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Cognitive (Im)Penetrability of Vision

Restricting Vision versus Restricting Cognition

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Introduction

The debate on the cognitive penetrability of vision concerns the possible dependence of vision on cognition. A proper evaluation of this debate requires a specification of the two relata involved in the dependence relation and of the kind of relation itself, if there is one. As we will see, there are different suggestions as to which the relata are and what exactly the dependence of the one on the other is. I argue that the terms in which the debate was framed lead to a problematic dilemma that may be roughly formulated as follows: either vision is not dependent on cognition, namely, it is cognitively impenetrable, and consequently vision is alienated and disconnected from thought, or vision is dependent on cognition, i.e. it is cognitively penetrated, and as a result the distinction between vision and thought is blurred. In this chapter I examine this dilemma and suggest a possible way out.

The chapter consists of two main parts, Sections 1 and 2 and Section 3. The first part examines Pylyshyn's approach to cognitive penetrability and his suggestion that only the initial stage of visual processes, called 'early vision', is cognitively impenetrable, whereas 'late vision' is cognitively penetrable. This suggestion focuses mainly at the sub-individual level and restricts the dependence of vision on cognition, by restricting the scope of the first relatum to late vision. Moreover, it takes the second relatum, cognition, for granted and makes no distinction between different kinds of penetrating cognition. The suggestion implies that late vision is penetrable by the same kind of cognition by which states of the central systems are penetrable. I will argue that this approach disconnects early vision content from the world and from the cognitively penetrated visual content available to the perceiver, on the one hand, and, on the other, it blurs the distinction between the cognitively penetrated visual content and the content of thought.

For this reason, in the second part of the chapter I suggest an alternative approach based on the opposite move. I formulate this suggestion at the level of visual experience. The first relatum, visual experience, is taken for granted, while a restriction is introduced on the kind of cognition that can directly penetrate visual experience. In particular, the suggestion is that visual experience, unlike thought, is directly penetrated only by practical non-propositional knowledge. This implies that the cognitive penetrability of vision should be distinguished from the cognitive penetrability of thought, since vision is cognitively penetrated only by practical nonpropositional knowledge. This suggestion, if tenable, opens up space for a middle position between the two alternatives that create the dilemma since (a) differentiating the cognitive penetrability of visual experience from the cognitive penetrability of the content of thought preserves the distinction between vision and thought, and (b) taking visual content as penetrated by practical nonpropositional knowledge makes it an object-dependent content available to the embodied perceiver.

In order for this position to be appropriate for overcoming the dilemma, the way vision is distinguished from thought must account for the distinctive content of visual experience. I will argue that this position succeeds in accounting for the distinctive content of visual experience by analysing the kind of dependence visual content has on practical non-propositional knowledge. To this effect, I initially examine the kind of dependence between the two relata that Pylyshyn's approach introduces. Pylyshyn conceives the dependence as causal and, more importantly, as semantic-rational. He further specifies this semantic-rational relation in terms of a particular kind of inference, one which is related to the inferential promiscuity of beliefs. This amounts to a strong notion of inference, which presupposes that the inferentially connected representations have contents that (i) are propositional (given that they can be contents of beliefs), and (ii) are not domain-specific. If one adheres to this strong version of cognitive penetrability, then a system with representations that depend rationally on certain representations of another system without satisfying (i) and/or (ii) has to be taken as cognitively impenetrable, even though it is not informationally encapsulated. Thus, between the informationally encapsulated systems and the systems that exhibit strong cognitive penetrability, a variety of systems can be specified that are neither informationally encapsulated nor strongly cognitively penetrable. I call this kind of cognitive dependence 'weak cognitive penetrability', and argue that it should be further specified in anti-representational terms, as the dependence of visual content on practical nonpropositional knowledge.

This is a more radical option on cognitive penetrability found in the work of a number of philosophers and scientists who reject the framework of the Representational and Computational Theory of Mind (RCTM) and support anti-representationalist approaches to perception and cognition. In these approaches, the processes subserving perceptual and cognitive capacities are not taken as consisting in computational transformations of symbolic representations. This precludes an understanding of cognitive penetrability in terms of a (promiscuous or not) inferential dependence of symbolic

representations of the perceptual systems on symbolic representations of the cognitive systems. Thus, Pylyshyn’s semantic criterion of cognitive penetrability is not applicable to the anti-representational approaches. For this reason, I attempt to develop an account of weak cognitive penetrability that is not based on the inferential dependence of symbolic representations of the perceptual systems on symbolic representations of higher-level systems.

In particular, I examine different kinds of constitutive dependence of perceptual content on practical nonpropositional knowledge, and suggest that this dependence should be conceived as a rational non-inferential relation, for it is in this way that we can account for the distinctive content of visual experience. I focus mainly on a particular kind of practical nonpropositional knowledge, sensorimotor knowledge, and I explain further the rational non-inferential dependence of visual content on sensorimotor knowledge in terms of the structure of the act of perceiving. I suggest that, according to the weak cognitive penetrability I am proposing, what makes available to the perceiver the sensorimotor knowledge on which visual content depends is the implicit and non-receptive bodily self-consciousness constitutively involved in the act of perceiving.

1 The Traditional Framework for the Cognitive Impenetrability of Perception

Pylyshyn (1980) coined the term ‘cognitive penetrability’ in the context of the traditional RCTM. He conceived cognitive penetrability as a semantic-logical dependence of the content of symbolic representations processed in a system on the content of representations, such as goals and beliefs, processed in cognitive systems. Pylyshyn (1999a: 343), for instance, explains the notion as follows:

If a system is cognitively penetrable then the function it computes is sensitive, in a semantically coherent way, to the organism’s goals and beliefs, that is, it can be altered in a way that bears some logical relation to what the person knows.

This is supposed to be a rational and not just a causal dependence of a system on the cognitive systems. In such a case, representations outputted