experience of such objects, although they do not form a part of the content of that experience; they are sensational properties of the experience. In these cases, the shape-relevant contents of the experiences will be 'round' and 'square' respectively. While the distinction is said to be between 'representational' and 'non-representational' properties, this should not be taken to be indicative of any commitment to a representationalist account of perception. An equivalent but neutral way of putting the difference would be to say that it holds between properties of what is experienced and properties of the experience.

The way that Noë has defined 'appearances' though - as relational properties holding between objects and observers - allows him to resist the conclusion that the properties that are dubbed 'sensational' by Peacocke must be attributed to non-representational features of experience. Appearances are relational properties that can themselves be perceived and these properties are identical to those that emerge from Peacocke's examples: the nearer tree presents a larger visual appearance to a suitably located observer; a plate or a coin presents an elliptical visual appearance while a table or a postage stamp presents a diamond-shaped appearance. Once we allow that these can be perceived, these properties can form a part of the content of an agent's experience. The plate *looks* elliptical; the table *looks* diamond-shaped. Noë calls these properties variously 'occlusion properties', 'P-properties', 'apparent properties', but I shall stick with the latter. The plate presents an elliptical apparent shape, and two plates located at different distances away from the observer present different apparent sizes.

Sensorimotor skill, argues this version of the enactive theory, is what allows the agent to perceive the real properties of objects *in addition to* these apparent properties. So an experience of an object will possess two levels of content - one which specifies the object's apparent properties and one which specifies its real properties. The plate looks both round and apparently-elliptical. Since apparent properties are relational properties - specifying how things look *from here* - such a story does not involve experiences that possess contradictory content. The first level of content specifies how things looks from this perspective while the second level depicts how things really are with the object.

Unlike the first version of the enactive account, then, we are not here dealing with the activity of subpersonal stimulation, but with perceptual content. So what is tracked or understood in bringing to bear sensorimotor skill is not a changing pattern of input, or a changing series of sensations, but a changing experience of a relational property of the world. And it is changes in *content* that are understood, not changes in non-representational properties (that is a further option that will be considered below). As an agent moves around an object the visual appearances that are presented to him change, and so does his experience of those appearances. In experiencing apparent properties, part of the content of an agent's experience specifies his own relation to or perspective on the objects in his environment. But this content is ambiguous in an important sense, just as the patterns of stimulation were ambiguous in the previous version of the enactive story. A single appearance does not uniquely determine the nature of the object presenting that appearance. For example two objects, one of which is a rectangle and the other a parallelogram, may present identical apparent shapes (may project the same image onto a perspex screen) to a suitably located point in space. However, the overall profile of apparent shapes presented by each object to a series of different locations is uniquely specified by its real shape. A rectangular object presents a particular pattern of visual appearances to a moving observer, while a parallelogram presents a different and distinctive pattern, even though from certain angles they look the same with regard to shape.

As before, the account emphasises the law-like connection between the invariant properties of objects and the appearances they present, and therefore between the invariant properties and the content of experiences of their appearances. Perception is the active process of exploration of objects by way of keeping track of the changes in how they look. It is the bringing-to-bear of knowledge of how appearances change with movements to reveal the constancies that are present amid these changes.

Objects present apparent colours, too, and these are dependent upon the conditions of illumination of the scene and upon the relations between the agent, object and light-source. So an agent's perspective on an object includes these conditions in addition to his spatial relationship to the object, and a grasp of changes to these conditions is part of what determines perceptual content in certain cases. The apparent colour of an object can be thought of as the shade of paint that would have to be used to make a life-like image of how the object looks from here. The apparent colour of a red chip under white light, for instance, may be the same as that of a white chip under red light; each could be painted with the same shade of red paint. An individual object that bears a single colour can have parts that present different apparent colours, too, as when a wall is unevenly lit or partially veiled by shadow.

The sensorimotor understanding required to perceive the conditions-independent colour (as we might call it) of the wall will involve a grasp of the potential dynamics of these patterns of apparent colour as they change in response to movements or alterations in lighting conditions.

Non-visual perception follows the same model, although each involves a somewhat different interpretation of the agentôs *perspective* on the perceived object. Sounds, for example, present apparent volumes: two sounds whose sources are located at different distances from the observer may present the same apparent volume. The sound of a distant car may appear to be the same volume as that of a nearby recording of a car - their volumes are the same-from-here. But their apparent volumes will alter in different ways - according to different laws - in response to a movement on behalf of the agent or sound-source, just as the apparent size of an object does. There are constancies present amid the changes in appearance.

While vision and audition involve a perception of appearances that alter in response to movements around, away or towards an external object, tactile perception involves exploratory movements over their surfaces. So a 'perspective' on an object from a tactile point of view is just the relation between the part of the body that is in contact with that surface and the part of the surface in contact with the body. The tactile appearance of an object is just that part of the object that is available to the agent without moving over its surface; that is, the part that is available to him at any given instant. So, the tactile appearance that is presented to an agent who places his hand on a flat surface, say, is hand-shaped. The low-level, appearance-specifying content of a tactile experience depicts this hand-shaped part of the object. It is by keeping track of the ways in which this appearance changes as the agent's hand moves over the surface of the object that the real properties of the object are revealed. The feeling-the-bottle case described by O'Regan & Noë can be reiterated: feeling the real shape of the bottle in spite of experiencing only the tactile appearance of the bottle at any given instant is a matter of knowing that the different parts of the bottle are accessible by moving one's hands over its surface, knowing the characteristic ways in which the appearance of the bottle changes. So the real shape of an object is perceived in spite of the fact that the agent is only ever, strictly speaking, in contact with a hand-shaped part of the object. Changes in appearance are understood when changes in the low-level content of experience are understood, since the latter map onto the former by specifying them.

The possibility of perception without movement must, as before, be retained. An agent is capable of experiencing the objects in his environment even when he does not employ any exploratory movements that yield changes in appearance. In the absence of movement, it is not the case that the agent *only* experiences the apparent properties of objects, for example the elliptical apparent shape of a plate. He experiences its real round shape too. According to this version of the enactive story, this is only possible for an agent who brings to bear his predictive sensorimotor knowledge of how the content of his experience would change with respect to apparent properties were he to make a movement of his body. In seeing the plate as round and elliptical-from-here, he brings to bear his knowledge of how the latter would change were he to move around it. He knows that round objects present appearances that change in characteristic ways, and he knows those characteristic ways. More generally, the enactive account is committed to the view that perceptual content is determined not only by the kinds of properties to which an agent is perceptually sensitive but by her *understanding* of those properties and the ways in which they are delivered to her. As such, the account is analogous to a strong conceptualist model of perception on which an experience's content is constrained by the subject's conceptual repertoire. On the enactive story, similarly, it is the bringing-to-bear of particular bodies of sensorimotor knowledge (rather than concepts) that helps to fix what is perceived.

The contents of perceptual experiences, then, are said to be partially determined by the exercise of sensorimotor skill. When it comes to their qualitative character, though, it is not obvious that a sensorimotor account that appeals to a relation between agents and appearances that is itself perceptual can, without more work at least, be offered as a solution to or dissolution of the Explanatory Gap. As with any theory of perception, there are options available when it comes to the explanation of this perceptual relation; that is, in explaining how agents' experiences come to have content that specifies apparent properties. The option chosen will, in turn, affect the nature of the agent's sensorimotor understanding as this involves keeping track of changes in the contents of experience.

Noë's recent account, although it is a version-2 theory, is somewhat inexplicit about how the perception of appearances is to be treated. In 'On What We See', he talks of "encountering" apparent properties, of "discovering" them, even of "having sensations" (Noë, 2002, pages 63, 64 and 66 respectively). Given the general thrust of his thesis, though, it is likely that he intends this to be read as a direct-realist theory of perception, with an unmediated relation between agent and appearance. Thus changes in appearance that come with movement can be accessed directly; the agent has an immediate acquaintance with

apparent properties and so his sensorimotor knowledge is about them in a straightforward sense (in contrast to the previous view on which sensorimotor knowledge is of changes to patterns of stimuli, and of apparent properties only indirectly). Direct realist accounts are susceptible to arguments from illusion and hallucination, as will be discussed in chapter 4.

A final possibility for this version of the enactive account is that the perceptual relation that holds between agent and appearance is an indirect one. Here, perception of apparent properties is mediated by perception of sense-data, and it is an understanding of changes in sense-data in response to movements that constitutes sensorimotor knowledge. This is equivalent to taking Peacocke (as Noë reads him) at face value, and claiming that experiences have non-representational, sensational properties. So, the sense-datum attached to a nearby object is bigger than that of a far-away object, even if both are represented as being the same size in experience; the sense-data attached to a circular object are elliptical, and so on. Sensorimotor skill, on a view of this sort, can be interpreted in two different ways. It is either changes in the *content* of the experience that are understood, or it is changes in non-representational properties of sense-data. Therefore it is either the case that the indirect perception of an object involves two levels of content, as this version of the account has so far proposed, or it is the case that the only real content possessed by an experience is that which specifies real, invariant properties. If the latter, then sensorimotor knowledge produces content out of non-content; it produces content out of sensational character. Colour perception, for instance, would involve keeping track of changes in the qualitative character of one's colour sensations as changes in the conditions of perception alter.

The cases of sensory substitution discussed by Noë (Noë, 2002; O'Regan & Noë, 2001) seem to involve a commitment to this interpretation of the enactive theory. Here, the vision-like phenomenology of an experience induced by a tactile-visual substitution system (TVSS) is explained in terms of the vision-like sensorimotor contingencies that hold between sensational output from the TVSS and the movement of the agent's head and body. What is important are the changes to tactile *sensations* that come from such movements - actions of the head and body result in changing patterns of tactile sensation (on the tongue or back, typically), and these changes embody constancies that exist in the environment. This does not appear to involve tactile perceptual content specifying these constant properties (shape, say, or size), and so the sensorimotor aspect does appear to provide a higher level of content from changes in a lower one. It seems, on the face of it at least, to involve perceptual content being constituted by knowledge of changes in patterns of sensation; changes to non-representational properties. So the TVSS case is more like that of the primitive insects case

discussed in section 1 above than it is of the other Version-2 options here.

To clarify, the options available to a sensorimotor theorist who proposes an indirect theory of perception has two options: 1) Experience involves two levels of content. The first level specifies apparent properties and it is a sensorimotor understanding of changes in these that yields the second level, that which specifies real properties. I have indicated that Noëôs favoured interpretation of the perceptual relation to appearances is a direct realist one. 2) Experience has only one level of content, that which specifies real properties, but experiences have additional, sensational properties the sensorimotor understanding of which yields perceptual content. The second option shares similarities with both the first, subpersonal version of the enactive account and with the second, perceptual version.

If sensorimotor skill is construed as the understanding of non-representational properties, it needn't be the case that the changing properties of sensations that are understood mirror those of the appearances of external objects, just as was true for the changing patterns of subpersonal stimuli in the first version of the theory. The shape, say, of a sense-datum needn't match that of the object to which it is attached. Instead, what is important is that sensations change in law-like ways that are characteristic of the real properties that are their causal basis. For example, it needn't be the case that the sensation that is caused by perceiving an elliptical appearance is itself elliptical, so long as changes in that sensation that come with movement behave in a regular fashion that can be understood by the perceiver. It needn't be the case, furthermore, that the redness of a sensation is a property that is shared by the appearance or object, but so long as changes in this sensational property uniquely determine an external property (perhaps a surface reflectance property), the agent's relation to the latter is perceptual. In the TVSS example, the sensations felt on the agent's back or tongue need not share any of the properties of the objects that are perceived by way of sensorimotor mastery. The perception of a large object need not involve a sensation which is felt on a larger region of the back than that which is felt during the perception of a small object, for instance. It is, as always, the changes to the relative patterns of sensation that fix the perceived properties.

To summarise - Version 2 of the enactive approach proposes that the access that perceivers have to the appearances of objects is perceptual in nature, and the content of such perception specifies 'apparent properties' which, in the visual case, can be identified as the properties of the image that an object would project onto a perspex screen perpendicular to the line of sight, and more generally as the properties that objects (sounds, smells etc) seem to have

from a given perspective. Sensorimotor skill involves understanding changes in the content of an experience of appearances. It is either the case that bringing this understanding to bear *constitutes* the perception of the real properties of objects, or that it *results* in an experience with a second level of content specifying real properties that is constrained by the perceiver's independent understanding of those properties.

On an indirect theory of the perception of appearances, a further option emerges. Rather than being an understanding of changes in the content of experience, sensorimotor skill could be an understanding of changes in non-representational properties of sense-data. The explanation that this version of the enactive approach provides concerning the qualitative character of experience will depend upon how the perceptual relation between agent and appearance is elucidated.

I have termed all of these options õVersion-2ô accounts because they share the view that the relation that holds between the perceiver and the apparent properties of her environment is a personal-level phenomenon, in contrast to the construal of Version-1 stories.

2.4: Version 3 – A Simpler Perceptual Treatment.

The third version of the enactive approach again interprets the relation between agent and appearance as a perceptual one but involves a rejection of 'apparent properties' as Noë construes them, and so the contents of perceptual experiences come out differently. Although it again shares their central features, I have separated this version of the account from those in the preceding section because its implications are importantly different. It remains the case, on this third option, that sensorimotor knowledge brings about a new level of content that is inaccessible to perceivers who are ignorant of sensorimotor dynamics, but the objects and properties that are specified at each level are not the same as those entailed by the kinds of enactive theory outlined so far.

In the visual case, to begin, rather than taking there to be appearances construed as properties that an object would project onto a perspex screen perpendicular to the line of sight, what are perceived prior to the exercise of sensorimotor understanding are simply those *parts* of objects that are visually accessible from a perceiver's location. From where she stands, a visually-sensitive perceiver can directly see only the facing sides of solid objects. It is not part of the content of her visual experience on the current view, though, that these objects possess apparent properties. The side of a cube is seen as being square and bearing a particular spatial orientation with respect to the observer, and not as being diamond-shaped. Rather than looking bigger, a nearer tree looks the same size as a further tree and closer. This

conception brings the visual case in line with the tactile case, for example. Tactile appearances, we saw, are just those parts of an object or surface that are accessible to an agent at a single time; the hand- or finger-tip-shaped area of a flat surface, for instance. On the current interpretation of visual appearances the same is essentially true; they are those areas of an object that are visible in an environment that may be cluttered with occluding surfaces. It is not the case, though, that these are to be specified in terms of two-dimensional occlusion properties or patches.

Noë's account, by contrast, results in there being a quite different explanation for the cases of visual and tactile perception respectively. Visual appearances taken as apparent shapes, sizes and colours are not the same as parts of objects. The perception of the appearance of a round surface from an angle, for example, does not involve perceiving merely a part of the round surface - it involves seeing it all at once, as being elliptical-shaped. So this case cannot be compared straightforwardly with a tactile example, because these *do* involve the perception of parts of objects, and there are no 'apparent shapes' in the relevant sense: no properties that are not possessed by the object are perceived. Noë's account, then, must propose one sensorimotor story for the tactile case - the real shape of the object is revealed by exploring the different *parts* of the object - and another for the visual case - the real shape of the object is revealed by exploring its changing *apparent shape*. The current proposal is a rejection of the claim that agents perceive apparent properties at all, so these properties do not show up as contents of their experiences on any level. Instead, it is real properties - real shapes, real sizes and real colours - that are perceived prior to the exercise of sensorimotor knowledge.

If this move is made, though, the role of sensorimotor skill is diminished - there is more, essentially, in the first, pre-sensorimotor level of content. On a Version-3 account, there is no need for a sensorimotor story to explain how agents come to see the real shapes, sizes and colours of objects - or their spatial relations to the observer - the content that is to be fixed by any putative enactive ability is additional to that which specifies these properties. There is still a role to be played by the exercise of sensorimotor understanding in helping to determine perceptual contents on this view, though. Although only ever having immediate visual access to the facing side of an object (by which I mean visual access that doesn't require moving around the object; we can remain noncommittal over whether the perception of the facing side is 'direct' or 'indirect' in a more technical sense at this stage), this account states that we nonetheless have a sense of the presence of the far side of the object too, and

that this sense is genuinely perceptual. We have, that is, a perceptual sense of the 3-dimensional shape of the object, of its continuity through space with parts that are occluded. A sphere looks spherical, in spite of the fact that only a hemispherical part of the object is visible; a line looks straight and continuous even though part of it is concealed from view. Furthermore, objects look solid and extended even though only their surfaces are accessible to vision.

The third version of the sensorimotor account argues that it is this content that is acquired by way of enactive skill. Therefore the third version allocates a more modest role to sensorimotor skill - just to the determination of 3-dimensional-shape and extension content rather than to 2-dimensional shape content and so on. Again, we can consider sensorimotor skills as abilities to resolve ambiguity. The first level of content, specifying how things look from here, is ambiguous over the real properties of the objects that present these appearances. It could, for instance, be that the thing that looks like a sphere from here could be a half-sphere, or that a straight line is in fact broken in the region occluded by some surface. These cases present visually identical parts to a suitably situated observer, and so result in identical experiences under normal circumstances. Movement, though, reveals - or would reveal - the hidden parts of the world to the observer, and thus reveal objects' real 3-D shapes and extension. It is through understanding the changes in how-things-look-from-here that agents perceive these properties. Noë himself uses these cases, for example in his discussion of the perception of a tomato (2004b, p3), but treats them, wrongly, as being of the same type as the apparent-properties, Peacocke-style cases of before. He thinks, that is, that seeing the facing side of the tomato and knowing how new parts of it will come into view in response to movement is the same as seeing a round plate as looking elliptical and knowing how this apparent property changes with movement. While these cases may be on a continuum as far as possible constructions of the enactive view go, they donôt involve the same kinds of perceptual content.

Another 'apparent property' that is eliminated by this version of the theory is that of apparent colour. The proposal of the previous version was that surfaces appear to possess different apparent colours in regions that are illuminated by different lighting conditions - so a brightly lit patch of wall, say, has a different apparent colour from a more darkly lit patch. The apparent colour of each region is identical to the shade of paint which would have to be used by an artist if he were to create a faithful representation of the wall. On such an account, sensorimotor skill (more particularly, an understanding of how apparent colours

change in response to changes in movements *or* in conditions of illumination) yields a perceptual grasp of the surface's real colour, so the wall is seen as both apparently-bright-here-and-apparently-dark-there *and* as being uniformly coloured across its whole surface.

Version 3, however, rejects the claim that apparent colours enter into the content of visual perception. Instead, the content of an experience of a surface specifies both the real, uniform colour and the conditions of illumination. The wall is seen as being the same colour across its surface and as more brightly lit here, less brightly lit there. Whereas in the case of the perception of shape and size it is the relative *spatial* arrangement of objects in the environment that is specified in the content of a visual experience (along with real shape and real size), in the colour case it is the wider conditions of observation that pertain to illumination. This includes the relative location of light sources, reflective surfaces, shadows and so on. It is not the case, argues Version 3, that surfaces look different colours in regions that are differently illuminated - such patches look the same colour, the colour possessed by the whole object. It may be true, this version can concede, that paints of different shades would be needed to create an accurate image of the surface, but this need have no bearing on how best to specify the content of colour perception.

The rejection of apparent colours as contents of visual experience again attenuates the role of sensorimotor skill. It is the real properties of objects, along with conditions of lighting, that are perceived and this has no sensorimotor basis: it does not involve understanding any changes in appearance. The enactive part of this version of the theory accounts only for the perception of the properties of 3-D shape, extension and solidity.

In reducing the role of sensorimotor skill to fixing only the content that specifies 3-D shape and extension, this version of the approach has multiplied the work that needs to be done by whatever theory of perception is employed to account for the experience of appearances - that is, whatever theory we use to account for the *rest* of the content of experience. What is required is an explanation of how agents come to perceive the real properties of objects and their own perspective on them, which includes conditions of illumination. This content is not derived from sensorimotor skill on this model, and so an independent theory of perception must be brought to bear. As a result, the Version-3 enactive model is consistent with a range of both direct and indirect theories of perception. A representationalist account, for instance, could deal with these perceptual contents in intentional terms: in visual experience, objects are represented as having certain intrinsic properties and as bearing certain spatial relations to oneself.

2.5: Summary and Conclusions:

The three versions of the enactive theory, and the space of options that exist within these three interpretations, represent genuine differences when it comes to the role and nature of sensorimotor knowledge.

Version 1 construes the access that perceivers have to appearances as a subpersonal registration of stimulation, and sensorimotor skill as an understanding of the changes that patterns of such input undergo in response to movements. The changes embody invariant properties of external objects, and perception is the task of registering those invariant properties by keeping track of changing patterns of stimulation. Features of an agentôs sensory systems may constrain the properties of those patterns of stimulus that must be kept track of in experience, but the *ways* in which they change are nonetheless law-like and systematic. Some sensorimotor dynamics involve changes that are not (or not only) the consequences of movements, but are instead the result of alterations in conditions of observation such as lighting intensity and hue.

The second and third versions construe the relation between agent and appearance as a perceptual matter, although the two interpretations differ over which properties are specified in the pre-sensorimotor content and so also over which properties are perceived through the exercise of enactive skills.

Version 2 describes the phenomenology of visual experience thus: agents perceive both apparent properties and real properties, where the former are possessed by appearances and the latter by objects. Sensorimotor skill allows the agent to perceive real properties in spite of only ever being confronted by apparent properties at any given moment. As before, apparent properties - and the experiences thereof - change in regular ways in response to movements, and these regular ways correspond to invariant properties of objects. Two options are open to the sensorimotor theorist here - either sensorimotor skill involves understanding changes in the content of experience, or changes in the non-representational properties of experience.

Visual appearances are to be understood as the properties that objects would project onto a 2-dimensional screen perpendicular to the line of sight; apparent shapes, for example, are specified by the outline that would be drawn on such a screen, while apparent sizes correspond to the size of the patch that such a profile would occlude on the screen.

Version 3 limits the role of sensorimotor skill to the determination only of perceptual content that specifies the 3-D shape and extension properties of objects. Apparent properties as Version-2 models construe them are rejected, and the first level of perceptual content is taken to concern those parts of objects that are accessible to the perceiver from his current location, which includes the posture of his arms and hands and so on in the tactile case and takes into account occluding objects in the visual and auditory cases. Sensorimotor skill provides the perceiver with a perceptual sense of the presence and nature of those parts of objects that are outwith the current appearance, rather than with the perception of real properties out of apparent properties.

There are relational properties that show up in the contents of experience on this view: the parts of objects and surfaces that are in view from a particular perspective are constrained by the observerôs location and that of other entities in a cluttered environment. These object-parts are not to be confused with properties of profiles on a hypothetical 2-dimensional screen, none of which are perceived.

An additional possibility is that two or more of the versions presented above are compatible with one another, and that the sensorimotor theorist can adopt the claims of each. In arguing that enactive skill can yield both perceptual content which specifies real properties rather than apparent properties (where real properties are 2-D shapes, orientations, sizes, colours and so on) *and* content that specifies 3-D shape and extension, Noë's view appears to be consistent with both versions 2 and 3, for example. Such a story would involve two levels of sensorimotor skill - one which brings about the perception of real properties from apparent properties and the other the perception of 3-D shape and extension from a grasp of the ways in which the first level of content changes with movement. For instance, the visual perception of a cube would involve an understanding both of the ways in which the visual apparent properties of the cube change with movement, and an understanding of the ways in which new parts of the object would be revealed to view with movement. The plausibility of such a mixed version of the theory will rest upon that of its constituents.

In the next chapter, I outline a series of challenges to each version of the sensorimotor theory, and to the approach more generally, and conclude that none is satisfying in unqualified form. We can use the taxonomy I have drawn up in this chapter to assess more clearly what the possible components of an enactive perspective might be; we can understand that a simple appeal to 'the sensorimotor account of perception' is likely to confuse the details I have set out.

Chapter 2 Notes.

Footnote 1: Nothing I have said so far rules out that the second creature could essentially *become* the third creature through learning about sensorimotor contingencies; I will say little, in fact, about the origins of sensorimotor skills.

Footnote 2: In the visual case; it would be a further task to extend this treatment to the other sensory modalities.

Footnote 3: As we shall see, there are versions of the enactive approach that permit that this contact with appearance is not *immediate* in the traditional sense, but may involve representation. So we should take 'immediate' here to mean simply unimpeded, in the way that is true of the facing side of a table, say, but not its reverse.

Footnote 4: We might think that at least some movement is required in every perceptual episode ï say, a movement of the eyes or head in the visual case. However, it is important to note that there will be an anticipatory or counterfactual component to *every* experience, in that it is not the case that every possible sensory-relevant movement will be carried out during each perceptual encounter. One sees a cube, say, by bringing to bear oneôs knowledge of its full sensorimotor profile ï i.e. the ways in which its visual profile would change in response to oneôs movements ï but one doesnôt need to actually carry out each and every movement in that profile in order to do so.

Footnote 5: Here "images on the retina" is used as a shorthand for whatever patterns of early-visual-system activity need to be appealed to by the enactive theorist. I take it that O'Regan & Noëôs use of the same terminology is doing a similar job in their paper, and that they are not committed to its being (only) retinal image changes that are understood in visual perception.

Footnote 6: Indeed, such movements are not even *necessary* ï the idea is that the law-like relationships can be understood or recognised even in the absence of movement (see footnote 4).

Chapter 3: Difficulties Facing the Sensorimotor Approach.

Having outlined three competing versions of the sensorimotor theory in the previous chapter, the task now is to determine the plausibility of each interpretation, and that of the approach as a whole. I argue that the first two versions face significant challenges and that the third, while interesting, does not present us with genuinely explanatory resources when it comes to the difficult philosophical issues of perception and consciousness. I start by examining each of the options in turn and assessing how well they stand up to philosophical scrutiny before turning to some more general worries that face the enactive approach.

The three sensorimotor accounts developed in the last chapter vary in their explanatory ambition, with the first version being the most substantial and the third version the most limited in scope. The first version aims to account for both the content and qualitative character of perceptual experience while the third version attempts only to explain how one level of perceptual content - that which specifies 3-D shape, extension and solidity - is acquired. The second version has moderate ambition, since it hopes to bestow the sensorimotor aspect of the theory with an explanatorily significant role in the determination of content. As a result, as far as the genuinely sensorimotor components of each version go, the first account is susceptible to a wider range of challenges than is the third version, as we shall see.

3.1. Version 1:

Recall that this account states that sensorimotor knowledge concerns the ways in which subpersonal patterns of stimulation change in response to movements. The changes that occur to input patterns - images, for example, on the retina - embody constancies that are present in the changes in appearances, which in turn correspond to the real properties of external objects. Perceiving, then, is a matter of detecting or coming to be in touch with these constancies by way of understanding actual or possible changes in sensory input. In explaining perception purely in terms of the understanding of subpersonal stimulation, furthermore, O'Regan & Noë offer this version of the enactive theory as one to which the traditional problem of the Explanatory Gap ï the problem of how to explain the qualitative features of experience in physical terms - does not apply. It is with this strong claim, and the nature of the sensorimotor understanding that is at play here, that this section is concerned. I will argue that the cases that O&N present as exemplifying a successful explanation of qualitative character in experience fail to secure their wider conclusions concerning

Explanatory Gap closure, and that they fail to adequately respect the division between personal and subpersonal levels of explanation.

The primary argument for the claim that there is no Explanatory Gap on Version 1 of the enactive account rests upon a particular interpretation of the kinds of conditions that *would* yield a Gap, and the rejection of those conditions on this theory. There *is* an explanatory divide between a description in physical terms of activity of the brain during a perceptual episode and a description of 'what it is like' to undergo that episode, because the two domains are conceptually isolated (see, e.g. Chalmers, 2006). However, Version 1 maintains that there is no such divide between the qualitative character of an episode and its occurrence understood (in physical terms) as an extended, skilfully-mediated interaction between perceiver and environment. So the solution offered by the enactive theorist involves a reassessment of what it takes to constitute a conscious experience, and a description of those conditions that appeals only to physical events and processes.

As mentioned in the previous chapter, the two central cases to which O'Regan & Noë appeal in support of this strategy are that of the tactile perception of a bottle, and the analogy with the exercise of skills in driving a Porsche. I suggest that neither of these does the work that they are intended to do. On a Version-1 account, the exercise of sensorimotor knowledge involves anticipating or understanding the patterns of subpersonal sensory stimulation that are result of particular movements. The bottle case, however, does not obviously involve bringing to bear knowledge of *this* sort; in fact, it appears to rely on what I have called a Version-3 interpretation of the view on which what changes, and what is understood, is how different parts of the bottle will feel when one's hands travel over its surface. That is, it relies upon an agent's grasp of how a *perceptual* relation (a personal-level phenomenon) changes with movement, and not of how mere stimulation will change. In conflating these two accounts, I propose, the example results in a question-begging solution to the Explanatory Gap, one that is dependent upon the prior presence of phenomenal properties[1].

A perceptual contact with the surface of the bottle, however limited, carries with it a phenomenal character of its own. The part of the bottle with which my hand is in contact, that is, feels a certain way to me (cold, perhaps, or smooth), even if the perceptual presence of the rest of the bottle is constituted by my sensorimotor knowledge. At best, then, the example as it stands may be sufficient to account for the qualitative feel of the presence of the whole bottle (if we accept that this comes into the character of the experience), but leaves

untouched what it is for bottle-parts to feel cold, smooth and so on.

One way in which this case might be spelled out within the Version-1, subpersonal-tracking framework is to propose that the phenomenal component attached to one's current grasp on the bottle - prior to any movement - is itself a product of one's sensorimotor knowledge of the ways in which patterns of stimuli associated with the feeling of temperature and texture (etc) vary with movements. This is to acknowledge that there is a qualitative aspect to one's current, pre-movement grasp of the bottle, but to explain this too in sensorimotor terms. The third version of the enactive account as I have presented it makes a contrasting proposal - that sensorimotor skill provides the agent with a further level of content in virtue of keeping track of a lower level which itself has a qualitative feel. In the bottle case, the agent's sensorimotor mastery provides him with an experience of the presence of the bottle - its 3-D shape and solidity - through his understanding of the ways in which his experience of the bottle's coldness and smoothness vary with his movements. The version 1 story, on the other hand, claims that the agent's sensorimotor mastery provides the experience of the coldness and smoothness as well as the presence of the object, and we are owed an account of how this is.

If this suggestion is adopted, and I think that it is at least implicit in O&Nôs account, then the task will be to explain how sensorimotor mastery of subpersonal activity should feel like anything at all. After all, if the Porsche-driving example is to be believed, it is the perceiver's grasp of the ways in which patterns of input respond to bodily movements that carries with it - or rather constitutes - the phenomenal component of his experience. Without bringing to bear his sensorimotor expertise, that is, the inputs to his sensory systems have no intrinsic phenomenality. For a successful closure of the Explanatory Gap, what we need is not only an account of why performing certain suites of sensorimotor interaction with the world has a qualitative feel, but also why bringing to bear implicitly-held sensorimotor *knowledge*, in the absence of movement, should have a qualitative feel.

The Porsche-driving analogy does not satisfy the second of these tasks. Consider the requirement that an agent's *predictive* knowledge of sensorimotor contingencies be sufficient for his perception; that it is possible to have an experience with content and a phenomenal feel even without performing an exploratory movement. This shows that the qualitative feel associated with an episode of perceiving cannot be necessarily grounded in the performance of such an action, assuming that perception based upon predictive knowledge has a qualitative feel, and there is no reason to suspect that it does not. That is, the phenomenal

character of an experience, on an enactive approach, cannot be limited to what it feels like to perform an exploratory movement, and it cannot be limited to what it feels like to track patterns of changing input that are the responses to these movements. This is because experiences can take place in the absence of movements, and in the absence of such changing patterns of input.

There is, as far as I can see, no analogous qualitative feel attached to not driving a Porsche but knowing how it *would* respond were you to do so. While there may be such knowledge, and it may be possible to bring it to bear in some sense, perhaps whilst sitting in a Porsche, it is difficult to see how doing so yields any qualitative feel (beyond, perhaps, something akin to mental imagery). This failure of the analogy to match enactive perceptual cases is a symptom of the excessive emphasis that this part of O&Nôs discussion places on the bodily-exploration aspect of the sensorimotor theory. While many episodes of perceiving do involve physically exploring the environment with one's body, and it may even be the case that the possibility of perceiving without acting is in some sense dependent upon these cases, it is the *understanding* of the changes in input in response to movements that is important for the business of perception, even where a movement is performed. The possibility of perception through bringing to bear one's predictive knowledge of sensorimotor contingencies, which is a condition that the enactive view must uphold, shows that there are cases in which perception is possible without movement and without changing input, and thus that it is the agent's expectations concerning possible changes in input that here constitute his perception - an understanding of the ways in which the current input would change with movement. This understanding is based on expectancies, and these expectancies correspond to an implicit knowledge of the invariant properties that underlie sensorimotor contingencies. But the same must be true when an exploratory action is made, at risk of having to provide a radically different explanation of how perceptual content is acquired in the movement and no-movement cases respectively[2]. That is, it must be the understanding of sensorimotor contingencies that does the work in both cases rather than just in those situations where the understanding takes the form of predictive or anticipatory knowledge.

The challenge for Version 1 of the sensorimotor account is thus to explain how bringing to bear knowledge of changes in subpersonal activity - however this 'knowledge' is to be spelled out - can result in or constitute perceptual experience, and in such a way that dissolves the explanatory gap. An appeal to how it feels to act in a sensorimotor-skilful way - like that made in the Porsche-driving analogy - will be insufficient for this task.

A further condition on perceptual *awareness*, and one which receives only a comparatively

brief treatment in O&Nôs paper, is the requirement that an agent's knowledge of sensorimotor contingencies be integrated with his higher cognitive capacities. To have visual awareness, for example, the agent must not only master the ways in which patterns of visual input vary in response to the movements of his eyes, head and body, he must also recruit this understanding into his reasoning, planning and action-guidance. Perceptual consciousness, then, comes only when sensorimotor skills are put to use by higher cognitive faculties[3].

This condition is introduced to allow for cases in which sensorimotor knowledge is exercised to a certain extent, or for certain purposes, but where these are insufficient for consciousness. It is an attempt, that is, to refine the notion of 'bringing to bear sensorimotor skill' in such a way as to secure all and only cases of genuine perceptual awareness. The suggestion is that when an agent is making use of his sensorimotor understanding, but not integrating his knowledge of sensorimotor contingencies with his higher level functions, he is unaware of the objects and properties that underlie those contingencies. This is evidenced, argue O&N, in such cases as when an agent is driving a car and holding a simultaneous conversation with his passenger (section 2.6). Although the driver's brain is 'tuned to' the sensorimotor contingencies that are associated with the visual properties of the scene outside the windscreen, and can use them for the purposes of controlling the car, what he lacks is any awareness of the scene, due to his attending to the conversation. Awareness comes only with (and is constituted by) the exercise of sensorimotor knowledge for the purposes of planning and reasoning; employing such knowledge in the service of action-guidance is not sufficient.

More generally, the strategy aims to eliminate the possibility of there being a Zombie agent who is in possession of all the sensorimotor skill and understanding that has so far been discussed. Recall that a philosophical Zombie is a creature who is in possession of certain physical or functional attributes that are proposed by a theory as sufficient conditions for consciousness, but who nonetheless lacks any phenomenal awareness. If the conceptual possibility of such a creature is sustainable, then the relevant sufficient conditions are shown to be inadequate - we can conceive of a Zombie who satisfies the conditions without being conscious. Sensorimotor skills, especially on Version 1 of the approach and especially when we consider the predictive or anticipatory cases, look like prime candidates for attributes that could be possessed by a Zombie. That is, at least at first glance, it seems possible to conceive of a creature who has mastered all of the ways in which his subpersonal patterns of stimulation vary in response to his movements but who nonetheless fails to have any phenomenal experiences. This is simply a way of bringing out the intuition that knowledge of any sort, still less knowledge of brain activity, is an unlikely candidate for constituting perceptual consciousness in the first place.

The additional requirement that higher capacities such as planning and reasoning be integrated with such knowledge, though, appears to reduce the force of the Zombie claim, in that it becomes difficult to see what more would have to be added to give phenomenal consciousness.

Could a Zombie exercise sensorimotor skills for the purposes of planning and reasoning? O&N observe that such a creature would have to be endowed with what Block (1995) has called 'superblindsight' (O&N, section 7.1 and following) - the ability not only to make reliable discriminations between object properties in spite of having no conscious access to them (as a blindsighter can, to a certain extent) but to have access to the information on which those discriminations are made, still in the absence of phenomenal awareness. Blindsighters are required to 'guess' the nature of the stimulus, but perform at above-chance levels of accuracy. Superblindsighters, on the other hand, are indistinguishable in their behaviour and speech from normal perceivers because they have access to the information on which their 'perceptual' judgements are based; they don't need to be prompted to make a guess. On an enactive account of perception, the superblindsighter is an agent who has mastered sensorimotor contingencies, can make perceptual discriminations on the basis of exercising this mastery, and who has access to the contingencies on which perceptual judgements are made while still lacking phenomenal consciousness.

O&N deny that superblindsight is conceptually possible. It is not possible, they argue, to conceive of an agent who is capable of performing just like a normal perceiver in the absence of phenomenal consciousness. While blindsighters are limited to making fairly crude discriminations - between lines that are horizontal versus those that are vertical, say - a superblindsighter would exhibit a far wider range of 'perceptual' skills, such a wide range that the claim that he has no phenomenal consciousness diminishes in likelihood:

> "[I]f we imagine [the] informational content greatly enriched, as would seem required in the case of superblindsight, then the claim, on the part of the subject, that he lacks P-consciousness, becomes highly implausible. It is difficult to make sense of the claim that a person might offer an accurate description of a painting say, describing all the colors and the geometry of the composition in a natural manner, all the while having no experience of the painting. One loses all grip on what it could mean to say that the subject *has no experience*." (O&N; section 7.2, emphasis in original).

If this is right, then it is not possible to conceive of a Zombie who has access to the basis of his perceptual discriminations; that is, one who on the enactive view has access to the

sensorimotor contingencies that underlie his perception of the world. O&N propose that any agent who is capable of verbally reporting on the contingencies that are the basis of his perception, or of using them for the purposes of reasoning and planning has the requisite kind of access that threatens his status as a Zombie. For any agent who is able to use his mastery of contingencies for the purposes of reasoning and planning, in a way that is as rich and skilful as that of a normal perceiver, we 'lose all grip' on what it could be for the agent to lack experience.

This, as O&N note, is to 'cut across' Block's traditional distinction between Access-consciousness and Phenomenal-consciousness. Rather than there being a sharp line between conscious access to information and conscious phenomenal properties, or qualia, it may be appropriate to interpret at least some of the latter in terms of the former. At least, it may be inappropriate to insist that there are phenomenal properties that must be introduced and explained over and above one's explanation of an agent's access to and use of sensorimotor contingencies.

The proposal that a creature who can self-prompt his perceptual discriminations and responses but who is nonetheless unconscious is inconceivable is made, too, by Andy Clark in 'A Case Where Access Implies Qualia?', albeit in a way that involves an alternative conception of what it takes to self-prompt. This kind of strategy, furthermore, is one that I endorse and that I investigate fully in chapters 5, 6 and 7. It should be noted that the rather brief treatment I provide in this section is largely introductory ï much more will be said about this important feature as I proceed.

Clark considers the possibility of an organism who can not only make certain perceptual discriminations but *knows that he can when he can* by being in touch with the sensory modality that underpins his discriminatory ability. Being in touch with a modality, I argue, involves being able to integrate facts about its operation into one's higher-level capacities of planning and reasoning and so is identical to O&Nôs condition of cognitive access.

I take the organism discussed by Clark in the opening of this paper, who can "be interrogated about his own acts of perceptual difference-detection" to be essentially the same as a superblindsighter. And again, the argument is that once we conceive of this case in the right way, as involving a creature with the right kind of Access-consciousness, it is impossible to imagine what could conceivably have to be added to get Phenomenal-consciousness[4]. To be interrogated about one's acts of perceptual difference-detection is just to be asked whether one needs to guess about the informational basis of one's discriminations.

In response to an interrogation concerning a particular perceptual discrimination, Clark's creature can respond, he argues, in one of two ways. Either it must report *no* access to the means by which the discrimination was made; or it must report that it has some, perhaps limited, access to the sensory modality by which the discrimination was made. If the latter response is given, the agent is a putative superblindsighter whose access tells him, for example, that his discriminations are visual rather than tactile (Clark, 2000a, p1). In this case the creature's abilities exceed, in fact, those which O&N ascribed to their superblindsighter. As Clark puts it, "I have access *not just to the products of my sensory activity,* but also to certain aspects of the sensory activity itself" (p1, my emphasis). I take it that O&Nôs superblindsighter possesses only the former access: access to the sensorimotor contingency information on which a discrimination was made, which enables him not to have to guess in the manner of the non-super blindsighter.

However, the extra access proposed by Clark is easily accommodated by the enactive account. All it is, by hypothesis, is a non-inferential awareness of the sensory modality that is in use during a particular episode of perceiving. On the enactive account, information about sensory modality is available from two sources: 1) it is embodied in the contingencies that are encountered by the agent - visual sensorimotor contingencies behave in ways that are characteristic of vision, while tactile contingencies behave differently, and so on. 2) different modalities typically employ different parts of the body, or at least involve using them in characteristic ways (one may both touch and see by moving one's head, but one will move differently in each case). All that is needed for the kind of access that Clark suggests is 1) a means by which this information is recognised as being indicative of the modality in operation, and/or 2) a means by which the agent comes to know which parts of the body he is using and the way in which he is using them. Both of these, and especially the latter, appear to be eminently plausible candidates for capacities that are possessed by normal perceivers. Furthermore, they are non-inferential ways of accessing the modality in question - it is not that the agent uses his knowledge of which body-part is in action to *infer* the modality in use, it's rather that to know which body part is being used for the active exploration of the world just is to know the modality. This is because the enactive view interprets perceiving as exploring, so it is not that bodily action simply moves our sensory apparatus around, it partially constitutes our perception. So knowledge of sensory modality that is acquired in this way is unlike the example of an inferential access to modality that Clark himself gives: knowledge that closing one's eyes leads to an inability to make the desired discrimination.

Likewise, to pick up on the characteristic sensorimotor contingencies of one modality just

is to know that it is that modality which is in action. Clark notes that if any such access is to form a part of the explanation of the phenomenal feel of a perceptual discrimination, then it cannot itself be accompanied or constituted by a phenomenal feel of its own (*op cit.* p4), at risk of circularity. Access to modalities on the enactive view obeys this condition, too. There is no necessary phenomenal feel attached to knowing which part of one's body is being used to explore the environment, and neither is there one attached to recognising the sensorimotor contingencies that are particular to a modality.

Clark thinks that the what-it-is-like-ness of making a visual discrimination, its phenomenal quality, is captured by this notion of a non-inferential access to the modality:

> "[I]n this case, access-awareness (of the act of detecting a difference using a specific modality) seems to imply that there is (or is reported to be) something it is like to detect the difference". (*op cit,* p2).

It is a case, plausibly, where Access-consciousness implies Phenomenal-consciousness[5]. But Clark concedes (p7) that the scope of the explanation may be somewhat limited. The argument shows, if successful, that it must feel like *something* to make a perceptual discrimination when the requisite patterns of access to modality are in place, but it hasn't yet been shown that such an episode must possess the particular phenomenal feel that it does. For example, it shows that it must feel like something for an agent who has direct non-inferential access to his visual modality when making a discrimination between a red and a green stimulus, but *not* why the perception of the particular stimuli has the phenomenal feel that it does - its redness or green-ness.

This concession, it seems to me, falls out of the intuition that Clark's argument has only attempted to explain what it feels like to make a visual discrimination (say) *rather than a tactile one* (say), and that it hasn't explained what it feels like to make one visual discrimination *rather than another visual discrimination*. We can accept that the creature who has non-inferential access to his sensory modalities could necessarily never be a Zombie without accepting that his phenomenal consciousness is constrained to any particular character. In this sense, the case is still vulnerable to an Inverted-Spectrum style argument (see, for example, Block, 1990) - nothing has yet been said about why an agent's colour experience has just this phenomenal feel rather than its inverse, for instance.

Clark's argument, then, goes some way towards an explanation of phenomenal consciousness but not far enough to settle the matter, and certainly not far enough to resolve the issue in a manner that satisfies the qualiaphile. It is my goal in the remainder of the project to develop an account of conscious experience that employs a similar move to that

described above, but where self-prompting is performed by way of the perceiver's access to the space of actions that is enabled by his perceptual sensitivity to the world[6]. This route, as we shall see in the following chapters, avoids certain difficulties that face Clark and O'Regan & Noë's proposals.

The problem with making use of the Access-implies-Qualia proposal in either of the ways suggested so far is that it is unclear that this type of access is in fact in place, especially if there is a requirement that the product of the access be used for the purposes of planning and reasoning, and unclear whether access of any sort to patterns of subpersonal activity is sufficient for phenomenal consciousness.

For the superblindsight case to be inconceivable - for it to be impossible that such a creature could exist and still be a Zombie - the agent must have a very rich access to the output of his sensorimotor processing mechanisms, to an extent that renders him indistinguishable from normal perceivers. His ability to make perceptual discriminations is as finely-grained as our own, and thus he must have access to many and varied sensorimotor contingencies. Version 1 of the enactive account has argued that knowledge or mastery of sensorimotor contingencies is a subpersonal matter: it is either the case that there are mechanisms that are capable of recognising a given changing pattern of activation and producing a 'result', for example to recognise a pattern of input as being characteristic of round objects and producing an output with the content 'round', *or* it is the case that there is nothing more to perception than undergoing certain patterns of input even if they are not recognised as belonging to a particular external property. If the former is true, then access to sensorimotor contingencies is access to the output state and its content, with the use of this content for planning and reasoning. If the latter is true, then access to sensorimotor contingencies is just the ability to make use of certain expectancies concerning patterns of input for the purposes of planning and reasoning.

In both cases it is difficult to see that the right kind of access is in place. It is just not true, one might argue, that human perceivers have this access to the activity or output of their subpersonal mechanisms. Visual sensorimotor contingencies, for example, involve the activity of patterns of the retina or the early visual system, and it is implausible to propose that this activity is available for the purposes of reasoning, report, action-guidance and so on. But it is this activity which carries the information about the world on which perceptual discriminations are made, and it is access to this information that must be possessed by the superblindsighter if he is to avoid Zombification. To make finely-grained discriminations,

furthermore, the agent's access must be tuned to a wide range of potentially very similar patterns of activity.

If sensorimotor knowledge is construed as the personal-level ability to anticipate and make sense of the changing patterns of subpersonal stimuli that come in response to movements, then it can be sensibly denied that there is any such ability on the basis of the denial that there is any such access. In fact, O&N concede in section 6.6 that many 'low-level' sensorimotor contingencies like the patterns of stimuli on the retina are inaccessible to the agent, and this appears to contradict their requirement that contingencies must be integrated with reasoning and planning if they are to produce conscious awareness. The examples they give of contingencies that *are* available for access - like looking at a plate and seeing its elliptical profile - clearly involve a perceptual relation to the appearance of the plate (and so a Version-2 story), in contrast to the tracking-subpersonal-stimuli account of the rest of their paper.

If sensorimotor knowledge is construed as the recognitional capacity of a subpersonal mechanism, with an output specifying the invariant external property that is the causal basis of a changing pattern of stimulus, then it can be denied that the person has any access to the (content-bearing) product of such a mechanism. For example, if seeing a surface as being red is a matter of anticipating the ways in which it will impinge on one's visual system when suitably illuminated, it can be denied that any such anticipation is manifested in human perceivers. If, on the other hand, seeing the surface as red is a matter of one's subpersonal visual mechanisms producing an output with the content 'red' as a result of a recognitional process - say, a neural network - then it can be denied that persons have any access to such content, or denied that subpersonal states can truly have content proper in the first place.

The construal on which sensorimotor mastery is embodied in a subpersonal mechanism seems further from the spirit of O&Nôs original proposal anyway, in light of the stress which that model placed on the role of the active perceiver rather than the recognitional capacities of parts of his brain. So it looks as though O&Nôs theory requires quite a robust access on the part of the perceiver to the activity of his subpersonal states. Perceiving an invariant property of an object, on this view, just is taking that property to ground a certain pattern of subpersonal activity.

So the main worry facing this version of the enactive approach is that it is not clear that the kind of access to underlying processing that is required for the implication of phenomenal consciousness - that is, for the rejection of superblindsight - is in fact in place in normal perceivers. In light of this, it is not at all clear that the Version-1 model can be offered as a

solution to the Explanatory Gap. Even though a reinterpretation of the physical facts involved in perception that accommodates the activity of the whole animal rather than his brain alone might be enough to 'imply' a qualitative feel in some cases (most plausibly the bottle-in-hands example), the requirement that sensorimotor knowledge be integrated into planning and reasoning capabilities renders this version of the account unsuccessful in its stated aims.

3.2. Version 2:

The second interpretation of the enactive approach takes the relationship between perceiver and appearance to be a perceptual one, with appearances being construed as external, relational properties that hold between agent and object. Sensorimotor skill involves keeping track of the changes that take place within the experience of appearances in response to movements, in such a way that the agent is able to perceive the invariant properties of objects that underlie those changes. Perceivers see both the ways things appear to be - their perspectival or apparent properties - and the way things really are. In this section I challenge the adequacy of this construal of the enactive proposal on the grounds that this perceptual relation, if it were in place at all, would lead to experiences with a different content and character from our own.

As before, there are several ways of cashing-out what it is that is being understood or mastered in a body of sensorimotor skill, and of interpreting the nature of the perceptual content that is acquired through its exercise. First of all, there is an ambiguity over whether what I have called the 'second level' of content - that which is fixed by bringing to bear sensorimotor skill - does in fact constitute a further and independent level of content, content that specifies something over-and-above the changes in apparent properties that enter into the first level of content. On one reading, the perceptual content of an experience is conjunctive - agents see both the object's apparent properties *and* its real properties, and it makes sense to say that both of these contents really enter into the experience and that the person can use each content independently of the other.

On a second reading, though, it is not the case that perceivers see apparent properties *and* real properties, but rather that they see real properties *in* the changing patterns of appearances. There is nothing more, that is, to seeing an object as round (say) than seeing it as presenting an apparent shape that changes or would change in response to a bodily movement, and so the object's real shape cannot be reasoned about and so on (the content

cannot be used by the person) independently of this understanding. We can again note that this questions maps onto the conceptual / nonconceptual content debate in the following sense: if there is a second level of content that specifies the real properties of objects, then the conceptualist will insist that a perceiver whose experience possesses this content must possess the concept(s) that specify those properties. If, on the other hand, there is no further level of content independent of the changing apparent-properties level, then there would be no such conceptualist requirement concerning the real properties of perceived objects. Instead, the agent's understanding of these properties is, as Noë puts, quasi-conceptual - it is an understanding that involves knowing how apparent properties change in response to movements, rather than a full-blown intellectual-conceptual understanding.

Both of these interpretations, however, rely on the same assumption: that apparent properties form part of the content of an experience. We shall see below that this can be sensibly denied and that there is an alternative phenomenology available to us. First, though, there is a final way of construing this version of the enactive account that must be re-introduced. When I set up Version 2 of the sensorimotor story in the previous chapter, I noted the parallel between the apparent properties favoured by Noë and the sensational properties favoured by (Noë's reading of) Peacocke. Peacocke's cases propose, for example, that in the perception of two trees, one further away than the other, the image of the nearer tree (its 'size in the visual field') is larger than that of the further tree. This is a non-representational property of the experience, rather than a difference in content. The two trees are represented as being the same size, but their sensational properties are not identical. We can make similar remarks for the sensational properties of colour and shape-in-the-visual field; these are the properties that we would ascribe to sense-data if we thought such items were interposed between agent and object.

Noë rejects the idea of sensational properties of experience while maintaining the proposal that there are differences between the experience of the two trees. Apparent properties should be ascribed not to a hypothetical visual field but to appearances - relational properties that are non-mental, non-sensational. The two trees, then, present different apparent-sizes to a relevantly-placed observer and the nature of these properties is fixed by his spatial relation to each tree.

It is possible, though, to construct an enactive story on which what is kept track of when sensorimotor skill is brought to bear is not changes in the content of an experience but changes in its non-representational properties. On an account like Peacocke's, the sensational

properties of an experience change in regular ways in response to movements - the size-in-the-visual-field of the further tree increases in a predictable way as a perceiver moves towards it, for example. So it is open to the enactive theorist to argue that sensorimotor skill is based upon knowledge of the contingencies that hold between the agent's movements and the sensational properties of his experience. This is a different proposal from the other Version 2 models, but it shares with them the condition that sensorimotor skill is concerned with the changes that occur to properties of an experience, rather than to those that occur to subpersonal patterns of stimulation. The difference is that here it is non-representational properties of experience that are being tracked and understood.

Such an account relies, of course, on a theory of perception that endorses the notion of non-representational, sensational properties, and that these properties are capable of being tracked by the perceiver. If, furthermore, the enactive proposal is that all of the content of an experience is fixed by bringing to bear one's sensorimotor skills on patterns of changing sensational properties then that pattern must in some sense be bare of all content before the knowledge is exercised[7].

Although I think that Noë favours an account on which sensorimotor skill tracks contingencies that hold between movements and perceptual *content* that specifies apparent properties, his use of experimental data concerning TVSS suggests an underlying commitment to something closer to the tracking-sensational-properties version, or perhaps a mixed account where both representational and non-representational properties are understood. As mentioned in the previous chapter, TVSS apparatus are capable of inducing a vision-like perceptual experience by way of providing the agent with a pattern of tactile stimuli that varies with his movements. The agent moves a camera that is linked to an array of stimuli that is arranged, typically, on his back or tongue. The tactile sensations produced by this array change in regular ways in response to the perceiver's movements, and they change in ways that are characteristic of visual perception. They change in response to movements of parts of the body that are associated with vision, and the changes embody constancies that correspond to properties that are typically visually-accessible, like shape and location.

Following a period of familiarisation, users of TVSS systems tend to report that their experience is vision-like, or that it is more visual than tactile (see, for example, Bach-y-Rita, 1969). The sensorimotor theory can interpret these results as showing that the agent has mastered certain visual sensorimotor-contingencies, and that the experience gets its vision-like character - and its fairly limited perceptual content - from this mastery. This is a mastery

of the ways in which sensational properties change with movements, and not that of the ways in which perceptual content changes with movements. On an account like this, there is only one level of content, that which specifies real object properties. Apparent properties may show up in the non-representational component of an experience, but not necessarily. For instance, the tactile sensation on the tongue of a TVSS-user that is the product of the camera's image of a circular object may be localised on an elliptical region - an elliptical region which would change in a way that is characteristic of round objects in response to the camera's movement - but this needn't be the case. What is important for the business of perceiving the roundness of the object is that the sensations *change* in law-like ways, not that they share any of the properties of the object's appearance.

Similarly, Noë discusses another example in which it is 'sensations' which are being understood in a sensorimotor way. This is a case from Poincaré in which the experience of a rotating sphere as it changes colour is qualitatively identical to that of a colour transition due to a chemical reaction in a spherical container, but in which one is capable of distinguishing the two situations, he endorses Poincaré's claim that our experience "cannot be understood *just in terms of sensations,* but rather [in terms of sensorimotor contingencies]" (2004, chapter 6, p38; my emphasis). The use of this case and the focus on TVSS results hints at Noë's possible commitment to this interpretation of the enactive view, although elsewhere his language is more firmly rooted in perceptual content, perceptual 'seemings' and 'looks' and so on. The implications of these two views, and we have seen and will see, are different, and it is worth keeping clearly in mind which version of the sensorimotor scheme is being employed at every juncture.

I have grouped these two interpretations of the enactive approach together as 'Version 2' theories because they both require that the perceiver keeps track of changes in the properties of his experience, be they representational or sensational. As a result, the sensorimotor part of both interpretations is more limited in its ambition than was the earlier version which aimed to dissolve the explanatory gap and account for conscious experience in terms of access to subpersonal stimulation. What the Version 2 models need in addition to their sensorimotor component are, respectively, an explanation of how an experience comes to have its first level of content (that which specifies apparent properties) or an explanation of how an experience comes to have non-representational properties like the sensations on the tongue of the TVSS-user[8].

An attempt to dissolve the explanatory gap with respect to sensational properties along the

lines of the superblindsight arguments of the previous section is a possible line of enquiry. In the TVSS case, a superblindsighter would be an agent capable of making visual discriminations using sensory-substitution equipment, but who nonetheless reports no conscious awareness of the basis of that discrimination. Recall that the superblindsighter would have to have a degree of access to the activity of his subpersonal systems[9], and that he can use such information for the purposes of planning and reasoning. This access is what differentiates him from an ordinary blindsighter who has no knowledge of the basis of his guesses. In the current case, a form of access to the products of the subpersonal mechanisms responsible for the registration of the tactile input from the TVSS system is needed, because this is where the phenomenal component of the experience is located. On Clark's version of the story, a form of access to the sensory modality that is in use is a further necessity. Then, the argument proposes that it is impossible to conceive of a creature who possesses this access - at least in a rich and finely-grained sense - in the absence of phenomenal consciousness; that access implies qualia.

The current case is complicated by the fact that the sensational component of the experience is tactile while the representational component is visual (and, in fact, that it may make sense to talk of a qualitative feel that is visual in addition to the tactile sensations). The qualitative character of the experience - the what-it-is-like-ness - is in one sense visual in nature but in another sense tactile. So for the enactive theories to recruit Clark's proposed form of access, the agent must be able to monitor not only the activity of the tactile input but also the sensorimotor contingencies that are embodied in changes to that input that come with movement. The latter is a consequence of the enactive view's claim that the qualitative feel of an experience is constituted by mastery of sensorimotor contingencies. The phenomenal feel that is implied by access to the tactile stimuli just is what is tracked during the bringing to bear of sensorimotor knowledge according to the current proposal, given its commitment to the tracking of non-representational properties. For the TVSS superblindsighter to be inconceivable, then, he must have access to the tactile stimuli and in addition be able to monitor that access itself. The first type of access implies the phenomenal feel of the tactile sensations while the second type implies the feel of the visual aspect of the experience. This degree of cognitive access appears to be incompatible with observed cases of TVSS use, where subjects who adapt to the apparatus come to undergo the visual phenomenology whilst ignoring the tactile. This is not what we would expect if the former is grounded in sensorimotor understanding of the latter, and the latter requires integration into cognitive capacities.

Even if this kind of dual-access is intelligible it is still not clear that it is present in human

perceivers, especially if the link to higher-level capacities of reasoning and planning is a requirement. As before, it is not obvious that perceivers have any such access to their subpersonal processing, and it is not clear that Clark's argument explains why experiences feel like they do but only that they must feel like something.

A more general difficulty with any enactive account that relies on the understanding of changes in non-representational properties is the task of distinguishing these properties, if any exist, from the representational contents of experience and showing that it is the contribution of sensorimotor skill that makes the difference. In the TVSS case this is easily done by drawing the distinction between tactile sensations and vision-like content, with sensorimotor mastery constituting only the latter. The perceiver himself, in fact, can typically attend to one or the other. During normal episodes of perception, though, the division between representational and non-representational properties is much less clear. If such a division is to be made sharply then we must be able to identify properties of an experience that bear no content, and this is often difficult. So-called 'visual field properties', for instance, typically have an extension in two dimensions: the image of each tree in Peacocke's example takes up a certain size and shape. Does this spatial character contribute to the content of the experience, prior to the bringing to bear of sensorimotor mastery? If it does, then it is not the case that enactive skill is what fixes all of an experience's content, in contrast to the initial proposal of this interpretation of the theory. If it does not, their apparently spatial character is somewhat mysterious, indicating the existence of a 2-dimensional visual field.

This issue is one that carries over to the original Version 2 account that was introduced earlier. Here, it is changes in the representational content of an experience that are tracked during the exercise of sensorimotor skill. The content that is understood is 'low-level' content specifying the apparent properties that an object presents to a suitably located observer. Noë's idea, to reiterate, is that we perceive both apparent properties and real properties; plates look elliptical and round, for example. The central challenge for this proposal, raised in the discussion of Version 3 of the theory in the previous chapter, is that it can be argued that this content is in fact no part of ordinary perceptual experience. It can be sensibly proposed that plates and the like do not look elliptical at all, still less elliptical and round, but that they simply look round (or round and arranged at a particular spatial orientation). This is a possibility that is considered and rejected by Noë in chapter 3 of 'Action in Perception':

> "[A plate] looks elliptical to you, even though you can see that it is round... Some philosophers will not scruple to acknowledge commonplaces such as this.

> It is just not true that the plate looks elliptical, they will say. But how can we take this seriously? Certainly it is not the case that we wouldn't be likely to judge the plate to be elliptical, on the basis of how it looks. Nor is it likely that we would say that it looks elliptical. But surely it does look elliptical from here!" (Noë, 2004; p7 of chapter 3).

We should take seriously, though, the concessions made in the penultimate two sentences of this statement. It really is not the case that, in veridical perception at least, there is any tendency to report that apparent properties form part of the content of an experience. To this we can add that there is no tendency to act upon objects as though they possessed their putative apparent properties. There is no tendency, for example, to reach out to pick up a plate using a hand-grip that is tuned to elliptical rather than round objects. These are, of course, not conclusive arguments against the presence of apparent-property content. Milner and Goodale's work on the visual dual-streams hypothesis has shown that the control of action is likely to be guided by a separate processing stream from that responsible for conscious experience (Milner & Goodale, 1995). So tendencies to act on objects in certain ways may not be a reliable guide to the content that is present in experience. Actions such as reaching and grasping may be tuned to the real rather than apparent properties of objects independently of how those properties are perceived; they may even involve a further grasp of sensorimotor contingencies embodied in the processing of the dorsal stream.

On the other hand, we would need a good reason to agree with Noë that apparent properties form a genuine part of the content of experience, rather than playing some other role, in light of the lack of any tendency to judge and act upon the presence of such content. We can allow, after all, that perceivers may have some other kind of grasp or understanding of apparent properties, such as the knowledge of the image one would have to draw on a flat screen if one were aiming to make a lifelike representation of the object. This is the kind of knowledge at which visual artists excel, and which can be trained. But there is no requirement to conclude from this that perceivers with this knowledge have an additional level of content in their experiences, or that it is an understanding of how this content changes with movements that yields the rest of their perceptual content.

There is a more pressing difficulty facing this version of the theory, though, that is similar to the problem of distinguishing representational and non-representational properties that I noted in the tracking-sensational-properties version. The worry is as follows: the sensorimotor-mastery component of the theory states that enactive skills make a contribution to the perceptual content of an experience, they add a level of content that is not present in the perception of appearances. So any content that is acquired by way of (or constituted by)

sensorimotor skill is not present in the first level of content that specifies apparent properties, but that first level is still part of the experience. If we agree with Noë's phenomenology, this works okay for the elliptical-and-round plate case. The plate looks elliptical, but sensorimotor skill can be brought to bear in such a way that the perceiver takes the object to be circular. An agent with no enactive ability would see only the elliptical apparent shape; the circular shape is not available to him.

However, Noë's account aims to explain more than the perception of real *shapes* in sensorimotor terms. It aims, for example, to explain the perception of spatial properties too. The locations of the two trees in the Peacocke-style case, or at least their relative distances from the observer, are said to be perceived in virtue of understanding the ways in which their apparent sizes change in response to movements.

This content is not present to an observer who lacks the relevant sensorimotor mastery. So the first level of content - that which specifies the apparent sizes of the trees and which is available to the sensorimotor-ignorant perceiver - does not specify the spatial location (or relative distance) of the trees. The apparent properties presented by the trees must be perceived in this level as being arranged on a 2-D surface located somewhere in front of the perceiver. Similarly, not only must the plate look elliptical prior to the exercise of sensorimotor skill, it must look to be located on a 2-D plane perpendicular to the line of sight. It looks, according to Noë, elliptical and round; but it must also look to be located on this 2-D screen *and* out there in the world, if sensorimotor skill makes the contribution to spatial content. While the elliptical part of Noë's phenomenology is not too hard to swallow (if we disregard the concerns about the lack of any tendency to judge and act appropriately to this content), this located-on-a-flat-screen requirement is more obviously phenomenologically inappropriate.

If spatial properties are perceivable only by agents with sensorimotor mastery, this version of the theory must accept that the visual perception of appearances involves seeing them as located on a flat plane with no depth. There is no way to include 'apparent depth' or 'apparent location' as relational properties in the first level of content without eliminating apparent shapes: there will always be scope to ask the theorist who says that plates look elliptical *where* that elliptical appearance looks to be[10].

If, on the other hand, perceivers can see the apparent location of an object without recourse to sensorimotor skill, there is no obvious reason why they cannot see their real shapes and orientation (as my Version 3 of the approach suggests). For example, if a perceiver can see the apparent location of a plate, then he will be able to see that one edge of the plate is

further away than the other, and thus see that it is a circle on its side[11]. The choice must be made between accepting that the first level of content has no spatial component or accepting that it does, which constitutes a rejection of Version 2 in favour of Version 3.

The problems that are particular to Version 2 of the enactive model, then, relate largely to the phenomenology that its account of perception entails. Either it is the case that there are non-representational properties of experience whose changes are tracked when sensorimotor mastery is brought to bear, and which are non-content-bearing, or there is perceptual content that specifies apparent properties, where these are not arranged in spatial depth. Both of these detract, at least, from the radically enactive nature of the proposal. Perceptual states with non-representational, qualitative properties are precisely the sorts of thing that the enactive approach aims to eliminate; the aim is to do more than simply add a sensorimotor component to an existing sense-data style approach. Secondly, if the theory aims to give a sensorimotor story on which contingencies hold between movements and perceptual contents that specify external appearance-properties, we end up with a phenomenologically-unnatural account.

3.3. Version 3:

The primary difference between versions 2 and 3 is that the latter builds more content in to the first level of an experience, at the expense of the contribution of sensorimotor skill. Version 3 proposes that there is no enactive role played in the perception of the facing sides of objects (in the visual case), but only in providing for perceptual content that specifies their 3-D shape and continuity - what Noë calls the perceptual *presence* of parts of objects that extend beyond what is immediately in view. This brings the visual case in line with the tactile case, which is nicely susceptible to this sort of enactive explanation. When holding an object, for instance, one has a perceptual sense of the presence of the whole object that goes beyond those parts of it that are in contact with one's hands. One feels the whole object in spite of having immediate contact only with a hand-shaped part of its surface, say. On this version of the sensorimotor story, then, visual perceivers see those faces of objects that are unobscured by occluders and that are suitably illuminated and within an appropriate viewing distance and so on. There is spatial content prior to (or independent of) the bringing to bear of sensorimotor skill in that objects are seen as bearing a certain spatial relationship to the observer. A plate is seen as being round, on its side, and located some distance away. The pre-sensorimotor content thus includes both a specification of observer-independent

properties (real shape) and of perspectival properties (relative distance and orientation).

The problem with this account is that it has so far failed to provide an explanation, in non-sensorimotor terms or otherwise, of this first level of content. It is further still from the dissolution of the Explanatory Gap proposed by the first theory than was Version 2 above. In particular, it will need to provide an explanation of how visual perception comes to have spatial content, given the insistence on its non-sensorimotor nature that I made at the end of the previous section. The way that Version 3 has been set up makes it look as though it is only content that specifies *primary qualities* that is acquired through sensorimotor means (since I have stressed that it gives the perceptual presence of 3-D shape, extension, solidity). But spatial properties are primary qualities too and Version 3 will need a reason for why the experience of this quality is not mediated by sensorimotor skill while the others are.

In addition, it may be suspected that any successful explanation of how perceivers come to experience the facing parts of objects may be perfectly capable of accounting for the phenomenon of perceptual presence without recourse to sensorimotor talk. That is, that any account we give of the content that this version does not give a sensorimotor role to may be able to account for the sensorimotor part too. What this account will need, if it is to hold onto any sensorimotor contribution, is an explanation of the first level of content that goes just far enough, that doesn't also explain the 'second level' too. A representationalist approach, for instance, may see no problem in explaining the perception of the facing side of a tomato and the perception of the tomato as a solid and extended object in exactly the same way - in terms of the agent's construction of an internal representation of both of the relevant sets of properties as delivered by some perceptual mechanism.

The lesson to be learned from Version 3 of the enactive approach, I think, is simply that we can marry a sensorimotor contribution that assists in fixing content that specifies solidity, 3-dimensional extension and so on to any of a number of competing accounts of perception that are already on the market. Some versions of representationalism, for example, may allow that content that specifies these properties is constituted by the exercise of sensorimotor skills, and likewise some direct-realist accounts. As we shall see, the theory that I defend in the rest of the project, although it rejects the strong role of sensorimotor factors proposed by Noë and others, accepts that they may contribute to some limited perceptual contents.

For now we can consider any problems that threaten Version 3 of the enactive thesis. As in the previous interpretations, there is a question as to whether the understanding of sensorimotor contingencies - here, the ways in which new parts of objects are perceptually

revealed in response to movements - is the only understanding that perceivers have of real object properties, or whether this mastery is used to recognise features of which the agent has a further, perhaps conceptual, understanding[12]. In the case of the visual perception of a sphere, for example, the options are as follows: either the agent just sees the object as being one whose parts (sides, surfaces) are revealed and look a certain way as he moves around it, *or* he uses this knowledge to recognise the object as being a sphere, the concept of which he possesses. We can call these the 'purely-sensorimotor' and 'conceptualist' interpretations respectively. The former kind of understanding involves only a grasp of the content of experiences of an object from different perspectives, and/or how these contents change with movement. It is not an intellectual grasp of the property of being spherical, but is based instead on how the property looks: the understanding is that objects of this type present a half-spherical part of themselves to a visual observer located anywhere outside its surface. It is not the case that perceiver need to have a conceptual grasp of what it is to be 'half-spherical' in order to have this understanding, either, but only some grasp of how half-spheres look from a certain perspective. But the phenomenology of Version 3 demands that the half-sphere looks half-spherical to the agent and not, say, flat-and-circular (or any other 'apparent shape').

As such, this interpretation avoids at least some of the difficulties that face the conceptualist requirement that perceivers can only perceive that for which they possess concepts, for instance how to construe the nature of the experience of non-concept-users such as infants and animals. The purely-sensorimotor construal of Version 3 represents an advance on the correlative interpretation of Version 2 as well. In Version 3 what is understood is the way in which new parts of the physical object are revealed with movements, so only properties that are possessed by the object are perceived, both before and after the bringing-to-bear of sensorimotor skill (before: the facing side of the tomato; after: the presence of the whole tomato). There is no mention of apparent or relational properties. In the purely-sensorimotor construal of Version 2, however, what is understood is the ways in which apparent properties change, and perceiving real features just is perceiving them to have certain changing appearances (there is, by hypothesis, no additional conceptual understanding). Apparent properties are not properties that are intrinsic to physical objects, though, but depend upon the relations that hold between them and locations from which observation occurs. So the only possible perceptual content on Version 2 specifies properties that are not intrinsic to physical objects.

Version 3 need not attempt to dissolve the Explanatory Gap - the sensorimotor component of this version works over sophisticated perceptual content rather than patterns of

subpersonal activity. The qualitative character of experience is going to be constituted by more than what it feels like to perform a certain action and get a certain response, and there are options open for spelling out what that 'more than' is. As the least ambitious of the sensorimotor proposals, Version 3 leaves more work for that part of the theory that is not enactive in nature.

3.4: General Objections to the Sensorimotor Approach:

In addition to the individual worries that face the three interpretations that I have set out, there are a number of possible responses to the general thrust of the enactive approach to perception. The objections question whether the physical makeup of the human brain is apt for the manifestation of sensorimotor skill, whether sensorimotor skills reflect the actual character of our perceptual experiences, and whether there are alternative types of knowledge that could be brought to bear and play the role so far attributed to sensorimotor mastery.

3.4.1: Dual Visual-Streams Objection:

Milner and Goodale (1995) have developed an account of visual processing which divides conscious perception from the visual control of action in such a way that presents a *prima facie* problem for the sensorimotor theory, and although Noë briefly discusses and rebuts such a challenge in a way that I take to be successful (Noë, 2004, p.24) it will be illuminating to examine it here.

Milner & Goodale's dual-streams hypothesis[13] claims that there are two channels of visual processing that are physically and functionally distinct. The first channel passes through the ventral regions of the brain and is dedicated to conscious experience, while the second stream is located in the dorsal regions and is geared towards the visual control of action. The two channels carry different information: the emphasis of the action stream is on those properties of objects that are important to the rapid online guidance of bodily actions, whereas the experience stream is concerned with the stable and unchanging features of the world. The former processes the spatial arrangement of the world relative to the agent's own location - so that the possibilities for action upon these items are immediately present - while the latter has a more abstract, non-agent-centred spatial system more suited to reasoning and planning (analogous to the difference, say, between knowing that there is a rock within one's

reach and knowing where the rock is in relation to the rest of the environment for future use).

The data discussed by Milner & Goodale are compelling[14] and demonstrate that the functioning of the two streams, though typically in mutual agreement, can come apart in certain situations - for example in blindsight patients whose experience stream is damaged yet who maintain a (partially) intact action-guidance stream, or in cases of visual illusions to which only the experience stream is susceptible.

In light of this proposal, it may seem that the sensorimotor account of experience draws too close a link between perception and action in claiming that mastery of sensorimotor contingencies - that are action-involving - is necessary for experience. The anatomical and functional division between the two streams suggests, according to this objection, that their relationship is not as tightly coupled as the enactive approach claims. However, and as Noë himself anticipates, this is to misconstrue the nature of the sensorimotor approach: the theory does not suggest that experience is *for* action or the guidance of action; it is not the case that the processing of perceptual and action-guiding input would have to be performed together in a model of this sort. Input to the stream responsible for conscious experience changes in response to movements - which may or may not be guided by the dorsal stream - and if these changes are understood by the agent then he perceives the world.

We can construct a version of the sensorimotor account in the case of the action-guidance stream as well, since it too is sensitive to the real properties of objects rather than to apparent properties. Given that action-guidance is independent of conscious perception, such an account will most closely resemble Version 1 - it will be an unconscious tracking of subpersonal stimuli, not of a perceptual relation. As before, we can view this as a process of disambiguation - any given pattern of input does not uniquely specify the nature of the object causing the stimulus (an elliptical object and a round object may cause the same elliptical pattern, say). Bringing to bear an implicit understanding of changes in patterns of subpersonal activity, though, would be a possible mechanism for embodying sensitivity to real object properties. This is one possibility among many as far as the processing of the dorsal stream goes, and is hostage to empirical fortune, but if the sensorimotor approach is on the right track it is a genuine candidate. If each of the two streams proposed by Milner and Goodale involves sensorimotor mastery then understanding the relations that hold between the two (and further questions about why only one stream generates conscious experience if the underlying mechanisms of both are similar) remains a further project for the enactive theorist.

While I take the general thrust of Noë's response to this objection to be accurate, there is a more significant worry for the enactive view that also comes from this direction. Andy Clark and Naomi Eilan (2006), following Milner & Goodale's treatment of the ventral stream, have emphasised that the contents of conscious perception appear to be systematically insensitive to fine-grained sensorimotor details. This suggests that, contrary to Noë's view, what gets into perceptual awareness is not determined by an understanding of finely-executed enactive skills. The alternative, they state, and as the rest of the project will argue, maintains that perceptual content is geared towards providing quite coarsely-grained descriptions of external features for the purposes of planning and rational action-choice. Clark and Eilan's comments stem from remarks made by Clark and Toribio (2001), in which they label this problem for the strong enactive story *sensorimotor chauvinism.*

3.4.2: Sensorimotor Chauvinism:

The worry emerges from the enactive theoristsô insistence that characteristically *motor* systems are those that matter in the fixing of experiential content. Andy Clark and Josefa Toribio (Clark, 2002; Clark & Toribio, 2001) have argued that this insistence on the relevance of the details of sensorimotor contingency skill for the nature of conscious experience ties perceptual content too closely to action at the expense of higher-level cognitive systems such as memory, reasoning and planning. The thought here is that the link between a creature's perceptual and cognitive apparatus and the character of his experience that is required by the enactive theory is too restrictive: in a model of this sort "[my] conscious visual experience depends very very sensitively upon my implicit knowledge of a very specific set of sensorimotor contingencies" (Clark, 2002; p21). Because perceptual ability just is implicit mastery of sensorimotor contingencies, and these contingencies depend in turn on the nature of a creature's sensory physiology, any structural difference in a creature's sensory systems will result in a difference in what is experienced.

Clark offers two examples that serve to undermine this strict dependency: firstly the hypothetical case in which his own eyes perform their saccades slightly more rapidly than those of normal individuals, resulting in a different set of sensorimotor contingencies, and secondly the case in which a robotic table-tennis player is constructed with a rudimentary sensorimotor knowledge base. He argues that it should be up to empirical investigation to determine whether such cases would result in experiences of a different nature to our own - or even in any experience at all - rather than this being an a priori consequence of a

particular theoretical position. The implication of Noë's position is that the increased saccade rapidity *does* yield a qualitative experiential difference, and that the robot has an experience 'of a very different nature' to our own.

The problem is posed by Clark as a dilemma, one horn of which must be embraced by the skill theorist: "O'Regan & Noë must either accept that *every difference makes a difference*, or they owe us an account of which ones matter and why." (2002, p21, emphasis in original). Noë (2004) appears to accept the first alternative. In his discussion of sensory substitution (cases where a man-made apparatus is used to stand in for a damaged or absent sensory system), he claims that the degree to which the experience achieved through the substitute system differs from that of the original system corresponds to the degree to which the sensorimotor contingencies afforded by the former differ from those of the latter. A substitute system whose contingencies are very similar to those of the normal visual system, for example, will result in an experience that matches normal vision closely[15].

There is a deadlock, then, between Clark's intuition that not all differences in sensorimotor mastery should yield a difference in the way the world is experienced, and Noë's claim that only creatures with identical sets of sensorimotor knowledge can share identical experiential character. Clark's acknowledgement of the many roles that experience plays in a creature's life - including those of memory, planning and intentional action - strengthens his position, though. He argues that the world is presented in experience in such a way as to facilitate these activities - it is presented as populated by objects that can be acted upon, as offering opportunities for long-term goals and actions, and as stable and regular in a way that allows for the reidentification of remembered items and scenarios. It is factors such as these that are important to the way that a creature experiences the world, and thus the emphasis of O'Regan & Noëôs position on action in perception is too limited. Extremely sensitive dependence on very small sensorimotor differences (like the slightly-more-rapid-saccade case) is, according to Clark, *unlikely to matter* to the more high-level features of memory, planning and action - "What matters for visual consciousness is thus (I suggest) at best a select subset of the information O'Regan and Noë highlight. What will matter are whatever (perhaps quite high-level) aspects of those sensorimotor contingencies prove most useful for reason, recognition and planning." (Clark, 2002; p32)[16].

It is not absolutely clear what Noë's motivation for upholding the every-difference-makes-a-difference (EDMAD) claim is, and it is not obvious that it is a necessary requirement of the sensorimotor approach. Its virtue is that it would make the account simple and unitary - all

perceptual content is fixed by enaction mediated by sensorimotor skill. Noë himself concedes that there may be other layers of content that are constrained by the concepts possessed by a perceiver - an agent cannot see that the ballerina has fallen over unless he has the concept of 'ballerina', for example - but his description of this implies that concepts are brought to bear on a base level of content that is dependent upon sensorimotor mastery and nothing else. The base level is what provides the experience with its qualitative character, and it is this to which the EDMAD claim is relevant. For Noë then, an agent with no concepts could have an experience of the ballerina with the same qualitative character as that of a concept-user only if their sensorimotor skills matched one another.

We can compare the current discussion to that of the Porsche-driving example considered earlier. O'Regan & Noëôs claim, remember, was that driving a Porsche has a certain qualitative character, and that this is constituted by what it is like to perform certain skilful actions on the car and receive certain responses - for the car to accelerate, corner etc in a particular way. Similarly, the qualitative character of a perceptual engagement is said to be generated by the interaction between body and world; the phenomenal feel of an experience just is what it is like to interact in a certain way with an object and its appearances. Just as a Porsche and a Ford, say, will yield different sets of responses, so too will the exploratory probings of the world that are made by two creatures with different bodies. In both cases the sensorimotor contingencies are different, and so (by hypothesis) the qualitative character of the episodes are different - but dependent upon the details of the creatures' physiology. So the EDMAD claim with respect to the qualitative character of experience is a consequence of the way in which phenomenal feel has been set up in this account.

The distinction between the qualitative character of an experience and its content has not been sharply upheld in this discussion - either in Clark's objection to O'Regan & Noë or in their response (perhaps because they think that such a distinction cannot be upheld). Clark quotes O&N as follows:

> "[C]reatures with radically different kinds of physical makeup can enjoy experience which is, to an important degree, the same in content and quality. But it also allows for the possibility *(indeed the necessity) that where there are physical differences, there are also qualitative differences.*" (O&N, 2001; p4. Reproduced with emphasis added in Clark, 2002; p22).

If it is tenable to uphold a distinction between content and qualitative character, and to endorse the possibility that the two may come apart, then we can allow that two physiologically different creatures may have experiences that are the same in content but different in phenomenal character. This would be to accept the final sentence of the quote

above, but to maintain that sameness of sensory apparatus is not required for sameness of perceptual content. After all, if appearances are relational properties that hold between objects and locations of observation - and are independent of the sensory apparatus that may be used to detect them - then their exploration with one type of sensory system will be mediated by one set of contingencies but this does not rule out the possibility that a creature whose exploration of the object involves a different set of contingencies can have a perceptual access to the same property. For example, consider Clark and his swift-eyed twin in a case in which both encounter a circular plate. As they both explore the plate by moving around it, the elliptical appearances that each encounters will be the same (since they are not dependent upon sensory apparatus but only on perspective), but they will change in different ways - they will change at relatively different speeds. But if both Clark and his twin are capable of understanding these changes - as they are required by the sensorimotor view to do, if they are to perceive at all - then both will have an experience as of a round plate. The patterns of appearances that each perceiver encounters embody the same constancies - those that are characteristic of circularity - and perceiving is coming to be aware of those constancies. This we can allow even if the experiences have a different qualitative character. In addition, if the only physiological difference between Clark and his twin is that of saccade-speed, we should expect the content of their pre-sensorimotor-knowledge experiences (that is, their experience of appearances) to be identical.

If Clark's claim that what matters for visual consciousness is the interests and requirements of higher-level capacities like reasoning and planning is to hold not only for content but for phenomenal feel too (or perhaps better: that they go hand in hand in an inseparable fashion), then this constitutes a rejection of O&Nôs claim that qualitative feel comes from sensorimotor interaction. It is to argue that the Porsche analogy as it stands does not do justice to the phenomenal feel that comes with conscious perception. The demands of reasoning and planning in this case would be such to edit or emphasise some aspects of the way in which the car responds during driving; to select a subset of the sensorimotor contingencies. The qualitative feel - and not just the content - of the activity would be in some sense constrained by these demands rather than being sensitive to the minutiae of action-and-response patterns. In conscious perception, the 'sensorimotor chauvinism' charge can be levelled at both content and qualitative character, and if the latter holds up this points to a failure in the original model - that of tying phenomenal feel too closely to the details of action.

There are two points in the sensorimotor theory at which there is potential for an influence

of some sort by higher-level capacities such as reasoning and planning at the expense of purely sensorimotor activity. These correspond to the two possible ways of spelling-out the enactive proposal that I observed in section 3.3. above, where I noted that it is either the case that sensorimotor understanding allows a perceiver to recognise a property for which he has some further, perhaps conceptual, understanding; or that his understanding of a property - and his perception of that property - is limited to how it looks or would look when an exploratory movement is made. In the former interpretation, we can say that there is an extra level of content added to the experience, and that this is constrained by the understanding that the perceiver has of the property. For example he might be able to see that a ball is a sphere, and to use this content to reason about the object in a way that is impossible for a perceiver who lacks the concept 'sphere'. On the latter interpretation the ball is seen as an object whose appearance changes in regular ways in response to movements, and there is no further conceptual understanding.

If there is a second level of content that is fixed by the concepts that the perceiver possesses, then this is a space for the types of capacities that Clark suggests to enter into the picture. The desires, interests, familiarity and so on that the perceiver has concerning the perceived object may affect the content of the perception by affecting the ways in which the agent thinks about it.

On the other hand, if the contribution that sensorimotor mastery makes to an experience is not in allowing a perceiver to recognise a property for which he possesses a concept, then the putative role of higher-level capacities in the fixation of content will have to be exercised at the level of the 'looks' of objects and their properties. That is, if properties are only understood in sensorimotor terms, then it is within the sensorimotor component that higher-level capacities must be effective. There is space for this once we have realised that the relationship that holds between perceiver and appearance is a perceptual one (as I have stipulated in Versions 2 and 3 of the enactive approach). Agents perceive changing apparent properties and perceive real properties *in* those changing appearances. Depending on the account of perception that we employ to explain the agent's experience of apparent properties, there may be room for this content to be influenced by his higher-level capacities. A perceiver's visual experience of a pyramid, say, might not reflect its true apparent shape but only an edited or emphasised version of it that depends on his interests and plans as far as they concern the object. Then the perception of its real shape, which is possible only for agents who have mastered its sensorimotor contingencies, will be based in this edited or emphasised content too.

To clarify: once we describe sensorimotor knowledge as knowledge of how an object or property would look from a changing perspective, there is room to build in a higher-level influence on how the object or property looks from any given perspective - an influence that is determined by what the perceiver's goals and plans are, and how the object fits into these. The sensorimotor understanding of contingencies of this sort - including expectancies of how the property would look were a predicted movement to be made - is thus sensitive to the edited or emphasised version of how the property looks.

If this is accurate then Clark's objection could be successfully accommodated within a broadly sensorimotor framework. On the amended account, we can allow that sensorimotor skills work over content that is itself sensitive to higher-level capacities. This, however, would make it true that the content of perceptual experiences is not solely dependent upon the fine details of sensorimotor interactions - the editing and exaggeration, however it might be manifested, would have a source that is independent of sensorimotor considerations.

3.4.3: Ideal Appearances and the Redundancy of Sensorimotor Skill:

The previous two issues facing the enactive account have suggested that sensorimotor knowledge is not enough to explain the content of perceptual experience. The Dual-Streams Objection proposed that the visual system is not set up in the right way to behave in the manner suggested by the sensorimotor theorist while the Chauvinism Objection stressed that the real character of human perceptual experience does not reflect the close tie to action that the enactive theory demands.

The proposal to be examined here (discussed in detail in Kelly, 1999, although not endorsed there) can be taken to suggest that sensorimotor interaction with the environment is not a necessary component of perception. It proposes that there is a kind of content-constraining understanding that lies somewhere between full concept-possession and the purely perceptual grasp that exists on the enactive view, and that doesn't rely on motor skill for its acquisition or exercise. The theory, which Kelly attributes to Russell and Hering independently, is that what I have been calling the 'second level' of content - that which on the enactive view is fixed by the perceiver's sensorimotor skills - is grounded instead in a perceiver's understanding or memory of how the property in question tends to look under ideal or familiar conditions. So rather than needing to master the ways in which the appearance of an object or property changes in response to movements, the agent need only know *one* appearance, which we can call the 'ideal appearance'.

The conditions under which the ideal appearance is presented depend on the type of property in question - for colour properties the relevant conditions are those of illumination and ideal conditions are even, white light; for shape properties the relevant conditions are spatial, and ideal conditions are being located straight in front of the object, at a distance that is suitable for easy apprehension of its geometry. Alternatively, there may be a perspective on the object with which the perceiver is most familiar, and from which the object presents an appearance which he can easily remember.

This proposal, like versions 2 and 3 of the enactive account, involves two levels of perceptual content: one that specifies the object's apparent properties - or how they are perceived to be from the current perspective - and one that specifies its real properties. The disagreement between these two views is over the way in which real properties are understood by the perceiver, as this (we are assuming) is what constrains how they are perceived. Take the case of shape - on the purely sensorimotor view the real shape of an object is 'seen in' the pattern of changing apparent shapes; there is nothing more to seeing the roundness of a plate than knowing how its apparent elliptical shape changes with movement. Crucially for the present discussion, there is no 'privileged' appearance that fixes how the roundness is perceived - it is not the case, for example, that the apparent shape that the plate presents to an observer located straight in front of it (that is, a circle) makes more of a contribution to the agent's experience than any other individual appearance. The ideal-appearances view, on the other hand, makes just this claim. What is brought to bear in perceiving an object's real shape is knowledge of how it looks when viewed straight-on, i.e. under ideal conditions. Similarly for colour: the enactive view allows that knowledge of changes in apparent colour that come in response to changes in conditions of illumination may play a part in the perceiver's sensorimotor mastery (that is, that more than just purely motor-induced changes are relevant; I'll say more about this later), but it is again *changes* in appearance that are the key to his perceiving the real colour of a surface. There is nothing more to seeing an object as red than knowing how its apparent colour changes in response to changes in conditions of observation. Again, there is no privileged apparent colour - it is not that how the colour looks under even white light plays a special part in the perceiver's understanding. The ideal-appearances view, in contrast, states that the two levels of content specify, respectively: 1) the apparent colour of the surface, or how it looks under the current conditions, and 2) the colour that the surface appears to have under ideal conditions.

Recall that the enactive view must permit that agents can have perceptual experiences without moving. In these cases, a predictive understanding of the ways in which appearances

would change in response to movements is exercised. The bringing-to-bear of this knowledge constitutes the perception of the real properties of the scene. For instance, a perceiver can see that an object is a cube without having to move around it and encounter its changing aspect so long as he understands the ways in which that aspect would change were he to do so. It is a similar form of predictive understanding that is putatively exercised on the ideal-appearance view. Perceivers bring to bear their knowledge of how the properties that they are now encountering under non-ideal conditions would look under ideal conditions.

In both cases, this understanding is said to account for the phenomenon of perceptual constancy - the fact that certain properties of objects are perceived to remain the same even though conditions of observation change. On the ideal-appearances model, the constant property that is perceived across changing conditions is that which the object is perceived to have under ideal conditions - grass is seen to be the same colour at dawn and at noon because in both cases it is seen to have the colour it would seem to have under even white light. On the sensorimotor account, the constant property that is perceived across changing conditions is that which is responsible for the ways in which the object's apparent properties change in response to a change in conditions. There are constancies that underlie the characteristic ways in which the apparent shape of an object, for example, changes as the observer moves around it. Grass is seen to have the same colour at dawn and at noon because in both cases the viewer understands that the underlying colour property that produces *this* apparent colour under *these* conditions would produce *that* apparent colour under *those* conditions.

Kelly criticises the ideal-appearances position (which he calls the 'empiricist' position) for failing to account for the phenomenology of perceptual constancy appropriately. On his interpretation of Russell and Hering's view, what is perceived on any given occasion is *only* the ideal-appearance. Grass, for instance, looks the same colour at noon and at dawn because perceivers substitute the way its colour looks under the present conditions for the way it looks under ideal conditions. It is not that properties are perceived to be constant in spite of appearing different under different conditions, it is that they don't appear different at all. This is to construe the ideal-appearances view as being disanalogous to the enactive account - rather than there being two levels of content, one which specifies how things appear from here and the other how things really are, there is only one: how things appear under ideal conditions.

We can, though, interpret the ideal-appearances model in the way that I have done above, as being at bottom a similar kind of proposal to the sensorimotor view but involving the

bringing-to-bear of a different kind of understanding. This would be to claim, contra Kelly's objection, that agents perceive *both* properties-in-context *and* properties-as-they-really-are, where the latter is understood as properties-as-they-appear-under-ideal-conditions. If Kelly is right, of course, this is not a faithful interpretation of Russell and Hering's position, but it is one that fits nicely with the discussion so far.

The existence of this possibility, if it can be sustained in the right way, threatens the requirement that it is changes to the way things look that come in response to movements that are important to the business of perception. Once we've accepted that the exercise of an agent's understanding, suitably construed, can play a role in constraining the contents of his experiences, that is, it is an open question as to what that understanding pertains to. Interpreting such understanding as a grasp of the ideal appearance of an object or property, rather than of its profile of sensorimotor contingencies, provides us with an alternative account of perceptual constancy phenomena, and there may be others.

3.5: Summary and Conclusions:

The differing explanatory goals of the three possible construals of the enactive story have resulted in their being open to challenges from different directions. A **Version 1** account aims not only to secure a sensorimotor explanation of perceptual content, but also of phenomenal character. Once we see that phenomenal facts supervene on physical facts concerning the exercise of sensorimotor skills and their integration into a perceiver's higher-level cognitive capacities, this story goes, we can provide a non-question-begging closure of the Explanatory Gap. The appeal to higher-level integration, I noted, is a move that is shared by Tye's (1995) representationalist approach and Clark's (2000) access-implies-qualia strategy, and is employed to ensure that the account can distinguish between uses of sensorimotor skills that are not consciousness-implying (for example, in the guidance of action) from those that are. My particular concern for this version of the account is that, given the way that sensorimotor contingencies have been set up as dependencies that hold between movements and patterns of subpersonal sensory stimulation, the requisite kind of integration with higher-level capacities for reasoning and planning cannot be in place. Even if we can make sense of there being a personal-level understanding of contingencies of this kind, and I'm not sure that we can, the further condition that this makes a difference to an agent's thinking, planning, goal-selection and so on is an unrealistic one.

On **Version 2**, in contrast, sensorimotor dependencies hold between the perceiver's

movements and her perceptual relation to externally-located appearance properties. This account not only leaves that perceptual relation unexplained, but also results in a two-level view of perceptual content that has unacceptable consequences. The exercise of sensorimotor understanding, on this approach, brings about a second level of content, specifying an object's invariant properties, from an initial level specifying its apparent properties. The second level is uniquely determined by profiles of movement-inspired change within the first level - apparent shapes, for example, transform in ways that are characteristic of the real shapes that underpin them. The problem with this, I argued, is that it is far from clear that perceptual content has this two-level structure in general. Although it may be a sustainable description of the visual perception of shape[17], where we can talk of the surface of a square table, say, as having a diamond-shaped appearance from here, talk of a two-level *spatial* content, for example, is very unnatural. For a visual experience of the real distance to an object to be brought about by a perceiver's grasp of movement-induced changes to its apparent distance, as this view would imply, there would have to be a commitment to apparent-distance content in experience, and this is obscure. To put the point in a different way, if part of what is experienced in vision is the apparent shape that an object would project onto a 2-dimensional screen perpendicular to the line of sight, it seems that the view is similarly committed to the apparent *location* of that screen forming a part of the spatial content of the experience. We shall see in the next chapter that the explanatory plausibility of the second version of the enactive view varies across the sensory modalities.

Version 3 of the enactive view is in a sense the weakest, in that it leaves the distinctively sensorimotor component with little to do. It notes simply that there is a possible sensorimotor contribution to perception - that which determines or constitutes the experience of objects as solid and extended in 3-dimensional space - that could supplement the resources of a range of existing perceptual theories. For example, it may be that a representationalist can appeal to an agent's sensorimotor skills in explaining how he comes to experience objects as solid and extended but retain standard representational vocabulary in explaining all other contents. Likewise, a direct realist may state that the perceiver is in immediate contact with only the facing sides of objects but can nonetheless have a fuller experience of the whole object as perceptually present in virtue of bringing to bear sensorimotor knowledge. I find this version a plausible one, and as we shall see it is consistent with the treatment I develop in the rest of the project, but a possible concern is that the sensorimotor factor it introduces will be made redundant by the explanatory apparatus employed by particular theories of perception. A representationalist account, for example, that appeals to a causal chain between object and

perceiver in explaining the contents of perceptual states may have built-in resources to accommodate the content that version 3 attributes to sensorimotor factors.

Three more general concerns were introduced. Firstly it was noted that empirical results support Milner & Goodale's division between two separate visual processing streams, one devoted to conscious perception and the other to finely-grained motor control, and that this presents a *prima facie* difficulty for any theory that takes action and perception to be co-constituted. While I accepted Noë's response that the enactive view is not in fact committed to any consequences that are directly in conflict with the dual-streams results, a further upshot of Milner & Goodale's position is that the contents of the conscious stream appear to be systematically insensitive to fine sensorimotor details. From this issue emerged the second strand of my critical analysis - the objection of *sensorimotor chauvinism* (Clark & Toribio, 2001). The contents of experiences, this view suggests, present the world as an arena for rational action and response; for ready discrimination, comparison and segregation in ways that capture what is important about the environment for the perceiver's ongoing interests and goals. The delivery of this content and the implications of this view will be focused upon in the rest of this project, but for now it suffices to note that any considerations that count in favour of the view that perceptual content is of this form, and as such may involve rough-and-ready editing and exaggeration (where this enables fast and fluent interaction) at the expense of fine sensorimotor tuning, count against the strong enactive model.

Thirdly, I offered one alternative construal of the kind of understanding that might constrain perceptual content and which deals with perceptual constancy phenomena as successfully as the sensorimotor project. On this picture, an agent may be capable of bringing to bear knowledge of a property's *ideal appearance* rather than of its full sensorimotor profile; to grasp, for example, that the surface of a table that has a diamond-shaped appearance from here would present a square appearance from face-on. The second level of content is again the invariant property albeit specified, this time, in terms of how that property looks or would look under ideal conditions. This alternative introduces the possibility that there are viable alternatives to the sensorimotor construal of perceptual understanding.

These considerations undermine the enactive project, especially in its more ambitious variants. It is unclear that we can develop a sustainable account of perception that depends upon an appeal to skilfully-mediated sensorimotor understanding that is neither question-

begging nor empirically unjustified. The challenge has been to the left-hand-side of purported sensorimotor contingencies - if the patterns that change with movements are taken to be subpersonal it is problematic to locate their role in personal-level perceptual phenomena; if they are taken to be perceptual we lose the truly enactive flavour of the approach and end up with a phenomenologically-implausible description of the content of experience.

In the next chapter I investigate some features of non-visual perception from an enactive perspective, as these modalities have received little attention in the literature, before turning my attention to how the sensorimotor approach must deal with cases of *mis*perception. In doing so I highlight some further worries for those who intend for the enactive model to be a fully general theory of perception.

Chapter 3 Notes.

Footnote 1: I doubt that Noë & O'Regan themselves take this particular example to demonstrate a successful Explanatory Gap solution, given that such a solution is not the primary focus of their paper.

Footnote 2: One possibility is to endorse a kind of disjunctivism here, where the division is between cases of perception in which an exploratory movement is made and feedback is received, and cases that involve only the bringing-to-bear of predictive knowledge of how inputs would change with movements. The task then would be to explain how the latter could be qualitatively identical to the former. The case of *mis*perception is a separate issue that will be examined in chapter 4.

Footnote 3: This condition has a precedent in certain representationalist accounts of perceptual consciousness, e.g. Tye (1995), where the aim is to distinguish those kinds of content-use that are sufficient for consciousness - higher-level transactions of some sort - from those that are purely unconscious.

Footnote 4: Of course, enthusiasts of qualia will deny precisely this claim and argue that it forms a question-begging construal of phenomenal consciousness. From the point of view of those who endorse the access-implies-qualia move, though, the reverse is true: it is question-begging to hold that there are intrinsically phenomenal properties. I shall examine these competing views in detail in chapter 6.

Footnote 5: The possibility that such access implies that phenomenal consciousness is (merely) *reported* by the creature is one whose assessment I defer until chapters 6 & 8; I take it that this significantly different proposal is not the interpretation that O'Regan & Noë employ in their argument, and is closer to what has been called a *phenomenal concept strategy* (Stoljar, 2005).

Footnote 6: This option is gestured at by Clark as a possible means of access to modality, in keeping with the thrust of his proposal, but left undeveloped in his paper.

Footnote 7: This interpretation of the theory is close to that described by A.D. Smith (2002).

Footnote 8: It may be that an explanation of the content of perception would suffice as an explanation of its character, of course, so these shouldnôt be taken to be necessarily separable.

Footnote 9: A kind of access, recall, that I have argued is not capable of being in place, and which is possibly conceptually confused.

Footnote 10: The treatment that Noë gives of the patient of a cataract operation, on page 5 of Real Presence, on which "Large objects far away looked to this post-operative patient like small holes nearby", is the closest he gets to acknowledging this two-level spatial content requirement.

Footnote 11: This response constitutes a rejection of the personal-level diagnosis of perceptual constancy phenomena. Rather than there being a problem of how it is that objects can be perceived as having observer-independent properties when all the agent has access to is perspectival properties (where this is solved, on the enactive view, by employing

sensorimotor expertise), both kinds of content are óalready thereô in perception by the same (representational, say) means.

Footnote 12: Or, indeed, some other practical / nonconceptual understanding that is not sensorimotor in character.

Footnote 13): Milner & Goodale's treatment presents a different functional division to the earlier, influential proposal of Ungerleider & Mishkin (1982), on which the relevant separation is between 'what' and 'where' streams.

Footnote 14: Although the strict and complete separation of the two streams as I have presented it is probably an overstatement, as important cross-connectivity exists. I take it that the broad division of functional labour into action and perception streams is correct, however.

Footnote 15: Although more recently Noë has denied that his view entails the EDMAD claim (Noë, in conversation). If this is right, then the argument I present in this section can be taken as further motivation for this denial.

Footnote 16: We can run an identical objection with respect to the non-motor factors that are said to feature in a perceiverôs sensorimotor understanding, such as a grasp of changes to apparent colour that are the result of alterations in conditions of illumination. Is it the case, such a challenge would go, that every minute detail of changes to reflectance, intensity, hue and so on must get into perceptual content?

Footnote 17): On my own view, even apparent-shape properties don't come into visual content - plates don't look both elliptical and circular. It is my experience, however, that intuitions genuinely vary on this matter. For a review of philosophers who also deny the two-level view see Noë, forthcoming, section 1.

Chapter 4: Non-Visual Perception and Perceptual Error.

So far my discussion has largely been concerned with visual perception, its content and the means by which this content might be fixed. This reflects the focus of the sensorimotor approach literature - Noë, for instance, has said little about non-visual experience - and of the philosophy of perception literature more widely, where there is a trend to accept vision as the paradigm of a sensory modality and to assume that conclusions about its nature can be extrapolated to non-visual cases. A unitary account of the senses - that is, one that explains in similar terms how each modality gets its content and phenomenal properties - is a desirable philosophical goal, and the least that we should hope for are explanations of individual modalities that are compatible with one another and that do not require radically different conceptual apparatus. As a result, if we are to sustain a sensorimotor model of visual perception (if a proposal like Noë's survives the kinds of issues I have raised up to now) then we should expect our explanation of non-visual perception to rely upon similar considerations; we should be able to speak in terms of the active exploration of appearances, of multiple levels of content being fixed by the exercise of sensorimotor skills and so on, in auditory, tactile, gustatory and olfactory perception.

The purpose of this chapter is to investigate the extent to which the central features of the enactive approach can be carried over to non-visual sensory modalities, and to argue that the contribution of sensorimotor understanding to these cases is rather limited. While an agent's grasp of the sensory consequences of her movements may present her with some of the *spatial* properties of the entities she detects non-visually, the rich range of experiences of sounds, smells, tastes and the like are not adequately accounted for on this model. Non-visual experiences, and especially those achieved by olfactory or gustatory means, have, I argue, a somewhat different structure to those of vision. It is more difficult in these cases to separate the properties of the objects of experience from the properties that they appear to have from the perceiver's current perspective, and it is not clear that non-visual perception has an active-exploratory character. As a result, my view maintains that sensorimotor considerations influence non-visual perception in ways that are partially distinct from those that bear upon the visual case.

Although it may tread on some philosophers' toes, I will assume for simplicity that the sensory modalities are discrete and countable - limiting my discussion to sight, hearing, touch, taste and smell - and that it is possible to determine the content that experiences from each modality bear.

4.1: Non-visual Perception on the Enactive Approach.

The sensorimotor approach, as has been described in detail in the previous two chapters, is characterised by its *active* construal of the business of perceiving: rather than being a passive reception of information, perception is constituted by the skilful exploration of the world, as mediated by 'sensorimotor contingencies', ways in which patterns of stimulation change in response to one's movements. In chapter 2, I identified an important division in the ways in which this proposal can be interpreted; it is either the case that what an enactive perceiver keeps track of as she moves is the changing patterns of subpersonal stimulation - inputs to her retinae, for example - or it is something at the conscious level, either a primitive level of experiential content, or non-representational properties with intrinsic phenomenality. Many of the considerations of this chapter, however, apply equally to each of these interpretations and the individual ways of chopping up the general approach will be noted only where they make a real difference.

Visual perception, according to the enactive theory, involves moving one's eyes, head and body in order to alter one's perspective on the environment. By drawing on one's knowledge of the ways in which how things look from here change in response to one's movements, one perceives the constancies that exist within these changes - apparent shapes, for example, change in regular ways that reveal the real physical shapes that underlie them; apparent colours alter in comprehensible ways, furthermore, in response to alterations in the conditions of illumination. On Noë's view, only a creature who is capable of exercising a particular set of bodily skills (and of understanding the resulting changes in input) can undergo visual perception; he needs to have mastered the contingencies that hold between appearances and changes in the conditions of observation.

Noë claims, furthermore, that both the content *and* the phenomenal character of experience is explicable in sensorimotor terms; there is no real separation of the two. The qualitative properties of an experience of redness, for instance, are tied to the sensorimotor contingencies that apply to red surfaces - for an object to look red just is for it to look as though its apparent colour will change in ways that are characteristic of redness. This is in opposition to theories of colour experience that endorse colour *qualia* (see, for example, chapter 4 of Noë, 2004), and more generally to any account of perception that ascribes a significant causal or constitutive role in the determination of phenomenal character to activity of the brain rather than to that of the whole creature. The enactive view, that is, hopes to eliminate the need for an explanation of how the brain generates content and

qualitative character by showing that these can be explained in terms of the exercise of skills by the active perceiver.

The problem with extending this account to non-visual experience is that it is not clear that such bodily exploration typically takes place in these cases, or that there are relevantly similar and trackable conditions of observation here. A pre-theoretical survey of some cases of non-visual experience reveals this. When you hear birdsong, for example, it is not obvious that you explore the real nature of the sound by keeping track of its apparent nature; in fact, it is hard to make sense of what could correspond to these categories. It is even less clear that there is exploration involved in experiencing the taste of a cup of coffee, say, or what such exploration could possibly involve. Neither of these episodes of perception appear to require movement of any sort for their content or phenomenal character. Unlike in vision, where we have a perspective upon the world as it is laid out before us and we are capable of shifting this perspective, the other senses are - at least at first pass - more amenable to the passive rather than active construal. When we smell the scent of a flower, say, the notion of having an olfactory *perspective* on the property in the sense in which we have a visual perspective on a coloured surface, for example, is not a natural one. In light of this, any account that makes it a requirement that perceivers skilfully alter their perspective seems to run into difficulties when it comes to these cases. Initially, then, it appears that a passive rather than active account of non-visual perception will be required, one on which the content and character of the experiences is grounded in the nature of the input - the activity on the tongue, say, or on the skin - rather than in changes to that input.

The enactive model, we have seen, does not demand that a movement is performed on every given perceptual occasion. What is important, instead, is that a body of sensorimotor knowledge is brought to bear. A changing pattern of input (or of low-level content, or phenomenal properties) is not needed; all that is required is that the perceiver brings to bear his understanding of how the current input *would* change *were* a particular movement to take place. I have called this the predictive or anticipatory version of the enactive view. Is this available as a response to the apparent lack of a movement component in the non-visual cases? Is it always the case that some body of sensorimotor skill is brought to bear here even when an exploratory action is not performed?

No. For at least some aspects of the contents of non-visual experiences, changes that come with movement are simply irrelevant. There are, we can concede, some alterations to the

input to non-visual modalities that are the results of bodily actions, and so it is not the case that these modalities are totally passive. The strength or intensity of an odour, for instance, recedes as the olfactory perceiver moves himself away from its source (or moves the source away from himself). Similarly, the taste of an object in one's mouth may increase in response to a movement of one's tongue, and diminish as the object is removed or swallowed. But these are not, I contend, examples of the exploration of such properties in the relevant sense, and being able to anticipate the ways in which such changes would occur were such a movement to be performed does little or nothing to fix the content or character of this kind of experience. Knowing that the smell of a rose, say, will increase in intensity as one brings one's nose up to it does nothing to determine the distinctive floral scent that is experienced. In perception by gustatory or olfactory means, the changes that come with motion apply only to the intensity, or perhaps the salience, of the experience. In contrast, we can identify (following Noë) all sorts of properties that appear to alter during visual exploration - apparent colours, shapes, sizes and so on - where these changes are the result of either a change in the observer's spatial perspective or in other conditions of observation. In the next section I give a more detailed treatment of the sensorimotor element of non-visual perceptual content.

A quick note about how this issue applies to the two competing interpretations of the enactive account: (1) if we take sensorimotor skills to operate at the level of subpersonal stimulation (as in the original OôRegan & Noë account), then perceiving the real properties of the environment is a matter of understanding the *constancies* that are embodied in a given changing pattern of activity. What is important (O&N, 2001; section 2.2; and my chapter 2) is not the nature of any particular pattern of input - for instance, any particular retinal image - but that the patterns change in regular ways that correspond to external properties. A particular retinal image may not itself be square, but when it changes in ways that are characteristically indicative of the presence of a square surface when the agent moves his eyes, the perceiver is in a position to track this constancy. Both the content and the qualitative properties of the experience come from the agent's bringing to bear his knowledge of the sensorimotor profile of squareness, and not - to repeat - from the nature of any individual pattern of subpersonal activity.

If what I have said about non-visual perception is right, though, there is no such changing pattern of subpersonal activity that is capable of embodying constancies like this. The pattern of activity on the tongue will not change in a law-like way when coffee, say, is explored because no exploration necessarily occurs during a taste experience. Again, the only changes

to input that take place in response to movements of the tongue and so on are those to the intensity of the activation, and it is unclear why these should contribute to content or phenomenal character. It is unclear, anyway, why these changes should be better candidates for this role than the patterns of stimulation themselves: what seems to be doing the work is the fact that coffee stimulates the taste-buds in a different way from orange juice, for example, rather than that this stimulation changes in a characteristic way for each property when the agent moves. If this is right, then the emphasis seems to be on the processing done by an agent's brain rather than on her skills as an embodied actor.

(2) The second interpretation of the enactive account, on the other hand, states that there are two levels to perceptual content, and that the latter is constituted by the exercise of one's sensorimotor grasp of the former. The first level specifies apparent properties - the ways things appear to be from one's current perspective - and the second specifies real properties; only by keeping track of the former does one perceive the latter. Perceiving the real square shape of the table involves keeping track of the changing apparent diamond-shapes as you move relative to it, for instance.

This account has some appeal in the visual case, where we can make sense of the idea of apparent colours and shapes and so on (even though, as I have argued in chapter 3, we end up with an explanation that does not do proper justice to the phenomenology). In non-visual perception, though, the problems identified so far can be re-cast in this language: it isn't clear what it means for something to smell or taste a certain way *from here*, or for this to change as we move our bodies. It isn't clear what an 'apparent taste', rather than a 'real taste', could be (or an observer-dependent versus observer-independent taste). Again, it can't be changes in how things appear that determines the content of the experience because no such changes occur, and so a passive model on which the brain does the work is appealing.

One way in which Noë construes the perception of the first level of content in the visual case is as follows:

> "To experience something as *elliptical from here* is to experience it as occupying a certain place in your sensorimotor space, e.g. as being such as to be blocked from view by *this* sort of an occluder, or as being something whose outline could be traced by such and such a movement et cetera." (2004, chapter 4; p1; emphasis in original).

As before, this is not an account that can be carried over without difficulty to the explanation of non-visual modalities. The content of non-visual experiences tends not to specify spatial features of external objects that can be tied to one's own capacities of

movement (or 'tracing') like the example of apparent shape. Nor do there appear to be any correlates of the grasp of 'occluders' outside of the realm of visual perception.

4.2: Is Any Non-Visual Content Explicable in Sensorimotor Terms?

I mentioned above that one way that non-visual features change in response to a perceiver's movements is along the dimension of intensity or salience. Smells, for example, are stronger and more easily identified the closer one's proximity to their source, while sounds are louder and clearer. This is the one sense in which it is appropriate to talk of there being non-visual perspectival or apparent properties, and an understanding on behalf of the agent of the ways in which they change with her movements may be a contributory factor to some non-visual perceptual contents.

Although it is hard to sustain the claim that all of the content and character of non-visual perception is grounded in sensorimotor skill - largely, as I have suggested above, because of the paucity of candidate movements in these cases - there are some components of these modalities to which enaction does appear to make a contribution. The enactive account carries more weight in the cases of auditory and tactile perception than in gustatory and olfactory perception, but in fact we can identify plausible aspects even of the content of smell and taste experiences for which sensorimotor considerations may play a part.

We have seen already that tactile perception is amenable to enactive explanation; indeed, Noë argues that we should take this to be our paradigm of a sensory modality, rather than vision. In some cases at least, it makes sense to describe the content of a tactile experience as exceeding what is immediately given to the part of the body involved in the perception. In our familiar case, an agent feels the whole three-dimensional shape and solidity of a bottle that is held in his hands, in spite of the fact that only his fingertips are in contact with the object's surface. On the enactive view, of course, this is possible because the agent brings to bear his knowledge of how the rest of the bottle *would* feel were he to move his hands over its surface; he experiences the bottle as accessible by means of sensorimotor skills.

This kind of account works pretty well, I think, for the general case of shape and size content in tactile perception. When the object is large, the perceiver understands the ways in which he can move his hands, say, over its surface; when the object is small the changes will come with movements of the fingers, or movements of the object itself. Texture, too, is a plausible candidate for this kind of explanation - perceiving a surface as smooth appears to

require an understanding of the way that how it feels would change as one moves one's body over it.

For those contents that are explained by the enactive proposal, it should be impossible to conceive of a creature who lacks the relevant sensorimotor understanding but who nonetheless is capable of experiencing the property. Barring, perhaps, the case of a creature capable of entirely enveloping external objects - and who might be able to perceive the whole 3D shape of an object 'in one go', as it were - it is difficult to imagine the possibility of fully perceiving by tactile means in the absence of bodily exploration and the understanding that goes with it. In contrast, the more passive nature of taste and smell renders them easily ascribable to even the most inert of creatures.

The sensorimotor basis of tactile perception, however, extends only to its spatial components - size, shape, relative location, texture - and not to temperature. This is an issue where disambiguating and counting the senses may be problematic - the perception of temperature may be separated from the modality of touch, or it may not be. If it is a genuine facet of tactile perception (as strikes me as the intuitive categorisation), then this is tactile content for which the enactive view is inappropriate. If it is better described as a separate modality in its own right, of course, then it will be a further case that appears to resist enactive explanation. The only temperature-relevant changes that come with movement, like in the gustatory and olfactory cases, are those of intensity: we may understand that the warmth of the fire recedes as we move away from it, but this 'sensorimotor skill' does nothing to explain the content and phenomenal quality of the experience. It isn't clear that there is anything analogous to perceptual constancy in the case of temperature. Recall that in the case of colour, for instance, we can talk of two regions of a surface that bears the same observer-independent colour (say, red) as presenting different apparent colours (say, shades of pink), and that enactive skill resolves this discrepancy for the perceiver – he sees the real colour by exercising his knowledge of how the apparent colours change in response to alterations in conditions of observation. When it comes to the experience of heat and cold, though, there appears to be no such two-level composition; two parts of the same object that feel different with respect to temperature (say, two parts of a car that has been left out in the sun) are not also felt to be the same temperature through sensorimotor interaction.

Auditory experience fits to some degree with the enactive proposal, to the extent that it bears spatial content. Locating a sound in experience, on this story, involves knowing how its intensity or apparent volume changes as one moves through space. A sound from one's left changes in a different way from a sound from one's right as one moves left, for example.

This case, in fact, accords most closely with Noë's overall conception, and appears to resist the objections I have made so far to the sensorimotor model. I argued in the last chapter that the dual-content account failed to adequately describe the phenomenology of visual experience; that, for example, round plates do not look apparently-elliptical and circular at the same time, as Noë claims. In auditory experience, though, the division between apparent and real properties is quite a natural one to draw, albeit only where apparent properties are carefully restricted.

Consider the case in which you hear a far-off siren, at the same time as listening to a programme on a nearby radio. There is a sense in which you may hear the two sounds to be the same volume (or even that the siren is quieter than the radio), but another sense in which the siren sounds louder than the radio - after all, the siren *is* louder than the radio, and the experience is not illusory. The enactive view can explain this phenomenon by appealing to the claim that you perceive the real volumes in virtue of understanding how their apparent volumes would change were you to move relative to their sources. You hear the siren as being louder than the radio because you know that its apparent volume would increase - to a threshold far higher than that of the apparent volume of the radio - as you approach its source. This explains, too, why it is possible to mistake a sound that is in fact of low volume and close proximity for one of higher volume and greater distance: you simply bring to bear the wrong profile of sensorimotor contingencies[1].

I claimed that in the visual case, a property like Noë's putative 'apparent size' - on which model a distant object has a smaller apparent size than a nearby object - could be rejected in favour of the more phenomenologically-apt 'looks further-away' interpretation. On my view, distant objects don't have a dual-content with respect to size; when one's visual experience is veridical, they look to have their real sizes and to be far away. In the auditory case above, though, my intuition is reversed: I find it more acceptable to say that the siren sounds apparently-quieter than the radio, and - by bringing to bear sensorimotor knowledge - that it sounds to be louder. I concede, though, that this is a case where intuitions about phenomenology are not clear-cut, and where they consequently don't hold much rhetorical weight. On Noë's view, the visual case matches this one - nearby objects are apparently-large(r) in the same way that sounds whose source is nearby are loud(er). To reiterate, I am committed to the latter but not the former.

My proposal regarding the case of auditory perception, then, is tentative: that content relating to the spatial location and arrangement of a sound-source is plausibly explained in sensorimotor terms and, although less clearly, that content specifying the volume of a sound may be similarly explained.

The case of smell is, I propose, similar with respect to enaction to that of hearing: we can locate smells in perception, and this ability (this content of the experience) can be put down to the ability to keep track of the ways in which the intensity of the smell changes as we move - we experience an odour as coming from *over there* because it gets stronger as we go in that direction. Again, there are competing descriptions of what is being specified by this content here: it is either the *location* of the smell, or it is the *source* of the smell. Each of these may be more or less appropriate in individual cases (I think it's more natural to speak of, say, a pervading scent of air-freshener as being *located in* a room, but of the smell of baking bread as *coming from* the oven), but both are amenable to this sensorimotor explanation. As with the other modalities, it is hard to dissociate spatial content in the experience from action; unclear, that is, how a wholly inert perceiver could locate smells or their sources in perception.

Again, my view is that the olfactory case differs from the visual one in that it is appropriate to speak of an odour's apparent intensity (or its intensity from here) in a way that I rejected for visual properties.

Taste is the most spatially-impoverished of the senses. Not only is it inappropriate to propose a perspective from which one enjoys gustatory experiences, in the way that one has a visual perspective on the world, it is also the case that perceptual content that picks out the source of a taste does so, in a sense, in non-spatial terms. Rather than specifying a location from which a taste is 'coming from', the experience picks out the *object* to which the taste property is ascribed, on some suitable construal of 'object' that includes liquids, vapours, gases etc. One tastes the orange, for example, and not the location of the orange.

Sensorimotor understanding, however, can be seen to apply in this case too. Through knowing that the taste will recede as the orange is removed from one's mouth, and that the very same flavour will come back when the orange is replaced, one experiences the taste as an enduring property of the orange itself. Here, enactive skill does not contribute to the character of the experience - it does not fix the orangey-ness of the experienced flavour - but it does, I contend, fix its intentionality *per se*. That is, it allows the agent to experience the taste property as a property of the external world; a property that endures and that can be detected by bringing oneself into contact with appropriate objects[2].

The same is true for the other examples I have provided in which sensorimotor understanding is not what accounts for the content and qualitative feel of an experience: this understanding *does* provide the agent with an awareness of the world-directedness of his experiences. The warmth of a cup, for instance, is attributed to (experienced as being a property of) the physical object in virtue of the knowledge that the warm sensation would

recede were the cup to be taken away.

In non-visual perception the exercise of sensorimotor skills contributes only to the specification of spatial content, which in turn may ground a perceiver's sense of self versus other; the explanatory task of accounting for the remainder of non-visual content and phenomenal character has been left untouched by the enactive model. The pitch and timbre of sounds; the sweetness, sourness and bitterness of tastes; the particular qualities of smells and so on have not been adequately addresses by enactive considerations.

4.3: Conditions of Observation in Non-Visual Perception.

So far I have claimed that enactive skills are irrelevant when it comes to what are traditionally described as secondary qualities in perception: they contribute nothing to the perception of smells, tastes, warmth and cold and so on. The visual perception of colour, however, is said by Noë to draw upon a sensorimotor understanding not only of the ways in which apparent colours alter in response to the perceiver's movements, but also of the ways in which they change as further conditions of observation change. These extra conditions are those of illumination - for colour perception the agent needs to understand how the apparent colour of an object will change as the object is moved into, for example, brighter light or light of a different hue. To experience grass as green, say, the agent must understand that it will look green under uniform white light, but will take on a dark brown apparent colour under red light and so on. There are motor-related changes, too - this bright patch here will change its location on the object as the object is moved in relation to the light source, for instance. Both types of change can contribute to the understanding possessed by the agent, and therefore to the content of his experiences.

The requirement that the visual perceiver must bring to bear sensorimotor skill in order to perceive even colour properties entails that any agent who is capable of undergoing colour-sensations, but who lacks the relevant body of sensorimotor skill, is not enjoying a true colour experience. The perceiver whose perceptual contents only specify the first level of Noë's proposed dual-level account - that is, only the apparent colours of objects, or how they look with respect to colour from here - is not enjoying a true colour experience. The bringing to bear of sensorimotor skill is necessary in order to disambiguate possible colour contents: a red sensation (appearance) may be the result of a white wall that is illuminated by red light, or of a red wall lit by white light, or of a pink wall lit by red-ish light and so on. The red sensation/appearance alone is therefore not sufficient for a contentful experience.

If the same were true of the non-visual modalities, then this would be a possible response on behalf of the enactive theorist to the charge that changes that are the result of movement are irrelevant to content. By extending the scope of 'sensorimotor knowledge' to include a grasp of non-motor influences, the enactive theorist could argue that this is the kind of mastery whose exercise is necessary for non-visual perception (I know of no philosopher who has made this move, but there is logical space for it).

This strategy, I suggest, is not available as a viable explanation of the non-visual cases because there are no correlative non-motor conditions of observation here whose changes must be mastered. There is no possible disambiguation between apparent properties that are the possible results of multiple real properties.

Superficially, there are non-visual cases in which the perceived property changes as a result of non-motor influences that could, potentially, be understood in the same quasi-sensorimotor way as those of illumination condition. Orange juice, for example, tastes different before and after brushing one's teeth; an E played on the piano sounds different when accompanied by a C or an A; a rose smells different when accompanied by the scent of air-freshener or in its absence. Differences to what we could call background conditions result in differences to how properties are experienced.

These situations do not match the case of colour perception, though, because there is no bringing to bear of sensorimotor knowledge in order to disambiguate possible contents in these examples; the sensation - or appearance - is enough to settle the content of the experience. When tasting the orange juice prior to brushing one's teeth, for example, how it tastes *then* is enough for the juice to be experienced as having an orange flavour - it is peculiar to imagine that one has to bring to bear one's knowledge of how it would taste when accompanied by the flavour of toothpaste, or any of an open-ended range of flavours, in order to have this content.

We can put this point another way: Noë introduces the non-motor-changes understanding to account for the phenomenon of perceptual constancy in the colour case. Perceivers see the real colours of objects in spite of their apparent colours changing across conditions of illumination, and it is the bringing to bear of knowledge about the nature of these changes that constitutes this constancy according to the enactive view. The ambiguity inherent in any individual apparent colour (red-wall, white-light versus white-wall, red-light, for example) is resolved by the exercise of sensorimotor skill. In non-visual perception, though, it is not clear that such constancy exists, or that non-visual experiences involve the resolution of ambiguity by sensorimotor skill. For constancy to be present, it would have to be the case that, for example, the 'real' taste of the orange juice is experienced in addition to its 'apparent'

taste following tooth-brushing; that the real sound of the E is experienced in addition to its apparent sound when played with each other note; that the real smell of the rose is experienced in addition to its apparent smell when accompanied by air-freshener.

I take these to be phenomenologically inaccurate descriptions of the content of non-visual experiences. Only the *new* property is experienced in these cases, and that any constancy that may be involved is not at the level of experience. There is simply a new taste that is experienced when orange juice and toothpaste combine, a new composite sound when notes are played together and a new scent when more than one smell mixes in the air. As noted above, it makes little sense to talk of real and apparent properties in the non-visual modalities; there is no dual-level content here[3].

The 'grasp of changing conditions of observation' component was introduced by Noë to show that in visual perception it is never enough to undergo a particular colour sensation (in his terms: to perceive a particular colour appearance) - for genuine colour experience the perceiver must exercise his mastery of the ways in which the sensation would change in response to changes in illumination. In non-visual perception, though, this route is not available and the consequence is that any particular sensation is fit to fix the content of experience in the absence of any extra 'grasp of changing conditions of observation' condition. What we need, of course, is an explanation of how particular sensations come about, but this will not be achieved in enactive terms.

4.4: Illusion And Hallucination.

By examining cases of illusion and hallucination in visual and non-visual perception, we can further demonstrate that the enactive account does not have the resources to explain all perceptual phenomena. Where it falls down, as in the cases investigated above, is in accounting for the perception of apparent or sensational properties. Although there are certain features of visual illusions, for example, that can be accounted for fairly naturally under the enactive framework, there is no satisfactory general account of misperception in sensorimotor terms.

4.4.1: Illusion.

For the sensorimotor model to be successful, it would have to describe illusory and hallucinatory perception on its own terms - that is, cases in which an experience is non-

veridical would have to be explained as failures on the part of the agent to successfully enact the right content or to bring to bear the right body of sensorimotor skill. There are cases of illusion in both visual and non-visual perception for which this type of explanation *is* appropriate, but this is possible only for misperception involving the limited component of content that can be attributed to a sensorimotor source.

Visual cases first: when, for instance, a perceiver sees a far-off tower as being round when in fact it is square, this can be put down to his bringing to bear an inappropriate body of sensorimotor knowledge. To see the tower as round, on the enactive view, is to anticipate that its apparent shape will change in ways that are characteristic of round objects. For the illusion to occur, the perceiver's experience of the appearance of the tower - which may be indistinct from her distant location - must result in her bringing to bear a body of sensorimotor knowledge that is inappropriate to that appearance. Perception goes right when the anticipatory component of the agent's understanding of sensorimotor dynamics matches what would in fact happen were she to move in certain ways; it goes wrong when these come apart.

Similarly, the visual perceiver may be perceptually mistaken about the colour of a surface as a result of failing to resolve its apparent colour correctly. According to Noë's account, the red wall lit with white light and the white wall lit with red light may present the same apparent colour to the agent, but the apparent colour will change in different ways in response to changes of illumination depending on which real colour is present. When the wall is really red but the agent mistakenly brings to bear his sensorimotor knowledge of how the appearance of white walls change, he will undergo a colour illusion. His expectations, which determine the content of his experience on the enactive view, concern sensory changes that are characteristic of white rather than red.

To the extent that sensorimotor considerations apply in contributing to the contents of non-visual experiences, a similar story can be told about illusions in these cases too. An auditory or olfactory perceiver may be mistaken about the spatial location (or source) of the properties he experiences if and when he fails to correctly anticipate what will happen to the intensity of the sound or smell as he moves. If he expects a sound to increase in volume as he moves to the left, for example, with this expectation suitably construed as implicit and skilful, then he will experience its source as being to his left (for that is what having an experience with this content consists in). There may be further illusory cases that involve the perceiver moving, correctly keeping track of the resulting changes to his sensory input, but *unsuccessfully* keeping track of his movement (that is, getting the right-hand-side of the sensorimotor contingencies wrong). The possibility of such cases will depend on the extent

to which perceivers must understand their own movements on the enactive story.

Some tactile spatial illusions, too, seem amenable to sensorimotor explanation, either where the agent has failed to keep track of his own movements, or where he mistakenly anticipates that a certain movement will yield a certain change in input. An agent who holds what he thinks is a glass bottle in his hands will experience the object as solid and bottle-shaped by bringing to bear his knowledge of how its tactile appearance will change in a certain profile of ways, but these expectations may go awry if the object is in fact differently shaped in all but the regions with which his hands are in contact.

While failing to bring to bear the right body of sensorimotor knowledge can result in perceptual content that is illusory, this description is appropriate only in those cases where it makes sense to talk of both real and apparent properties. Illusions, after all, are by definition those perceptual situations in which what is experienced does not match the way things really are. In the cases mentioned, though, the perception of apparent properties (which, recall, have been defined as objective, relational properties) is veridical - it is only the content that specifies invariant properties, constituted by the exercise of sensorimotor skill, that is not accurate. If all cases of illusion could be described in this way - as failures to bring to bear the right body of sensorimotor knowledge on veridically-perceived appearances - then the enactive account would be on firm ground.

For Noë, though[4], apparent properties are capable of being perceived and the first level of his dual-content story specifies these (we are said, for example, to *see* both the real and apparent shape of the plate). The question arises, then, as to whether it is possible to misperceive the apparent properties themselves and if not, why not?

In the visual example above, the apparent colour of a red wall lit by white light matches that of the white wall lit by red light - they both have a reddish hue. This apparent colour is a real, non-mental property that is determined by the physical properties of the wall, the character of illumination and the location of the observer. Noë thinks that you perceive this apparent shade *and* the real colour that underlies it; the latter of which through the exercise of sensorimotor skill. But we haven't been given an explanation of what it is to perceive the apparent colour: is it possible to misperceive the apparent colour? If so, how? If not, why is the first level of perceptual content immune to error?

Some familiar visual illusions do seem to be cases in which apparent properties are misperceived, and so resist explanation in sensorimotor terms. The Mueller-Lyer illusion, for instance, cannot be described as a failure to resolve the apparent properties of the figure

correctly by sensorimotor means. For an enactive explanation to be given appropriately here, the two lines would have to present different apparent lengths and the perceiver would have to bring to bear an inaccurate body of sensorimotor knowledge concerning the ways in which objects with those lengths would change in response to movement, as in the square-tower case. It is not, however, clear that this is a sensible description of this scenario. The lines *do*, on Noë's account, present apparent lengths that can change as the agent's perspective moves. For example, when the page is perpendicular to the line of sight the apparent length of the lines is at a maximum, and when the page is sloping away from the viewer the lines are apparently shorter. But the two lines visually seem to be different lengths even when both are located on the same plane (on the page), even though their apparent lengths are the same from any location orthogonal to the page, so the difference cannot be put down to a difference in their respective spatial relations to the viewer.

If the enactive theorist is to maintain the view that the illusion is the result of the correct perception of appearances coupled with the incorrect exercise of sensorimotor skills, then he must provide us with an explanation of how *contextual* - and therefore extrinsic - properties like, in this case, the diagonal arrows on the ends of the Mueller-Lyer lines - can alter appearances.

The phenomenon of colour contrast, too, seems to involve the misperception of apparent properties - here, the apparent colours that Noë claims are specified in the first level of visual content. Colour contrast occurs when the colour of a surface appears to change when another coloured surface is placed adjacent to it. Again, an extrinsic contextual property - the presence of an adjacent surface or surfaces - affects the character of the experience, and the enactive theorist must explain with what this change is to be identified. The sensorimotor theorist cannot claim that it is to a mental/sensational property because such properties are anathema to the enactive approach, but if it is a property that can be affected by extrinsic changes it is not clear what kind of property it could be. Apparent colours, on the enactive view, are relational properties that hold between surfaces, locations and lighting conditions, with no mention of the influence of other surfaces and their properties.

In the Mueller-Lyer and colour-contrast cases, then, we have visual illusions that correspond to the misperception of apparent properties - of apparent length and apparent colour respectively. They are thus not amenable to the enactive explanation that may be given of the earlier cases I presented. We cannot make an appeal to the misguided employment of sensorimotor understanding, as we did there, for the perception of apparent properties hasn't been given a successful sensorimotor interpretation. While we may be able

to give an enactive account of how invariant colour properties are perceived within changing apparent colour properties, we can't give one of the perception of apparent colour properties themselves. As a result, illusions that involve their misperception cannot be given a sensorimotor treatment.

4.4.2: Hallucination.

Hallucinatory experiences, even more so than illusory ones, cause trouble for the enactive theory in that they are situations in which there is phenomenal character and content - albeit perhaps only to a limited extent - in the absence of any correlative external object. Experiences of this kind cannot therefore be episodes of the active exploration of appearances as mediated by sensorimotor contingencies, because there is nothing appropriate to be explored. They show, then, that the active-exploratory construal of perception, with its focus on the exercise of whole-animal skills, is misguided.

Hallucinations occur in both the visual and non-visual modalities, although the former are more familiar. Visual hallucinations include coloured afterimages and drug-induced visions, for example, while non-visual hallucinations can be undergone by migraine-sufferers, say, prior to onset. In these cases, vivid olfactory and gustatory experiences are had in the absence of their standard external cause. Auditory hallucinations, too, can be induced by direct contact with the brain during surgery, while tactile hallucinations include phantom-limb phenomena. In these situations the hallucinatory experiences appear straightforwardly to be the result of brain activity and not of an extended period of exploratory interaction with appearances.

Noë's enactive account of hallucination in 'Real Presence' (p33 and following), I will argue, does not fit with his earlier story of sensorimotor dependence. Throughout his development of the enactive theory, Noë has emphasised that appearances are non-mental, albeit relational, properties of objects and that perception consists of keeping track of the ways that they change with movement. A consistent reading of the enactive view is that it adopts a direct realist position as far as appearances go - it involves a relation between the perceiver and the appearance: perception is an active process of exploration of the world. As with any direct realist position, there are difficulties in accounting for cases of illusion and hallucination.

We can define hallucination as the experience of properties or objects that are not present.

In these cases there is - by hypothesis - nothing present that can stand in the same relation to the agent as in the case of veridical perception. There is no object that is there to be explored through skilful action. There are no changing appearances that can be understood (or, as in the case of illusion, misunderstood) by the perceiver.

Yet Noë says that "when I *hallucinate* yellow I *act as if* I were seeing yellow by drawing into play the sensorimotor profile of yellowness" (forthcoming; p34; emphasis in original). This can't be right - why should acting a certain way when not in the presence of a yellow appearance produce the same experience as when you are in the presence of a yellow appearance? Why should acting in a certain way produce any qualitative experience at all? Indeed, if acting a certain way is sufficient for a contentful, qualitative hallucinatory experience, what role does exploratory interaction with external/relational appearances play during veridical perception?[5].

We can allow, however, that hallucinatory experiences acquire (some) perceptual content only in virtue of the exercise of sensorimotor skill, while maintaining that non-sensorimotor considerations are responsible for the remainder. The spatial contents that I have argued are the realm of sensorimotor skills are candidates here: while the phenomenal character of a migraine-induced smell is not fixed by the exercise of enactive skills, its apparent external location (if it is experienced as having one) may be the result of anticipating the ways in which its intensity would change in response to movements. This may be true even if the performance of said movements would not in fact reveal said changes; what is important is the expectation on behalf of the perceiver. Indeed, it is difficult to imagine that such content could be undergone in the absence of these kinds of expectations.

We should be careful not to suggest that the division between the content and the phenomenal character of an experience can be mapped easily onto the contribution of sensorimotor and non-sensorimotor mechanisms respectively; that the brain is responsible for the latter and the whole animal for the former. Part of the phenomenal feel of a perceptual episode, as Noë has argued, is grounded in the expectations of the perceiver in such a way that his current sensations are not enough - in the absence of these expectations - to account for the full qualitative component of the experience. The sensations at one's fingertips when holding onto a football, say, are not all that we must appeal to in explaining the qualitative feel of holding the ball - there is a perceptual sense of the presence of the whole ball that is grounded in one's expectations of the way it would feel were one to move one's hands around its surface.

In contrast to this case there is gustatory experience where, I have claimed, expectations about changes that are the result of movements do not make any contribution to perceptual content. The phenomenal character of such an experience - say, the fruitiness of the taste of orange juice - is not determined by the perceiver's expectations, and the content of the experience just *is*, it seems, this qualitative character.

The considerations investigated above demonstrate, I believe, that the enactive claim that it is the skilful exercise of sensorimotor knowledge that determines the content and character of experience is in error, and that the activity of the brain alone is an important contributory factor. One way of filling out this contribution - one version of which I develop in the remainder of the project - is to argue that the brain supports *representation* in experience. Other traditional treatments of perception are consistent with this brain basis, too, and the burden of explanation is on the enactive theorist to show why we ought to extend the supervenience base of experience to body and world.

4.5: Summary and Conclusions:

Non-visual, non-tactile experiences and cases of perceptual error are problematic from the point of view of the enactive approach. The possible contribution to perception of dynamic sensorimotor exploration and understanding differs across the sensory modalities, given the different structures and contents of their respective experiences. It is not at all clear, though, that each modality shares the essentially exploratory nature that is emphasised by the sensorimotor view, nor that we can tell the same two-level-content story or deal with perceptual constancy phenomena in these cases.

On a personal-level construal of sensorimotor skill, where what is understood is how appearances alter in response to movements, we saw that visual perception involves resolving observer-independent properties such as shapes and colours out of perspectival properties. This is said to account for how perceivers can experience constant features of objects in spite of always observing them from a particular location and under particular conditions. I have suggested that while this account may work well for some aspects of perceptual content across sensory modalities ï most notably in regard to spatial content ï it is not helpful when it comes to others.

Sounds, I take it, may have an apparent volume (a volume from the point of view of an auditory observer) and a real volume, while smells may have an apparent intensity and a real

intensity. A consistent sensorimotor story may be told according to which the spatial content of these senses is determined (perhaps constituted) by the exercise of the perceiver's implicit, practical grasp of how these apparent properties change or would change in response to her movements[6]. Similarly, the spatial content of tactile perception, exemplified in the familiar bottle-in-hands example, is amenable to sensorimotor explication.

The non-visual content that is enacted, though, is limited to this spatial component. If the view is right, then perceivers are presented with certain properties as spatially located or extended, or as moving, when they bring to bear their understanding of how the appearance of these properties alters in response to their movements. This story says nothing, on the other hand, about the distinctive qualities of non-visual experiences, whether these ought to be ascribed to the objects of such perception or to experiences themselves. It says nothing about what it takes for a scent to be experienced as floral, for a sound to be high-pitched, for a surface to be hot to the touch.

Most problematic is taste perception, where (at least in certain cases) exploratory world-engagement is absent and any distinction between apparent and real properties is hard to sustain. Sensorimotor expectations may allow the agent to perceptually ascribe a taste to an object, and so provide world-directedness in experience, but even this may be lacking when, for instance, one has a taste that is simply in oneôs mouth. If the enactive approach is intended to accommodate perceptual experiences from each and every modality then these represent challenging cases[7].

Some features of *mis*perception can be dealt with on sensorimotor terms, while others resist this form of explanation. Those limited perceptual contents that depend upon the exercise of sensorimotor skill can form part of an illusory experience when the skills are employed inappropriately - for instance, when expectations concerning sensorimotor dynamics that are characteristic of one shape are triggered by the presence of a different shape. Some illusions, on the other hand, and I made reference to the Mueller-Lyer as an exemplar, seem to be cases in which it is apparent properties themselves - defined as external, relational in nature - that are misperceived. Apparent shapes and colours and so on are capable of being misperceived, and the enactive view has not (yet) provided the resources to explain how this might occur.

Similarly, hallucinations are experiences that take place in the absence of external objects that can be explored, and so the enactive theorist must provide an account of how states that may be qualitatively indistinguishable from those involved in genuinely perceptual episodes can come about. If the response is to say that sensorimotor understanding can be brought to

bear even without object-involving exploration, then we deserve a full treatment of this (obscure) notion.

I take it that these considerations, and the problems facing the enactive approach as a whole that I highlighted in the previous chapter, put pressure on sensorimotor views in their role as explanatory projects with ambitions to accommodate all perceptual phenomena. While active exploration and sensorimotor understanding may be required for an agent to undergo experiences with spatial content ï where this may be the hallmark of world-directedness in perception ï it isn't clear how or whether this can be extended to perceptual contents in general.

Chapter 4 Notes.

Footnote 1: This is another phenomenon, however, that could be explained by the 'ideal-appearances' view: rather than bringing to bear one's knowledge of the full profile of sensorimotor dynamics, that is, it may be that the same result could be obtained by appealing to knowledge of what the volume of the sound(s) would be from an ideal perspective.

Footnote 2: At least some cases, though, resist even this limited sensorimotor explanation. For example, medication that is taken intravenously can sometimes cause a taste in oneôs mouth in a way that seems entirely free from sensorimotor interaction.

Footnote 3: Again, even if we were to accept a dual-content view here an ideal-appearances version appears to me to be more compelling than a sensorimotor one. If the real taste of the orange-juice is experienced in addition to its apparent, adulterated taste it is because the perceiver brings to bear her knowledge of how orange juice tastes with a clean palette (that is, under ideal tasting conditions), and not how its taste changes over a full range of conditions.

Footnote 4: On, at the very least, some readings of Action in Perception. This, in my terminology, is a Version 2 enactive account.

Footnote 5: One way to go on this, to which Noë appears to be sympathetic (in discussion, Edinburgh Perception & Action workshop; March 2007), is to endorse a form a *disjunctivism*. Non-hallucinatory cases of perception are, on this view, given one treatment - a sensorimotor, direct-realist one - while hallucinations are taken to be introspectively-indistinguishable states of a different kind. The challenge for the enactive theorist is then to explain why acting in a particular way in the absence of an external object should result in (or constitute) a state that is indistinguishable from an episode of genuine sensorimotor exploration of an object. This is no easy task.

Footnote 6: I offer this only as a *consistent* treatment, not as a true one. A representationalist account, for instance, may do equal justice to the phenomena. The aim here was to explore how an as-yet-undeveloped enactive account of non-visual perception might go, not to defend it.

Footnote 7: Non-perceptual experiences, too, are difficult to explicate in sensorimotor terms. It is unclear, for instance, how pains, itches and orgasms involve active exploration mediated by knowledge of sensorimotor contingencies. It may, however, be that the enactive view is intended to apply solely to perceptual cases.

Chapter 5: Introducing the Action-Space Account.

I have argued that the very deep and direct relationship between action and perception that is proposed by the enactive approach is not a satisfactory one. Except perhaps in limited cases, neither the content nor the qualitative character of perceptual experience are adequately explained by appeal to the exercise of finely-tuned sensorimotor understanding. Yet action and perception are obviously importantly interconnected; at the very least, there is an instrumental relation between an animal's perceptual and motor abilities. Perceptual sensitivities guide world-directed actions while movements allow agents to alter their observational perspective on the environment. In this chapter I introduce my positive account of the relation between action and perception, which goes significantly further than a thesis of mere instrumental dependence. While the sensorimotor theory emphasises the influence that actions have on perception, the account I develop takes the opposite view and stresses the role that perception has in presenting agents with opportunities for world-engaging action. Thus we are able to retain a focus on perceivers as embodied, active agents without committing ourselves to the strong enactive approach.

On the view that I will develop, spaces of action are specified by perceptual contents. When an agent with suitable perceptual sensitivities encounters an environment, she is empowered to perform certain suites of possible action that are constrained both by that environmentôs properties and constituents, and by features of the perceiverôs body and skill-set. Particular objects, for example, can be acted upon in characteristic profiles of ways by embodied agents, while cognitive or epistemic action-types such as comparing, tracking and recognising are afforded by surface or geometric properties. Conscious perception is constituted, on my view, by the representation of these spaces of action in a format that is apt for integration into the perceiverôs ongoing planning and rational action choice. My starting points are the models proposed by Philip Pettit (2003) and Andy Clark (2000a), and I acknowledge the precedents set by these accounts before developing the central features of the ócaction-spaceô approach, as I shall call it, in the remainder of the project.

In chapter three, I examined a cluster of proposals that aimed to show that certain patterns of access consciousness entail the presence of phenomenal consciousness. As will be developed below, the action-space approach makes use of this strategy, too, as its aim is to motivate the claim that phenomenally conscious experiences are constituted by a particular form of access to spaces of perceptually-enabled action. Access consciousness is in the business of poising the contents of mental states for use in planning, reasoning and the

guidance or targeting of intentional action; questions about its functioning are said to be the 'easy' problems of consciousness. Phenomenal consciousness, on the other hand, concerns the 'what it is like-ness' of experience, and the 'hard' problem of consciousness involves explaining how such a phenomenon could be embodied in or caused by a physical system. The proposals I investigated all claim that if an agent is capable of bringing to bear a particular form of access consciousness - that is, bringing to bear access consciousness on a particular form of target - then he will necessarily undergo a phenomenal experience; there will be something it is like to be him. Such an explanatory move, if successful, would constitute a reduction of the phenomenal to physical/functional facts about the agent as an integrated system capable of interaction with the world.

The accounts that emphasise this access-implies-qualia move are similar in that all acknowledge the fact that perceivers exist in environments whose constituents have characteristic effects on agents' sensory systems when both are located appropriately, effects which typically enable the perceiver to navigate through that environment and to act upon and within it. It is the integration of these effects into the agent's higher-level capacities of planning and reasoning that entails phenomenal consciousness - on these accounts, perception just is a matter of this integration. Where the theories to be considered *differ* is over which stage of this causal chain - from sensory input from the outside world to the suite of effects that are enabled in the perceiver as a whole - is appropriately described as the 'target' of access-consciousness, the target of integration with higher-level functioning.

In section 5.1, I reiterate the existing options for the relevant target of access-consciousness: patterns of sensorimotor dependence; features of sensory processing that are characteristic of one modality rather than another; spaces of actions enabled by perceptual sensitivities. I argue that the most plausible candidate target of access-consciousness is the latter of these.

Section 5.2 introduces Philip Pettit's *looks as powers* account (Pettit, 2003) as an exemplar of the view that the important direction of influence between action and perception is one where the stress is on what perception can do for action, rather than the reverse. This account is then compared in section 5.3 to the sensorimotor model endorsed by Hurley & Noë (2005), and I argue that Pettit's model offers a more satisfying treatment of what it is that constitutes perceptual awareness. Section 5.4 and the majority of the following chapter are devoted to defending the claim that proper examination of access-consciousness and the kinds of capacities it can support provides genuine explanatory headway when it comes to phenomenal consciousness.

5.1: Three Alternative Access-Based Accounts:

O'Regan and Noëôs account, at least on one plausible interpretation, required that the agent's access be to patterns of changing stimulus activity - for example, on a simplified reading, to images on his retina in the case of visual experience. Only when sensorimotor contingencies - ways in which these patterns change in response to the agent's movements - are integrated with his higher-level capacities of planning and reasoning will the agent be phenomenally aware of the world that underpins those contingencies. This integration can be described as the agent's having access-consciousness whose target is sensorimotor activity.

My objection to this was that it is not clear that any such access is really in place, and that it is not even obvious what it would mean for it to be so, given that access is a personal-level phenomenon while patterns of input are subpersonal. O'Regan and Noëôs theory is what I have called a Version-1 sensorimotor approach: it is (explicitly) the changes to the agent's sensory input activity that come with his movements that matter to perception, in contrast to its being changes to perceptual content or changes to phenomenal properties (as other versions of the enactive account propose[1]). According to O'Regan and Noë, then, the effects on the perceiver that are caused by his engagement with the world and which must be integrated into his goals and reasons during perception are those that concern his sensory systems, rather than the agent himself or his skills and capacities. I take such integration to be impossible, given the way that access has been set up so far, as modelled on Block's original distinction. It is not the case that perceivers are capable of keeping track, for the purposes of planning and reasoning, of their own subpersonal states or changes within them. As I read Noë's recent work, furthermore, he too rejects this account for these reasons, and adopts an approach that is no longer amenable to the access-implies-qualia strategy.

Andy Clark's account can be divided into two alternatives and it is the latter of these, on which access is to a suite of enabled actions, that I will develop[2]. Clark's overall claim is that if the agent has a form of *direct, non-inferential access* to the sensory modality with which he makes a discrimination, there will be something it is like for him to make that discrimination (i.e. phenomenal awareness). So the effects that the perceiver's environment has upon him, and which must be integrated with higher-level capacities in perception, are those concerning the *channel* or *mode* of input from external world to agent.

The first way in which such access could be in place is for the agent to be in touch with the vehicles that subserve a discrimination - the brain states themselves that underlie the sensory modality - and to understand non-inferentially that particular vehicles correspond to one

modality rather than another[3]. Leaving aside the question of whether this would genuinely constitute *non-inferential* access, this account, I suggested, was subject to the same kind of objection as that to which O'Regan and Noëôs model was vulnerable. As before, the presence of access to subpersonal states - vehicles - is implausible or, perhaps, nonsensical. Agents are not able to integrate facts about the brain states that are active when a particular sensory modality is in operation into their ongoing plans and reasoning. Clark notes that he does not favour this reading himself.

The second way in which access to sensory modality could be in place is for each modality to empower the agent in characteristic ways and for the agent to have access to these ways. That is, for the different modalities to poise the agent to act out a characteristic skill-set. There could be, for example, distinctive ways in which visually-acquired information empowers particular actions and interventions; distinctive auditory or tactile action-spaces and so on. Access to sensory modality, then, would be in place if access to the signature action-space was. The effects that the agent's environment has upon him, and which must be integrated with his higher-level capacities in perception, are those that enable him - *qua* skilful actor - to perform certain actions on and within that environment.

A central proposal of the action-space view is that access to a suite of enabled actions suffices for phenomenal consciousness. We can begin to understand this claim by noting that a creature who has this access in place is, as before, in the position of a superblindsighter. Not only can he make perceptual discriminations and act in ways appropriate to stimuli, he knows that he can when he can. He doesn't need to be prompted into carrying out his perceptual skills, because those skills are directly available to him. Crucially, the target of access-consciousness is, on this proposal, a personal-level phenomenon - the space of enabled actions is the suite of responses and interventions that the agent himself can perform; there need be no contact with subpersonal vehicles or states.

If it is right, as O'Regan and Noë argued, to hold that superblindsighters are conceptually impossible - that once we establish a rich enough set of self-prompted perceptual responses it is inconceivable that an agent with these abilities lacks qualitative awareness - we begin to make plausible the claim that certain patterns of access consciousness may constitute phenomenal consciousness. It is difficult to see what more could have to be added to creature capable of self-prompting any of a suite of perceptual skills in order for her to be conscious, if that alone is not sufficient. Note, too, that there are other ways in which the information that enables the space of actions to be performed can be put to use that do not entail

consciousness, as in the absent-minded car driver case. What is important to the appeal to access-consciousness, and that will be developed in the remainder of the project, is its being bound-up with (perhaps constituted by) the integration of contents into the agent's reasoning, planning and rational action-choice. The aim is to separate kinds of information- or content-use that are sufficient for phenomenal consciousness from those that are not.

This type of account aims to show not only that there is *something* that it is like to be an agent with the requisite pattern of access consciousness, but also that it entails *particular* phenomenal feels. Clark's concession was that, were access only to facts about which modality is in operation, all that would be entailed would be that it feels like *something* rather than nothing to be an agent with that access. Once we replace this with the notion that perceivers access a whole action-space, though, we can see that there are resources available for an explanation of particular phenomenal properties. Spaces of action, including those that are of a cognitive or epistemic nature, are sufficiently finely-grained to make this suggestion plausible. The distinctive kinds of phenomenal feels that are attached to particular sensory modalities, too, can be dealt with in action-space terms. A perceptual episode has a peculiarly *visual* phenomenology, for example, when it involves the empowerment of suites of actions (comparings, trackings, and sortings) that are characteristic of vision ï the ability, say, to discriminate objects and surfaces at a distance when they lie on an unobstructed, straight path from the viewer. Tactile phenomenology, likewise, comes with certain patterns of empowered bodily skills, typically those involving the part(s) of the body that are in contact with the perceived object or surface, and a similar story can be told for the other modalities.

5.2: Looks as Powers.

The action-space account, I noted, interprets the relation between action and perception as having a direction that is in a sense the reverse of that proposed by radically enactive views. We must consider not the perceptual effects of action, but the action-oriented nature of perception. This is in accordance with the account set out by Philip Pettit in his 'Looks as Powers', which we can see as a precursor to the action-space model.

Pettit offers an explanation of colour looks as *manifest powers*. An item looks red, for example, if it looks as though it can be sifted, sorted and tracked in a particular profile of ways; a profile that is characteristic of red objects. Only objects with a red look cause this suite of effects in the observer, and looking red just is manifestly empowering the effects.

This is, importantly, in direct opposition to qualia theories of colour looks, which state that there is an intrinsic property of red objects that is in principle separable from its effects on the observer (that is, separable from the ways in which he can sift and sort it, etc); namely the qualitative property of redness. On the qualia account, the space of perceptually-enabled actions (at least as far as sifting and tracking and so on go) is grounded in or based upon the presence of qualitative properties - red objects are sorted together (say) because they share a similar phenomenal property. On the powers account, on the other hand, there is no such causal dependence of powers on phenomenal properties - for an object to look red just is for it to present an action-space that specifies the ways in which it can be sifted with and sorted from other objects that can be visually discriminated. The action-space must have an unconscious basis - there must be a brain-level sensitivity to the intrinsic properties of red objects (say, to their surface spectral reflectances) that enables the agent to sift, sort and track them. These sensitivities show up in the behaviour of blindsighted subjects, and so their employment is not alone a sufficient condition for consciousness. This is a theme to which I shall return during the following chapters.

An agentôs being access-conscious of the set of skills that a particular property enables (that is, for those skills to be *manifestly enabled*) does not require her to possess any understanding of or access to the brain processing that subserves it. I can distinguish, for example, a square drawn with red ink from its white background, but I can't distinguish a square drawn with infra-red ink from the same background. This is because my eyes and visual system are sensitive to the light reflected from the former, but not the latter. While I may be access-conscious to the skills that the red square enables, I need have no understanding of the causal chain that subserves them - the reflection of light of a particular wavelength, the excitation of my retinae and so on.

One condition that needs to be satisfied by the manifest powers account is that each manifest skill-set that is to be identified with a particular colour-look must be sufficiently finely-grained to be a plausible substitute for a *quale* of redness. That is, it must be impossible for an object to manifestly empower in ways that are characteristic of the property of redness without looking red:

> "[The powers account] must point us towards a range of colour effects rich enough to make it plausible that anything which has those effects is going to look red; it should become difficult to imagine the effects attending something that had a different look or to imagine the look having different effects." (Pettit, 2003; p12).

In order to satisfy this richness constraint, the set of powers that a particular colour property manifestly enables must be extended beyond the set that can be performed *now*, in the sense that it must be manifestly the case that the object can be sifted, sorted and tracked across conditions other than those that are currently in place. The set of things that the agent can do with an object on the basis of its colour (where this is to be construed as whatever physical property the object possesses that the agent's colour-vision system evolved to detect) at a particular moment is very limited - perhaps he can judge it to be more or less similar than some other object(s) in the scene, to visually discriminate it from its background and so on. This restricted set of powers is not rich enough to secure the kind of account that Pettit is after (as he acknowledges), and so we must include a fuller set, extrapolating to the skills that would be enabled in contexts other than the present one. The agent therefore has manifest *expectancies* about the skills that he would be able to perform in those contexts. Just as the sensorimotor account emphasised the need to appeal to expectancies concerning the sensory consequences of possible movements or changes to conditions of observation, so the powers account must make reference to expected skills.

For an object to look red, for instance, is for it to look not only as though it can be distinguished from the current context (the present background, say), and sorted from the other objects in the present scene, but also that it looks as though it can be tracked across different backgrounds, sorted with similar objects that aren't here now and so on. Without this extended account of the powers that a property enables, the set of skills that is attached to the colour look is too impoverished to secure the plausible elimination of the corresponding quale. After all, a green-looking object could be distinguished from the current context, and sifted from the other constituents of the present scene just as the red-looking object can, so this constrained skill-set can't be enough to determine the look of the object. It can't even legislate between red and green, let alone particular shades of red; a spectrum inversion could occur and the same current skill-set would remain in place.

A red object, on the other hand, can be sifted, sorted and tracked across a different - and *uniquely* different - profile of *counterfactual* scenarios from that of green objects. Red objects stand out in certain contexts more saliently than green objects, say, and should be sorted more closely with and sifted more obviously from some objects than others.

Pettit's claim is that once (and only when) this counterfactual set of skills is made manifest, which is to say that the perceiver *anticipates* which skills would be empowered in contexts other than the present one, the set of manifest powers will be rich enough to make it implausible for the right look not to be present when the effects are. I shall call the grasp of

the ways in which the object/property would be distinguished, sifted, sorted etc in contexts other than the present one the *anticipatory component* of the look. The anticipatory component is what rules out the possibility of spectrum inversion.

We need to take care, though, not to give an account of this anticipation of counterfactual skills that relies on a question-begging construal of the perceiver's grasp of the counterfactual situations (the set of different backgrounds, for example, or the set of possible object with which the current object would be sorted/sortable) in which those skills would be employed. It seems to me that the agent would have to have some kind of understanding of, or access to, the counterfactual contexts themselves, in order to have a grasp of the ways in which a property that is present *now* would have the particular suite of effects on the agent in those contexts. But we need to be careful to provide an acceptable interpretation of what this grasp or understanding is; one that does not itself rely on 'looks' that require some other form of explanation.

We can't say that it is simply the case, for instance, that for an item to look red is for it to look as though it should be sorted with objects that look orange and sifted from objects that look green (etc), because this, at least without modification, is no explanation at all. Likewise, it can't be that for the object to look red is for it to look as though it can be easily tracked across backgrounds that look green, and less easily across backgrounds that look orange, say. Explanations of this sort would themselves have to be filled-out by providing an account of what a 'look' is, either in terms of qualia or in terms of some other intrinsic property, or in terms of manifest powers. The first two of these construals seem problematic. Consider, for example, the *sifting* aspect of the anticipatory component of the look, the agent's grasp of the kinds of objects from which the current object would be sifted were they encountered together. It can't be, say, that the agent grasps that red objects would be easily sifted from objects that possess green qualia, and less easily from those that have orange qualia: the account at which we are aiming is one that hopes to eliminate qualia altogether.

Furthermore, it can't be the case that the agent's grasp of those objects from which the current item could/should be sifted is grounded in any understanding of their intrinsic properties, because he need have no such grasp. He need have no understanding, for instance, of their surface spectral reflectance properties (which, remember, are the properties to which his visual system is sensitive - the sensitivity that enables his perceptual skills in the first place). So it can't be that he anticipates that the current object would be siftable from objects with such-and-such surface spectral reflectance properties, because he has no

understanding of those properties. Remember, access to the skill-set that a property enables is supposed to be a personal-level phenomenon; we are considering access-consciousness in Block's sense of the term, as the availability for the agent's report, reasoning, planning and so on. It certainly isn't the case that the agent can reason, plan, report the ways in which particular surfaces reflect particular frequencies of light at different ratios.

The third option, however, is more successful: it is to claim that the agent's predictions concern the ways in which the current object would show up in conditions where other powers are manifestly enabled; that is, where the counterfactual backgrounds, counterfactual sets of objects that afford sifting and sorting and so on, are themselves understood as manifestly enabling in certain ways. This results in a *holistic* interpretation of looks as powers, where to experience the sifting, sorting and tracking responses that *one* property enables requires locating that set of skills within a wider and interconnected body of skills. For an object to look red, say, is for it to manifestly inhabit a particular location in the space of similarities and differences that hold among visually-discriminable objects.

On this account, the agent would predict that the current object could be sifted from a set of objects that are themselves siftable and sortable in particular ways, and sorted with a different set of objects that are themselves siftable and sortable in other ways. The looks that come into the anticipatory component of the look of the current object are set up in manifest powers terms: for an object to look as though it would be easily distinguishable from a red background is for it to look as though it would show up against a background that manifestly enables the set of skills characteristic of red objects.

The holistic nature of his account thus becomes more clear: the manifest set of skills that constitutes the *predicted* look of the counterfactual situation must itself include a predictive component; it must itself satisfy the richness constraint. The account would involve something like the following as far as *sifting* goes: for the current object to look red, it must (inter alia) be manifestly easily siftable from objects that look green, were they to be encountered together, where for an object to look green is for it to be (inter alia) easily siftable from objects that look red, were they to be encountered together, where...etc. We end up with a regress of looks mutually dependent on other looks, but not a vicious regress. This is a holism, I think, which bears out the intuition that any agent who had no grasp of the similarities and differences that hold among colours would fail to really be a colour-perceiver. The current proposal holds that there is nothing more to colour perception over and above the manifest grasp of ways in which objects can be visually sorted and sifted and so on.

5.3: The Sensorimotor Account versus the Looks as Powers Account:

The proponents both of the sensorimotor account and of the manifest-powers account, respectively, state that the two theories are fundamentally similar in approach (Hurley & Noë, 2005). Both require that perceivers are skilful agents and that experience involves drawing upon a body of skills or knowledge; both support their claims using similar kinds of empirical evidence; both have similar implications for the metaphysics of perception.

It would be a mistake, however, to draw the parallels between these two theories too closely. Although both employ the argument for the entailment of phenomenal consciousness by access consciousness, we have seen that the target of access on each model is different: on the enactive account the target is changing patterns of input while on the powers account the target is the enabled skill-set. Although, as Hurley & Noë note, both theories "view perception and action as tightly interconnected" (p1), we have seen that the connection proposed by each is not of the same nature. An example mentioned both by Pettit and by Hurley & Noë, the case of a ball's looking to be going fast, demonstrates the alternative descriptions of the action-perception link that their accounts provide. For Pettit, a ball looks to be going fast insofar as it looks as though it empowers certain *responses* of judgement and action in the perceiver:

> "[T]he ball has a look that is essentially tied to the effect of inducing in you the judgement 'It's going fast!' and, no doubt more primitively, certain reaching and ducking responses." (Pettit, 2003; p8).

As is characteristic of Pettit's approach, the claim is that there is no effect-independent 'fastish' look (as he puts it) that is separable from the responses that the ball manifestly enables in the perceiver - all there is for the ball to look fast is for it to look as though these responses are appropriate.

Hurley & Noë, on the other hand, describe the case in the following way while stating that their treatment is consistent with, and supportive of, Pettit's account:

> "Seeing the ball enables ducking to avoid it, and does so manifestly. But it looks as if the ball can be avoided by ducking *because* it looks as though ducking would make the situation look different in certain ways." (H&N, 2005; p5; emphasis in original).

As is characteristic of *this* approach, what is important is that the agent understands the ways in which the appearance of the scene would change in response to his movements, and

not the ways that the scene empowers him *per se*. He has access to the set of actions that a particular scenario affords because he has access to the sensory consequences of performing those actions.

Hurley & Noë want this grasp of sensory consequences to be what grounds the manifest empowerment of skills that Pettit's account emphasises, and it will be instructive to examine how plausible this claim is. First, we should note that their proposal is *not* that the agent has expectancies about the sensory consequences of ducking (and, similarly, for the other actions that the moving ball affords) and then *infers* that those actions are possible given the circumstances, although this is one way of reading the view. Instead, the set of possible actions is seen *in* the set of dependencies between movements and changes in appearances (that is, the body of sensorimotor contingencies) that is experienced according to the enactive account. The enactive perceiver has a set of expectancies about the sensory consequences of his movements which are brought to bear in his experience - as I examined in chapters 2 and 3 - and this constitutes his access to the action-space.

On Hurley & Noëôs story, furthermore, the action-space is *manifestly* enabled for the agent because he experiences it in the expectancies that he has for the sensory consequences of his movements:

> "In seeing the ball coming, the perceiver also knows what the sensory consequences of doing this or that will be, and hence knows how to respond for certain purposes." (op cit. p6).

The manifestness of the perceiver's access to the action-space is here explained in sensory terms - the set of possible actions is experienced in bringing to bear sensorimotor contingency knowledge, which is itself perceptual in nature. On the enactive view, perceiving just is bringing to bear one's sensorimotor knowledge: for an object to look square, for example, is for it to look as though there will be a characteristic pattern of sensory consequences to one's movements relative to the object; and this is for it to look as though it enables those actions, according to Hurley & Noë.

In addition, knowing how to respond "for certain purposes" - that is, presumably, for the fulfilment of his goals and plans, for the avoidance of harm and so on - *follows* the agent's grasp of the ways in which his actions result in sensory consequences, too, and is grounded in that grasp on this account: the agent knows that he must duck in order to avoid the ball because he knows that the situation will look different if he ducks. He comes to know what it is appropriate for him to do through knowing what the sensory consequences of the set of possible actions are.

This suggestion, it seems to me, gets things the wrong way around and (a charge we have seen levelled at the enactive account before) puts too much stress on the changes that come to sensory inputs in response to movements. This time, the stress on sensorimotor contingencies is at the expense of the non-sensory effects of acting that matter to the agent. It matters more to the agent, I propose, that ducking the ball avoids pain and damage than that it changes the appearance of the scene. Perceivers come to know what it is appropriate for them to do through knowing what the non-sensory consequences of the set of possible actions are. I shall discuss this more fully in the next section.

Hurley & Noëôs claim that the manifest action-space is grounded in sensorimotor contingencies suffers from the objections raised to the enactive account more generally in chapter 3. I will recap these only briefly here. The crux of the problem is that it remains unclear how we ought to interpret the 'sensory consequences' of a perceiver's movements, and what kind of role a grasp, understanding or prediction of these consequences is to play in our account of perception. If 'sensory consequences' are construed as patterns of subpersonal activity (as O'Regan and Noëôs original account proposed), then it is not obvious that they can be integrated with the personal-level capacities that conscious experience is said to require. In the current example, it is not obvious that the agent confronted with a moving ball has any interest (or *should* have any interest) in the ways in which the images on his retinae will alter if he ducks the incoming projectile; what matters is rather that it does not strike him. More basically, it is not obvious that he sees the possibility of ducking *in* seeing the ways in which ducking would change his subpersonal activity.

If, on the other hand, 'sensory consequences' are themselves perceptual in nature then it isn't clear what role the grasp of an action-space could have as far as *perception* goes. For instance if the perceiver's knowledge of sensorimotor contingencies is to extend to the anticipation of how the ball will look when he ducks, or perhaps how the ball and his own body and the rest of the scene will look, then this is going to require a full-blown account of what 'looks' are, to start with. If Hurley & Noë provide us with an explanation of what it is for the ball, perceiver and scene to appear a particular way (which they have failed to do so far), it won't be obvious that the action-space is what is doing the work when it comes to explaining looks, and so it won't be clear that this is a proposal that is in the spirit of the other accounts on offer here. For Pettit, 'looks' are explained in terms of manifest powers - for an object to look red, for example, is for it to manifestly empower in ways that are characteristic of red - so we don't want to have to appeal to more looks in order to explain manifestness. Hurley & Noëôs reliance on 'sensory consequences', then, jeopardises what is distinctive about the manifest-powers account - that phenomenal consciousness is to be

reduced to patterns of access-consciousness.

In the case of colour, as we have seen above, the kind of account endorsed by Pettit involves the agent's being manifestly confronted with a set of sifting, sorting and tracking skills that is characteristic of a particular hue. If Hurley & Noë mean for their account to be of the same nature, their proposal must be that this action-space is made manifest to the agent when he brings to bear his knowledge of how each of these actions changes the appearance of the colour - the sensory consequences of each of the actions. However, the sifting, sorting and tracking skills of the action-space account simply don't have sensory-consequences of the kind that Hurley & Noë are looking for. Sifting red objects together, say, doesn't change their look. In light of this, it cannot be that a perceiver is manifestly enabled in ways characteristic of red because he brings to bear his knowledge of the sensory consequences of those ways, because no such sensory consequences exist. If Hurley & Noë have in mind some other set of actions or skills - other than those set out in Pettit's account, and which *do* have sensory consequences that can be anticipated - then they owe us a description of these.

Pettit's account is thus preferable to Hurley & Noëôs alternative. The range of enabled actions to which a Pettit-style account can appeal go beyond those that have sensory consequences, and so it has richer resources to deal with the variety of possible perceptual contents. In addition, the powers model avoids the potential circularity attached to offering an explanation of looks in terms of a grasp of how looks change, and allows us to include in perceptual content what is important to an agent's ongoing goals, reasoning and planning, rather than restricting it to sensorimotor details.

5.4: The Manifestness Condition:

There is a certain amount of confusion in the literature over what it is for a particular suite of actions to be *manifestly* enabled in perception. This is obviously a key notion in accounts of the sort I have been discussing, and so one that deserves an accurate characterisation. We have seen that if the action-space is to explain the phenomenal look of a perceptual episode it is not enough for it to be *merely* enabled - that is, for a creature to be sensitive to the possibilities of action that are afforded by an object or property - because in blindsighters and Zombies we have agents who have this sensitivity but lack phenomenal awareness. Thus the action-space must be manifestly enabled in the perceiver: the agent's grasp of the action-space must be such that it entails that he is not a Zombie. Of course, in giving an explanation

of manifestness we cannot appeal to phenomenal awareness ï that is, the direct and non-inferential access to which we make reference cannot be access-by-way-of-phenomenality ï on pain of circularity.

This section compares two possible construals of the manifestness condition the first of which was introduced above, in the discussion of Hurley & Noëôs account, while the second emerges from a careful consideration of the access-implies-qualia claim. I take the latter, which is the best understanding of the brief treatment provided by Pettit, to be the more successful.

The sensorimotor story, as proposed by Hurley & Noë, claims that there is a perceptual element to the agent's grasp of the action-space that takes place when he encounters a particular object or property. In the visual case, he must *see* the possibilities for action that the scene affords, and this is what it is for the action-space to manifestly empower him. Pettit, too, slips into this way of talking in a manner that, I will argue, does not square with the rest of his account.

> "That a seen object manifestly enables me to do such things means that I see it, rightly or wrongly, as enabling me in that way. The contrast is with the imagined case where I find or think that I have such capacities but have no immediate sense of where they come from... [I] will not see it enabling me - see it as enabling me - to do them." (Pettit, 2003; p8).

Here, the object only manifestly enables the agent when he is able to *see* the action-space that it affords, although there are other ways in which he can come to know that it is present (for example through inference, as in the case of the blindsighter who comes to learn that he has certain discriminatory abilities with practice). For Hurley & Noë too, as noted in the previous section, the action-space is seen *in* the set of sensory consequences that each possible action would have; the perceiver's sensorimotor-contingency expectancies. An object looks to afford some action because it looks as though that action would have a particular sensory consequence.

It may be that the use of 'see' in these descriptions is misleading, and that these philosophers have a different interpretation in mind (perhaps the second construal that I will develop below), but any account that requires the *seeing* of the action-space to itself be perceptual in nature has done little to defuse the problems of perception. If the space of possible actions that can be performed on an object or property is something that can be seen, we are owed an explanation of how such seeing occurs. If the manifestness condition of the manifest-powers account requires as much philosophical analysis as perception itself,

that is, the account loses its shine as a genuine explanation of consciousness.

This first interpretation of manifestness, furthermore, loses sight of the attempt that this kind of account makes to explain phenomenal consciousness in terms of patterns of access consciousness, the issue from which I started this chapter. Once we focus on this claim, I suggest, we can develop a more suitable notion of manifestness.

The central claim of the original sensorimotor approach is that perceiving is a matter of bringing to bear one's *knowledge* of sensorimotor contingencies - a body of skills and expectancies concerning the sensory consequences of one's actions. Once these contingencies are integrated with one's higher-level capacities of reasoning and action-planning, argued O'Regan & Noë, phenomenal awareness will be entailed. This is thus a version of the access-implies-qualia claim, with the access being constituted by the bringing to bear of sensorimotor understanding. Crucially, this story does *not* involve its being the case that the agent must *see* sensorimotor contingencies; indeed it is unclear what such a proposal would mean. Rather, the agent's grasp of sensorimotor contingencies is his integration of stored (*learned*, according to Noë) knowledge into his planning and reasoning.

If we accept Hurley & Noëôs proposal that the agent's manifest grasp of the action-space is grounded in his sensorimotor knowledge, then, we must tell a story along similar lines to these. The agent does not *see* the action-space in seeing the sensorimotor contingencies because the latter are not the type of thing that can be seen. Instead, knowledge of the action-space must be *brought to bear* in bringing to bear one's knowledge of the sensory consequences of the actions. The agent's grasp of the action-space is a matter of the integration of knowledge about possible actions into higher functioning, rather than a matter of becoming perceptually aware of them in a way that requires an independent explanation.

So the claim that manifestness comes from the *seeing* of the action-space is not quite right; what we need here is an account of what it is for knowledge of this kind to be 'brought to bear' in perception, and of what kind of 'knowledge' this is in the first place. This is the same as enquiring into the nature of the 'access' that is said to imply phenomenal consciousness. The condition that the action-space must be *manifestly* enabled, then, will rest on the account we provide of this access, and not on some perceptual relation that agents have to possible actions.

On this interpretation of Hurley & Noë the perceiver's grasp of the action-space remains grounded in his sensorimotor knowledge - the agent's knowledge of the possible space of actions afforded by an object is a part of his knowledge of the sensory consequences of

those actions and so is not independent of it. Pettit's account, though, makes no reference to the sensory consequences (and I have suggested that an appeal to these is philosophically problematic anyway) of performing the actions in the action-space, so if his account of manifest access involves bringing knowledge to bear, then it will be a body of knowledge that *is* independent of expectancies concerning changes in appearance. On a Pettit-style account, in fact, the knowledge that is brought to bear in perception can simply be about the space of actions that can be performed on an object or property and, perhaps, some of the non-sensory effects of performing those actions that matter to the agent. I noted in the previous section, for example, that it matters more to the agent that ducking to avoid a ball will avoid pain or damage than that the ball will have a different appearance once ducked. If the two accounts under investigation here are right to claim that perception involves bringing to bear a body of relevant knowledge, we should favour the alternative that ascribes to the agent knowledge of consequences that matter to his interests. Furthermore, the only set of actions to which the agent can have access according to Hurley & Noë are those that have sensory consequences, since knowledge of the former is bound up in and dependent upon knowledge of the latter. Pettit's account, meanwhile, allows that the agent can be manifestly confronted with a wider range of possible actions - actions that have no sensory consequences at all, or no relevant ones, but that have other consequences that matter to the agent's interests.

By rejecting the claim that action-understanding is a part of sensory-consequences understanding, this reading of Pettit's view circumvents the problem of having to explain what these sensory consequences are. Having to make an appeal to sensory consequences in one's explanation of perception, I have maintained, is an undesirable commitment that this view succeeds in avoiding.

I have been taking 'bringing knowledge to bear', 'integration with higher-level capacities' and 'access' to be identical, and they tend to be used interchangeably in the literature. Clark's 'direct, non-inferential access', for example, should be read simply as the agent's ability to use the components of the action-space to influence his cognition and behaviour, rather than as a separate faculty or processing stream from which higher-level capacities draw. The accounts presented by Hurley & Noë, Pettit and Clark are making essentially the same claim - that perception is about keeping track of the effects that the outside world has on you, in such a way that allows you to navigate and use its constituents for your ends. Accessing the action-space, then, just is bringing to bear one's knowledge of the possibilities for action that the scene affords in such a way that can guide one's choice of action and intervention. If this

knowledge is brought to bear whenever its object is present - that is, if it is forced upon the agent - and if this knowledge tells the agent how he can act *now*, then the action-space will be manifestly enabled. Manifest access on this second interpretation, then, is not about *perceiving* the action-space - at least not where this requires a further account of how such perception occurs - but of the possibilities for action becoming available to influence the agent's action-choice and behaviour whenever the possibilities are present.

Consider the case of the moving ball again. The first interpretation of manifestness states that seeing the ball to be going fast is constituted by *seeing* that it enables certain responses (of ducking and so on). Seeing the responses is what makes them manifestly enabled. But this isn't a satisfying explanation if 'seeing the ball to enable certain responses' is itself a perceptual matter; in this case, we are merely shifting the burden of explanation rather than reducing it.

The second interpretation, on the other hand, states that the ball manifestly empowers the agent just when the space of responses and interventions that he can make at a time is made available for him at that time for the purposes of informing his ongoing decisions about how to act. If, as I have suggested, we reject the enactive theorists' proposal that the agent's knowledge of how he can act on the ball is grounded in his grasp of how the ball would *look* were he to act in particular ways, we can allow that part of what he understands (part of what he uses to guide his behaviour) is the set of non-sensory consequences that acting will afford; for instance, we can allow that he knows that ducking will avoid the ball. Perceiving is thus bringing to bear one's knowledge of how one now can and should act on and within the world.

In the case of colour perception, too, we can tell an analogous story: coloured objects do not *look* to empower in characteristic ways; they do not look to be siftable, sortable and trackable. They manifestly empower the agent in that he has access to these skills when they are enabled in him, for the purposes of planning and cognition. The agent's knowledge of the sifting, sorting and tracking skills that are enabled by a particular object locates them in a holistic body of such abilities; he understands that this object can be picked out against backgrounds that themselves manifestly enable him along certain dimensions.

This way of filling out perceptual consciousness, I suggest, bears out an intuition that we have about which kinds of creatures are conscious and which aren't. For instance, we can imagine a primitive creature who responds automatically to the presence of a stimulus by, say, swimming towards it. Whenever the stimulus appears the action is carried out. The

action may even be the *appropriate* response to the stimulus in terms of the fulfilment of the agent's goals if, for instance, the stimulus corresponds to the presence of food or oxygen, in which case there is a sense in which the agent *should* swim towards the stimulus. However, because this agent doesn't confront a *space* of possible actions, and has no choice about how to behave, the manifest-powers account dictates that he is not perceptually aware of the stimulus. This is a conclusion that we are inclined - I think - to draw about this case pre-theoretically. Even an amateur roboticist could build a device capable of behaving as this creature does, and we would have little temptation to ascribe to the device conscious awareness.

Consider, on the other hand, a more sophisticated creature who is capable of *controlling* his behavioural response to the presence of the stimulus, even if the extent of his control is only the ability to act or refrain from acting; to swim or to remain stationary. The manifest-powers account states that if the creature is able to integrate the possibilities for action that the stimulus affords into his plans and goals (etc), then he will be perceptually aware of it. If he can choose to act, say, when he is hungry and to refrain from acting when he isn't - when he knows that the choice exists whenever it does so - there will be a way that the stimulus looks to him. Our intuitions are less clear in this case, I suspect, but we are more inclined to accept that a creature of this sort has conscious awareness; indeed our inclination to accept this increases as the richness and sophistication of the creature's sensitivity to the space of possible actions does. That is, the extent to which the agent has control over the actions that he is capable of performing given the situation in which he finds himself.

5.5: Summary and conclusions:

We have the beginning of an account, drawing upon insights made by Pettit, on which perceptual awareness of an environment is constituted by being made manifestly able to perform a space of possible actions on and within that environment, where such actions include those of a cognitive or epistemic nature. Manifest access to, or knowledge of, an action-space provides the agent with self-prompting skill - it allows him to not only be perceptually sensitive to the world but to know that he is (when he is) and to know what the 'results' of these sensitivities are, namely that they present him with his environment's possibilities for action and cognition. The perceiver takes his environment to present these possibilities in that they are integrated into his ongoing planning and reasoning, and this is what conscious perception is. It is the *ongoing* integration of the perceiver's knowledge of the action-space that makes this knowledge distinctively perceptual. In confronting the

action-space, the perceiver has a grasp of what he can do *here* and *now*, and is thus *poised* to perform in those ways; he knows that he can track and discriminate these objects right here, and is ready to reach them, grasp them, avoid them and so on, according to his needs and goals. This is all there is for him to being aware of his surroundings. These central claims of the account will be developed in full in the following chapters.

The action-space model offers advantages over the sensorimotor theory and extends the explanatory impetus of the looks as powers story. It maintains an action-oriented focus without restricting perceptual contents to those entailed by the enactive approach, where detailed sensory consequences of exploratory actions are key. While Pettit's emphasis is on *colour* looks, the action-space account suggests that perceptual contents in general can be given an action-oriented interpretation, again where actions may be either bodily or epistemic in nature. Solid, shaped objects that are located at a certain orientation and location in space, for example, empower an embodied agent in characteristic suites of ways provided that she is suitably perceptually sensitive to their properties. They constitute obstacles to her progress and opportunities for climbing, ducking, lifting, pushing and so on, but are also items that offer means to the satisfaction of her ends, and that she can categorise, discriminate and track over space and time.

My proposal is that manifest empowerment should be construed as empowerment to which the perceiver has direct, non-inferential access, and so that the account recruits Clark's access-implies-qualia tactic. This way of filling out manifestness differs, apparently, from Pettit's own treatment which takes a suite of actions to be manifestly (visually) enabled when it is *seen* as being enabled. My account rejects this perceptual relation in a way that accords with the 'bringing knowledge to bear' interpretation endorsed by the sensorimotor theory, although the knowledge that is exercised[4] concerns possibilities for goal-satisfying, world-directed action rather than the sensory consequences of movements. In putting the account in this way, we avoid limiting the space of possible manifestly empowered actions to those that have sensory consequences.

I noted that Pettit's explanation of colour looks must be amended to accommodate a kind of holistic interdependence of the sifting, sorting and tracking skills to which he appeals. In order for a surface to look red to a perceiver, it must manifestly empower her to discriminate, compare and contrast it with respect to other colour-looks that are themselves understood in sifting, sorting and tracking terms. A perceiver needs to have a grasp of a whole space of colour powers in order to have a grasp of any. This amendment is consistent with what Pettit states, but clarifies the interrelated nature of spaces of perceptually enabled action.

I begin to develop the action-space account in the next chapter by providing reasons to accept the claim that particular patterns of access-consciousness, those that constitute manifest empowerment of a space of enabled actions, may entail phenomenal consciousness. I proceed by undermining the principal competitor to this view - an approach that endorses intrinsically qualitative properties of experience. The action-space theory aims to do more than simply explain why perceptual experiences feel like *something* to their subjects, it aims to provide a satisfying account of why particular perceptual encounters have their characteristic looks and feels.

Chapter 5 Notes.

Footnote 1: These other versions of the enactive theory, recall, cannot accommodate the current strategy of attempting to explain phenomenal-consciousness in terms of access-consciousness of sensorimotor contingencies, for the sensorimotor dependencies they propose involve the effects of movements on features that are already phenomenally-conscious.

Footnote 2: This view is only gestured towards in Clark's access implies qualia paper, but the proposal is one that he now endorses (see, e.g., Ward, Roberts & Clark, in progress).

Footnote 3: As Clark notes, this follows a suggestion made in Güzeldere, 1997.

Footnote 4: Where 'knowledge' is too strong, but is a suitable place-holder for now. The correct construal will be explored in chapter 7.

Chapter 6: Conscious Experience.

We saw in the last chapter that the action-space account involves an extension of Clark's 'access consciousness entails phenomenal consciousness' proposal, upon which the qualitative feel attached to a perceptual experience is explained but not explained-away. Setting phenomenal consciousness in terms of access consciousness, that is, is not to deny that experiences have a genuinely qualitative component. It is to deny, however, that phenomenal properties are mysterious, intrinsic or irreducible features of the agent's mental life. The strategy in this chapter is to undermine the plausibility of the ascription of phenomenal properties construed this way to experiences. On the action-space model experiences are temporally-extended encounters with the world during which the perceiver takes his environment to afford certain possibilities for action and cognition, and this is *all there is* for it to look (sound, taste, feel etc) a particular way to him. There are no further qualitative properties attached to such episodes.

One source of resistance to theories of perception, like this one, that eliminate intrinsic phenomenal properties is the intuition that they leave something out in their description of what it is to enjoy a conscious experience; that they haven't explained the difference between being consciously aware and its being 'all dark inside'. The current proposal, however, states that once we explain what it is for the world to look (sound, feel, and so on) a certain way to a perceiver this is all that needs to be accounted for. Any perceiver for whom the world appears this way is not all dark inside.

The entailment or implication of phenomenal consciousness by access consciousness is thus not to be read as a causal relation but rather as a constitutive one. It is not that the phenomenal feel of a perceptual episode is the result or end-product of some access activity - instead, the subjective look of a particular property is constituted by the perceiver's non-inferential integration of the property's possibilities for action into his higher-level capacities for planning, reasoning and the control of action. The claim is that for any agent who is confronted by his environment's characteristic action-space - where confrontation with an action-space is for it to be manifestly afforded - there will be something it is like to be that agent at that time. As outlined in the previous chapter, it is this 'confrontation' that is to be set in terms of access or (which is to say the same thing) in terms of 'bringing knowledge to bear'. If such an account can be sustained, there will no longer be a conceptual division between access- and phenomenal-consciousness; the latter can be viewed as a species of the former.

6.1: Locating the Action-Space Account.

The task now is to defend this conception against those who might charge it with behaviourist leanings, and more generally those who think that it leaves something important out of its explanation of conscious perception. Why, such a critic might ask, should such patterns of access result in any qualitative feel at all? Doesn't the action-space story involve only types of behaviour and dispositions to behave?

I believe that my discussion in Chapters 3 and 5 has mitigated the force of such a response already, where I commented that it is hard to imagine what more could have to be added to a creature who could self-prompt his perceptual discriminations in order for him to be phenomenally conscious (where self-prompting is achieved through non-inferential access to the space of possible actions). There, I noted that one feature that distinguishes blindsighted patients from their visually conscious counterparts is their inability to carry out discriminations (etc) unless prompted by an experimenter (at least until they learn that their perceptually-grounded guesses tend to be reliable). The first step towards the action-space account was to suggest that one way to secure *self*-prompting - the ability of the agent to no longer have to rely on the experimenter's input for guidance on when to make a particular discrimination, judgement etc - would be for the agent to have direct, unmediated access to the suite of actions and interventions that the stimulus affords, including the ways in which it can be sifted and sorted and so on. A putative Zombie would have to be a self-prompter in order to fit the criteria - as legend dictates - of behaving exactly as we conscious perceivers do. If the action-space account is right, a creature whose self-prompting is grounded in a direct and non-inferential access to the skills that are enabled in him by the presence of a particular stimulus will have phenomenal consciousness, and therefore necessarily not be a Zombie.

There is a way of reading this strategy, though, and particularly of reading Clark's proposal in 'A Case Where Access Implies Qualia?', which confuses the structure of the action-space account and is misleading over its components. Such a confusion can be identified in Pete Mandik's commentary on Clark's paper (Mandik, forthcoming), and there are hints of it in Clark's paper too. The problem lies in ascribing too much to the perceiver *pre-access*, as it were: in interpreting the direct, non-inferential access that we need for the action-space account to work as something that can be simply bolted-on to some other set of discriminatory capacities that the agent already possesses. The higher-level access proposed by the action-space account should not be seen as being an extra addition to a system that

can already make perceptual discriminations, it should be seen as partially constituting the agent's ability to make such discriminations. Similarly, such access is not something that is attached to a system that is already capable of acting; it is partially constitutive of the ability to act intentionally.

The problematic interpretation emerges from the first proposal made in Clark's paper - that the access that is supposed to secure qualia has as its target the mode of discrimination (that is, the sensory modality) employed by a perceiver. Clark's suggestion at this stage, as is illustrated by the way he sets up the case in which he is interested, is that we should consider a creature who is able to make perceptual discriminations and then add to the creature a higher level of access-consciousness whose target is the modality by which these discriminations are made. Such access, the argument goes, is sufficient to secure phenomenal consciousness.

Once we interpret the action-space model more clearly, however, we can see that it ought not to involve this two-part structure, at least not in the way that Clark's original set-up assumes. First, the action-space account is interested in sensory modalities only insofar as they enable different sets of actions for the agent, so the higher-level access that we ought to be considering is targeted at action-spaces rather than (directly) at modalities. Second, prior to the addition of this access the creature is unable to self-prompt, so it is unreasonable to describe him as capable of making discriminations - at best he has perceptual *sensitivities*. This distinction matters, as we shall see, given certain liberal views on when qualia are present. Mandik's argument is, I suspect, typical of the kind of response that many will be tempted to give to the action-space story, and examining it will allow us to see the competing interpretations of qualia more effectively and to determine the resources that are available to those who think that phenomenal consciousness is conceptually distinct from access consciousness.

Mandik states that Clark's position (the first proposal made in his paper, that direct, unmediated access involves discriminating sensory modalities) occupies an unstable mid-point between two competing accounts of qualia, the liberal position and the conservative position.

The qualia liberal, first of all, has an undemanding view of when qualia are present, and in particular holds the following:

> "[T]he mere fact that a system is able to make perceptual judgements about features of its environment entails the existence of phenomenal consciousness... in order to have qualia, the creatures need not access information about which

> modality they employed, they need only employ the modality." (Mandik, forthcoming; page 4).

Clark's argument is based upon consideration of a scenario in which there exists a creature who is capable of making such perceptual judgements, and we are invited to consider the position that the creature will be in if he is capable of directly accessing the sensory modality that subserves such judgements - that is, if a higher-level of access is added to a system that is already capable of making discriminations. Clark's claim is that the 'extra' access implies the existence of phenomenal consciousness. But this is redundant, according to the qualia liberal, because qualia are *already there* given the ability to make discriminatory judgements. Clark is thus accused by the liberal of smuggling qualia into his scenario instead of reducing or explaining them. His argument will work, then, only if there is a suitable way of filling-out those abilities that are possessed by the creature prior to the addition of access that doesn't imply qualia even on the liberal view.

My suggestion is that there is a confusion over what it is for the creature to "employ the modality" here. There are *two* readings of this, which parallel the abilities of the self-prompter and the blindsighter respectively, and Mandik assumes that the first reading holds. Once we embrace the second reading, I propose, we can see that any further attempt by the liberal to maintain that qualia are 'already there' is very implausible, but that it is equally implausible to maintain that they are *not* there once the appropriately-construed second-level is in place. On the first reading, Clark's creature is a self-prompter capable of making perceptual judgements when they are appropriate - for example, when(ever) he is confronted with a visual stimulus - even before the higher level of access is added. He employs a sensory modality when he makes such judgements and discriminations on the basis of that modality. The liberal can then claim that such a creature already has phenomenal consciousness at this stage, that there is something it is like for the agent to make a perceptual discrimination, and indeed it is not clear what role any 'extra' access capable of discriminating the sensory modality could contribute. Clark's argument, if this is an appropriate description of it, would thus be redundant - qualia would be implied only because they would be present in the first place.

On the second reading of "employ the modality", though, all that the creature initially possesses is a *sensitivity* to the outside world that shows up in his *prompted* guesses (as with the blindsighter). He doesn't know when it is appropriate to make a perceptual judgement, and so if he is not accompanied by a prompter he will not be capable of doing so. As I interpret this case, it is not legitimate to say that a creature like this is really able to make

perceptual discriminations at all - and so this interpretation will involve something of a revision of the way that Clark sets up the case in his argument. The action-space story should say that a creature without the higher-level access that is said to imply qualia will not be able to make perceptual discriminations at all, but only has perceptual sensitivities. The latter are not sufficient by themselves to imply qualia, on anything but an implausibly radical position. More generally, the pre-access agent is unable to *act* at all in the ways that are perceptually enabled, because he doesn't know that he can. Access to the space of perceptually-enabled actions, on the other hand, allows these possibilities to be carried out intentionally.

The access that the action-space account proposes is what brings the agent to a position in which he *is* a self-prompter, where (at least when self-prompting is direct and non-inferential) self-prompters are phenomenally conscious. On this second interpretation, Clark is actually in agreement with what the liberal says about the first way of reading "employ the modality": that any agent who is genuinely capable of making perceptual judgements when they are appropriate - and not simply of being sensitive to visual information - will undergo qualia. What Clark's argument (and, more fully, the action-space account) provides, though, is an explanation of the means by which such a self-prompting capacity comes about[1].

To summarise - the first reading of Clark's position states that we ought to consider a case in which a higher level of access, capable of discriminating sensory modalities, is added to a creature who is capable of making perceptual discriminations. The qualia-liberal says that this addition will make no contribution to securing phenomenal consciousness, because phenomenal consciousness is already implied by the ability to make discriminations. The second reading of Clark, the improved action-space account, states that the creature doesn't truly have the ability to make perceptual discriminations prior to the addition of the higher level of access, but possesses only sensitivities to information. The extra level of access secures self-prompting, the ability to make perceptual discriminations, and phenomenal consciousness.

Now, either the liberal has to say that mere sensitivity to information is sufficient for the presence of qualia, or he must admit that the additional access that the action-space model proposes can make a qualia-implying contribution after all (the qualia *conservative*, to be considered below, states that neither condition is sufficient for qualia). The first of these options is unattractive as it would entail that, for example, a thermostat or a petrol-gauge have phenomenal consciousness. It is *too* liberal, I suggest, to state that qualia must be present wherever there is informational sensitivity. Clark, the qualia liberal and I all agree, as far as I can see, that any agent who is really capable of making perceptual discriminations

when appropriate will be phenomenally conscious, provided that this ability is grounded in a non-inferential understanding of when such discriminations can be made (rather than, as with the experienced blindsighter, by coming to know from his past performance that he tends to be able to discriminate stimuli). So we shouldn't see the access-implies-qualia argument as claiming that some extra access is needed on top of the ability to make appropriate discriminations, we should see it as a way of filling-out what it is to have the non-inferential grasp of when a discrimination can be made (and the kind of discrimination that can be made, and so on) that is required for the possession of this ability.

Contrary to Mandik's objection on behalf of the liberal, then, it is not the case that the current position smuggles qualia in by covertly assuming the presence of a capacity that already implies phenomenality. Prior to the non-inferential self-prompting capacity that the action-space account proposes, all that the creatures we've been considering possess is a perceptual sensitivity to the world that shows up in the reliability of their prompted guesses. If we accept the blindsighter's claim that he has no phenomenal awareness of the stimuli about which he can guess (and this is in line with our intuitions about the kinds of creatures who are conscious and unconscious), there is little scope for a radically liberal theorist to claim that perceptual sensitivity alone is enough for qualia. If this is right, then Clark's hypothetical systems to which higher-level access is added are not already phenomenally conscious prior to that addition.

The qualia conservative, on the other hand, has a more demanding conception of when and where qualia are present. Mandik thinks that the conservative, too, will not accept Clark's position:

> "[T]he conservative holds that adding all the modality specific introspective access in the world will be (logically, conceptually) insufficient to give rise to phenomenal consciousness... the phenomenal does not logically supervene on the physical and adding the ability to discriminate one's own sensory modalities is merely adding more physical stuff that does not logically entail the addition of qualia." (*op cit*. page 4).

For the conservative[2], Clark is proposing the addition of a capacity that is ultimately of the same access-based kind as that which is already present, and neither entails the presence of qualia. There is discrimination of states of the world and discrimination of sensory modalities, and neither is the right kind of thing to account for phenomenal consciousness. The conservative doesn't accept the conclusion that the self-prompting blindsighter is no longer a blindsighter, a conclusion that, I acknowledge, has been so far defended with only

an appeal to intuition.

Again, though, we can do something to mitigate the force of this objection by developing a clearer treatment of the perceptual abilities that the action-space model proposes (where, remember, these are different from those made in Clark's first proposal). Once we do this we can see that the account being developed here does not merely involve one discriminatory power being brought to bear on another, and so that there are ways to defend the view from the qualia conservative.

Prior to the addition of extra, higher-level access, I suggested, the hypothetical creature should only be considered as being perceptually sensitive to the world. He doesn't have *access* to his environment, though, because access (on the construal I've been using throughout, owing to Block) requires integration with higher-level capacities of reason and planning and so on. So it's not the case that this scenario involves one mode of access being brought to bear on another. Instead, the action-space account states that the presence and operation of the agent's perceptual sensitivity enables - and forces - the bringing-to-bear of his knowledge about the space of possible actions.

One way of filling-out the relevant distinction here is to set 'bringing knowledge of the action-space to bear' in terms of transactions among representational contents. This is the view I will develop and defend in the next chapter. A representationalist framework will allow us to locate the action-space account more easily with respect to its competitors in the philosophy of mind. Access to an action-space can be viewed simply as representation of that space in a way that feeds into higher-level capacities of reasoning and action-planning and -selection. When content specifying a suite of possible world-engaging actions and interventions is capable of flexibly influencing an agent's ongoing, goal-directed activity, she is manifestly empowered to perform those actions.

The question, then, is whether the qualia conservative can maintain that even once the agent is thus manifestly poised in front of an action-space he still undergoes no phenomenal consciousness. The conservative must argue that a creature can be affected by his environment in such a way that he is capable not only of acting on it appropriately, but of knowing what the space of possible actions is, of integrating these possibilities with his plans and goals (etc), of judging and acting upon the relative similarities and differences that hold between parts and constituents of the world without all this carrying with it any phenomenal feel. The action-space account, to repeat, holds that there is nothing more to experiencing the world - with all the qualitative aspect that this involves - than being manifestly confronted

with this set of perceptual effects for the purposes of action-choice, deliberation and control: once these are secured phenomenal feel comes for free, as it were.

As Pettit notes (2003, p5 and following), the 'traditional' picture (that is, the qualia-conservative view) has it that qualia are what underpin the perceiver's ability to sift, sort and track objects - he can sort red objects together, for example, because they (or perhaps the agent's experiences of them) all bear similar red qualia. So for the conservative qualia are separable from their effects, they are intrinsic properties of experience. In addition, the traditional picture holds that qualia are ineffable, irreducible to physical or functional states, directly introspectible and private. In the following sections I motivate the claim that the traditional picture is mistaken, and that the burden of proof is on the qualia conservative to tell us why conscious experiences should be interpreted as having these features.

6.2: Qualia:

I take it that the qualia-conservative position presents the most significant challenge to the action-space account, and that the dispute hereabouts looks at first pass to come down to a clash of intuitions: the intuition had by the advocate of the action-space story that nothing more is required for phenomenal feel than manifest confrontation with the space of possible actions and interventions appropriately construed, versus the qualia-conservative's intuition that 'manifest confrontation' isn't even the kind of thing that can explain subjective feel and that effect-independent phenomenal properties are real.

This is, of course, the debate to which much of Daniel Dennett's work has been directed and, as a species of Dennett's general approach, the action-space account is entitled to tackle the qualia-conservative using his resources. The thrust of Dennett's argument is that it is not possible for anything to meet the conditions set on qualia by the conservative; that it is impossible to sustain a credible account of intrinsic, effect-independent qualitative properties even on the conservative's own terms. If this is right - and the rest of this chapter will consider the case for this claim - then the debate will no longer be a mere clash of intuitions. Instead, we will have a principled reason to reject the conservative position and alternatives such as the action-space model will be on firmer ground. Whatever is 'left over' once the unsustainable properties of qualia are rejected - that is, whatever qualitative aspect of experience that resists the 'intrinsic, ineffable, private' label - is the target of explanation by the action-space account. Like Dennett, this model does not aim to explain what it is for experiences to have phenomenal properties as construed by the conservative, but rather to explain their "nearest real-world correlate" (as Clark has put it, in conversation). What this

explanation amounts to, I propose, is simply an explanation of what it is for the world to look or appear to be a particular way to an agent.

The action-space account can provide a fuller and potentially more satisfying explanation of phenomenal consciousness than does Dennett's own interpretation, I suggest, although it is essentially an addition to his treatment rather than a competitor. Roughly, for Dennett, once the effects that a perceptual episode has on its subject have been accounted for nothing more need be said (or can be said) about how the experience felt for him. The action-space account spells out more richly what these effects are: they are suites of skills to which the perceiver has manifest access, skills that allow him to discriminate, sift, sort, track and interact with physical objects and employ them towards the satisfaction of his goals.

6.2.1: Intrinsicality.

The qualia-conservative holds that there are phenomenal properties of experiences that are intrinsic to them, in the sense of being independent of any of the effects that the experience has on its subject (his dispositions to react, judge and report and so on). They are intrinsically phenomenal in that they are irreducible to physical or functional facts about the state of the perceiver. They are the properties that give an experience its 'what it is like-ness'.

Dennett concedes, eventually (Consciousness Explained (hereafter ñCEò), p461), that he is a verificationist when it comes to questions of qualia: given that there could be no evidence for their presence, independently of their effects, qualia-talk is strictly meaningless. The impossibility of verifying an experiencer's claims about his phenomenal properties renders them neither true nor false. This is a strong claim that is unlikely to convince those who endorse the conservative view, but it does shift the burden of explanation onto their position - they must provide a defence of the intrinsic-and-effect-independent interpretation rather than simply assuming its accuracy. The problem with the conservative construal of qualia, even without going as far as verificationism, is that it is unclear what kind of explanatory role it could play: what kinds of facts could be explained by proposing the existence of effect-independent qualitative properties of experience? The only possible answer is that there are cases in which there is something left over - some kind of subjective, private feel - once an experience is stripped of the effects that it causes on the perceiver; or in which the same suite of effects can be present in conjunction with different subjective feels. If either of these is a genuine possibility, the conservative will be able to show that qualia and their effects are separable. Two such cases are summarised below and Dennett and the action-

space theorist agree that the conservative is in fact unable to sustain a division between an experience's effects and its qualitative properties (albeit while enumerating different kinds of effects).

The first of these (Dennett, Quining Qualia (hereafter ñQQò), section 4) features two coffee-tasters, Chase and Sanborn, whose opinion of a particular brand of coffee has altered over time: where once Maxwell House was their favourite brand now neither taster enjoys it. The two, however, offer different reasons for this change - Chase maintains that the *taste* of the coffee has stayed the same but his *tastes* (that is, his evaluative response to the taste) have changed, while Sanborn opines the opposite (that it is not his tastes that have changed, but the taste of the coffee itself that has altered). For the qualia conservative there is a real distinction here - both of these situations are possible given the separability of qualia (taste) from effect (evaluation). Both Chase and Sanborn can be correct in their judgement of what has changed, and if both are right then they are each in a different position experientially from the other; their qualia are different.

For the verificationist, on the other hand, there could be no evidence to decide whether either Chase or Sanborn are correct in their assertions, and so their statements are meaningless. No evidence could be adduced to support Chase's claim that his qualia have stayed the same while his tastes have changed - nothing, that is, that could favour this interpretation over its converse - and the same is of course true for Sanborn. The qualia-conservative's insistence on the intrinsic, private, effect-independent nature of qualia secures this. There is nothing available to the third-person observer that could allow him to adjudicate over whether it is taste or tastes that have changed in either case. Furthermore, as Dennett notes, there is nothing available for Chase and Sanborn themselves to appeal to in supporting their respective claims. Their earlier qualia are inaccessible to them, and so cannot be compared against their present qualia. The conservative proposal that their *present* qualia can be infallibly known (which, Dennett states, is a response for which there is "a strong temptation") is, he suggests, "a mysterious doctrine".

For Dennett, Chase and Sanborn are in identical positions because there is nothing to their experiences over and above their responses and those responses match one another. There are no intrinsic qualitative properties over and above the evaluative and cognitive effects that the coffee has on each taster, so to ask whether such properties have changed or remained constant is to ask the wrong kind of question. The action-space account is in agreement with this thesis and provides a way of filling-out the kinds of cognitive effects that are relevant here. In the Chase and Sanborn discussion, Dennett focuses on the evaluative or affective

aspect of the perceivers' responses to the coffee; we are to consider the two tasters coming to dislike something that was once appealing to them. This can't be *all* that there is to the experience, though, because the affective component is in a sense too coarse-grained to secure the differences between particular experiences. Chase and Sanborn may like two different coffees equally, say, and thus exhibit the same set of affective responses in two different perceptual cases, but we are not tempted to say that their experiences in these cases are thus necessarily identical (a clearer case: a perceiver who likes coffee just as much as he likes tea, and so who exhibits an identical suite of such affective responses to both drinks. Stating that this affective component is all that there is to the experience in each case is unsatisfactory).

On the action-space story, following Pettit, the suite of responses that a perceiver exhibits upon perceptually encountering a property includes his manifest grasp of the ways in which he can sift, sort and track the property (skills to which Dennett gives little attention). These are more finely-grained than the perceiver's affective responses (his like or dislike of the property and the kinds of behaviour these result in) - coffee can be sifted, sorted and tracked over a different range of conditions than tea can be, for example. Once we include these kinds of skills in the set of responses to be considered in the Chase and Sanborn case (that is, if the two tasters have the same responses to the coffee in ways that include their dispositions to sift, sort and track it etc), it becomes still less clear that there is a sensible question to be asked about whether it is the responses or the qualia that have changed over time. Could it really be that Chase and Sanborn both dislike the Maxwell House, are able to judge its similarity to and difference from other brands of coffee (even if only on a practical level; i.e. that both are able to locate it on a scale of similarity and difference with the others when confronted with each), are able to recognise it on repeated trials and, perhaps, in combination with different flavours, but for its nevertheless to taste different to each of them? If not, then the putative separability of the taste of the coffee from its effects is a false distinction. The action-space account, in setting out clearly the range of effects that we ought to be considering in this case, has made this falsity more compelling.

The need to take abilities of sifting, sorting and tracking into account - in addition to the affective, emotional, evaluative responses suggested by Dennett in this case - is more obvious in cases where there is no clear affective component at all. For instance, it isn't obvious that perceivers always have preferences when it comes to colours, say, so there will be no unique set of such responses that we can appeal to in explaining colour experience. Here we can't ask, as we did in the Chase and Sanborn example, 'what is left over in the

experience of yellow (for instance) when we remove how the agent feels about yellow?', because it is likely (though perhaps not certain) that the agent has entirely neutral preferences as far as yellow is concerned. We *can* ask, though, 'what is left over when we subtract the perceiver's manifest ability to sift, sort and track the yellow object over a range of conditions?', and reasonably answer: nothing at all.

The second kind of case that the qualia enthusiast can appeal to is that of the Inverted Spectrum (see, for example, Block (1990)). Again, this is said to show the separability of qualia from their owners' responses and is, in effect, a limiting case of the scenario in which Chase and Sanborn find themselves. The story is familiar: we can imagine, according to the qualia-conservative, two agents who behave identically as far as their colour-relevant responses go but who enjoy colour sensations that are reversed - they have inverted spectra. Pillar-boxes, tomatoes, sunsets and so on look red to the first agent, but look green to the second (that is, they look the way grass, cucumbers and limes look to the first agent). Both agents use the same colour terms, of course, and exhibit the same suite of reactions and attitudes - both are relaxed by the presence of blue (including physiological responses such as a decrease in heart-rate), both call red 'warm' and green 'cold' and so on.

For Dennett (CE, chapter 12, section 4) the apparent possibility of inverted spectra is again an artefact of an unsustainable view of qualia and as such is no real possibility at all. Once the agents' responses are in place there is nothing more (nothing subjective or qualitative) that needs to be considered, nothing that could have explanatory value. There is no possible evidence that could settle the question of whether two perceivers' qualia were the same or different, and so the question has no answer.

By appealing to skills of sifting, sorting and tracking the action-space account can again reinforce Dennett's claim that explaining perceiver responses is all that there is to explaining experience. In order for the behaviour of the two perceivers to be identical, as the inverted-spectra cases demand, they must exhibit the same pattern of similarity and difference judgements, the same pattern of sifting, sorting and tracking and so on. Pettit (2003, p235 and following) notes that the effects associated with looking red, for example, are rich and complex, and include the ability to distinguish it from other coloured objects under different conditions of illumination and perspective, and across an extended period of time. He claims that it is impossible to conceive of an object's causing this range of effects without looking red (by implication just *this* shade of red, too). If this is right - and I concede that there is some more work to be done in specifying just which kinds of skills are to be appealed to here - then spectrum-inversion is not a possibility: sameness of effects entails sameness of look,

because the latter is constituted by the former.

In both of the above cases the burden of proof, at least, is on the qualia conservative; he must provide reasons to believe that there are effect-independent qualitative properties of experience. In light of the range of perceptual effects that the action-space account presents, it is not at all clear that there is any role for phenomenal properties on top of these.

6.2.2: Ineffability & Privacy.

The second of the conservative's proposed features of qualia, closely related to the first, is that of *ineffability*. Phenomenal properties are said to have an essence that is inexpressible by the agent; he will be unable to communicate the 'what it is like-ness' of the taste of coffee, the redness of a ripe tomato, the timbre of a cornet. This feature stems from the intrinsicality condition above, according to which qualia are separable from their effects and are primitive or unanalysable. There are thus no terms available for the agent to describe his qualia, because they have no more simple components from which a description could be built.

The rejection of intrinsicality, then, goes a long way towards the elimination of ineffability - once we see that there is nothing that satisfies the condition of being an effect-independent, qualitative property of experience we can see that there is nothing that is delivered to the agent that has a mysterious, ineffable-in-principle nature. On the other hand, and as Dennett notes (CE, p376 and following), theories that reduce qualia to complex suites of responses and dispositions can appeal to *practical* ineffability. The complexity of an agent's perceptual responses - their affective component, the memories invoked, their effect on his ongoing behaviour, the ways in which the property can be manifestly sifted, sorted and tracked and so on - render them out of bounds to verbal report. Perceivers simply do not (and need not) have the conceptual or linguistic resources to provide descriptions of everything that takes place during a perceptual episode, and this is the source of the apparent ineffability therein. There is, however, no barrier in principle to a complete description of the effects that a perceiver's encounter with a property has on him were he to be provided with all of the relevant information (as Mary the Brilliant Colour Scientist has been, for example; more on this case below). On the deflationist or eliminativist view, of course, securing this description would amount to securing a description of 'what the experience is like'.

Where the vocabulary is available, furthermore, there is a great deal about the agent's experience that he *can* report, so the alleged ineffability of what is experienced has been

overplayed by the conservative. Although the action-space account does not require that each element of the manifestly afforded space of possibilities can be reported by the agent (it demands only the weaker claim that each element must show up at the personal-level), many of them can be. What does red look like? Well, it looks quite a lot like orange, and a lot less like blue. Normal human perceivers have a grip on the terms that can be used to describe the relative similarities and differences that hold within the colour-space; they have a quite finely-grained vocabulary that enables such description. For the other sensory modalities, however, there is a far more limited conceptual and linguistic apparatus available: in what respect is the taste of orange juice more similar to that of lemonade than of coffee? We don't have terms that naturally describe such cases; we don't have terms for each and every component of any action-space with which we can be confronted, and this is a further source of apparent or practical ineffability. Similarly, the agent has no access to the properties of objects (some microphysical reflectance properties, on standard accounts of the visual case) that ground his skills and judgements of similarity and difference. On the action-space model, abilities of sifting, sorting and tracking (etc) are *enabled* by the brain in light of its sensitivities to these properties, but only the sets of possible skills and actions themselves are available to the agent, so he cannot report what it is in virtue of which his skills are present. In perceptually encountering a red object, say, he will be manifestly empowered to sort it with other red objects, sift it from green objects and so on, but will have no knowledge of the properties or sensitivities that ground these abilities.

Again, once this suite of effects has been secured there is nothing more to be added: there is no further property of the experience (indeed it is unclear what it would *mean* for an experience to have properties; see the next section) that is made available to the agent but about which he can say nothing.

Privacy, too, can be given a deflationary treatment on the current approach. The privacy condition is, again, tied closely to the other features of qualia endorsed by the conservative. It is hard to separate clearly privacy from ineffability, but the key notion seems to be that one agent's qualia can in principle be known only by himself - they are unavailable to the second- or third-person perspective. Dennett (QQ, p544) states that privacy should be read as *idiosyncrasy*. An agent's detection-systems and perceptual responses are idiosyncratic in that they depend subtly on his physiology, his past experience, his preferences, his goals and so on. Given their complexity, no other agent is likely to share these features, although the extent to which they are shared by two or more agents will of course match the extent to which their experiences are similar, because their experiences are constituted by the sets of manifest responses on the current view.

As with ineffability, there is no privacy-in-principle. Two perceivers with identical detection-systems and responses will undergo identical experiences when located in identical circumstances. The question of *third*-person access to an agent's experience will be addressed below, when considering Mary the colour-scientist.

The action-space story extends the field of possible perceiver-responses to make Dennett's idea of privacy as idiosyncrasy more compelling. Can we imagine two perceivers who when they encounter a property are confronted with identical action-spaces, including identical spaces of sifting and sorting etc, but who undergo different experiences? It's not obvious that we can, and even if our intuitions are simply unclear (rather than favouring the eliminativist position) this again demonstrates that the qualia-conservative owes us *arguments* in support of the existence of intrinsic phenomenal properties.

6.3: Manifest Empowerment Again.

The focus of the action-space account on *manifest* empowerment allows us to expand upon the 'dispositions to behave' that crop up in Dennett's examples, and to emphasise the importance of controlled rather than uncontrolled behavioural responses again. Consider 'Intuition-Pump #2' from 'Quining Qualia':

> "Could Gallo Brothers replace their human wine tasters with a machine? A computer-based "expert system" for quality control and classification is probably within the bounds of existing technology. We now know enough about the relevant chemistry to make the transducers that would replace taste buds and olfactory organs (delicate color vision would perhaps be more problematic), and we can imagine using the output of such transducers as the raw material--the "sense data" in effect--for elaborate evaluations, descriptions, classifications." (QQ, p522).

and Dennett's imagined response from the qualia-conservative:

> "[B]ut surely no matter how "sensitive" and "discriminating" such a system becomes, it will never have, and enjoy, what we do when we taste a wine: the qualia of conscious experience!" (QQ, p522).

The abilities listed at the end of the first passage are identical to those suggested by Pettit as the basis for colour-looks, and are the kind of cognitive or epistemic actions that the action-space model seeks to similarly employ. But Dennett's use of such skills in this example is in danger of missing out on the manifestness condition that does the work in these theories: on the action-space account it's not enough that the mechanical wine-taster is

merely *disposed* to produce particular evaluations, descriptions and classifications (the text suggests that the system in question is purely input-output; whenever wine goes in, out comes the response), it needs to have its own abilities made available to the rest of the system, to its higher-level capacities of action-choice, planning and reasoning. If it lacks such sophistication it won't be a perceiver in anything like the way humans are.

As it stands, the wine-tasting machine only has qualia (or rather, the state of the wine-taster constitutes its having a phenomenal experience) on the ultra-liberal construal of qualia that we saw above, on which *any* system that is sensitive to information has them. This isn't the construal that the action-space theorist has to take - he can argue, instead, that only agents who are capable of controlling their actions, of integrating the possibilities for action into their plans and goals, have qualia (or rather, that explaining their manifest confrontation with those possibilities exhaustively explains their experiences, 'phenomenal properties' and all). Given Dennett's own discussion of Zombies and, particularly, of blindsight (CE, especially p327 and following), where he argues that nothing more needs to be added to explain qualia once *normal* behaviour has been explained (that is, behaviour that doesn't require external prompting), it seems clear that he has in mind something more than mere dispositions to respond. Normal, self-prompted behaviour (as I have called it) requires the agent to have a higher-level grasp of the kinds of things he can do, the kinds of ways he can act on and within his environment. This grasp is, on the action-space account, part of the suite of perceiver-responses that must be considered in explaining conscious experience, in addition to those that are not under his control.

6.4: Qualia as Non-Representational Properties of Experience.

Another way of describing the intrinsic and effect-independent nature of qualia, popular in the literature, is to say that they are *non-representational* properties of experience; features of a perceptual episode that are not exhausted by its content. It is through this way of talking that the claim that qualia are properties *of* experiences is most explicit.

Although 'strong representationists' (e.g. Tye, 1995) reject this proposal by maintaining that the only properties available to the agent in perception are those that his experience represents the world as having, and so that even properties such as colours, tastes and pains are represented to him as being present, the qualia-phile is likely to be unhappy with this for a number of reasons. He can appeal, for example, to the apparently non-representational nature of some experiences (e.g. Rey, 1998), or to experiences that have the same content but different qualia (e.g. Peacocke, 1983). In experiences of these sorts, we are said to be able to

isolate properties that are possessed by sensations themselves, independently of what the agent takes his experiences to represent, and so to demonstrate that such sensations (qualia) exist.

Visual experiences, for instance, are said to possess non-representational *visual-field* properties that explain why (say) two trees located at different distances from the observer have different apparent heights in spite of being represented as having identical heights (Peacocke, 1983; p12). The nearer tree is said to look taller than the further one, in spite of both being taken to be the same height by the viewer, and this is because the nearer tree fills a greater expanse of the perceiver's 'visual field' than does the distant tree. The visual field is a mental arena on which visual qualia are located, and its existence (or that of something very like it) is entailed by any theory on which visual qualia are intrinsic properties of experience. Any such theory, after all, must locate visual qualia *somewhere* (even if only in the sense of answering the question of what they are supposed to be properties *of*) and, given the argument from illusion, they cannot be located in physical space (they cannot be the properties of physical objects). The sense-datum inference, which grounds the non-physical nature of the visual field, is made in the argument from illusion as follows: when an agent has an illusory or hallucinatory experience as of the presence of something green (that is, an experience of a green object that isn't there, or isn't green), there is something green in his experience, or towards which his experience is directed; this green thing isn't a physical object, by hypothesis, therefore it must be a non-physical thing. Given that veridical and non-veridical experiences are indistinguishable, the objects of veridical experiences, too, must be non-physical. The possibility of illusion in all of the agent's sensory modalities implies that the same is true of non-visual experience.

The action-space account has no need for non-representational properties of experience. All that the agent visually encounters are objects that look a particular way to her, where this can be explained in terms of manifest powers. Experiencing the world involves taking it to be a certain way, which in turn is constituted by the perceiver's manifest grasp of the possibilities it affords her for action, intervention and cognition. It rejects talk of a 'visual field' in favour of 'that part of the world that is visually available to the agent', and so the account must deny that the two trees look different sizes in Peacocke's example[3]. The content of the experience is exhausted by the perceiver's manifest grasp of the action-spaces afforded by the two trees (which, if their properties are identical, differ only in those actions that are determined by their respective distances from the agent). If it was the case that the two trees really did look to be different heights, then this look should show up in the dispositions of

the perceiver - she should be disposed to treat the trees differently, including her dispositions to judge their respective heights, to sift and sort their heights with others, to use the higher tree as a vantage point when needed and so on. No such dispositions are in place in normal perceivers, and so it is unclear in what sense the two trees are supposed to look unequal in height.

The supposed 'bigger in the visual-field' look of the nearer tree shows up, as far as I can see (and as I noted in Chapter 3), only in the tendency to think that if one were to paint a picture of the scene, the image of the nearer tree would take up a bigger portion of the canvas. This is right, of course, but it tells us nothing about mysterious, two-dimensional visual fields; the ability to think like an artist allows us to imagine the shapes that objects would project onto a two-dimensional screen but doesn't demonstrate that such a screen is present in experience[4].

On the action-space account, the difference in the apparent size of the two trees can be explained, if it needs to be explained at all, in terms of the fact that the nearer tree obscures a larger portion of the rest of the *world* than the further tree does, from the perceiver's current position, and that the nearer tree fills a larger portion of egocentric space. Part of the action-space that a particular object affords, then, is the set of interventions it *curtails* as far as the rest of the scene is concerned. The nearer tree prevents the agent from acting on a wider portion of the scene than does the further tree (at least insofar as it prevents him from discriminating, tracking and responding to the parts of the scene that are obscured). In order to keep track of the nearer tree, furthermore, and orient himself to act upon it, the agent must move in a wider arc - he must tilt his head to see its peak, for example, to a degree that is not required to see the top of the distant tree. This is what it means for the closer tree to fill a greater portion of his egocentric space. As with the other supposed properties of qualia, explaining this feature is all there is to explaining the 'apparent size' of the tree. The perceiver, then, does not take the two trees to be of unequal heights at all, so there is no evidence of non-representational properties of a visual-field[5].

The burden of proof, once more, is on the qualia conservative to provide reasons to accept the existence of non-representational properties of experiences. He must provide, in the visual case, a sustainable account of what the visual field is, and what properties it is supposed to possess. I have introduced a competing explanation in action-oriented terms of the facts to which the qualia conservative appeals in support of his view.

6.5: Mary the Brilliant Colour Scientist.

The influential case of Mary the colour-scientist (Jackson, 1982) aims to establish that there are non-physical, intrinsically-phenomenal properties of experience, facts about which can only be known by agents who have undergone those experiences. In this section I argue that the Mary scenario does not establish an anti-physicalist conclusion, for there are no non-physical facts that Mary comes to know. Insisting on an answer to questions about what an experience is *like*, I suggest, indicates an underlying (and, typically, question-begging) adherence to the qualia-conservative perspective that I reject. On the action-space account, explaining the qualitative aspect of conscious experience involves explaining how the *world* looks, feels, tastes, sounds and so on to the perceiver, and not how his *experiences* feel to him. Experiences are perceptual encounters during which spaces of possible action are represented in a form that is suitable for integration into the agent's ongoing planning and action-selection, and it is not clear what it would be for such encounters to bear phenomenal properties.

Mary, we are asked to imagine, has been captive from birth in a black-and-white room with no exposure to any coloured stimuli. She has, nonetheless, come to know all of the physical facts that there are to know about colour perception, from surface reflectance properties of objects to neural transactions in the visual cortex and their effects on the perceiver. The question, of course, is whether Mary learns anything *new* when she leaves the room and experiences a red rose (say) for the first time. The qualia-conservative answers in the affirmative, appealing to the strong intuition that Mary comes to know *what it is like* to see red, a fact that is not captured by her knowledge of physical processes and properties. The deflationist or eliminativist about qualia, on the other hand, holds that the facts about Mary's experience are exhausted by her knowledge of the physical. This doesn't mean, though, that Mary already knows 'what it is like' to see red prior to having the experience of red. Rather, and as I shall argue below, it means that such questions are inappropriate; they carry the assumption that there are qualitative properties of experience when in fact this is the very question at issue. Asking a subject what her experience is like amounts to asking her to describe its phenomenal properties. On the action-space account and its siblings there is no answer to questions of 'what it is like' that bear this assumption (although even Dennett, I suggest, seems to have missed this point when he pursues an answer to 'what it is like' questions in, e.g., 'What RoboMary Knows'). Instead, the relevant question concerns what the *world* is taken to be like in experience.

As with Dennett's approach to these questions, the action-space account takes the business of explaining experiences to be one of explaining the effects that a perceptual encounter has upon its subject. Once we establish the suite of effects that a visual encounter, for example, has on the perceiver's sensory systems, and the beliefs and responses these engender, this counts as an exhaustive explanation of the experience. There are, I propose, a number of ways in which these effects can be cashed-out, and only once we focus on the space of enabled actions that are empowered by a particular perceptual encounter do we get a satisfactory explanatory framework. I will consider two responses that Dennett gives to his "blue-banana" example (which I take to illustrate simply the lessons of the original Mary case, to which I return), before defending the action-oriented view.

Dennett (CE, p399 and following) develops an alternative scenario to Jackson's original in which Mary is shown, upon leaving her black-and-white room, a blue banana. If the qualia conservative is right, Mary will be fooled by this: she won't realise that the colour of the banana in front of her doesn't match the normal colour of that fruit. In fact, even though she knows that bananas are yellow, she will come to think that *that* (the blue colour) is what yellow looks like. Dennett, in contrast, argues that once we take seriously the premise that Mary knows *all* of the physical facts, we can see that she will know enough to pass the test - enough to know in advance how bananas should look. Given Mary's knowledge of all of the physical, brain-level facts about visual perception, we can see that this includes some *salient* fact(s) about how her neural systems will respond to yellow, and which will allow her to tell when she *isn't* experiencing it. All she has to do is determine whether the salient 'yellow' effect is present, and if it isn't she knows that the experience she is having isn't of yellow (although she won't yet know which colour it is that she is experiencing). Taking on board her supposed omniscience about physical facts, Dennett continues, lets us see that she knows *all* of the relevant brain-level facts - and not just those that are peculiar to the perception of one colour over another - *all* of the details about how her brain responds to red, to yellow, to green and so on. So when she sees the blue-banana for the first time not only can she know that she's not experiencing yellow, she can know that she is experiencing blue by comparing the state of her brain to the state that she learnt her brain would go into upon encountering blue.

There is, however, a confusion on Dennett's part here, at least if the rules of Jackson's original Mary example are adhered to. For there is no requirement that Mary has omniscient access to her brain-states *when she leaves the room*, and so her neuroscientific knowledge

will not help her to pass the blue-banana test. When in the room, she comes to learn how her brain will respond to blue objects and to yellow objects (and so on), but in order to know which colour she is seeing upon leaving the room, she would have to compare the state her brain goes into on her encounter with the banana with her prior knowledge of the state her brain *would* go into when she sees each colour. This she cannot do, for she has no access to the state that her brain goes into upon seeing the banana, any more than you or I do. Likewise, prior knowledge of how her brain will respond to red objects will not be sufficient for Mary to know that she is seeing a *red* rose when she leaves the room.

What we need, instead, is some *personal-level* response that is peculiar to one colour rather than another (because it is only personal-level phenomena to which Mary has access when she leaves the room), and which she can compare to the responses that she has learned will be the effects of seeing particular colours. That is, to pass the blue-banana test, she needs to learn how *she* will react to different colours and then compare her actual response to these known responses. If she has the blue-response when she expects a yellow-response then she knows that something suspicious is afoot.

One suggestion that satisfies this constraint is that Mary can compare the *beliefs* that she comes to have upon leaving the room with those that she knows in advance that she would have in different perceptual situations:

> "[Mary says:] 'You have to remember that I know *every*thing - absolutely everything - that could ever be known about the physical causes and effects of colour vision. So of course before you brought the banana in, I had already written down, in exquisite detail, exactly what physical impression a yellow object or a blue object (or a green object, etc.) would make on my nervous system. So I already knew exactly what *thoughts* I would have (because, after all, the "mere disposition" to think about this or that is not one of your famous qualia is it?).'"
> (CE, p399-400; emphasis in original).

Matthew Elton (2003) makes, on Dennett's behalf[6], the implications of this position more explicit: coming to believe that the world is a certain way is *all there is* to perception; it is what *constitutes* perceiving the world to be that way. Seeing is believing. The differences between what we might call perceptual and non-perceptual beliefs can be explained, on this Dennettian view, in terms of the relative richness of their contents:

> "When one sees that the cat is on the mat one acquires a great deal of information that is lacking when one is simply told that the cat is on the mat. When one sees the cat one comes to know a great deal about its position, its

> orientation, its colours, its size, the way it looks in the prevailing lighting conditions, how like or unlike it is to other cats one has known, and so on." (Elton, 2003; p152).

For a rose to 'look red', then, is for it to reliably produce the belief that it is red in normal perceivers under standard conditions of illumination. For it to look red to Mary is for it to produce beliefs concerning its redness in her. Importantly, there is nothing 'it is like' to entertain such perceptual beliefs.

Dennett appears to acknowledge, at least implicitly, that the focus on what Mary comes to *believe* is going to convince few qualia-conservatives. After all, their claim is that perceptual beliefs, and in particular beliefs about colour, are grounded in and dependent upon qualia - you believe that the rose is red because you undergo a red quale when you see it. It is *cheating*, Dennett thinks the response will be, to say that Mary's prior knowledge of her belief-states is sufficient to allow her to pass the blue-banana test. For the conservative, although there is a correlation between colour beliefs and colour experiences it is a *causal* correlation - Mary will come to believe that the rose is red *because* she experiences it as being red[7].

In addition, it is not clear that the "acquisition of a great deal of information" in perception is best described in belief terms at all. Beliefs are conceptual and intellectual to an extent that seems separate from the role of perception, and such a construal would rule out young children and animals from the realm of conscious experience. What we need, and what the action-space theory provides, is a personal-level but nonconceptual suite of perceptual effects.

When one sees the cat on the mat, on this view, one represents the situation in a form that is suitable for integration with one's ongoing action planning, targeting and execution, and not (or not necessarily) in a form that is suitable for conceptualisation or verbal report. An object or scene's being represented in this way is what it takes for it to have a particular look from the point of view of the observer. It is not the case, this view maintains, that such representation *feels* a certain way to the perceiver; it is not the case that this perceptual taking bears phenomenal properties.

As with Elton/Dennett's seeing-is-believing proposal, where it was inappropriate to ask 'what is it like to have a particular perceptual belief?', it is inappropriate to ask, for example, 'what is it like to take the object to be blue?', at least where this assumes that there are properties of the perceptual episode that could be described in answering such a question. The qualia-conservative view relies upon this assumption, and takes it to be reasonable to

ask questions of this format. In addition to the effects that a scene has on the observer - in terms of his confrontation with the space of actions that it affords - there are said to be further phenomenal properties of the encounter, properties that specify not just what *red* is like, but what the experience of red is like.

Consider Peacocke's two-trees example again. For the conservative, the part of the visual experience representing the nearer tree bears a non-representational, phenomenal property of being larger-in-the-visual-field than that of the further tree. The action-space story, as I described above, accounts for this apparent discrepancy in size by appealing to features of the suites of actions that each tree manifestly empowers in the perceiver. The nearer tree obscures a larger portion of the environment, for example, and requires a wider arc of bodily movements in order to be kept track of by visual means. The experience of each tree involves representing these action-spaces in a way that poises the agent to act on the world in different ways. But it is not that such representation bears a qualitative feel of its own; there are no further phenomenal facts about being manifestly confronted with a space of actions.

There is no answer, on the action-space view, to 'what it is like' to see red once we subtract how red looks to the perceiver. That is, once we have explained what it is for a scene to look a particular way to the agent, this is all we need to explain to give a complete account of his experience of that scene. This is a crucial point to note, I think, and it is here that Dennett's account exhibits a second confusion. Dennett's story aims to eliminate phenomenal properties of experience along similar lines to those of the action-space theory. Once we describe all of the effects that a perceptual encounter has on the perceiver, there is nothing more to be said; no extra properties of the encounter that specify what the encounter is like.

Dennett's attempts (in 'What RoboMary knows') to answer further questions about 'what it is like' to have an experience hint at a failure to acknowledge that such attempts are inappropriate. There, Dennett aims to show that Mary doesn't need to have had a prior experience of redness in order to know what such experiences are like (and he discusses a series of convoluted set-ups in which Mary simulates having the experience rather than having it herself and so on), when in fact he should realise that such questions are redundant by the lights of his own theory. If experiencing is believing (or, more generally, for an agent to undergo certain perceptual effects), and this is supposed to *explain away* 'what it is like-ness', then it is hopeless to subsequently ask 'but what is it like to have the perceptual beliefs or effects?'.

In the blue-banana case, we were looking for a suite of personal-level perceptual effects

that Mary could compare, upon leaving the house, with the knowledge that she gained inside the house of the effects that a visual encounter with a particular colour would engender. If she can compare the effects that the blue banana has on her with those that she knows she ought to have upon seeing a yellow object, she will not be fooled. Although manifestly empowered spaces of action are personal-level effects, I suggest that Mary will be unable to compare these to her prior knowledge and so that she won't be able to pass the blue-banana test. Again, this is not because they carry with them any non-physical, phenomenal properties, but only because they involve a form of representation that is nonconceptual, in contrast to the conceptual knowledge that Mary has of colour perception[8].

When inside the black-and-white room, Mary learns all of the physical facts about colour and colour-perception, including details of the suites of perceptual discrimination and comparison that will be enabled by her visual processing. She learns them in propositional, conceptual form and can report them, reason about them and so on. The problem is that she is unable to compare these facts with those that she encounters in experience; in the former case they are represented in a format suitable for verbal report and conceptualisation, in the latter they are represented in a format suitable for integration into action-planning and goal-directed behaviour.

Mary's failure to pass the blue-banana test (that is, to know that she is seeing a blue rather than a yellow banana) does not, of course, indicate that there are non-physical facts to which she doesn't have prior access, facts about phenomenal properties. It indicates only that the comparison she would need to make in order to pass the test - the comparison of actual perceptual effects with expected effects - is not available to her. In the room, she knows all the facts there are to know; in experience she represents (a subset of) the *same* facts, but for different purposes.

Consider the following analogy (which is not, I hasten to add, a direct parallel to the current case, but it is relevantly similar): Betty the Brilliant Fluid-Dynamicist has been locked in a dry room from birth, but has nonetheless come to learn all of the physical facts about three rivers labelled A, B and C. She knows all of the facts about their capacity, flow-rate, turbulence and so on. Prior to her leaving the room for the first time, experimenters swap the three rivers' labels around, so that river A is labelled 'B' and vice-versa. Does Betty know that this switch has been performed when she comes to see the rivers for the first time? Her chances of noticing the discrepancy are determined by the extent to which she can map the observed features of the rivers onto the sets of facts that she knows in advance about each river. But if she isn't able to conceptualise (reason about, report) the facts that she represents in experience, this doesn't mean that there are facts - let alone non-physical facts - about the

rivers that she didn't know before. So it is possible for Betty to fail this test (which is, I suggest, the fluid-dynamical equivalent of the blue-banana case) without this violating the claim that she knew all the physical facts in advance.

Not only can *Mary* know all of the facts about her experiences in advance of having them but so can a third-person observer, provided he is furnished with the right kind of knowledge. As Mary did, he will have to learn which physical properties Mary's sensory systems are sensitive to and which sets of skills these sensitivities will enable in her. He will have to know which sets of properties she will take to be more or less similar than others, which properties she can track over particular lighting conditions and so on. Once the third-person observer knows all of these facts, there is nothing more to knowing how Mary will take the red object to be - she will take it to present her with just this suite of possibilities for action and cognition. As noted in the section on Privacy, it may be that the third-person is incapable of taking red objects to be this way himself, in light of his idiosyncratic physiology and skill-set, if his brain is not sensitive to the same properties as Mary's (as would be the case if he was colour-blind, for example). In such a case he may take two objects to be more similar to one another than Mary does, for instance, and in doing so they will appear differently to him than to Mary. But provided we grant him an omniscient grasp of physical facts, there is nothing that he cannot know in principle about Mary's experience; nothing mysterious, ineffable or intrinsically phenomenal.

Does Mary learn *anything* new in Jackson's original case, according to the action-space account? Yes, albeit of a skilful rather than propositional nature. She gains the ability to perform certain actions fluently and intentionally, on a non-inferential basis that she lacked before she left the room. She comes to be able to sift and sort red objects from particular backgrounds, to track them over time, to compare and contrast them to others and so on, without having to go through complicated chains of reasoning using her prior propositional knowledge of colour and colour perception. She acquires the skill of picking out red objects from their backgrounds by sight, and thus of acting on them efficiently and figuring their presence into her ongoing plans and goals.

This accords well, I think, with our intuitive sense of what Mary can do when she leaves the room but lacks within the room. Her propositional knowledge isn't sufficient to provide her with the swift, world-engaging practical knowledge that she possesses upon perceptual exposure to colour. There is a present-and-future directedness to the space of actions that is empowered in perception that is missing from Mary's conceptual grasp of possible

perceptual scenarios. In being confronted by an action-space, Mary knows what she can do *now*, within the current environment, and she knows this directly and in a way that allows her to interact with the objects that empower her.

6.6: Summary and Conclusions.

I began this chapter by locating the action-space theory's views on consciousness with respect to two extremes - the liberal view and the conservative view. Once suitably interpreted, the liberal view is the closest to that which the action-space account endorses: an agent who has direct, non-inferential access to a space of perceptually-enabled actions, including epistemic actions such as discrimination and comparison, and who can thus perform them unprompted is a conscious perceiver.

The qualia-conservative alternative, on which patterns of access-consciousness (that is, direct and non-inferential access) are simply insufficient for phenomenal consciousness, presents a significant challenge to the action-space view. I argued, however, that the intrinsic, private and ineffable phenomenal properties that it posits are either unsustainable or can be explained away using action-oriented resources, along Dennettian lines. My claim is that the considerations I presented shift the burden of proof onto the conservative, who must provide arguments in favour of qualitative properties of experience. Construed as intrinsic and effect-independent properties, qualia are mysterious. I resist, with Dennett, the separation of perceptual effects from qualitative character. Once we interpret perceptual effects in the full range of ways available to the action-space theorist it becomes hard to see what role, causal or explanatory, could be played by additional phenomenal features.

The apparent privacy and ineffability of so-called phenomenal properties, too, are accommodated by the action-space approach. Experiential content depends finely upon details of an agent's perceptual sensitivities, as mediated by her idiosyncratic sensory systems, and is nonconceptual. It is therefore largely inaccessible to verbal report and conceptual reasoning.

The action-space account is to be understood as a species of representationalism, where perceptual content is given an action-oriented treatment. Conscious experience involves spaces of possible action being represented in a format suitable for integration into an agent's action-planning and goal-directed response. Perceptual episodes do not bear qualitative features; so-called non-representational properties of experience can be explained in action-oriented terms.

Mary the brilliant colour-scientist does not come to know anything new when she leaves her black-and-white room. Instead, she comes to represent certain facts concerning which actions she can perform in a new way, a way that enables her to act swiftly and fluently within her environment, even though the same facts were already available to her through scientific, propositional knowledge. She gains the ability to discriminate, track, compare and contrast coloured objects by sight and to figure the possibilities they enable into her ongoing activity without prompting.

When it comes to consciousness, the action-space account has traded upon Clark's *access-implies-qualia* strategy. We can see now, though, that the claim that access implies qualia is a little disingenuous: access doesn't imply qualia for there are no qualia, at least as traditionally conceived. Of his original proposal, Clark stated that:

> "[I]n this case, access-awareness... seems to imply that there is (or is reported to be) something it is like to detect the difference". (Clark, 2000; p2).

There are two suggestions here - the first that access implies that there really is something it is like, and the second that access ensures merely that the agent will report certain claims about his experiences, to the effect that there is something it is like to undergo them. My view is that the implications of the action-space model are situated at a mid-point between these two suggestions. In experience, construed as access to a space of enabled actions, there really is a way that the world appears - objects are taken by the perceiver to be a particular way, and these figure into her ongoing interactions with them. At the same time, though, the direct and non-inferential nature of the access, coupled with the nonconceptuality of action-oriented content, means that perceivers will report that visually discriminable items, say, 'just seem different' to her. She has no access to the means by which discriminations are made (contra Clark's original suggestion), and the space of empowered actions is too finely-grained to be reportable in full (in Dennett's terms it is practically ineffable). The verbal reports that perceivers make, that is, may suggest an analysis of conscious experience that is closer to that of the qualia conservative, even though that analysis is mistaken.

Chapter 6 Notes.

Footnote 1: *Self*-prompting is to be taken to contrast with prompting by an external agent, as in the familiar blindsight examples when the subject must be told when to make a guess about a stimulus. However, it is not that the self-prompter plays the same role by telling himself when to guess; rather, the important feature is that the self-prompter needn't *guess* at all.

Footnote 2: Where these will include, e.g., Chalmers, Block.

Footnote 3: This point recapitulates my rejection of *apparent properties* as they came into Version-2 sensorimotor theories in chapters 2 and 3.

Footnote 4: This point echoes that made in Schellenberg (2007, p608).

Footnote 5: Can this kind of explanation be carried over to the case of auditory perception where, as I stated in chapter 4, I am willing to endorse apparent properties of, for example, volume? I think so, and without entailing the existence of non-representational properties of auditory experiences. There is a straightforward sense in which some sounds fill a bigger region of auditory space than others, where this can be accounted for in action-oriented terms as before. Loud, nearby noises obscure the detection of quieter or more distant noises, and facts like this help to determine the space of epistemic actions that such sounds manifestly empower. Two sounds can thus be perceived as having different volumes from here, given that from here they empower different action-spaces (different suites of comparisons, judgements and contrasts), without this being explained in terms of the experience of one bearing a louder *quale* than that of the other.

Footnote 6: I doubt that Elton's interpretation is a completely faithful reconstruction of Dennett's views, but his focus on the perceiver's beliefs will help to illustrate my point here.

Footnote 7: Note that this is in direct contrast to the direction of the Pettit-style approach on which perceptual skills are not based upon phenomenal feels, but rather qualitative properties are constituted by the manifest empowerment of those skills.

Footnote 8: I will defend the proposed nonconceptual nature of action-oriented content in the next chapter.

Chapter 7: Content and Representation.

The action-space account maintains that experience is constituted by an agent's possession of various content-bearing mental states that present the world as an environment providing particular opportunities for action. Typically, representationalist accounts (e.g. those of Dretske and Tye) have taken the contents of experiential states to specify states of affairs (or facts, or objects) in a manner that is neutral over the ways in which the perceiver can act in or on them; they present to the agent shapes, colours, textures, loudness and so on. Although this kind of content can of course figure in the agent's selection of actions and interventions, such an influence would constitute a further step beyond the more fundamental presentation of action-neutral properties to the perceiver in experience.

This chapter motivates the proposal that perceptual representations are action-oriented, and elucidates more fully how the higher-level integration of such content into action-planning and reasoning is to be understood. I will argue that we can give a nonconceptual treatment of this relation by deflating the cognitive or intellectual resources that an agent requires in order for this integration to be in place, while still maintaining the genuinely world-directed nature of perception. Roughly, for a perceiver to be poised over an action-space in the relevant sense is for her to be capable of figuring the suite of possibilities that her environment presents into her ongoing intentional and world-engaging behaviour.

The reasons for favouring a nonconceptual account of perceptual content are threefold and familiar: perception is finely-grained; perception is belief-independent; perception is possible even for creatures with limited or no conceptual resources (a view that is denied by, for example, McDowell, 1994a). A nonconceptual action-space story must, of course, aim to satisfy all of these constraints. It must be possible, first of all, for an agent to integrate action-oriented contents into higher-level capacities in such a way that is faithful to the finely-grained character of experience. In the case of colour, say, he must be able to integrate the subtle details of his discriminatory abilities, his sifting, sorting, tracking and comparing skills and so on. Secondly, as we have seen in some examples of illusion, the higher-level capacities appealed to must be capable of coming apart from (and are therefore independent of) an agent's *beliefs.* The content of an experience of the Mueller-Lyer illusion, for instance, must *poise* the agent to act differently with respect to the figure's two parallel lines (to visually sift them apart from one another in terms of length, say), since this is what is constitutive of his experiencing them as different lengths, without its being the case that he believes their lengths to be different. Thirdly, the higher-level capacities must be those that

are available to all plausible candidate perceivers; they cannot be those that are not possessed by, for example, a dog or a cat. For this reason, it is implausible to demand that the action-space content must be capable of forming part of a chain of inference, or of being verbally communicated.

Many of the explanatory tools to which the action-space theory can appeal are simply those that are employed by standard representationalist accounts. In light of this, the action-space approach can provide a natural explanation of cases of perceptual illusion and hallucination. Establishing the representational nature of perception along action-oriented lines, we shall see, has a number of advantages over traditional accounts when it comes to explaining the activity of real creatures under environmental constraints.

We can give, following Clark (1997), an essentially teleofunctional account of how mental states come to have the content they do, including those that specify possibilities for action. Traditionally, teleofunctional accounts assert that a particular brain state bears content that picks out the property of the world with which it was selected to co-vary. A state represents feature X when it is that state's function to be activated in the presence of Xs. The condition of evolutionary selection of function is a requirement in that it rules out having to conclude that a state represents any property with which it does in fact co-vary -- in the familiar case, it rules out having to say that the content of a frog's perceptual state is the disjunctive 'fly or black speck'. Here, the function of the representation (if it makes sense to call the state representational in the first place, that is) is to enable the frog to catch flies, to provide nutrition for the frog, and *not* to enable him to catch flies-or-specks. On a view like this, the content of the representation is the action-neutral property of being a fly.

On the action-space account, too, a mental state achieves its content through the functional role it has been selected to play in a wider cognitive system. Clark emphasises the rather more holistic focus of this view:

> "[A processing system is representational if] it depicts whole systems of identifiable inner states (local or distributed) or processes (temporal sequences of such states) as having the function of bearing specific types of information about external or bodily states of affairs." (Clark, 1997; p147).

> "The status of an inner state as a representation thus depends not so much on its detailed nature (e.g. whether it is like a word in an inner language, or an image, or something else entirely) as on the role it plays within the system." (*op cit*. p146).

We need to look not only at the state of affairs by which a *particular* state is activated - as a more straightforward teleofunctional story might have it - but, in addition, at the role the state plays in interactions with a complex and interrelated suite of other states. It is this fuller, multi-directionally influential role that determines both a stateôs content and its status as a representation. If something along these lines is correct, then we have a non-mysterious way in which it is sensible to ascribe action-oriented contents to particular mental states, for the same set of reasons that we might be tempted to ascribe action-neutral contents to a state.

The kind of access to a space of actions that the current approach wishes to endorse, then, should be equivalently non-mysterious: it is for content that describes a particular suite of possible actions to be made available to higher-level capacities akin to planning and reasoning; for the perceiver to be able to employ these contents in selecting targets and means by which his goals can be satisfied.

7.1: Integration and the Nonconceptual Status of Action-Space Content.

The revised access-implies-qualia move that has been in play so far claims that when(ever) a particular pattern of access consciousness is in place an agent will undergo a phenomenally-conscious experience, where this pattern of access is to be construed as a direct and non-inferential form of knowledge about the possibilities for action that a scene presents. This strategy makes it the case that the (only) content that makes it into conscious experience is that which is understood by the agent, on a suitable interpretation of 'understanding'. That is, that perceptual contents are fixed by an agent's cognitive resources as well as by the information to which his sensory systems are sensitive - fixed both from above and below, as it were. At the same time, the action-space theory wishes to remain free from conceptualist conclusions - the cognitive resources that constitute access are not to be taken as fully concept-involving, inferentially-promiscuous and so on, but simply as whatever largely practical understanding it takes for it to make sense to say that an agent has been apprised of a *space* of possibilities that informs intentional action. This condition, I have suggested, accords well with our intuitions about the kinds of creatures that undergo conscious experiences: the rejection of the conceptualist requirement rules in animals and young children, while the condition that genuine *appraisal* of a space of actions is required rules out mere information-sensitive devices and simple organisms such as paramaecia.

As with mainstream nonconceptualist accounts, of course, there is no requirement that *all* perceptual content is nonconceptual. The action-space story can permit further levels of content that are determined by the perceiver's conceptual resources. The commitment here -

an attractive one, as far as I can see - is only that there is some level of conscious perceptual content that can be shared by concept-users and non-concept-users alike, and which is constrained by an agent's grasp of the possible actions afforded by her environment.

The direct and non-inferential access to which the action-space account appeals cannot, on pain of circularity, be anything like 'access by way of qualitative experience', as that would result in a circular explanation of perceptual experience. While a standard account of discriminatory abilities takes perceptual skills to be grounded in how things look to the agent (tomatoes can be picked-out, tracked and sorted because they look red, for instance), the action-space account proceeds, with Pettit, in the reverse direction: manifest empowerment of the skills determines the look of a surface or object (tomatoes looks red just because they manifestly empower a characteristic suite of abilities). The access required by the action-space account is to be given a deflationary interpretation - it is simply whatever is required for the agent to come to know, in a not-too-demanding sense to be developed below, without inference or reflection, what she can do in a particular situation. It is for action-oriented representational content to be delivered to her at the personal-level in such a way as to influence her intentional behaviour and, where present, her thought and deliberation.

A minimal characterisation, then, of higher-level integration is that it is exhibited by a creature who can figure a number of different possible actions into her ongoing goal-oriented activity in a way that enables her to act flexibly on a scene, and where she does not need to infer which actions are possible from antecedent information. Such a creature may, as a result of this capacity, act in a different way on the same scene upon two different occasions when she has different goals and projects in mind; she can control her actions relative to what she wants.

If conceptual content is defined as that which is apt for integration into reasoning, inference and so on, and which is open-endedly recombinable with other contents possessed by a thinker, then the understanding and integration implicated by the action-space account does not involve conceptual content[1].

The integration of an action-oriented content into an agent's ongoing practical reasoning, action-selection and action-initiation capacities is a context-sensitive affair, and fails to imply the full generality that is definitive of concept-use. Nor does it entail that perceivers who bear this ability are capable of making inferential transitions regarding action-spaces, goals and opportunities, or themselves, or of verbally communicating these features. It *does* require, though, that perceivers are able to use action-space information to guide and control

behaviour towards the satisfaction of particular goals, over an extended period, where these goals are themselves nonconceptually entertained.

Susan Hurley points out that:

> "A conscious animal... has the ability to keep track of relationships between what it perceives and what it does. This ability enables it to use information about itself and its own states and activities as well as about its environment to meet its needs. It doesn't follow that it has the ability to reason systematically about aspects of itself, others and the environment in a variety of ways detached from its needs. Its abilities may be more or less context-bound" (Hurley, 1998; p16).

What we have, then, is a form of *nonconceptual reasoning* concerning possibilities for action and their relationship to the agent's goals and their satisfaction. Goals, plans and intentions may be temporally fleeting, existing only until their fulfilment perhaps, and the agent's understanding of how chains of means and ends can be carried out may be constrained by the particular circumstances in which she finds herself. Thus the extent to which the agent can be said to *understand* or *grasp* a space of perceptually-afforded actions may be limited (to a greater or lesser extent) by the task at hand, and needn't involve any capacity to generalise what may be understood in particular cases.

Nonconceptual reasoning of this form should be distinguished, too, from purely *practical* understanding of particular actions, at least where that is conceived of as knowing-how. An agent may have the latter without the former, although the division may not always be a sharp one. A blindsighted subject, for example, may be described as having knowledge-how of some physical activity but be unable to figure the performance of that activity into her ongoing behaviour where appropriate (unless externally prompted). The kind of integration into higher-level capacities that the action-space theory endorses, then, is one that demands that action-oriented content shows up at the personal level, in influencing goal-directed intentional behaviour, without this requiring full concept possession.

The action-space account has a particular set of resources at its disposal to explain the content of perceptual representations, namely Clark's model of Experience-Based Selection (hereafter ñEBSò; Clark, 2001, 2006a). EBS is a response to conclusions drawn by dual-streams theorists of vision (Milner & Goodale, 1995, 1998), purporting to show a deep division between vision-for-action and vision-for-experience. Clark argues that the role of the ventral visual stream - the one responsible for conscious perception - is to provide the agent with information about possible *targets* for action and possible *types* of action[2]. In this

respect (following Goodale, 1998) the two visual streams operate in a relationship that is rather like that involved in the use of a tele-assistance device.

> "The operator decides on the target and action-type (for example 'pick up the blue rock on the far left') and the robot uses its own sensing and acting routines to do the rest".
> (Clark, 2001; p36).

The fine details of action-guidance are carried out by way of the dorsal stream's sensitivity to the parameters of target objects, while the selection of those targets and of the kind of action to be performed are the job of conscious input. Thus on this approach the way that the world is *described* in experience is itself an action-oriented matter -- the environment is presented to the agent in a format suitable for her active, reasoned engagement. Part of what the agent is informed of perceptually, on a possible interpretation of the EBS proposal, is the *appropriateness* of particular actions, where appropriateness is relative *both* to the agent's goals and objectives *and* to the properties of the target object[3]. A full wineglass, for example, offers certain opportunities to the thirsty perceiver, and may be presented as a target for action, but the agent's implicit grasp of the glass's fragility, weight and so on - and of its status as *full* - make a difference to the suite of action-*types* that his experience presents as well. A full wine glass manifestly empowers different types of action to those empowered by an empty wine-glass, say, or by a full plastic receptacle of the same shape.

A further indication that conscious perceptual contents concern targets-for and types-of action emerges from certain cases of visual illusion. The fine details of bodily actions such as reaching and grasping are known to resist visual illusions like the Mueller-Lyer[4]. The width of a two-finger grip, for example, is scaled to the real length of each line rather than to its illusory length. The *type* of grip that is employed, on the other hand, is determined by the illusory contents of experience - a line that looks longer in the Ponzo illusion, for example, will be engaged with a power rather than a precision grip[5]. These results support the action-space theory's view that the content of visual experience specifies quite high-level action-type properties as opposed to finely-grained sensorimotor details.

On the current story perceptual content and its integration into higher-level capacities is nonconceptual and hence available to agents who don't possess intellectual reasoning abilities. As such, it is not unreasonable to expect it to be able to come apart from the content of beliefs and judgements for those who have these, under certain conditions.

The separation of 'integration into higher-level capacities' from judgement and conceptualisation, however, brings with it a difficult case: that in which the action-space

theory demands that a space of actions shows up in a perceiver's planning-for-action, but where this would actually conflict with her explicit judgments about what is possible or appropriate. An example is the situation the perceiver encounters in the Mueller-Lyer illusion. Perceptually, the two lines appear different lengths and the action-space theory entails that the agent will intentionally treat them differently (if, for example, she is asked to point to the line that is longer), as her perceiving them this way *just is* to be manifestly disposed to treat them this way. At the same time, of course, the informed perceiver is not at all tempted to point to either line, correctly judging them to be in fact equal in length. Is her belief that actions that would treat the lines as different would be inappropriate compatible with her being poised to treat them differently in her ongoing goal-oriented activity?

Two promising responses, at least, are available: i) The defender of the action-space theory may appeal to *aptness* for integration rather than actual integration[6]. Thus an action-oriented content is conscious not when the perceiver actually alters or initiates her behaviour on its basis, but when she is capable of doing so; when the content is available to influence her intentional activity. This is compatible with this content being in conflict with that of her beliefs - she simply possesses representational states whose contents are inconsistent, but these states are not in competition (just as in a standard representationalist story where a perceptual state can represent a different content from one's current belief states, even when both concern the same object or property).

I am concerned, though, that this response is a little obscure and that it may lose sight of the feature that makes the action-space model a compelling explanation of conscious experience. It is unclear whether we can adequately make sense of a content's being *apt for* integration into higher-level capacities when that integration itself is difficult to define. Furthermore, it isn't clear how a creature whose perceptually-acquired action-oriented states are (merely) apt for higher-level integration is any better off than a blindsight patient, if those states in fact make no difference to her planning and behaviour. Genuinely *manifest* empowerment, required to secure conscious experience on the action-space account, is difficult to make sense of without the condition that the actions really show up in how the perceiver plans and acts. A detailed and systematic analysis of what counts as aptness for integration (as yet undeveloped) may provide more support for this option.

ii) Alternatively, the action-space theorist may stick to his guns and hold that the perceiver *is* poised to treat the two lines in the Mueller-Lyer diagram differently, but that this is trumped in this special case by his explicit judgement that he ought not to. The agent's sensory systems deliver (presumably for valid evolutionary reasons) action-oriented contents that are

different with respect to the two lines and these are directly, non-inferentially accessed by the agent. There is a sense in which the perceptual contents must be *forced* upon the agent, not only because he does not infer them from elsewhere but because they are resistant to change when they conflict with his beliefs. This is, of course, what we should expect of experience; experience is not a voluntary acquisition or use of content.

The disposition to treat the lines differently with respect to length will show up in the controlled behaviour of an uneducated perceiver (that is, a perceiver who doesn't know that the diagram induces an illusion) or a non-linguistic animal *not* in the fine-details of his actions but in the ways in which she sifts, sorts, classifies and discriminates the lines and how these affect the *types* of action she chooses to perform, and the targets of those actions. The idea is that in those limited cases in which there is a belief whose content is in conflict with that of perception, the belief content may be what determines the agent's choices over which actions to deploy, and on which targets. In standard cases, though, this work will be done by direct integration of perceptual, action-space content.

7.2 Reasons to Favour Action-Oriented Content over Action-Neutral Content.

Why should we prefer a story on which perceptual content comes out as action-specifying rather than action-neutral? For a number of reasons. First of all, it is unclear whether the access-implies-qualia move can be carried out successfully without interpreting the necessary non-inferential understanding in an action-oriented way, as a direct feed into action targeting and selection. Recall that this move was made in order to defend the claim that superblindsighters are inconceivable - the idea being that once the relevant self-prompting abilities are in place it no longer makes sense to describe the agent as a non-conscious-perceiver. Self-prompting, on the action-space story, occurs when the agent has unmediated access to the space of possible actions afforded by a scene: when action-space content makes contact with higher-level capacities responsible for intentional action[7].

An advocate of action-neutral perceptual content, though, would have to maintain one of the two following options in order to uphold the access-implies-qualia move, and both are problematic. The first possible strategy is to argue that conscious perceivers have in place a direct and non-inferential access to content that specifies the action-neutral properties of the world but still to construe that access in action-oriented terms. To claim, that is, that an agent has direct access to this content when he can integrate it into his ongoing action-planning and

reasoning. Self-prompting, on this option, would be possible when contents specifying shapes, colours and so on (the properties appealed to by standard representationalist accounts) are made available directly for the purposes of action.

This, however, is likely to constitute a form of *mediated* access, and so lacks the key feature of the action-space account. On this view, the system would have to firstly be apprised of the action-neutral properties and (only) then, following processing or inference, be able to assess the space of actions made possible by the presence of those properties.

The alternative is to interpret the direct, non-inferential access required for the implication of qualia not as the use of representational content for the purposes of *action*-selection but as content-use for some other personal-level abilities such as inference and belief. On this kind of story, a putative superblindsighterôs self-prompting would come from the content of some state that represents action-neutral properties being made non-inferentially available to her cognitive systems when(ever) those properties are present. For instance, for her to *believe* that a blue square is in front of her (and in contrast to the action-space content proposal, on which direct access is constituted by the use of content that specifies those actions that are appropriate to the presence of a blue square).

As noted above though, the access-implies-qualia move, when filled-out in terms of content making a difference to intentional action, is no barrier to non-concept-users being conscious perceivers. The account allows us to locate consciousness where we want it - ruling out mere information-sensitive creatures but not requiring full conceptual resources. The alternative that takes the relevant access to be to action-neutral content for the purposes of belief and inference, though, is subject to the familiar worries that face conceptualist theories: any creature who lacks capacities of belief and inference cannot be a conscious perceiver; for a creature to experience *any* property, he must be able to form a belief about it. Neither of these conditions is plausible, and so we have reason to prefer an account on which perceptual content is action-oriented rather than action-neutral if we want to exploit the access-implies-qualia argument.

The second reason to favour an account on which perception involves representing the world as an arena for actions rather than as neutral and objective is that being able to make use of action-oriented content directly is a computationally efficient strategy for creatures who need to survive in complex surroundings in real-time (Clark, 1997; Millikan, 1996). Agents who need to behave quickly and appropriately given the contents of their environments will be ill-served by having to represent that environment in objective, action-neutral terms and only then assessing its possibilities for action and intervention. Conversely,

an agent who is presented with those possibilities in a format suitable for ongoing intentional action has fewer computational or inferential steps to perform prior to acting.

Millikan presents the case of the food call of a hen to its brood (Millikan, 1996; p5-6), a representation that has both descriptive and directive content (a 'pushmi-pullyu' representation in Millikan's idiom). Descriptive content depicts features of the environment in a neutral way while directive content picks out what can or ought to be done given the state of that environment. Mental representations, too, possess this dual-content - describing the world to the agent and directing her towards a particular course of action. In this case, the hen's call's descriptive content is 'there is food here now' or similar, while its directive content is 'come here now and eat!'.

> "[It is reasonable to assume] that the effect of the call on the chicks is not filtered through some all-purpose cognitive mechanism that operates by first forming a purely descriptive representation (a belief that there is food over there), then retrieving a relevant directive one (the desire to eat), then performing a practical inference and, finally, acting on the conclusion. Rather, the call connects directly with action ... directly translating the shape of the environment into the shape of a certain kind of conforming action." (Millikan, 1996; p6).

Although this case is not a direct parallel to the claims of the action-space theory, as we shall see below, it illustrates the thinking behind the argument from efficiency: for the chicks' purposes, having to read-off possibilities for action from an all-purpose, objective representation of some feature of the world is a time-consuming and resource-hungry exercise. Far better, for their purposes, to be confronted with the directive content in an unmediated fashion. The perceptual representations undergone by the chicks, then, specify the directive content of the hen's call, and there is no *need* for them to specify the descriptive content (Millikan's treatment is a little unclear here: certainly the call itself bears both descriptive and directive content, but elsewhere Millikan describes perceptual representations as doing so too. Yet the use that the chicks make of perceptual content is purely directive in this case).

There are two salient differences between Millikan's case here and the cases that the action-space account takes to involve phenomenal consciousness. Firstly, the scenario as described appears to take it that the chicks respond automatically to the hen's food call: the presence of the directive content triggers a particular behaviour. This is, as per the quote above, in contrast to the alternative in which behaviours are inferred from action-neutral content. Again, though, the action-space account attempts to tread a mid-line between these two cases: conscious perception involves neither the direct triggering of an action nor the

representation of objective properties, but instead involves the representation of a space of possibilities for action. In Millikan's example, the chicks are not confronted with a space of *options* for action as they have no control over their behaviour; the directive content engages a single behavioural routine, that of moving to the food-source. Such an ability to respond appropriately but inflexibly is all well and good when one is an infant chicken, given that (when operating successfully, in accordance with its proper function) it satisfies what is in fact a necessary requirement for survival. Conscious perception - according to the action-space story - is achieved only when a suite of options for action is made available to the perceiver to integrate with her *own* goals and plans, though. Only when (or if) the chick is apprised of the possibility of *not* acting on the food call (an action-space with only two possibilities; a binary action-space), or of acting in one of a suite of *different* ways (a complex action-*space*), will she be a conscious perceiver of the food call. Possessing states with directive content, then, is not in itself sufficient for an agent to be confronted with an action-space[8].

7.3) Illusion and Hallucination:

The action-space approach must be able to deal with cases of illusion and hallucination, and its focus on action-oriented representations, one might think, presents this project with particular complications. In this section I develop an account of perceptual error that acknowledges the distinctive role of action-oriented content. An analysis of these kinds of cases, furthermore, allows us to see more clearly what the commitments of the action-space account are when it comes to the contents of *veridical* perception. So the investigation here is intended to accommodate more than simply certain special cases of experience; it aims to clarify the more general proposals of the earlier sections of this chapter. Getting clear on cases of illusion allows us to ascribe genuinely representational status to experiences on the action-space model (with representation comes the possibility of misrepresentation) and to determine the standard of normativity for those representations. The section closes with some brief remarks about the metaphysical status of colour.

The issues described here - especially those concerning the world-directedness of perception - will be dealt with more carefully in the following section, but they are helpfully introduced by way of familiar examples of illusion.

One failure of the sensorimotor approach, I argued in chapter 4, is its inability to plausibly account for the possibility of illusion and hallucination. Noë's most recent version of the

enactive story presents perception as being constituted by an agent's performance of certain sensorimotor skills; the bringing-to-bear of knowledge concerning how appearances change in response to movement. Appearances, here, are relational properties that hold between perceivers and objects - a circular plate, for instance, presents an elliptical appearance to an observer located away from and at an angle to it. Visual perception, for Noë, has two levels of content - that which specifies appearances (that plate looks elliptical), and that which specifies real properties (the plate looks round). The second level of content is brought about by way of the agent's exercising her sensorimotor know-how.

Some cases of illusion, I suggested, are amenable to description in these terms - the far-off square tower that looks round, for example, may present an ambiguous visual appearance that is resolved in the wrong way by the agent when she brings to bear her enactive knowledge (that is, if her expectations about how the tower's appearance will change with movement are typical of round rather than square objects). Other cases of illusion and all cases of hallucination, however, cannot be explained in enactive terms: they are cases in which even apparent properties are misperceived, and Noë has not provided us with the resources to account for such facts. When it comes to hallucination, he suggests that what goes wrong is that the agent *acts* in a way that is characteristic of a particular property, and thereby comes to perceive it in its absence. There is no reason, I objected, to suppose that acting in a particular way should result in any qualitative experience at all.

One *prima facie* worry for the action-space story is that its explanation of perceptual content as action-oriented renders it unable to describe cases of illusion in a natural way. Ordinarily, we want to be able to say that illusion involves an agent's experience getting something wrong about the *world* - as presenting her with a specification of the way her environment is that fails to match its real properties. Seeing the square tower as being round is an illusion because the experience presents the tower as being a way that it is not. Standard representationalist approaches can accommodate situations like this by applying the language of *mis*representation - a perceptual illusion is simply a case in which the content of an experience misdescribes the state of the world. On a possible reading of the action-space proposal, though, all that an experience tells the agent is what *she* can *do* in her present environment. Thus perceptual error, one might think, must - on this view - be a matter of getting something wrong about (misrepresenting) *oneself*, rather than being misinformed about the state of the external world. This is, potentially, quite an unnatural way of describing at least some cases of illusion.

The implications of this, though, are further-reaching. If the content of an action-space

representation fails to present the external world as being a certain way, then we lose the ability to describe them as being genuinely *perceptual*. I shall argue, in this section and the next, that the action-space theorist need not be committed to so strong a thesis as this, and that far from being a source of difficulty for the account this feature can assist in the explanation of certain cases of illusion. There are at least some cases, that is, in which it is appropriate to describe a perceptual error as a failure to accurately assess what one can *do* in one's current environment.

To begin with I want to focus on what I take to be one of the most compelling cases in which perceptual content is constituted by poise over a space of actions, that of the perception of a noise (or some other feature of an object) as *pulsating* (Grush, 1998, from paragraph 18, following Evans, 1985). On Grush's story, which is in essence an action-space account, a perceiver has an experience of pulsatingness when she is "put into a position to" perform a certain body of skills (paragraph 18), where these skills are of exactly the kind I endorse:

> "[P]art of the content of pulsatingness, for us, is that it is something with which we can coordinate a number of sensorimotor skills. These skills include not only the capacity to play conductor, but to generate expectations, to compare the phase of different oscillating objects, and many others... If [an agent] cannot bring these skills to bear then it is difficult to see how he could be credited with a perception of the pulsation." (Grush, 1998; paragraph 21).

I take it that a perceiver's being 'put into a position' to perform suites of skills like these is, as the action-space story maintains, for her to be able to self-prompt their performance; to be directly confronted with their possibility. She needn't carry out any of the suite of poised skills in order for her experience to bear the relevant content. However, there is more to this poise over an action-space than merely knowing *that* a certain set of skills can be carried out. It's not just that the perceiver of pulsatingness knows that she can wave her hands in a particular rhythm - after all, she can do that when no pulsating sound is present at all - but that she knows, in some sense, the *appropriateness* of moving in this way *given the presence and nature of the sound*.

> "Our experience presents *the oscillating thing* as something one which we could bring any of a host of such skills to bear (I seem to recall the term 'affordance' being used for this sort of thing in the not-too-distant past)." (*op cit*. paragraph 21; emphasis added).

The experiencer perceives the pulsatingness of the sound in knowing that she can wave her

hands (etc) in time with its rhythm. A perceptual *illusion* concerning pulsatingness, our ordinary usage of the term tells us, would involve the sound being presented in experience as pulsating at a different frequency from its actual one (where this includes its not pulsating at all). If such content is constituted by the perceiver's being poised to perform a space of actions, then such illusory content will involve being confronted with a space of actions that does not in fact match the rhythm of the noise; where the suite of actions are not *appropriate*. We can imagine a case like this occurring, I think, in a situation where a sound is echoed, say, or perhaps where its perception is influenced by the Doppler Effect.

Where there is an illusion concerning pulsatingness, then, the perceiver is not mistaken about what she can *do*, for we can stipulate that she is entirely capable of acting out any of the suite of movements she takes herself to be able to perform. She is, rather, wrong in taking the skill-set to match up with the pulsation of the sound; wrong in thinking, for example, that if she waves her hands like *this*, she will be able to conduct the noise correctly. Grush points out, too, that parts of the skill-set with which the agent is confronted are cognitive or epistemic (in the same way as those proposed by Philip Pettit): they consist of expectations, abilities to compare and contrast, sift, track and so on. Part of what it is to hear a sound as pulsating at a certain frequency is to be able to judge its phase relative to that of other noises. In the illusory case these judgements and comparisons will be in error as well; a sound whose frequency is experienced as being faster than it in fact is will be mentally sorted with a set of other pulsing noises with which it doesn't belong, for example.

The possibility of *mis*representation in this case allows us to see more clearly what the content of a veridical experience is. Although action-*oriented*, such content does not merely specify the kinds of action that can be performed at a time, but which actions it is appropriate to perform, which actions enable successful engagement with the environment, which actions are presented as opportunities by features of the world. As we shall see in the next section, this means that perception can be both action-oriented and properly world-directed.

A somewhat more difficult proposition for the action-space account is the case of colour-perception and colour-illusion. I suggest, however, that the account has the resources to deal with these cases in a way that draws upon those features that are more clearly evident in the previous example. Consider, for instance, a white wall that looks pink under certain conditions of illumination. According to the action-space story (following Pettit, 2003), an object looks pink when it manifestly empowers her to perform a particular suite of sifting, sorting and tracking responses; when she is poised to judge the relative similarity of the surface to other environmental features, compare and contrast them and so on.

The wall's looking pink is an *illusion*, then, when the space of perceptual discriminations, judgements and comparisons that the perceiver takes herself to be able to make comes apart either from those that she *can* make, or those that it is appropriate for her to make. The wall should not be sorted together with other pink objects, nor sifted from white objects; it is not more similar to red than to light grey. Likewise, the surface cannot be easily tracked across a white background under normal conditions, nor will it blend in against a reddish background. The agent's expectations about what she will be able to do are mistaken, as are her judgements of relative similarity and difference, and therefore she undergoes a perceptual illusion as to the colour of the object.

Colour illusion, and by extension the content of colour experience, shares the same structure as the pulsatingness case. In both, perceptual error involves getting something wrong about the state of the world, which fits with how we naturally want to describe illusions. One difference lies in the fact that the skills involved in the perception of pulsation are largely bodily in nature - they include the ability to 'conduct' the rhythm of the sound, to nod or sway in time with it and so on - while those involved in colour perception (and, I take it, for that of other secondary qualities) are mainly cognitive or epistemic - including comparing, judging, sifting. Both cases do contain elements of each kind of skill - a pulsating sound poises the perceiver to compare and judge, while the ability to track a coloured feature may involve moving one's eyes and body - and there is a continuum on which any action-space will lie between the mental and the bodily. An agent who is in error about whether he can perform *either* type of skill, though, will not only be wrong about his own state, but also about that of the world.

These considerations tell us, again, about the nature of representational content in veridical colour perception and, indeed, about the status of colours themselves. Following Pettit (and, as he puts it, "many philosophers"; 2003, p1), we can state that an object (or a surface, volume, or film) possesses the property of being a particular colour, say blue, just in case it looks blue to suitable perceivers under standard conditions of illumination. Different theories of colour perception are committed to different construals of what it is for an object to look a particular colour:

Qualiaphiles may fill this out by stating that an object's looking blue is constituted by its producing an experience with a blue quale. Here, blue-ness is a non-representational property of the experience itself.

A standard **representationalist** story - one on which action-neutral properties are those that are represented in experience - which aims to account for all of the features of

experience in terms of content (that is, that rejects additional intrinsically-qualitative properties) will assert that colour experiences represent objects as having colour properties, whether veridically or non-veridically. There are two ways that the representationalist can go on this: i) to endorse objectivism about colour and identify colours with (or reduce them to, or take them to be emergent from) physical properties of objects, or ii) to reject objectivism about colour, thus implying that all colour perception is systematically in error.

The **action-space account** states that an item has a certain colour-look iff it manifestly empowers a particular suite of sifting, sorting and tracking skills.

I argued in chapter 6, and following Dennett, that there are no intrinsically-phenomenal properties of experience, no colour qualia, and so the action-space account is in explicit opposition to the first of these possibilities. Both of the options in the second alternative, too, are problematic. Colour objectivism faces familiar criticism: there appear to be no plausible candidate agent-independent properties; metamers demonstrate that different physical (reflectance) properties can result in identical colour appearances; colours stand in relationships to one another (relationships of similarity and difference etc) that are not matched by those of any corresponding physical properties. A full treatment of these worries is beyond the scope of the current project, but if they bite then a representationalist account on which colours are real properties whose representation and misrepresentation is like that of any other is undermined.

The second option available to the representationalist is closer to what is implied by the action-space story. It states that objects are systematically misrepresented as having colour properties that they do not in fact possess, thus eliminating the need to provide suitable agent-independent correlates for them. Colour experiences are always wrong; objects, surfaces, volumes etc are not coloured after all. Two creatures who undergo different colour experiences when looking at the same surface, on this view, are both mistaken. On the action-space account, in contrast, these two perceivers are equally *right*. Their experiences accurately describe the space of sifting, sorting, tracking and comparing skills that the surface empowers, even though these spaces are different. Perceivers who have different colour experiences will make different similarity judgements, sort sets of coloured objects into different categories, have difficulty in tracking different objects across coloured backgrounds and so on.

There is another sense, however, in which an agent's colour experiences may be systematically in error, namely where the skills that he is poised to perform fail to track anything observer-independent. For example, a perceiver may be capable of visually sorting

together a set of objects even if they share no common intrinsic property, or of easily sifting apart two sets of objects that are barely different. Mohan Matthen (1999, 2005) has argued convincingly that colour experiences carve up the world in ways that are useful for the agent, sometimes at the expense of being faithful to its intrinsic nature. Visual similarity need not match similarity of surface spectral reflectance, for instance. The skill-set over which an agent is poised, then, may edit or exaggerate similarities and differences in the world in order to enable the agent to more efficiently engage with his environment. The structure of an animal's visual system may emphasise the contrast between ripe fruit and its surrounding foliage, say, in order to make the opportunity for food more salient. Illusions like the Mueller-Lyer, described above, demonstrate that systematic editing/exaggeration can present the agent with an action-space that fails to map onto the real structure of the world.

The action-space story, then, makes it the case that colour experiences are accurate in specifying the suite of perceptual skills that is enabled by a surface, but that skills such as sifting, sorting and comparing may not track any real dimensions of physical or structural similarity and difference.

Ordinary colour illusions involve an object looking a way that it does not look under standard conditions to standard perceivers. What constitutes a standard perceiver, of course, differs among species, and so what counts as a colour-illusion does too. A human perceiver undergoes an illusion when the action-space he takes to be empowered by a surface is not the one that the surface standardly empowers human perceivers under normal conditions (when he takes a surface that manifestly empowers the space of actions that is characteristic of green objects under normal lighting conditions, say, to empower him in ways that are characteristic of blue objects).

Hallucinations, on the action-space approach, involve situations in which the agent takes himself to be empowered in ways that completely come apart from the world, where she is entirely perceptually mistaken about what an object enables her to do because there is no such object. A hallucination of a red patch to one's right involves taking oneself to be poised to sift, sort and track the patch in a characteristic suite of ways (to sort it with pink-ish objects and apart from green-ish ones), and also to interact with the patch using a particular suite of bodily-movements (to reach out to the right in order to touch it, to shift to the left in order to avoid it). It's for that action-space to be represented, and the content to be integrated into higher-level capacities. It does not involve, contra the enactive story, actually moving in those ways, nor does it involve being confronted with a particular external appearance

property or understanding the way in which that appearance would change with movement, for there is no such property present.

The representation of a space of actions in experience may be non-veridical in any of a number of ways. An experience may misdescribe the suite of actions that is appropriate to a perceptually-encountered object (illusion) - in which case the agent will take herself either to be able to perform a suite of actions that she cannot in fact carry out, or to be able to perform actions that don't match those that the object would enable her to perform under standard conditions - or the experience may describe a suite of actions as pertaining to an object that isn't there at all (hallucination).

7.4 Action-Space Content is World-Directed.

It is time to address more fully an issue that arose in the last section in relation to perceptual illusions but which - as I noted there - has wider implications for the status of perceptual representation more generally, namely the tension between the *agent*-involving content of action-oriented representations on the one hand, and the required *world*-involving nature of perception on the other. This section aims to show that the agent's grasp of action-space content - variously described so far as its 'integration with higher-level capacities akin to planning and reasoning', the agent's being 'poised' or 'put into a position' to perform certain skills, or for her to have 'access' to them - can be accounted for in nonconceptual terms while at the same time posing no threat to the properly perceptual (i.e. world-directed) status of her experiences. The material here draws on and develops a proposal made by Bermudez & Macpherson (1998, especially paragraph 33), which is itself a response to Gareth Evans.

Recall that the claim that action-oriented content must be integrated with higher-level capacities tied to intentional action was made (chapters 4 and 5) in order to secure the phenomenal properties of experience. It is inconceivable, I suggested, for a creature to be *confronted* with a space of possible actions - for that space to make a difference to its ongoing action-and-interaction-planning - without thereby being conscious. Evans makes a similar move, but his aim is to secure genuine perceptual *content*. Contentful states - those that present part of the external world to the agent - are to be distinguished, on Evans' account, from states that are merely *informational*. A state is informational if it co-varies systematically with some feature of the world, via a channel of input, and this is in agreement with the teleofunctional model outlined above (the difference being that my proposal follows Clark in allowing that such states can have their informational content

influenced non-instrumentally by output as well as input; see section 7.5 below).

For Evans an informational state becomes truly contentful only when it is integrated into higher-level cognitive capacities. As Bermudez & Macpherson put it:

> "Evans claims that an informational state might *loosely* be thought to have [spatial content] just if it embodies purported information about the environment in virtue of belonging to a set of inputs which vary systematically with some spatial facts. However, he says that in order for an organism to be in a state that has spatial significance for that organism -- that is in order for it to contain spatial content in a *strict* sense -- more is required. The organism must exhibit complex input-output connections of a certain type."
> (Bermudez &Macpherson, 1998; paragraph 11).

It is not enough, though, that just *any* input-output arrangement is in place, even where such connections are sensitive to the right kinds of spatial facts about the environment. For, as Evans points out (1982, p157), it is obvious that evolution could have produced a creature advantageously sensitive to particular properties of the world without its being a conscious subject of experience. The crucial feature for Evans is that the input-output links are mediated by a "thinking, concept-applying and reasoning system" (p158). It is only when an informational state is made available to the agent for the purposes of thought and action-planning that it becomes genuinely contentful. This is because it is only when such integration takes place that the perceived object is presented as being *independent* of the perceiver, and hence as objective. This is the issue touched upon in the previous section on illusion: the concern is that any theory of perception that emphasises action-oriented content runs the risk of failing to capture the world-directed nature of experience.

Adrian Cussins (1992) explains how Evans' appeal to integration with thinking and concept-applying aims to secure the presentation in experience of an *objective* world in spite of the skill-based character of perceptual content. In Cussins' language, the *realm of reference* is the objective world, while the *realm of embodiment* is the way in which perceivers of that world are capable of interacting with it using the skills, bodily and cognitive, that it enables them to perform. The problem, then, is whether an agent's access to the realm of embodiment is sufficient to count as access to or presentation of the realm of reference:

> "Does the organism enjoy a content that is specified via the *realm of reference* in virtue of having this experience which is specified via the *realm of embodiment*? Is a portion of the independent world (that which makes contents correct or incorrect) thereby presented to a subject (that which grasps contents, and acts on their basis)? That is, does a part of the realm of embodiment being given in experience-mediated knowing-how make it the case that a part of the

> realm of reference (the objective world) is given to a subject?"
> (Cussins, 1992, p659; emphasis in original).

In the absence of integration into higher-level cognitive abilities, the argument goes, we must give a negative answer to this question, because confrontation with the realm of embodiment (confrontation with an *action-space*) fails to present the environment as independent of the observer:

> "[G]iven only the realm-of-embodiment-specified content, all the "subject" (experiencing organism) has is an experiential awareness of how to move etc. in response to local changes in its environment. If this is a subject's conception of a referent, it would be a conception of something as not independent of contingent characteristics of the subject itself. The necessary separation between subject and object would not have been achieved." (*op cit*. p659).

When it comes to the contents of *thoughts*, the necessary separation between subject and object (what Cussins calls "S/Ojectivity", the first syllable of which rhymes with 'toe') is achieved only when the Generality Constraint is satisfied (Evans, 1982) - only when the agent is able to open-endedly recombine the components of his thought with his other concepts. For instance, it is only accurate to describe an agent as the bearer of the thoughts 'red dog' and 'blue cat' when he is also able to think 'blue dog' and 'red cat'.

The content of a nonconceptual, action-oriented experiential state too, on Evans' account, is transformed in such a way as to be properly world-presenting only when it serves as input into the perceiver's thinking and reasoning systems, because only then does it satisfy the Generality Constraint. To summarise, the move is this: action-space content only provides the agent with information about himself, or about how objects can be dealt with by himself; this isn't enough for him to grasp the independence of those objects from himself, and therefore doesn't count as perceptual representation; independence and objectivity only come through the satisfaction of the Generality Constraint, and so experiential states must feed into conceptual resources in order to acquire properly perceptual status.

But the requirement that a state only counts as perceptual when it's apt for integration into a concept-applying and reasoning system appears to violate all three of the reasons for favouring a nonconceptualist account of perception. An agent's conceptual repertoire is not so finely-grained as the content of his perceptual states; the contents of his experiences can come apart from what he believes and reasons about; concept-applying and reasoning systems are not possessed by young children and animals. It's too demanding a conception of what is required for the possession of perceptual states. The question, then, is whether the

integration of the content of action-oriented states into something *less* than full concept-application (as the action-space model intends) can achieve S/Ojectivity and hence count as perception proper. The action-space approach maintains that the necessary integration is with the more limited and less cognitively-sophisticated systems devoted to action-planning and initiation, by way of what I have called nonconceptual reasoning. The key to S/Ojectivity, as we have seen, is that perceptual content presents objects in the world as independent of the perceiver. An agent can't be presented with features of the external environment in experience unless this holds. So the question becomes whether nonconceptual, action-oriented content can present a perceiver-independent world or if, instead, it presents only what is dependent on contingent characteristics of the subject[9].

There are reasons to believe that nonconceptual content can present an objective world to the perceiver. Bermudez and Macpherson (Bermudez, 1995, 1998; Bermudez & Macpherson, 1998), for example, argue that a creature can have a nonconceptual *point of view* that is grounded in certain Gibsonian perceptual contents (consistent with those endorsed by the action-space approach). Briefly, information about bodily invariants that bound the field of vision, information from visual kinesthesis about the movement of the perceiver, and information about possibilities for action and reaction that the environment affords the perceiver (B&M, paragraph 29) provides, in the visual case, the agent with primitive sense of self and other[10]. Such information, they note, is available to young infants and animals.

Secondly, it needs to be emphasised that the integration of possibilities for action into action-planning and initiation is a temporally-extended affair which reflects, again, the agent's trajectory through the world (B&M, paragraph 33). Part of what is involved in the perceiver's taking there to be certain opportunities for action, and in these opportunities influencing her ongoing planning, is her understanding of those possibilities as *enduring* rather than momentary[11]. At any time, it is not simply that the agent takes herself to be able to perform certain actions or skills *now*, but rather that there is an opportunity for action that can be returned to, form part of a chain of goal-satisfying actions, be employed both today and tomorrow and so on. Integration with action-planning and initiation involves temporal extension not only insofar as the opportunities for action afforded by the environment are grasped as ongoing, but also in that the agent's own interests, goals and so on are in constant flux. Action-spaces are grasped by the agent as impacting not only on his current needs and projects but as capable of satisfying future goals as and when they emerge. This grasp can still accord with the nonconceptual reasoning introduced above, as it is still context-specific

and not open-endedly reapplicable by the agent.

Bermudez and Macpherson claim that "it seems plausible to hold that one cannot determine to act in an environment-directed manner without an understanding of the spatial relations in which one stands to the relevant features of the environment."(B&M, paragraph 24), where information about these spatial relations is perceptually-derived. I am tempted by the stronger claim that it is plausible to hold that one cannot determine to act (that is, act in a planned, intentional way) in an environment-directed manner without an understanding of the spatially *and temporally* extended space of opportunities for action that the environment affords. Any agent who lacks such a grasp, I suggest, may have a degree of sensory contact with the world, but is not capable of true, world-directed perception. In addition, on the action-space account the perceiver's understanding of spatial relations is itself given in action-oriented terms - it is not that the agent's capacity for world-engaging action rests on some prior grasp of action-neutral spatial relations but rather that it relies on his grasp of the space of possible interactions and behaviours.

On the enactive/sensorimotor account of perception, an agent has a genuinely perceptual experience when he understands the dynamic relationship between his movements and his sensory inputs. The sense of self and other is acquired through knowing, at some level, that one occupies a particular point of view on the world, reflected in the contingencies that hold between what one does and what one experiences. The point of view, here, is essentially an *active* one insofar as the agent is capable of moving around and within the environment. But it is also essentially a sensory one: the agent's grasp of S/Ojectivity is constituted by his understanding that he is located in a world that impinges on his sensory systems. The first two components of the nonconceptual point of view mentioned by Bermudez and Macpherson - information about one's bodily contours and how they constrain sensory input, and information about one's own movement through the world - are thus incorporated by the enactive approach.

On the action-space account, meanwhile, the agent's point of view is active insofar as the world is presented to him as an arena for action and interaction, as a space of opportunities for goal-satisfaction and extended, meaningful interplay. It is sensory only derivatively, insofar as access to action-spaces is perceptually mediated. As discussed in chapter 3, the fine sensorimotor contingency details do not necessarily figure in the agent's presentation of the world. What matters, instead, is the set of ways in which features of the environment afford the agent kinds of skilful interaction.

7.5 Hurley and the 'Classical Sandwich'.

Susan Hurley (1998, 2001) presents a further set of challenges to any theorist attempting to discern the relationship between perception and action. One traditional but problematic conception that must be avoided, she argues, is that of the 'classical sandwich' - the view that perceptual systems constitute channels of *input* to a central locus of cognitive processing while action systems constitute its *output*; with a serial input-cognition-output relationship holding among these components. Here, cognition is the sandwich-filling that separates the independent layers of perception and action. The sandwich is a *classical* one because the processing carried out by cognition, transactions among contentful states, conforms to traditional classical constraints of compositionality, recombinability and so on.

The sandwich model maps the personal-level capacities of conscious perception and intentional action onto, respectively, subpersonal level paths of input and output processing. Perception is essentially passive: in the visual case, information is received at the retina, processed, and a representation is constructed. Cognition comes next: judgements and beliefs are formed on the basis of perceptual content, followed by intentions to act. Finally, actions are performed.

Hurley's task - at which she is successful - is to demonstrate that this approach is fundamentally misguided. Empirical results, she shows, are at odds with this conception; examples are numerous in which the neat division of labour proposed by the sandwich picture breaks down, where distinctions at the subpersonal level fail to map onto those at the personal level, and where there are non-instrumental (that is, in some sense *constitutive*) links between perceptual and intentional content[12].

Hurley notes that there are three broad ways of resisting the sandwich account (2001, p1 and following): i) to put pressure on the notion that central cognition is classical in nature; ii) to question whether cognition is central and distinct from perception and action; iii) to propose ways in which action and perception are deeply and non-instrumentally connected to one another. The body of Hurley's discussion is devoted to the latter of these approaches, and the empirical cases she examines are most clearly intended as counterexamples to the claim that there is a strict separation between action and perception along input-output lines. The action-space account, I will argue, is consistent with Hurley's results in spite of bearing a superficial resemblance to the classical sandwich structure. In taking on board the implications of Hurley's conclusions, though, we can see that the analogy between the action-space account and the tele-assistance model of vision exploited by Clark is somewhat too restrictive, and needs to be amended. There is no presentation of targets for and types of

action on anything like a perceptual screen, nor is *input* the sole source of information concerning opportunities for action[13].

Some of the language I've used so far in my treatment of the action-space account may appear to affirm a commitment to something like the classical sandwich picture or - and I take this to be less theoretically-weighty - to a rough equation of perception with input and action with output. For example, the account is set in terms of the agent's *confrontation* with a space of actions and of her use of contentful states for the purposes of the construction of intentions subsequent to action; there is a general perception Ÿ integration with cognition Ÿ action structure. Furthermore, teleofunctional stories have traditionally tied perceptual contents solely to inputs: a causal chain running from the external feature to the activation of an internal state by way of incoming stimulation is what determines that state's content. Millikan's account, mentioned above, follows this model, as does Gareth Evans' treatment of *informational states*, as we saw above.

More generally, the action-space account as I have developed it is a reaction to the flaws I take to be present in the sensorimotor, enactive approach to perception. That perspective, of course, is explicitly and diametrically in opposition to the classical sandwich model, emphasising as it does the constant dynamical interplay between perception and action. Any thesis that contradicts the enactive approach, then, runs the risk of going too far in the other direction and making the functional separation of perception and action too complete. The worry is that the action-space model fails to respect the essentially dynamical, feedback-involving nature of this relationship[14].

The empirical examples appealed to by Hurley amply demonstrate that there is no obvious simple alignment of perception with input and action with output. Instead, she suggests, we should consider there to be a relation of interdependence here, in such a way that both perceptual and intentional content can be seen to be functions of both inputs and outputs, or their relations (where *being a function of*, Hurley explains, can be treated as *supervening on*, being *determined by* or being *constitutively dependent on*). My suggestion is that these cases do not threaten the action-space approach and, indeed, may provide support for it.

One characteristic example, which has been closely focused on in the follow-up literature, emerges from C.R. Gallistel's case in which a patient's eye is partially paralysed (Gallistel, 1980). When the patient tries to move her eye to the right, for example, the world appears to her to shift to the right, even though the eye does not move. Thus there is a change in the agent's visual content in spite of their being no change to the retinal image, demonstrating

that input is not the sole determinant of perceptual content. The influence of the intention to act (the intention to move the eyes to the right) is *non-instrumental*, in contrast to the straightforward instrumental dependence exhibited between perception and action in ordinary cases. Visual perceptual content depends on where the agent is looking, for instance, and so changes in the agent's perspective brought about by his actions result in changes in that content - an instrumental relationship. In the case of the paralysed-eye (and others dealt with by Hurley), the influence of intentional content on perception is not mediated by this kind of influence on the orientation of the body, since here there is no such influence, but is *direct*. In Gallistel's example, the non-instrumental dependence bears only upon the *spatial* content of the experience - there is an apparent shift in the location of the constituents of the scene.

The action-space account is consistent with these results. The explanation it provides of the spatial content of experience is a particularly compelling one, in contrast to the more difficult cases of secondary qualities. An object's looking to be situated on the agent's left, for instance, is to be explained in terms of the perceiver's grasp of the suite of actions that allow her to interact with the object, to reach out and pick it up, to turn and orient herself towards it and so on (Evans, 1985; Grush, 1998), in addition to those epistemic skills that allow her to re-identify the object, to class it with others etc. Perceiving the location of an object, on this view, is inseparable from being poised to perform certain actions upon, with or around it.

The world's 'appearing to swing to the right', then, is, on the action-space model, a matter of the agent's being poised over a new - or evolving - space of actions; for the agent to take herself to be able to track the motion of the scene, for instance. This, in turn, involves the action-oriented contents of particular states being integrated into the agent's ongoing planning and reasoning. The lesson to be taken from cases that exhibit non-instrumental influence of intentions on perceptual content is that this action-oriented content is not solely dependent upon input from the senses. The action-space account is entitled to make the same move in this respect as any other representationalist story - to allow that perceptual content can be a function of both input and output (to the extent that these distinctions make sense at all in a complex, feedback-involving system). This sits well with Clark's teleofunctional account of action-oriented content, on which the content of a state is determined by the role it plays in a wider complex of states. That role, it seems, need not be serial or unidirectional; perceptual states need not simply be part of a chain of input to central cognition, independently of action and intention.

This leads to something of a moderate revision of the teleassistance model of perceptual

processing which, on my view, carries unnecessary sandwich-model baggage. There remains a fairly sharp division of the action/perception labour on the teleassistance view, tied to the dual-processing-streams account of vision: one channel, the ventral stream, is responsible for conscious perception, which is the basis for intentions to act, which are then carried out under the guidance of the dorsal stream. As it stands, this picture leaves little room for the kind of recurrent influence of output on perceptual content demanded by the rejection of the sandwich story. What comes up on the screen of perceptual content looks to be fixed by the input to the ventral stream; what goes into the agent's deliberation and intentional action is what shows up on the screen.

This reading of the teleassistance model, then, must be revised to permit the possibility of non-instrumental dependence of perception on output, but this is a quite minor revision. Functionally, the basic story can remain the same - perception involves the agent's being able to take on board the possibilities for action presented by a scene for the purposes of informing his ongoing reasoned activity, perception presents her with targets for and types of action, and there is a separation between vision-for-perception and vision-for-action. All that is amended in response to cases like Gallistel's is the dependence of perceptual content on input only.

Clark acknowledges this concession himself, proposing that there might be a non-instrumental role for 'gross motor intention' on perception (Clark, 1999; p14-16). Gross motor intentions are the result of the agent's selection of action-targets and -types, his initiation of a particular goal-based behaviour, and depend upon the processing of the ventral stream. Fine motor tuning, on the other hand, is the preserve of the dorsal stream.

> "The possibility remains open... that acts of gross motor selection might actually *influence* the conscious content of the visual experience even if fine motor tuning remains relatively insulated. It remains possible, for example, that had the gross motor command selected different action-types or different goal-objects, the visual experience would have differed, and done so non-instrumentally, i.e. without the need for any change in gross input."
> (Clark, 1999; p15; emphasis in original).

At this stage in his argument, Clark concurs with Hurley's claim that there is a non-instrumental role in the fixation of perceptual content for processes other than input. It is worth noting, though, that this concession (and the conclusion to be drawn from cases like the paralysed-eye) remains neutral over the level at which this influence takes place. After all, it won't do, *given the aim of rejecting the classical sandwich*, to say simply that, because intentions can help to determine perceptions, there is a non-instrumental role for *output*, as this loses sight of the fact that the aim is to show that intentions, too, are a function of both

input and output (or their relations). That is, it would be a mistake to map output alone onto motor intention. The non-instrumental role for output is present, then, only insofar as it is involved in determining intentional content.

Clark subsequently offers an alternative reading of the influence of motor intentions on perception, one on which the relationship is instrumental and mediated by *attention* (op cit. p18 and following). Whereas in the ordinary case, intentions change what is perceived by changing the position or location of the body, Clark's suggestion is that they do so by changing the focus of attention (and he directs us towards the body of evidence for the claim that perceptual content is attention-dependent).

For this to be a successful move in the cases described by Hurley, it would have to be possible for attentional resources to be responsible for a particular change in the content of experience, and for that change not to require a corresponding change in input (for there is none in Hurley's examples). It isn't obvious to me that the paralysed-eye case, for one, satisfies these conditions. Those situations to which we might most readily appeal in arguing for the attention-dependence of perceptual content are those in which the perceived scene or event is complex, composed of many features in which the agent may be more or less interested and so on. The familiar inattentional blindness scenarios, for instance (e.g., Mack & Rock, 1998), have this structure. The job of attention appears to be to select particular features of the scene, to direct the agent's cognitive resources to salient properties (perhaps those that suit his ongoing interests), in such a way that can lead to the neglect of others.

I doubt that Gallistel's case can be given an instrumental, attentional-shift explanation in the way that some other cases can be. Covert attentional-shift can alter the contents of consciousness without changing gross input, and so it would have to be covert attention at play in the paralysed-eye example. But it is far from clear the apparent shift of the world to the right in the patient's experience can be put down to his covertly shifting his attention to some new part of the scene. It is the *whole scene* that appears to move, after all. If this is right, then there are at least some cases in which there is a direct, unmediated / non-instrumental influence of intentional content (or, at least, of motor-command content) on perceptual content.

I am concerned, too, that there may be some cases - perhaps on the boundary between those in which a change in perceptual content is mediated by attentional shift and those in which the influence is direct - where it will simply be *impossible to tell* what the source of the content of experience is. It may be impossible to verify which of two competing hypotheses - the alternatives Clark develops - is the correct one, at least in the absence of a

worked-out theory of the nature of attention.

This worry aside, there doesn't appear to be a particular challenge to the action-space view from this feature of Hurley's rejection of the Classical Sandwich. Perceptual content of an action-oriented kind, it seems, can plausibly be a function of both input and output, or of the relations between them. This possibility, in fact, supports the claim made above that action-oriented content is conducive to an agent's efficient interaction with his environment. If experiences don't have to 'wait for' new input before their new contents can be made available to the agent, but instead can be updated in response to ongoing loops of intention, expectation and feedback, then the perceiver can operate swiftly and effectively in response to new situations.

At present, I wish to remain neutral over the other commitments of the Anti-Sandwich model. The action-space account does not commit us necessarily to either a classical, connectionist or dynamical-systems approach to cognition, or hybrids of these (on the other hand, of course, the general approach of this account has been to understand conscious perception in the context of real, embodied-embedded creatures under biological constraints, so it is likely to favour non-classical options). The lesson from this section is simply that the action-space account's treatment of perceptual content is consistent with a Hurley-style rejection of a neat input-cognition-output division and is not threatened by the empirical results she appeals to.

7.6: The Function of Consciousness.

On qualia-conservative views, where the qualitative features of experience are said to be intrinsic and irreducible, there is the possibility of separating phenomenal and functional properties and of asking what *use* the former have in light of this separation. The possibility of Zombies, on approaches of that sort, raises questions about the *function* of consciousness and the role it plays both at the level of individual creatures and at the level of the evolutionary development of intelligent behaviour. Epiphenomenalists, for instance, state that consciousness plays no causal role in a creature's life but is just a side-effect or by-product of some causally-efficacious physical structure. Conscious Inessentialists, moreover, ask why it is that consciousness evolved given the supposition that everything that is done by consciousness for those creatures who have it could have been done without it.

If the action-space approach is correct, though, such separation is impossible. Consciousness *just is* confrontation with a space of actions; it just is a particular nonconceptual form of action-oriented content-use. This approach gives us the resources for

a compelling anti-epiphenomenalist position and - although perhaps not quite so compelling - for an anti-inessentialist one too. The functions of consciousness, it follows, are those whose operation is dependent upon the agent's manifest access to an action-space.

First of all, epiphenomenalism and conscious inessentialism must be clearly distinguished, for their claims have differing implications in spite of their superficial similarities. The version of epiphenomenalism in which I am interested states that there are qualitative properties of experience that have no causal weight. Their presence is incidental to the engine-room of causal interaction: the physical states that underpin the phenomenal properties. Even in our richly phenomenally-textured mental lives, it is the brain states and processes that underlie our experiences that perform the causal work. In order to defend an anti-epiphenomenalist viewpoint, then, it will be enough to show that there is in fact a causal role played by consciousness in the mental or behavioural lives of those creatures who possess it.

Conscious inessentialism is the weaker claim that, even though consciousness may play some functional role in *us* and similar creatures, it is not *necessary* for the performance of that function. Owen Flanagan puts it thus:

> "For any intelligent activity *i*, performed in any cognitive domain *d*, even if *we* do *i* with conscious accompaniments, *i* can in principle be done without these conscious accompaniments". (Flanagan, 1992; p129).

This view is implicit in any approach that accepts the possibility of Zombies, at least where they are conceived of as creatures who are outwardly, behaviourally identical to us but who lack inner qualitative lives. On these views there is no behaviour, no matter how cognitively demanding or apparently sensitive to phenomenal features, that cannot be performed by a Zombie.

Flanagan and Thomas Polger take the view further:

> "[Some philosophers] think that the hardest problem is explaining how brain states could give rise to phenomenal states. This is indeed a hard problem. But this problem is certainly no more difficult than the problem of why and how it is that there came to be conscious creatures at all. Why did evolution result in creatures who were more than just informationally sensitive? There are, to the best of our knowledge, no good theories about this, and it is one of the reasons for pressing the conscious inessentialism worry".
> (Flanagan & Polger, 1995; p15).

The concern seems to be that if being conscious is not a *necessary* condition on the

performance of any intelligent behaviour it is mysterious why it evolved in the first place. Unlike the epiphenomenalist, remember, the inessentialist can allow for a robust causal/functional role for those creatures who in fact possess it, and so the task in defending an anti-inessentialist position is not simply to show that such a function is present or even useful in some class of animals, but to show that consciousness is necessary for its performance.

> "[F]rom the fact that consciousness is inessential to highly evolved intelligent life, it does *not* follow that it is inessential to our particular type of intelligent life." (Flanagan, 1992; p129).

On the action-space account, Epiphenomenalism gets no purchase. Consciousness is not something that is contingently attached to particular mental states and not others; it is not a special kind of causally-inert, intrinsically-qualitative property possessed by certain perceptual contents and not others. Instead, functional facts about the agent determine her status as conscious or otherwise: she is conscious (the world appears to her to be a certain way) when she is poised over the space of actions that the world enables; she is non-conscious when this condition fails to obtain. These functional facts, in conjunction with others, have causal efficacy. They help to explain the agent's goal-directed, flexible behaviour.

Conscious Inessentialism is harder to resist. To do so, we would have to find some ability that conscious creatures have that could not possibly be possessed by an unconscious creature - a type of skill or behaviour for which consciousness is genuinely necessary. Flanagan & Polger consider and reject a number of putative candidates. Firstly, they suggest, one might appeal to the essentially *serial* nature of consciousness. In contrast to the typically massively parallel processing undergone by most of the brain, we might suspect that the important governing and selecting role played by the one-content-after-another stream of consciousness is a necessary one. Flanagan & Polger think that there obviously *is* an advantage to be gained by having such a serial processor to filter out the best quality information, but they think that it still isn't obvious why this would have to involve *conscious* content - they argue that we can conceive of the same kind of mechanism being in place purely unconsciously. Secondly, we might think there are particular kinds of conscious sensory states that are necessary for certain kinds of behaviour, and so that consciousness might have evolved to allow these behaviours. We might think that feelings of pain or lust, for example, are required for the generation of behaviours that avoid sources of injury or that provide one with a suitable mate and so on. Again, though, Flanagan & Polger suggest that

we can conceive of all of the behaviours being the result of *un*conscious information-sensitivity; for example insects can respond appropriately to pheromones from members of the opposite sex without being conscious ("Male luna moths are sensitive to certain female moth pheromones. Sensing these gets them flying miles to the right location for mating. (Humans have been known to travel even further, and often with less encouragement)". Flanagan & Polger, 1995; p17); and we might instead have reflexive behaviours that provide unconscious responses to damaging stimuli instead of their being accompanied by sensations of pain. Thirdly, it could be argued that learning and plasticity require consciousness, that only conscious creatures are capable of learning about their environments and themselves and of taking on new behavioural and cognitive tasks. The inessentialist can respond, as before, by claiming that all this can be done in the absence of consciousness. Much of our own learning is done unconsciously, for instance, and there are computers that approximate some forms of plasticity.

More promising, in my view, is the possibility that *flexible behaviour* is only possible for those creatures who are conscious. The account I have been developing holds that consciousness is to be *identified* as confrontation with an action-space, where this has the function of enabling certain kinds of flexible, goal-directed activities. The question now is whether consciousness, construed in this way, is necessary for that function: can agents exhibit richly flexible behaviour without being directly confronted with a space of possibilities for action? I wish to give a negative answer to this, albeit a somewhat tentative one, for reasons to be described below. My suggestion, then, is that consciousness *is* necessary for flexible behaviour and, indeed, cannot be separated from it.

'Flexible behaviour' here is simply to be contrasted (perhaps naïvely[15]) with automatic or non-intentional behaviour. An action is automatic just in case the agent has no control over its initiation; when he is incapable of doing otherwise in response to a stimulation. Flexible behaviour comes when the creature is informed about multiple possibilities for action and intervention (even, as noted before, where the possibilities may be only binary - to act or not to act) that are capable of satisfying ongoing plans and goals. On the action-space account, 'possibilities for action and intervention' are taken to include those that are cognitive or epistemic in nature, not merely those that are bodily, and to be manifestly confronted with an action-space is to grasp it as a temporally-extended suite of opportunities. Without being confronted with the space of actions, a creature is unable to act in flexible ways in response to the same stimulus - unless he knows the different opportunities of which the stimulus is indicative, he can't act appropriately to his needs.

The action-space account has stressed that only *manifest* empowerment of a suite of

possibilities counts as perception. It is not enough to be *merely* empowered, as we can conceive of creatures who are able to perform some actions without thereby being conscious. Manifest empowerment, the account proposes, is empowerment that the agent has a grasp of - empowerment that feeds into planning and practical reasoning. In order to demonstrate that conscious perception is necessary for flexible behaviour, we must rule out the possibility that such behaviour could be carried out by an agent who lacks manifest empowerment - that is, whose grasp of the space of opportunities either fails to make a difference to her planning and reasoning or does so indirectly. I take it as a condition on genuinely flexible behaviour that the possibilities for action and interaction afforded for an agent by a scene are integrated into her capacities for action-planning and initiation, so a creature whose grasp of the different ways in which she can act in that environment makes no difference to what she does is not a flexible-actor.

Is an *indirect* access to a space of actions sufficient for flexible behaviour? Direct access to an action-space has been interpreted as non-inferential or unmediated access - a perceiver with direct access to the space of possible actions afforded by her environment can self-prompt her actions without inferring them from antecedent information. There are two potential cases of *in*direct access to an action-space, though - 1) the case in which the agent (a blindsighter, for example) is accompanied by another agent who informs him of the space of possible actions by providing a running-commentary; 2) the case of the well-practised blindsighter who has learned that her 'guesses' about the state of the environment tend to be reliable and so can act without prompting. The first of these, I take it, is an example of *mediated* access to an action-space (the agent must be informed about the action-space by another system), while the second is an example of *inferential* access (the agent infers from past performance what it is possible for her to do). If either of these is capable of subserving flexible, goal-directed action for their bearers then we have possible counterexamples to the claim that consciousness is necessary for such behaviours.

The first option, where there is another *agent* who informs the creature about alternative possible actions, may permit flexible action of sorts, as when a blindfolded person is given instructions by others about what it is possible and appropriate to do at a given moment. So there is a (fairly uninteresting) sense in which consciousness - direct access to the action-space - is not a necessity when it comes to complex behaviour. If we add the condition that genuine flexible action must be in some sense *autonomous*, though, we can rule this case out. We end up with the claim that consciousness is necessary for self-prompted flexible acting: flexible action that doesn't require accompaniment by another mediating intelligent agent.

Could there be a scenario in which this mediating role is played by an automated system as opposed to another sentient creature, and would this secure the relevant sense of autonomy? My suspicion is that an agent in such a position would count, in fact, as being conscious and so that this doesn't offer a real alternative to the action-space account. Consider a creature who possesses an appropriateness-meter[16] that tells her what the current opportunities (action-types and -targets, plus cognitive/epistemic acts of comparison, sorting etc) are in a format suitable for integration with her goals and practical reasoning. If this system allows her to smoothly and flexibly operate in the world in accordance with her ongoing needs and projects, to navigate her environment successfully and so on, then we would be *disinclined to believe her* if she reported a lack of conscious awareness of the world. Indeed, it is difficult to conceive of a case in which all of the flexible, goal-directed behaviour is in place but report, verbal or otherwise, denies the presence of experience (as takes place in blindsight cases). In this case, the 'automated mediating system' would be playing precisely the role of whatever neural structures underpin our own action-oriented representation.

The same is true, I suggest, of the second option, where there is a putative *inferential* access to the action-space. Over time, blindsighted patients can learn to act or make judgements without the prompting of the experimenter, but nonetheless report that they have no conscious awareness. We can interpret this as an inference from past to present performance - the blindsighter comes to know what she can do now in light of what she has been able to do before. My intuition, again, is that if this ability becomes second-nature, and develops in such a way that the blindsighter is richly and smoothly capable of acting flexibly in a goal-directed way, then it will become unlikely that she will any longer report that she lacks conscious awareness. The 'inferentially mediated system', this time, would be doing the job of providing access to the action-space, and the line between direct and indirect access becomes a fuzzy one.

Any agent, then, who exhibits fluent, self-prompted behaviour that is geared towards the satisfaction of her goals and interests is necessarily a conscious perceiver. The world, as a domain of opportunities and affordances, necessarily *appears* to be a certain way to her. Thus consciousness, on the action-space story, permits of *degree* - it is not an all-or-nothing affair. Qualiaphiles, in contrast, are likely to be required to draw a line on the phylogenetic scale on only one side of which are qualitative properties present (it's not clear, to me at least, what half a quale would be like). For the action-space theorist the degree to which a creature is conscious - the richness of the appearance-properties that apply to her experiences - is dependent upon the extent to which spaces of opportunities for action are presented to

her. The more limited the suite of bodily and cognitive-epistemic activities she is apprised of (the suite that makes a difference to her practical reasoning and so on), the more constrained are the contents of her conscious experiences.

The function of consciousness, the action-space theory proposes, is to facilitate fast and fluid flexible engagement with the world. This is true both for *us* (and so epiphenomenalism is false) and it is a necessary role wherever such behaviour is instantiated (and so inessentialism is false).

A final difficult case for the action-space account indicates that there is still some work to be done in clarifying what counts as sufficient higher-level integration of action-oriented content. The account states that the integration that is consciousness-implying is whatever it takes for an agent to carry out an extended, goal-directed set of behaviours that enables her to navigate a space of obstacles and opportunities. It appears, however, that a *sleepwalker* is capable of doing this, in spite of lacking conscious experience[17]. A sleepwalker can act fluently in a complex environment, can select types-of and targets-for action appropriately, and can (apparently) follow some set of rudimentary goals and plans, or at least perform ongoing sequences of means-end chaining[18].

Two possible responses are available to mitigate the force of this objection, although legislating between them would require a full investigation of sleepwalking phenomena, a task that is beyond the scope of the current project. Firstly, it may be possible to maintain that the sleepwalker does in fact undergo a conscious experience, but forgets that she has done so upon wakening. We thus explain the reported absence of experience by appeal to a deficit in the memory systems on which report is dependent, and not by denying that an experience occurred. On this view the sleepwalker is confronted with a space of actions, and this constitutes her experience as in the normal case.

Secondly, and I think more promisingly, it may be possible to describe the actions performed by the sleepwalker as extended sequences of utilisation behaviour - actions that are appropriate to the semantic properties of encountered objects but whose initiation is not under the agent's control. If this is a sustainable option then it would not be the case that the sleepwalker is manifestly confronted with an action-space, but only that certain action-routines are triggered by her unconscious perceptual sensitivities. Sleepwalking thus does not involve the kinds of truly flexible behaviour that are made available by conscious experience.

I note this case only briefly to acknowledge that the action-space story requires some fine-tuning. The details, though, are likely to involve empirical rather than philosophical

questions, and the existence of - in my view - plausible responses to the sleepwalking case indicates that even the most problematic examples are not decisive objections to the account.

7.7: Summary & Conclusions.

The action-space account is a species of representationalism on which perceptual contents specify spaces of possible world-engaging action. The content of a perceptual state is determined by the role that the state plays within a wider framework of complex and interdependent representational systems. It is not necessarily the case that input alone fixes the content of a perceptual representation; it may be a function of either input or output or of the relations between the two.

A fruitful (if overly simplistic) way of thinking about action-oriented content in the visual case, I have suggested, is along the lines of Goodale's tele-assistance model, on which the conscious stream presents the agent with types-of and targets-for action. These contents may be systematically insensitive to fine sensorimotor details and may instead edit and exaggerate features of the world in order to emphasise what is important to the perceiver and her interests.

Experiences are conscious when perceptual contents are integrated into higher-level capacities devoted to flexible, goal-directed behaviour. Such integration constitutes a form of nonconceptual reasoning: action-types and -targets are presented to the agent in a way that allows him to assess their appropriateness to the satisfaction of his goals and plans, where these are themselves nonconceptually entertained. Action-oriented contents need not be open-endedly recombinable with other contents, or be inferentially promiscuous, but may be context sensitive and able to influence only a limited range of the agent's cognitive and behavioural activity.

The higher-level capacities into which perceptual contents are integrated, then, need not be fully conceptual, and this has advantageous consequences. Animals and infants are capable of contentful experience; we can explain the discrepancy in richness between perceptual and conceptual contents; we can deal with cases in which perceptual and belief contents come apart.

Although perceptual contents are essentially action-oriented they are importantly world-directed too, and so it is true to say that the account is one on which perceivers confront a mind-independent environment in experience. In Cussins' terms, their grasp of the realm of embodiment does not render the realm of reference out of bounds. For Evans this leap is made only when realm of embodiment contents are made available for the purposes of

thought and conceptualisation, for it is through the satisfaction of the generality constraint that states become genuinely contentful. On the action-space model, the same work is done by the agent's grasp of the temporally and spatially extended range of possibilities for action that an environment affords. In experience the perceiver learns not only about himself but about what it is possible and appropriate for him to do given the state of the world. In this way his perceptual states grant him a sense of self-against-other, of world-directedness.

Cases of perceptual error - illusion and hallucination - can be given a straightforward action-space treatment. An illusion occurs when a perceiver takes himself to be poised over a space of actions that is not in fact enabled by or appropriate to the objects in his environment; when, for example, he takes himself to be able to conduct the rhythm of a pulsating sound at a frequency that is different from that at which the sound is oscillating. In this case his experience gets something right - namely, that he can perform a certain suite of actions - but it also gets something wrong - that this suite is appropriate to the properties of the perceived item. In a colour illusion, for instance, the perceiver would be in error over the kinds of sifting, sorting, tracking and comparing actions that he can carry out over a range of perceptual conditions.

A hallucination is simply an extreme case of perceptual illusion - the action-space that is represented in an agent's hallucinatory experience comes completely apart from the space of actions that she can actually perform given her current environment.

In either case the beliefs possessed by the perceiver may lead her to reject what is presented to her in experience, and so her intentional actions may not be affected by the illusory content. She may know, for instance, that the two Mueller-Lyer lines are identical in length, and so fail to act upon them differently. In the absence of such judgements, though, the agent's selection and targeting of actions will follow the illusory content of experience, as that content feeds directly into those capacities.

It is the *function* of consciousness, on the current view, to enable fast and fluent interaction with the world in a way that is suitable for the satisfaction of the perceiver's goals and interests. Consciousness simply *is* the direct presentation of a space of opportunities for action and intervention; it isn't anything intrinsically-qualitative over and above that presentation. There is no room for epiphenomenalism to get a hold on the action-space account; once we establish what consciousness *is* there is no question about what it *does*.

More controversially, my suggestion is that *any* creature capable of richly flexible, goal-directed behaviour requires a direct appraisal of a space of possible actions and their

integration into planning and nonconceptual reasoning. If this is the case, then we have a necessary role for consciousness, and inessentialism is misguided.

Chapter 7 Notes.

Footnote 1: This is a quite demanding definition of conceptuality, and it may be possible to defend a weaker conception on which the contents and integration proposed in this chapter turn out to be conceptual. Such a distinction would be terminological.

Footnote 2: I noted in chapter 3 that the objection of sensorimotor chauvinism stems partly from the potential systematic insensitivity of conscious contents to fine sensorimotor details. My claim now is that the empirical work that supports the dual-streams hypothesis indicates that ventral stream contents specify targets-for and types-of action in a rather coarse-grained way.

Footnote 3: From this we can conclude that non-conscious agents fail to grasp the appropriateness of certain actions given their environment. This seems to fit rather well with DFôs deficiencies.

Footnote 4: See, e.g., Clark, (2001); Jacob & Jeannerod, (2003).

Footnote 5: Jacob & Jeannerod, (2003). Thanks to Dave Ward for introducing me to this case and its role in the action-space explanation.

Footnote 6: This is a view that Andy Clark has endorsed (in conversation). The distinction is akin to that which emerges in the literature on higher-order theories of consciousness, where the question is whether lower-level states must be *potential* or *actual* targets of higher-order states or processes in order to be conscious.

Footnote 7: Some may consider it a misuse of the vocabulary of 'access' to equate this with content-use, but I retain such talk in spite of this construal to acknowledge the genesis of this view in Clark's paper.

Footnote 8: Millikan does not claim that it is. These remarks are not intended as a criticism of her position, but simply as a clarification of the action-space proposal.

Footnote 9: This question is related (but not identical) to that addressed by Clark & Mandik (2002), in their discussion of *Umwelts*. Their concern is to establish that features represented by different creatures in their respective environmental niches can form a part of the same objective world. My interest is in the previous step - whether agents represent their environments at all in experience, given the action-oriented nature of perception on my account.

Footnote 10: A view which has roots in Merleau-Ponty (1945).

Footnote 11: Or, indeed, as *changing* or *evolving* - the point is that opportunities for action are not merely instantaneous.

Footnote 12: Following Hurley, by 'intentional content' I mean the content of an intention to act.

Footnote 13: There is no commitment to such a screen in Clark, of course, and he makes - as I describe - a similar point himself.

Footnote 14: Thanks to Susan Hurley for pointing this out.

Footnote 15: I doubt that there is a clear division between those actions that are automatic and those that are intentional. However, the distinction is, intuitively at least, sufficiently substantial for present purposes

Footnote 16: This suggestion owes to Andy Clark.

Footnote 17: This objection is made in Bermudez & Macpherson (1998); also explicitly to the action-space account by Macpherson, in conversation.

Footnote 18: "Teen Sleepwalks to End of Crane", BBC News, 06/07/05.

Chapter 8: Conclusions and Further Work.

Perceiving is a kind of knowing, on the views that I have considered in this project. It is either a kind of knowing that concerns how the appearance of the environment changes from one's perspective as one moves in ways that probe and explore that environment, or it is a kind of knowing that concerns *what* one can do in a given perceptual situation. I have defended the latter proposal, arguing that conscious experience is constituted by direct and non-inferential access to a space of perceptually-enabled actions, and their integration into one's ongoing planning, reasoning and action selection. Thus I reject the very deep and direct relationship between embodied action and experience that is endorsed by the enactive approach, where the emphasis is on how movement and interaction influence perceptual input, in favour of a connection that emphasises how perception can enable intentional, world-engaging behaviour. In this final chapter I reiterate and summarise the reasons for favouring this thesis, highlight the advantages it presents over both sensorimotor competitors and traditional theories of perception, and examine some promising avenues for future research.

8.1: The Enactive Approach.

I began the analysis of the sensorimotor perspective by dividing it into three variants, each of which shares the central features of the enactive framework but where differences lie in their respective interpretations of sensorimotor contingencies and knowledge thereof. The three versions conform in taking perception to be an active and exploratory pursuit - in order to experience one's environment, they assert, one must engage with it and bring to bear one's (implicit, skilful) understanding of the systematic ways in which its appearance alters as a consequence of one's movements around and within it. An understanding of these changes - these *sensorimotor contingencies* - is enough to count as a perceptual grasp of the constancies that underpin particular patterns of sensory change, namely real external features.

On the first version of this approach, attributable to O'Regan and Noë (2001), a sensorimotor understanding is an understanding of how subpersonal perceptual inputs change in response to movements, where properties of these inputs are dependent upon features of the perceived object and on the structure of the agent's perceptual apparatus. Sensorimotor knowledge works to extract information about constant external properties - shapes, colours, textures, spatial orientation and so on - from amid the idiosyncrasies of

changing perceptual stimulation. Perceptual *consciousness*, on this view, occurs when sensorimotor knowledge is recruited in the service of higher-level capacities of thought, planning and reasoning. For visual awareness to occur, for example, it is not enough that visual sensorimotor contingencies show up in the guidance of behaviour - as they may do, in the familiar case, during absent-minded car-driving - they must also be put in touch with more sophisticated cognitive abilities that enable the agent's rational interaction with her environment.

My major concern with this version of the enactive project is the discrepancy between the purported subpersonal level nature of sensorimotor contingencies (set up explicitly as holding between movements and, for instance, patterns of retinal imagery) and the requisite higher-level nature of the capacities with which such contingencies are said to be integrated. Retinal patterns and the like are simply not the kinds of thing that enter into an agent's judgements, plans and expectations. There is little doubt that the *brain* must be tuned to complex dynamics of movement and input in order to support the kinds of fluid engagement with the world of which we are capable, but this doesn't tell us what gets into the content of perception.

The second version of the enactive approach avoids this conflation of layers by pitching the sensory element of sensorimotor contingencies firmly at the personal level. Agents stand in a perceptual relation to so-called apparent properties, which are themselves individuated in relational terms. The apparent properties of an object are those that it presents to an agent located at a particular point in space. An apparent shape, for example, is the shape that an object would project onto a perspex screen arranged perpendicular to the observer's line of sight. A round plate projects an elliptical apparent shape to any perceiver located tangentially to it.

On this view perceptual content has two levels - one specifies apparent properties and the other specifies non-relational, real[1] properties - and the second level is brought about by the agent's sensorimotor understanding of the first. A visual experience of the circular shape of a plate is brought about by the exercise of the agent's knowledge of how the plate's apparent elliptical shape changes (or would change) in response to her movements. Sensorimotor knowledge is thus responsible for the phenomenon of perceptual constancy - the perception of unchanging properties amid evolving appearances.

There are two sources of difficulty with this variation of the sensorimotor viewpoint. One is that it leaves the explanatory task of accounting for the perception of apparent properties, the first level of content, untouched. Are appearances *represented* by the perceiver? Is there

a *direct* perceptual relationship in place? As it stands, the second version of the sensorimotor approach is consistent with a number of possible responses here and hence the strongly enactive element of this thesis is undermined. If sensorimotor considerations apply only to the perception of invariant properties then their role is somewhat limited; if, on the other hand, the first level of content is to be construed as somehow enacted/enactive as well, it is not at all clear how this is supposed to work.

The second concern is that this version fails to do justice to the phenomenology of visual experience. It is open to us to reject the proposal that both apparent and real shapes, for instance, are perceived. Plates, we might maintain, don't look elliptical and round, they just look round (and with a spatial orientation of some kind). In the case of shape this disagreement might be a simple clash of intuitions, with no obvious way to settle the question, but the worry is more pressing in the case of spatial location (the perception of which is said to be a sensorimotor matter, on this view). If the location of an object is perceived by bringing to bear one's understanding of how its *apparent* shape or location changes in response to one's movements, then these apparent properties must get into the content of perception as well. For the plate to look to be located away from the perceiver and to her right, she must grasp the ways in which its apparent elliptical shape *located on or moving across a perpendicular perspex screen* would change in apparent size or location as she moves. This description does an injustice to visual phenomenology.

On the third possible reading of the enactive approach there are again two levels of perceptual content but what gets into each level, and hence the contribution provided by sensorimotor understanding, is different from the story given by the second version. Version 3 eliminates visual apparent properties construed as profiles on a perpendicular flat screen in favour of a simple appeal to those parts of objects that are visually accessible from a particular location. Nothing diamond-shaped enters into the content of a visual experience of a square table viewed from an angle. Instead, the facing surface of the table (but not the side of the table that is occluded from the perceiver's point of view) is specified by the first level of content. Version 3 is not a strongly enactivist approach, and so we might give a representationalist account of how this content comes about, or a direct realist account, or any consistent alternative. There remains a role for sensorimotor skill, though, when it comes to content that goes beyond what is immediately available from the observer's current perspective. The agent's understanding of how her movements around an object will reveal its hitherto-unseen parts provides her perceptual sense of the presence of the whole, spatially-extended object. Similarly, her grasp of how she can move her hands in such a way

as to explore a large item presents her with a tactile perceptual sense of the whole object rather than only the small part of it with which she is in contact.

This version of the enactive view is a comparatively weak one in that it ascribes only this limited content-determining role to sensorimotor understanding. An explanation of the visual perception of the facing sides of objects (similarly the tactile perception of in-contact parts of surfaces and so on) has yet to be settled upon as far as this version is concerned, and I have speculated that a number of existing theories of perception may be consistent with the restricted sensorimotor contribution that this view endorses. One concern, though, is that the resources that a representationalist, for example, has at his disposal may render such a contribution unnecessary by explaining *all* of perceptual content without reference to enactive skills. Version 3, then, is put forward as a modest but plausible way of capturing the intuition that there is something perceptually significant about an agent's understanding of the ways in which he can change his perspective on objects, without having to commit to the stronger enactive theses.

There are a number of further, more general difficulties that face the enactive standpoint. Perception that is neither visual nor tactile, in particular, does not appear to be amenable to sensorimotor explanation due to its lacking the same essentially exploratory nature. Vision is deeply connected, even if only instrumentally, to movements of the eyes, head and trunk, while touch is importantly dependent upon skilful probing using hands, digits and so on. It is much less clear, though, that auditory, gustatory and olfactory perception share this active structure. Similarly, the enactivist proposes that perceptual content that specifies the real, underlying properties of objects is acquired by way of keeping track of changes to apparent properties that come with movements or with alterations in further conditions of observation, yet it is not obvious that non-visual perception is like this. When it comes to taste and smell, in particular, the putative division between real and apparent properties is not a natural one to draw. The distinctive content and character of experiences from non-visual modalities appears largely independent of sensorimotor understanding[2], and so a unitary account of the senses may prove elusive from the enactive perspective.

Secondly, certain cases of perceptual *error* are difficult to characterise under the enactive framework. Although some examples of illusion are successfully dealt with by appeal to the perceiver's misapplication of sensorimotor knowledge - as, for instance, when expectancies about the shape of a far-off tower go awry - others cannot be so explained. Errors that take place at the *first* level of content, prior to the sensorimotor contribution, are such cases. It

seems conceivable that a perceiver could be mistaken about the apparent shape of an object, say, given that such properties are there to be perceived. The elliptical apparent shape of a plate may look elongated or foreshortened, perhaps. It remains unclear how such an error could be given an explanation in terms of the misapplication of sensorimotor understanding[3].

Most seriously, the enactive view is challenged by a host of considerations that we can categorise under the heading of sensorimotor *chauvinism*. Empirical results[4] indicate that the contents of conscious experiences may be systematically insensitive to finely grained sensorimotor details, and instead emphasise or edit certain features in rough-and-ready ways that suit fluent interaction with the environment and the operation of quite high-level classification, comparison and tracking abilities. Perceivers are presented with action-targets and action-types in experience, and these enable her to select and initiate actions and to figure the possibilities they offer into her ongoing planning and reasoning. The online guidance of motor interaction, meanwhile, is performed unconsciously and its encoding is largely separate from that of conscious perception.

On the enactive approach, at least according to a strong reading like Noë's, perceptual contents are determined by the exercise of bodies of sensorimotor knowledge, where these are sensitively tuned to enduring object properties. There is little room, on this view, for the kinds of selective smoothing-out or exaggeration in experience of differences or commonalities between encountered properties that evidence suggests are exhibited in real-world perceptual engagements. It may be possible, however, to give an account on which a non-sensorimotor contribution that has these perceptual effects is consistent with the weaker, version-3 enactive model. A representationalist account, for instance, where sensorimotor factors contribute to content that specifies solidity and 3-dimensional extension but where representational states may be updated on-the-hoof in the service of real-time interaction with the environment, is a possibility.

The emphasis of strongly enactive theories on fine sensorimotor details, furthermore, obscures what is *likely to matter* to the agent in experience[5]. The empirical evidence confirms what we would expect to see from biologically-constrained perceptual systems, namely a potential insensitivity to the intricacies of sensorimotor dependence (which the agent doesn't need to know about) in favour of the delivery of representations that code for semantic features and those that bear significance for the perceiver's plans and interests.

This is the starting point for the action-space alternative, which involves a reinterpretation of the relationship between action and perception. On this account experience is not an

essentially active or exploratory achievement; it is the means by which agents become acquainted with the suite of possibilities for action and intervention that their environments afford. Spaces of action show up at the level of perceptual content - conscious experiences are episodes during which such spaces are represented in a format suitable for integration into the plans, reasons and intentions of the perceiver so as to empower richly flexible, goal-directed behaviour. The aim is for this model to explain both the content and the qualitative character of perceptual experience.

8.2: The Action-Space Theory - Perceptual Content.

The easy cases are those that involve spatial content in visual perception, where it is plausible that an object's looking to be located to one's left, say, is constituted by one's dispositions to act upon it in particular left-directed ways, and one's understanding of those dispositions. Certainly it is difficult to imagine a separation of such dispositions to act from the perception of the object as being so located. Notice that, contrary to the enactive view, it is *not* that the understanding concerns how the appearance of the object will change in response to left-wards movements but rather that it concerns the characteristic suite of actions that the object affords from the perceiver's point of view - including the ability to keep track of it over an extended period, to reach out and pick it up, to sort it with other similar objects and so on.

A second compelling example to which I have made reference (chapter 7, section 7.3, following Grush (1998)) is that of pulsatingness in auditory perception. Part of what it is to hear a sound as pulsating, on the current view, is for it to put one in a position to act in certain ways that reflect the sound's rhythm - to play at being a conductor, to tap or wave one's fingers in time with the rise and fall of the noise and so on. It isn't clear that an agent who has no sense of the space of actions that the perception of the noise empowers can be said to experience it as pulsating - a grasp of the action-space is integral to that component of the auditory content.

More challenging, of course, is the case of colour perception, where the link to action is much less apparent. Following Pettit, though, the action-space account appeals to cognitive or epistemic actions such as sifting, sorting, tracking, comparing and recognising. A surface looks red, for example, when it empowers a particular finely-grained suite of epistemic actions that consist of abilities to keep track of the surface as it shows up against a range of different backgrounds, to categorise it with other similarly coloured objects and discriminate it from those of different shades, to pick the surface out as one that has been encountered

before and so on.

Different scenes and environments, then, empower perceptually-sensitive agents in different and characteristic ways. Consider an embodied creature located on an empty, flat plain. His range of options and activities is severely curtailed; he can, perhaps, gesture, move parts of his body with respect to one another, and traverse and explore the ground in a number of ways. Populate the plain with one solid object, though, and the space of actions he can perform expands in ways that are constrained by that item's properties and by his own physiology. An immobile mound of material, say, can be climbed upon, avoided, pushed, seen-over, and used as a vantage point or to aid navigation. A sphere, meanwhile, can be lifted with two hands, rolled and moved, and - if uniform - does not have perceptually distinguishable sides. A cube, a line, an edge, a slope and so on all offer other distinctive suites of actions, as do combinations thereof. A complex environment constructed of such physical entities thus (potentially) offers the embodied perceiver an equivalently complex framework of obstacles and opportunities, depending upon the make-up of his body and his perceptual sensitivities.

Add to this solid, spatially-extended habitat properties of reflectance and conductance and the transmission of information through the air by various means, and a suitably sensitive perceiver will then be able to perform discriminations, comparisons and segregations at a distance, and to keep track of changes and constancies over time and in space. Each separate sensory modality will typically enable a suite of actions that has different components - vision, for instance, empowers sortings and siftings of surfaces under particular conditions of illumination, while tactile perception enables the discrimination of objects by touch on the basis of texture and consistency.

The action-spaces that enter into the contents of experience are constrained by peculiarities of embodiment - certain actions are only available to creatures who have a particular physical constitution; the experiences of an agent who cannot move around but who can employ individual body parts in goal-directed ways will differ from those of a creature who can do both. Similarly, some animals may not possess the perceptual sensitivities that are required for certain types of discrimination and classification (compare, for example, human colour perception to that of a pigeon). The shape of the action-space that an environment affords a perceiver, then, is determined by features of both agent and world - the perceiver comes to occupy a niche in which her sensitivities are tuned to what her environment can offer her.

It is not enough, the action-space account proceeds, to be merely *sensitive* to possibilities for action, for we can conceive of creatures who possess such sensitivity in the absence of perceptual awareness (blindsighters; inattentive car-drivers; information-processors). What is required is that spaces of action are represented in such a way as to be available for integration into higher-level capacities of reasoning and planning (chapters 6 and 7). Note that this strategy mirrors that of the version-1 enactive account: mere information use does not count as perception, what matters is recruitment into thought and cognition, suitably construed.

This is the condition of *manifestness* - empowerment of an action-space is manifest when it is known about by the agent in question, when it is available to make a difference at the personal-level. When an action-space is manifestly empowered (and only then), there is a way that the world looks (sounds, feels etc) to the perceiver. I shall rehearse the reasons for thinking this in the section on consciousness below.

Integration into higher-level cognition is not to be understood as a conceptual affair - action-oriented contents need not be generally recombinable or inferentially-promiscuous. All that the account is committed to is that possible actions are figured into the agent's ongoing plans and goal-directed behaviour, in what may be a quite context-specific way. Knowing that such-and-such an option for action will assist in the completion of a particular task does not entail the ability to generalise that knowledge over an open-ended range of different tasks and circumstances. We are rightly reluctant to ascribe concept-use to most animals, but the range of abilities proposed by the action-space account, according to which possibilities for action are directly and non-inferentially figured into ongoing action-planning and response, are much more plausibly borne by non-humans. We can label this *nonconceptual reasoning* (see section 7.1), a kind of practical, direct and non-inferential evaluation of the appropriateness of particular world-engaging actions that is sufficient to ground flexibility of behaviour.

The nonconceptual nature of action-oriented perceptual content does not rule out the possibility that some creatures have experiences that bear conceptual content too, of course, where the extent of the latter will be constrained by the agent's conceptual repertoire, reasoning and linguistic abilities and so on. A task for the future is to assess how the proposal of nonconceptual action-space content fits into traditional philosophical questions concerning the justification or grounding of conceptual contents in experience.

The action-space account is compatible with the dual-visual-streams results, and the interpretation of the role of conscious experience that these indicate. Conscious content need

not be finely tuned to sensorimotor details but can instead highlight what is important to the agent by representing action-types and -targets, while online action guidance can be modulated by unconscious processing. On the sensorimotor approach, the actions that the agent is manifestly capable of performing are limited to those that have sensory consequences (for manifestness is spelled out in terms of the perceiver's understanding of these consequences on this view). The action-space theory is not bound by this constraint - all sorts of possibilities for action and intervention, both bodily and epistemic, can enter into the content of perception.

It is possible, furthermore, for the representation of types and targets for action to go wrong, resulting in perceptual error. An agent may take himself to be able to perform a suite of actions that is not in fact possible or appropriate given the state of his environment (illusion), or be poised to act on an object that isn't there at all (hallucination). In both of these cases there is a way the world *looks* to the perceiver, where this is constituted by her representing a space of actions, bodily and epistemic, for the purposes of goal-directed behaviour.

There are a couple of possibilities that allow that the action-space approach can permit of a sensorimotor contribution to experience and that suggest that to neglect the ways in which an agent's perceptual situation changes while she moves is to miss out an important feature of her experience as an embodied observer. At the same time, however, neither of the options to be considered detract from the characteristic action-space flavour of the account offered here, and nor do they make significant concessions to the criticisms levelled at the enactive approach in the early chapters.

We could, on the first alternative, pitch a sensorimotor story at the subpersonal level and appeal to it as part of the *enabling conditions* for personal-level action-space confrontation. A requirement on the possession of abilities of sifting, sorting and tracking, for example, is that the agent possesses perceptual sensitivities to relevant surface properties of objects (etc). An explanation of the subpersonal whirrings and grindings that underpin such sensitivities could readily appeal to mechanisms that have a sensorimotor nature - mechanisms that can be understood as predictive of future visual inputs, for instance. Perhaps more compelling are abilities that involve bodily engagement with objects. As is well-understood[6], catching a moving ball relies on complex and multi-layered strategies at the subpersonal level - control systems that modulate the image of the ball on the retina, for example, on the basis of actual and expected input. Many of these are properly, if broadly, described as having a sensorimotor character.

To allow that there may be an important subpersonal enactive component to perception is not to endorse what I called a version-1 sensorimotor account, though, and the reasons I gave against favouring that type of explanation still stand. On the current option, where subpersonal sensorimotor activity can be counted among the enabling conditions of conscious perception, what gets into the agent's high-level reasoning and planning abilities, suitably construed, are the types of possible action that are perceptually enabled by those conditions, and not the conditions themselves. Just what the enabling conditions are is an empirical question.

There is a second possible contribution that sensorimotor considerations may make to the action-space account, one that is consistent with the first but which takes the enactive component to be present at the personal level. We can begin this option by noting, as I did in chapter 7, that being poised over an action-space is an extended and dynamic affair - perceivers are not presented with mere time-slices of opportunities for action, but come to grasp that there are enduring and ongoing ways with which their environment can be engaged. The action-space theorist can concede that part of what determines this grasp is an understanding of the space of actions that an object or property would present to the agent were she located differently; an understanding of the relationships of continuity and change that hold between her movements and what she can do within her habitat. Perhaps, for example, the perceiver is standing in front of a solid cube of about head-height. Part of what fixes the content of her visual experience could then be not only the space of actions that is provided by the front-face of the cube, but also her grasp of what she would be able to do if located behind or on top of it, say. I take it that this essentially sensorimotor content is implicit in the action-space account as it has been presented and does not amount to a serious revision of the approach.

In the case of experiences that are neither visual nor tactile, it is less clear that a sensorimotor component is in operation at either the personal or subpersonal levels. As pointed out in chapter four, while it may make sense to explain the *spatial* content of olfactory perception, for example, by appeal to the agent's grasp of how a smell's intensity or salience increases and recedes as she moves, it is far less clear that the distinctive character of the odour can be given non-circularly in these terms. It may well be, for instance, that a dog experiences a rabbit as being over there *in* grasping the continuity and change that its smell exhibits as he moves or would move, but it is less clear how this explanation can be extended to the dog's experience of its particular rabbit-y scent. More generally, too, non-

visual perception does not appear to share the essentially exploratory structure that the enactive view postulates, as the division between apparent and real properties is not a natural one to draw in these cases.

The action-space account, meanwhile, can draw upon (for example) the dog's implicit grasp of the temporally-extended dynamic of movement and scent-intensity (sensorimotor component) to explain the spatial content of his olfactory experience, but explain 'the rest' - the way that the rabbit smells to the dog - using the language of the dog's manifest sifting, sorting and tracking skills, his ability to integrate the significance of the scent into his ongoing behaviour and so on. In doing this we avoid the danger of the circular appeal to 'changes in how things smell' that undermines the purely enactive approaches.

Combining the action-space and sensorimotor accounts in either or both of these ways (and the full extent to which they are compatible I leave as a task for future consideration) is advantageous for at least two reasons:

1) There is something obviously right about the enactive story's assertion that a perceiver's actions are a source of sensory significance, and we seem to be able to capture this insight by elucidating that significance in terms of goal-satisfaction through intentional action. Sensorimotor mechanisms provide some of the means by which agents are capable of performing complex world-engaging activities that contribute to the fulfilment of their projects.

By giving an account of the sensori- side of sensorimotor dynamics in action-space language, too, we resist the need to talk of either patterns of subpersonal stimulation or of phenomenologically-dubious *apparent properties* entering into perceptual content. Perception doesn't involve keeping track of changes to how things *look*, at risk of circularity, but (partially) involves keeping track of changes to what can be *done* in a given situation.

2) We retain the ability to account for much of the content of experience in terms that are isolated from the purely sensorimotor story. Entities in the world can be given in experience as *solid objects*, for example (insofar as they are presented as being resistant to force, as being something that can't be passed-through, as something that can be lifted, pushed, turned upside-down), rather than as loci of appearance-properties. That is, we retain what is likely to matter to perception, namely a description of what the important features of the environment are when it comes to the fulfilment of ongoing projects and goal-satisfaction, rather than the finely-grained details of changes to sensory input that come with movement.

A personal-level sensorimotor element adds to the action-space account an *anticipatory* factor in perceptual content. On this view, expectations about what one will be able to do during or following certain kinds of movement help to determine an experience's content. The extent to which such an anticipatory contribution exists is open to debate, as is the relative priority of sensorimotor and non-sensorimotor considerations in content-fixation. As before, there is an extent to which at least some of this is implicit in the action-space account already, given that these features constrain the kinds of actions that embodied perceivers can perform (and so the spaces of actions that they integrate into their plans and intentions), especially given that an important physical object that must be understood is the agent's own body.

Two further complicating factors exist when it comes to perceptual content on the action-space view. One is the possible contribution to experience of an agent's grasp not of what she can do in a situation, nor of how that will change as she moves, but of how objects behave in relation to one another[7] - how they interact, collide, break, fall, bounce and so on. There is a question, too, as to the extent to which action-types and -targets include what might be called the semantic properties of objects. That is, whether quite high-level functional attributes of objects and the action-types they afford are perceived (for example, whether the visual experience of a chainsaw includes content that specifies its tree-cutting affordances), or if the actions that are presented in experience are limited to those that involve only primitive interaction with objects *qua* physical entities[8].

The action-space story entails that perceptual contents are constrained by the perceiver's understanding of what she can do at a given time, which in turn depends upon her grasp of how objects behave and of the particular function of objects with which she is familiar. Do we, then, allow that *any* component of her understanding can influence what enters into the content of her experiences? This, again, is a task for future research, but for now we can note that these issues suggest, principally, that the lines between perception, understanding and action are not absolutely clear-cut (which is a conclusion to be expected, given the complexity of the issues hereabouts). The conceptual resources possessed by a perceiver may be difficult to determine, and there may be intermediate cases, and we can predict that the content of different perceivers' experiences may vary according to their cognitive powers[9].

So far, the focus of the action-space theory has been on *perceptual* experience of external objects, where the central claim is that a direct and immediate grasp of the possibilities that such entities present for intentional action suffices for experience. An option for future

consideration, though, is the extent to which action-oriented contents can be appealed to in the explanation of other kinds of sensory awareness such as pains, itches and tickles; in accounting for bodily or body-image experiences[10]; or in explaining temporal experiences - the perception of time as unfolding. It may be possible, for example, to identify spaces of action and response that are characteristic of particular bodily sensations and to give them a manifest-empowerment treatment as before, or to appeal to the perceiver's grasp of spaces of action as extended and ongoing in accounting for her experience of temporal flow.

8.3: The Action-Space Theory - Consciousness.

On the question of phenomenal consciousness, the action-space account is located between what we can call[11] a liberal and a conservative view. The liberal view is that qualia are present wherever there is sensitivity to perceptual information, while the conservative view is that qualia enjoy a special status - they are intrinsically-phenomenal, private, irreducible properties of experience. The integration of action-space content into higher-level capacities of planning and reasoning that the account requires for consciousness entails that it is more than a liberal view - mere information processing is not enough; content that makes a difference to these capacities at the personal level is. The rejection of the conservative position is more involved and relies upon a Dennettian deflation of qualia, where the central assertion is that there is no conceivable separation of so-called phenomenal properties of experience from their effects (see chapter 6 for details). Explain the effects of a perceptual episode - where the action-space account sets these in terms of manifest empowerment, and so advances Dennett's own treatment - and this amounts to an explanation of the qualitative features of experience. There are no qualia as the conservative interprets them, no effect-independent, ineffable properties of experience. Experiences are encounters with an environment, during which the perceiver takes the world to be a certain way for the purposes of engagement with it.

This notion of poise over an action-space aims to explain what it is for the world to *appear* a particular way to a perceiver and, correspondingly, what it is for it to sound, feel, smell and taste a certain way. This, I have suggested, is all it takes to account for the 'what it is like-ness' of experience; it is just inconceivable that the features described by the action-space picture could all be in place - that a creature is poised over a suite of appropriate responses and interventions - and yet it not be the case that there is something it is like to be that creature. Maybe we can design a strictly non-conscious robot who can traverse an obstacle-filled room without mishap, who is at least in some sense appropriately sensitive to the

opportunities for action that the layout of the scene affords him. But the idea is that once these opportunities and impediments are capable of feeding into the perceiver's formation of goals and plans directly and non-inferentially, we lose our sense of the agent's still being unconscious: there must be something it is like to be in her position. Superblindsighters - unconscious perceivers who are nonetheless able to perform perceptually-enabled actions without prompting - are thus inconceivable.

Susan Hurley and Alva Noë (2003) introduce a distinction between three kinds of explanatory gap: i) the absolute gap, the question of why physical activity in the brain should result in conscious experience at all; ii) the intermodal comparative gap, the question of why neural activity gives rise to experiences of one modality rather than another; iii) the intramodal comparative gap, the question of why neural activity gives rise to an experience with just *this* visual character (say) rather than *that* visual character (an experience of red rather than an experience of green, for example).

Hurley and Noë maintain that the two comparative explanatory gaps can be closed by appeal to sensorimotor dynamics, but that this leaves the absolute gap untouched. Each sensorimotor modality is underpinned by characteristic suites of sensorimotor dependence; an experience's being auditory, say, is due to its sensorimotor character and not due to the region or pathway of the brain that is activated. Each experience within a given modality is also constrained by a distinctive dynamic - red experiences correspond to a different sensorimotor signature to that of green experiences. It is a further question, they say, as to whether the absolute gap can be tackled using the resources of the enactive approach.

The action-space account could be taken as a competing solution to only the comparative gaps or, and this is the view that I endorse, as a solution to both the comparative gaps and the absolute gap. As with any representationalist account, it could manage the former by explaining differences in phenomenal feel by reference to different contents in experience, and could be willing to concede that this nonetheless fails to explain why possession of representational states should feel like anything at all. Thus a proponent of the action-space theory could claim, firstly, that different sensory modalities manifestly enable different kinds of action-space and, secondly, that particular experiences within a modality are constituted by the manifest enabling of a particular action-space that determines how that experience feels.

For even this moderate explanatory goal to be fulfilled, though, the action-space account must make plausible the claim that for each sensory modality there is a corresponding type

of action-space, where this entails simply that there are characteristic possibilities for action that are made available by each modality alone. Similarities, too, in the qualitative feel of experiences of different modalities should be explicable by reference to similarities across their related action-spaces (just as they would be by reference to similarities in sensorimotor dynamics on the enactive view).

Does the action-space theorist have the resources to explain the peculiarly *visual* phenomenology of visual experience, the characteristically *auditory* feel of hearing, and so on? I think so. We can enumerate a variety of dimensions along which the actions that are enabled by a particular sensory modality are peculiar to that modality. A modality may, for instance, enable actions that can be performed by employing particular parts of the body, or may require the movement of certain body-parts in order to enable its actions. A modality may enable actions that have particular spatial properties - the actions enabled by vision, for example, include those that are extended across space to objects that are outwith the reach of tactile perception. In line with the concession made above to the enactive approach, a modality may enable actions that have particular sensorimotor dynamics - actions whose temporally extended nature is of a particular kind. The cognitive or epistemic actions, too, that a modality enables may be distinctive - a certain type and range of sortings and comparings may be made available only by gustatory perception, for example. Finally and more generally, action-spaces enabled by separate modalities may be composed in unique ways - the suite of actions that are enabled together during an experience may be modality-specific.

These and similar considerations make it plausible that an action-space solution can be given to the inter-modal comparative gap. As Pettit emphasised, we can extend this to the intra-modal case too - once we give a rich enough account of the skills that are enabled by perceptual contact with a surface of a particular colour, for example, we can see why it is that the surface looks *that* way rather than any other.

A cautious defender of the action-space view may stop there and look elsewhere for a solution to the absolute gap, or admit defeat on that question. Once we construe this 'gap' correctly, though, we can see that an action-space closure of the comparative gaps plausibly amounts to a solution of the absolute gap.

Nobody believes that neural activity alone is sufficient for consciousness: an isolated piece of brain tissue kept alive in a jar does not sustain phenomenal awareness. So the absolute gap cannot be the gap between a physical description of the activity of a certain neural region and a qualitative description of the experience generated by that activity, for there is none.

We must consider the absolute gap to be the question of why there is anything it is like to be a whole physical system undergoing certain perceptual effects, where these effects may or may not be separable from the agent's extended interaction with her environment[12].

On the action-space model, 'what it is like-ness' is not to be interpreted in terms of the existence of intrinsically phenomenal properties borne by experiences. There being 'something it is like' to undergo an experience is not to be explained by appeal to qualitative properties of that experience (whatever that would mean), but by reference to the way that the world looks (feels, sounds, smells, tastes) during the encounter, where this is filled out in terms of manifest empowerment. At the same time, though, the action-space account - and a Dennettian approach more generally - has certain resources to explain why it might *seem* to the agent that her experiences have qualia as the conservative construes them. This seeming, of course, is not itself to be taken to be a phenomenal matter, on pain of circularity; rather, the strategy is to show why certain qualia-conservative judgements and reports concerning experience may occur. There are three reasons why talk of qualia may crop up in a perceiver's description of her experiences:

i) Directness: Access to a space of perceptually enabled actions is, the account has proposed, a direct and non-inferential matter. There is a sense in which the suite of possibilities is forced upon the agent, in that it is beyond his control. It is likely, as a result, that perceivers will report that the world *just seems* a certain way to them. They have no access to the means by which their discriminations are made or to what grounds the visual similarity and difference of, say, coloured surfaces. With the ability to recognise the modality that is being employed during a particular perceptual episode may come more specific 'seems-like' talk, such as "it just looks that way".

ii) Practical Ineffability: Similarly, the finely-grained, nonconceptual nature of action-space content renders it inaccessible to verbal report and reasoning. Perception is content-use for the purposes of action-selection and goal-satisfaction, and may be isolated from conceptual and verbal abilities. Perceptual content is thus practically ineffable, and the vocabulary that we do have is typically insufficient to capture in detail all of the features of our experiences.

iii) Apparent Properties: The action-space that a particular environment enables is partially dependent upon the perceiver's location within that environment. The suite of things that the agent can do with and around an object is constrained by the spatial relation that the object bears to her and to other objects in the scene. This results in a separation, as far as the agent

is concerned, between the ways things really are and the way things look from here; a separation that may show up in how she talks about her experience. To put the same point slightly differently, two objects that have the same intrinsic properties (shape, length etc) may manifestly empower the perceiver in different ways when she is situated at a particular location (as in the two-trees case discussed in section 6.4), and so be represented differently in her experience. She may then be tempted, incorrectly, to ascribe this difference to the experience itself (as when people say that the nearer tree looks bigger).

The action-space account tackles the problems of consciousness, then, using a two-pronged attack - firstly by deflating the conservative's notion of qualia and laying emphasis on what it takes for the world to look, sound, smell, taste and feel a particular way without these being construed as intrinsic properties of experience, and secondly by helping to explain why *talk* of qualia is so suggestive. The account is thus, as we might put it, *innocently eliminativist* in that it rejects the full-blown conservative analysis of qualia but does not deny that, for example, coloured objects look a certain way, textured surfaces feel a certain way and so on.

8.4: The Action-Space Account in the Wider World.

The action-space theory shares certain features with a number of existing approaches to the problems of consciousness and perception, and it is the task of this penultimate section to position the view appropriately with respect to these. I will not provide an exhaustive description of the details of the views to which my approach is similar, however, and the discussion is intended simply to provide a flavour of where the action-space model is to be located.

Firstly, the action-space account is helpfully considered as a species of *global* state (or global-workspace) view, on which conscious contents are those that are available to influence thought and behaviour in a flexible range of ways, typically by way of entering working memory (e.g. Baars, 1997; van Gulick, 2004, 2006), or 'fame-in-the-brain' theory (e.g. Dennett, 1990) on which conscious contents are those that survive in such a way as to be reported or reasoned about. These kinds of account share with the action-space theory the proposal that certain contents can be represented for non-conscious purposes while others entail that the system is a conscious one; certain uses of content, that is, are privileged. One salient difference is that my focus is on contents that feed into specifically action-oriented capacities, contents that figure in the planning, selection and control of goal-satisfying activities, but we might sensibly call this either global-workspace-use or brain-fame. If we

include in the notion of report certain non-verbal responses that are indicative of a content's being available to the agent for the purposes of intentional action, then Dennett's condition is an acceptable one too.

Some of the purported differences between these kinds of approach, moreover, appear to me to be purely terminological - it seems to matter little whether we speak of content-use or of integration or of global availability, for example - and we might view them as a family of broadly deflationary explanations of consciousness.

A second suite of views that mark the division between conscious and unconscious states in a similar way are so-called *higher-order* theories of consciousness, according to which conscious states are those lower-level states that become the target of some higher-order state or process, either thought-like (HOT views; e.g. Rosenthal, 1986) or perceptual (HOP or 'inner-sense' views; e.g. Armstrong, 1984) in nature; they are states of which the agent is *aware* by way of the higher-order activity. It is tempting to align the action-space approach with these, on the grounds that it proposes that the difference between conscious and unconscious states is that the former are *accessed* while the latter are not. We might, that is, take the direct and non-inferential access to which my account appeals to be akin to an inner-sense or the exercise of a higher-order thought.

This is not quite accurate, however, for it is not obvious that there is anything essentially higher-order about the action-space view. It is not the case (in contrast to HO views[13]) that lower-level unconscious *states* are the target of access here[14], but rather that their *contents* are accessed, in the sense of their being made available to certain capacities that facilitate intentional action. We emerge with the following story: there are certain perceptually-derived mental states whose content can be employed by a range of systems, only some of which count as making the agent himself aware of that content. This allows us to capture the plausible claim that conscious states are those that involve an awareness of the world (or an awareness as of the world) rather than an awareness of a perceptual state. The action-space view, then, should maintain some distance from the HO perspective in favour of the emphasis on global availability, suitably construed.

Thirdly, I wish to highlight the extent to which the action-space model is congenial to the influential *embodied-embedded* approach to cognition and perception, a paradigm that treats cognitive and perceptual capacities as essentially bound up with the complex dynamical interplay between an agent's body and her natural environment. On views of this sort the explanatory emphasis is on agents as physically embodied and environmentally embedded

(see Clark, 1999, for a review). Clark notes that there are two ways in which such approaches can be divided, and the action-space account squares very naturally with the first, and more moderate, of these. Clark's distinction is between simple cases "in which bodily and environmental properties merely *constrain* accounts that retain the focus on inner organisation and processing, and more radical appeals in which attention to bodily and environmental features is meant to *transform* both the subject matter and the theoretical framework of cognitive science" (Clark, 1999; introduction; emphasis added).

In retaining talk of representational states, the action-space theory corresponds to a simple case in which a focus is kept on internal structure; the content of a perceptual state is determined at least in part by the role that the state plays in the agent's overall cognitive architecture, where this is restricted to the brain and CNS[15]. At the same time, though, what the agent can *do* in a particular perceptual situation - which is of course what enters into the content of her experiences on the current view - is constrained by both her physical embodiment and her natural environment. Although the process not always infallible, the possibilities for action that are integrated into the perceiver's action-planning and selection will be those that she is capable of performing given the way her body is structured and the skills she has mastered. Similarly, the things that she can do depend on the world in which she is situated and that in which her ancestors were situated; her perceptual sensitivities to possibilities for action will have been shaped and fine-tuned over evolutionary time. The content and character of different perceivers' experiences is thus importantly dependent upon features of their brains *and* bodies *and* environments, as suggested by the options in Clark's first category.

As it stands, though, the action-space view need not extend its embodied-embedded commitments as far as the more radical options in Clark's second category. The approach involves no overhaul of the subject matter; we maintain traditional vocabulary and explananda - body and world must be taken into account but only insofar as they help to determine the contents of perceptual states.

A further possible future project is to assess whether the action-space account can be augmented by a treatment of the mind as *extended* (see, e.g., Clark & Chalmers, 1998). If cognitive resources are capable of extending beyond the body's boundaries, to include such scaffolding as written or diagrammatical material, memory aids and so on, then it is possible that the higher-level integration of action-space content (especially that which specifies epistemic actions) may be similarly influenced by such factors.

8.5: Action and Experience.

Consider an animal who can run, unprompted, through a dense forest littered with fallen logs, wet mud and overhanging branches. Her fluent, extended interaction with the complex environment demonstrates a finely-grained sensitivity to features of the forest that far outstrips her ability to conceptualise (report, reason about) them, yet her actions are appropriately tuned to what is required to satisfy her goal of travelling through it. She has more than simply the physical ability to run, jump, dodge and duck - she has the ability to perform these actions when they satisfy opportunities and to refrain from them when they don't, and the content of her perceptual representations is apt to inform any of a range of her intentional actions as and when this is required (when, for example, she wants to select only forked twigs from the forest floor). She is manifestly empowered; empowered in a way that fits into her practical knowledge and enables her to keep track of parts of her environment, to discriminate and compare them and to assess what they offer to her goals and interests. This is what it is for her to be poised over the space of actions that the forest enables and, the action-space account proposes, this is enough for her to consciously experience her habitat.

The action-space account provides an explanation of conscious experience that is in keeping with existing and emerging trends in philosophy of mind and cognitive science. It makes progress in accounting for what it is for objects, surfaces, sounds, smells, colours and tastes to perceptually appear a certain way to an agent, offers a deflationary treatment of phenomenal consciousness that fits with naturalistic intuitions, and enables us to see why and how consciousness emerged among flexible, adaptive creatures under environmental constraints. While I have rejected the strong enactive thesis, the action-space model can accommodate the need to take physical embodiment and interaction into consideration and to locate consciousness appropriately: not in isolated and passive Cartesian minds, but in the service of fluid, interested and active engagement with the world.

Chapter 8 Notes.

Footnote 1): Although apparent properties are real, in that they are observer-independent, I shall use 'real' as a shorthand for those properties that are intrinsic to objects.

Footnote 2): One possible exception being that of *spatial* content, as when a dog tracks a rabbit by its scent, plausibly keeping track of changes in intensity that come with movement.

Footnote 3): On a version-3 account, the nearest possible case (on which the facing side of an object is misperceived) can be given a representationalist treatment: the properties of the facing side are misrepresented.

Footnote 4): In the case of vision, at least. See Milner & Goodale (1995); Jacob & Jeannerod (2003).

Footnote 5): As Clark and Toribio put it. The 'chauvinism' idiom is theirs too.

Footnote 6): See Hurley (1998) for details.

Footnote 7): Where this is at least very close to what the psychology literature calls a 'naïve physics'. One of the most compelling cases in which perceptual content appears to be fixed by sensorimotor understanding is that in which a bottle is held in both hands and its whole shape, extension and solidity is perceived in spite of the limited tactile contact with its surface, due to the agent's grasp of how its feel would change with movement (see Noë, and my chapter 2). However, it is likely that this content may be partly determined by the perceiver's (practical, implicit) understanding of the dynamics of his interaction with the bottle; its weight, inertia, resistance to pressure and so on, rather than sensorimotor contingencies per se.

Footnote 8): As noted below, Jacob & Jeannerod's Ponzo illusion analysis demonstrates that sufficient information of this kind is provided to influence the kind of finger-grip that is employed in a reaching and grasping task, for example.

Footnote 9): A similar concern faces the sensorimotor view, since it is possible to question the nature and extent of the sensory changes that must be grasped by a perceiver. Must we, for example, include an agent's expectations concerning the ways the colours of leaves change during the course of a year? If sensorimotor contingencies are learned, then all sorts of learned changes to appearances may make a difference to perceptual content.

Footnote 10): Adrian Smith (unpublished MSc thesis) has proposed the outline of an action-space account of bodily awareness, for example.

Footnote 11): Following Mandik, forthcoming; it isn't clear that anyone is a liberal about qualia (except possibly some higher-order theorists who talk of both phenomenal properties and, separately, the awareness of phenomenal properties) - as we saw in chapter 6, though, an opponent of the action-space view may argue that the account amounts to this implausible position.

Footnote (12): See Hurley (1998, chapter 8) for an examination of these issues.

Footnote (13): Although Carruthers' treatment of the higher-order view appears to equivocate over this issue - "A phenomenally conscious mental state is a mental state [that is] the object

of a higher-order representation of a certain sort." (Carruthers, 2001; section 1), but "[P]henomenally conscious states are those states which possess fine-grained intentional contents of which the subject is aware, being the target or potential target of some higher-order representation." (*op cit*.).

Footnote (14): See my discussion of Clark versus Mandik; section 6.1.

Footnote (15): And not out into the world, as on vehicle-externalist views like Hurley's.

Bibliography.

Aglioti, S. et al. (1995) ñSize-Contrast Illusions Deceive the Eye but not the Hand.ò *Curr.Biol*., 5. 679-685.

Armstrong, D. (1968) A Materialist Theory of the Mind. Routledge.

Baars, B. (1988) A Cognitive Theory of Consciousness. CUP.
ð ð ð (1997) In the Theatre of Consciousness. OUP.

Bach-y-Rita, P. et al. (1969) ñVision Substitution by Tactile Image Projection.ò *Nature*, 221. 963-964.

Ballard, D. et al. (1997) ñDeictic Codes for the Embodiment of Cognition.ò *Behavioural and Brain Sciences.*20(4).

Bechtel, W. (1998) ñRepresentations and Cognitive Explanations: Assessing the Dynamicistsô Challenge in Cognitive Science.ò *Cognitive Science*, 22. 295-318.

Bermudez, J. (1995) ñNonconceptual Content: From Perceptual Experience to Subpersonal Computational States.ò *Mind and Language*. 10. 333-369.
ð ð ð (1998) The Paradox of Self-Consciousness. MIT Press.
ð ð ð (2000) ñPersonal and Subpersonal: A Difference without a Distinction.ò *Philosophical Explorations*. 2. 63-82.

Bermudez, J. & Macpherson, F. (1998) ñNonconceptual Content and the Nature of Perceptual Experience.ò *The Electronic Journal of Analytic Philosophy*, 6.

Block, N. (1990) ñInverted Earth.ò in Tomberlin, ed. Philosophical Perspectives, 4.
ð ð ð (1995) ñOn a Confusion about the Function of Consciousness.ò *Behavioural and Brain Sciences*. 18 (2). 227-287.
ð ð ð (1998) ñIs Experiencing Just Representing?ò *Philosophy and Phenomenological Research.* 59. 663-670.
ð ð ð (2005) Review of Alva Noë, Action in Perception. *Journal of Philosophy.* CII(5). 259-272.
ð ð ð Forthcoming. ñConsciousness, Accessibility and the Mesh between Psychology and Neuroscience.ò *Behavioural and Brain Sciences.*

Brooks, R. (1991) ñIntelligence without Representation.ò *Artificial Intelligence*. 47. 139-159.

Byrne, A. (2001) ñIntentionalism Defended.ò *Philosophical Review*. 110(2). 199-240.

Byrne, A. & Hilbert, D.R. (1997) ñColours and Reflectances.ò In Byrne & Hilbert, eds, Readings in Colour Volume 1: The Philosophy of Colour. Cambridge, MA.: MIT Press.

Campbell, J. (1993) ñThe Role of Physical Objects in Spatial Thinkingò In N. Eilan, R. McCarthy and M.W. Brewer (eds.), Problems in the Philosophy and Psychology of Spatial Representation (Oxford: Blackwell)
ð ð ð (1994) Past, Space and Self. Cambridge, Mass.: MIT Press.
ð ð ð (In press) ñSensorimotor Knowledge and Naïve Realism.ò *Philosophy and Phenomenological Research.*

Carruthers, P. (2000) Phenomenal Consciousness: a naturalistic theory. CUP.
ð ð ð (2001) ñHigher-Order Theories of Consciousness.ò Stanford Encyclopaedia entry.

Chalmers, D. (1995) ñFacing up to the problem of consciousness.ò *Journal of Consciousness Studies.* 2(3). 200-219.
ð ð ð (1996) The Conscious Mind. OUP.
ð ð ð (1997) ñAvailability: The Cognitive Basis of Experience?ò *Behavioural and Brain Sciences.* 20. 148-149.
ð ð ð (2003) ñConsciousness and its place in Nature. In Stich, S. and Warfield, F. The Blackwell Guide to Philosophy of Mind. Blackwell.
ð ð ð (2006) ñPhenomenal Concepts and the Explanatory Gap.ò In Alter & Walter, eds. Phenomenal Concepts and Phenomenal Knowledge, New Essays on Consciousness and Physicalism, OUP.

Clark, A. (1997) Being There: Putting Brain, Body and World Together Again, MIT Press, Bradford Books.
ð ð ð (1999a) ñAn Embodied Cognitive Science?ò *Trends in Cognitive Science.* 3. 345-351.
ð ð ð (1999b) ñVisual Awareness and Visuomotor Action.ò *Journal of Consciousness Studies.* 6. 1-18.
ð ð ð (2000a) ñA Case Where Access Implies Qualia?ò *Analysis*. 60. 30-37.
ð ð ð (2000b) ñPhenomenal Immediacy and the Doors of Sensation.ò *Journal of Consciousness Studies.* 7(4). 21-24.
ð ð ð (2001) ñVisual Experience and Motor Action: Are the Bonds Too Tight?ò *Philosophical Review.* 110(4). 495-519.
ð ð ð (2002) ñIs Seeing All it Seems? Action, Reason and the Grand Illusion.ò *Journal of Consciousness Studies.* 9. 181-202.
ð ð ð (2006a) ñCognitive Complexity and the Sensorimotor Frontier.ò *Proceedings of the Joint Session of Mind and the Aristotelian Society*. 80. 43-65.
ð ð ð (2006b) ñThat Lonesome Whistle: a Puzzle for the Sensorimotor Model of Perceptual Experience.ò *Analysis*. 66. 22-25.
ð ð ð (2006c) ñPressing the Flesh: A Tension in the Study of the Embodied, Embedded Mind?ò *Philosophy and Phenomenological Research.*

Clark, A. & Chalmers, D. (1998) ñThe Extended Mind.ò *Analysis*. 58. 7-19.

Clark, A. & Eilan, N. (2006) ñSensorimotor Skills and Perception.ò *Proceedings of the Joint Session of Mind and the Aristotelian Society.*80. 43-88.

Clark, A. & Mandik, P. (2002) ñSelective Representing and World-Making.ò *Minds and Machines*. 12. 383-395.

Clark, A. & Toribio, J. (2001a) ñSensorimotor Chauvinism?ò (Commentary on J.K O'Regan and A. Noë: A sensorimotor account of vision and visual consciousness). *Behavioural and Brain Sciences.*74. 979-980.

Clark, Au. (2004) ñFeature Placing and Proto-Objects.ò *Philosophical Psychology*. 17. 443-469.

Cussins, A. (1992) ñContent, Embodiment and Objectivity.ò *Mind*. 101. 651-688.

Davies, M. (2000) ñPersons and their Underpinnings.ò *Philosophical Explorations*. 3. 43-62.

Dennett, D. (1987) The Intentional Stance. MIT Press.
ð ð ð (1988) ñQuining Qualia.ò In Lycan, ed. Mind & Cognition: A Reader, MIT Press, 1990.
ð ð ð (1991) Consciousness Explained. London: Penguin.
ð ð ð (1995) ñThe Unimagined Preposterousness of Zombies.ò *Journal of Consciousness Studies.* 2(4). 322-325.
ð ð ð (2007) ñWhat RoboMary Knows.ò In Alter & Walter, eds. Phenomenal Concepts and Phenomenal Knowledge, New Essays on Consciousness and Physicalism, OUP.

Dretske, F. (1981) Knowledge and the Flow of Information. MIT Press.
ð ð ð (1995) Naturalizing the Mind. MIT Press.

Elton, M. (2000) ñConsciousness: Only at the Personal Level.ò *Philosophical Explorations*. 3(1). 25-63.
ð ð ð (2003) Daniel Dennett: Reconciling Science and our Self-Conception. Polity Press.

Evans, G. (1982) The Varieties of Reference. J. McDowell, ed. OUP.
ð ð ð (1985) ñMolyneauxôs Question.ò In The Collected Papers of Gareth Evans. London, OUP.

Flanagan, O. (1992) Consciousness Reconsidered. MIT Press.

Flanagan, O. & Polger, T. (1995) ñZombies and the Function of Consciousness.ò *Journal of Consciousness Studies.* 2(4). 313-321.

Fodor, J. (1991) A Theory of Content and other essays. Cambridge, MA.: MIT Press.

Gallagher, S. (2005) How the Body Shapes the Mind. OUP.

Gallistel, C.R. (1980) The Organisation of Action: A New Synthesis. Lawrence Erlbaum.

Gibson, J.J. (1966) The Senses Considered as Perceptual Systems. Boston: Houghton Mifflin.
ð ð ð (1979) The Ecological Approach to Visual Perception. Boston: Houghton Mifflin.

Glover, S. (2004) ñSeparate Visual Representations in the Planning and Control of Action.ò *Behavioural and Brain Sciences.* 27. 3-78.

Goodale, M. (1998) ñWhere does Vision End and Action Begin?ò *Curr. Biol*. 8. 489-491.
ð ð ð (2001) ñReal Action in a Virtual World: Commentary on O'Regan & Noë.ò *Behavioural and Brain Sciences.* 24(5). 984-5.

Grush, R. (1997) Review of Port & van Gelderôs Mind as Motion. *Philosophical Psychology*. 10(2). 233-242.
ð ð ð (1998) ñSkill and Spatial Content.ò *Electronic Journal of Analytic Philosophy.*

Güzeldere, G. (1997) ñThe Many Faces of Consciousness: a Field Guide.ò In N. Block, Flanagan, O. and Güzeldere, G. The nature of consciousness. MIT Press.

Hardin, C.L. (1988) Colour for Philosophers: Unweaving the Rainbow. Indianapolis: Hackett.
Harman, G. (1996) ñExplaining Objective Colour in Terms of Subjective Reactions.ò *Philosophical Issues*, 7: Perception. 1-7.

Hurley, S. (1998) Consciousness in Action. Cambridge, Mass: Harvard University Press.
ð ð ð (2003) ñAction, the Unity of Consciousness, and Vehicle Externalism.ò In A. Cleeremans, ed, The Unity of Consciousness: Binding, Integration and Dissociation. OUP.
ð ð ð (2005) ñActive Perception and Perceiving Action.ò In Gendler, T. and Hawthorne, J. eds, Perceptual Experience. New York: OUP.

Hurley, S. & Noë, A. (2003) ñNeural Plasticity and Consciousness.ò *Biology and Philosophy*. 18. 131-168.
ð ð ð (2005) ñCan Hunter-Gatherers Hear Colour?ò In Brennan, G., Goodin, R. and Smith, M. eds. Common Minds: Essays in Honour of Philip Pettit. OUP.

Jacob, P. (2005) ñGrasping and Perceiving Objects.ò In A. Brook & K. Akins, eds. Cognition and the Brain. CUP.

Jacob, P. & Jeannerod, M. (2003) Ways of Seeing: the Scope and Limits of Visual Cognition. Oxford: OUP.

Jackson, F. (1982) ñEpiphenomenal Qualia.ò *Philosophical Quarterly*. 32. 127-136.
ð ð ð (1986) ñWhat Mary Didn't Know.ò *Journal of Philosophy*, 83. 291-295.

Jeannerod, M. (1997) The Cognitive Neuroscience of Action. Blackwell.

Kelly, S.D. (1998) ñWhat Makes Perceptual Content Non-conceptual?ò *Electronic Journal of Analytic Philosophy.*
ð ð ð (1999) ñWhat Do We See (When We Do)?ò *Philosophical Topics*. 27. 107-128.
ð ð ð (2002) ñMerleau-Ponty on the Body.ò *Ratio*. 15(4). 376-391.
ð ð ð (2004) ñReference and Attention: A Difficult Connection.ò *Philosophical Studies*. 120. 277-286.

Mack, A. and Rock, I. (1998) Inattentional Blindness. Cambridge, Mass.: MIT Press.

Macpherson, F. (2003) ñNovel Colours and the Content of Experience.ò *Pacific Philosophical Quarterly*. 84(1). 43-66.
ð ð ð (2006) ñAmbiguous Figures and the Content of Experience.ò *Noûs*. 40(1). 82-117.

Mandik, P. (1999) ñQualia, Space and Control.ò *Philosophical Psychology*. 12. 47-60.
ð ð ð (Forthcoming) ñAn Epistemological Theory of Consciousness?ò In A. Plebe, ed. Philosophy in the Neuroscience Era.

Martin, M.G.F. (2004) ñThe Limits of Self-Awareness.ò *Philosophical Studies*. 120. 37-89.

Matthen, M. (1999) ñThe Disunity of Colour.ò *Philosophical Review.* 108(1). 47-84.
ð ð ð (2005) Seeing, Doing and Knowing. OUP.

McDowell, J. (1994a) Mind and World. Cambridge, Mass.: Harvard UP.
ð ð ð (1994b) ñThe Contents of Perceptual Experience.ò *Philosophical Quarterly.* 44(175). 190-205.

Merleau-Ponty, M. (1945) Phenomenology of Perception. Translated from French by Colin Smith. Routledge.

Millikan, R. (1989) ñBiosemantics.ò *Journal of Philosophy.* 86(6). 281-297.

ð ð ð (1996) ñPushmi-Pullyu Representations.ò *Philosophical Perspectives.* 9. 185-200.

Milner, D. & Goodale, M. (1995) The Visual Brain in Action. OUP.
ð ð ð (1998) ñThe Visual Brain in Action (Précis).ò *Psyche*. 4(12).

Moody, T. (1994) ñConversations with Zombies.ò *Journal of Consciousness Studies.* 1(2). 196-200.

Nagel, T. (1974) ñWhat is it Like to be a Bat?ò *Philosophical Review*. 83(4). 435-450.

Noë, A. (2001) ñExperience and the Active Mind.ò *Synthese*. 129(1). 41-60.
ð ð ð (2002a) ñIs Perspectival Self-Consciousness Nonconceptual?ò *Philosophical Review.* 52(207). 185-194.
ð ð ð (2002b) ñOn What We See.ò *Pacific Philosophical Quarterly*. 83(1). 57-80.
ð ð ð (2002c) ñIs the Visual World a Grand Illusion?ò *Journal of Consciousness Studies.* 9. 1-12.
ð ð ð (2003) ñPerception and Causation: The Puzzle Unravelled.ò *Analysis*. 63(278). 93-100.
ð ð ð (2004) Action in Perception. Cambridge, MA: MIT Press.
ð ð ð (2005) ñWhat Does Change Blindness Teach us about Consciousness?ò *Trends in Cognitive Science.* 9(5). 218.
ð ð ð (2006a) ñExperience of the World in Time.ò *Analysis*. 66(289). 26-32.
ð ð ð (2006b) ñExperience without the Head.ò In T.S. Gendler & J. Hawthorne, eds. Perceptual Experience. Clarendon Press.
ð ð ð (Forthcoming) ñReal Presence.ò *Philosophical Topics*.

Noë, A. & OôRegan, J.K. (2000) ñPerception, Attention and the Grand Illusion.ò *Psyche*. 6(15).
ð ð ð (2002) ñOn the Brain Basis of Visual Consciousness.ò In A. Noë and E. Thomson, eds. Vision and Mind. Cambridge, MA.: MIT Press.

Noë, A., OôRegan, J.K. & Myin, E. (2005) ñCorporality and Alerting Capacity in an explanation of the quality of sensory consciousness.ò *Progress in Brain Research*. 150. 55-68.

Noë, A. & Thomson, E. (2004) ñAre There Neural Correlates of Consciousness?ò *Journal of Consciousness Studies.* 11(1). 3-28.

OôCallaghan, C. (2007) Sounds: A Philosophical Theory. OUP.

O'Regan, J.K. (1992) ñSolving the 'Real' Mysteries of Visual Perception: The World as an Outside Memoryò *Canadian Journal of Psychology*, 46(3). 461-488.

O'Regan, J.K. & Noë, A. (2001) ñA Sensorimotor Approach to Vision and Visual Consciousness.ò *Behavioural and Brain Sciences.* 24. 883-975.

Peacocke, C. (1983) Sense and Content. Oxford: Clarendon Press.

Pettit, P. (2003) ñLooks as Powers.ò *Philosophical Issues*. 13. 221-52.
ð ð ð (2007, forthcoming) ñPhysicalism without Pop-out.ò In D. Braddon-Mitchell and R. Nola, eds. Naturalistic Analysis. MIT Press.

Port, R.F. & van Gelder, T. (1998) Mind as Motion. MIT Press.

Prinz, W. (1997) ñPerception and Action-Planning.ò *European Journal of Cognitive Psychology*. 9(2). 129-154.

Pylyshyn, Z. (2000) ñSituating Vision in the World.ò *Trends in Cognitive Science.* 4(5). 197-207.

Rey, G. (1998) ñA Narrow Representationalist Account of Qualitative Experience.ò *Philosophical Perspectives*. 12. 435-457.

Rosenthal, D. (1986) ñTwo Concepts of Consciousness.ò *Philosophical Studies*. 49. 329-359

Rowlands, M. (2006) ñSensorimotor Activity.ò *Psyche.* 12(1).

Schellenberg, S. (2007) ñAction and Self-Location in Perception.ò *Mind*. 116(463). 603-632.

Siegel, S. (2005) ñThe Contents of Perception.ò Stanford Encyclopaedia article.

Shoemaker, S. (1991) ñQualia and Consciousness.ò *Mind*. 100. 507-524.

Smith, A.D. (2002) The Problem of Perception. Harvard University Press.

Smith, A.J.T (2007) ñBodily Experience and Bodily Self-Knowledge: Feeling and Knowing Oneself as a Physical Agentò MSc diss. University of Edinburgh.

Spencer, C. (Forthcoming) ñUnconscious Vision and the Platitudes of Folk Psychology.ò *Philosophical Psychology*.

Stoljar, D. (2005) ñPhysicalism and Phenomenal Concepts.ò *Mind and Language*. 20(5). 469-494.

Strawson, P.F. (1959) Individuals. London: Methuen.

Thompson, E. (1995) Colour Vision: A Study in Cognitive Science and the Philosophy of Perception. London & New York: Routledge.

Tye, M. (1995) Ten Problems of Consciousness. MIT Press.
ð ð ð (1999) ñPhenomenal Consciousness: the explanatory gap as a cognitive illusion.ò *Mind*, 108(432). 705-725.
ð ð ð (2000) Colour, Consciousness and Content. MIT Press.
ð ð ð (2003) ñQualia.ò Stanford Encyclopaedia entry.

Ungerleider, L. & Mishkin, M. (1982) ñTwo Cortical Visual Systems.ò In Ingle et al, eds. Analysis of Visual Behaviour, Cambridge, Mass: MIT Press.

Van Gulick, R. (2004) ñHigher-Order Global States: an Alternative Higher-Order View.ò In Gennaro, ed. Higher-Order Theories of Consciousness. John Benjamins.
ð ð ð (2006) Mirror ï Mirror, Is that all? In U. Kriegel and K. Williford, eds. Self-Representational Approaches to Consciousness. Cambridge, MA.: MIT Press.

Varela, F., Thomson, E. & Rosch, E. (1991) The Embodied Mind. Cambridge, MA.: MIT Press.

Vierkant, T. (2002) ñZombie Mary and the Blue Banana.ò *Psyche.* 8(19).

Ward, D., Roberts, T. & Clark, A. (In Progress) ñKnowing What We Can Do: Actions, Intentions, and the Construction of Phenomenal Experience.ò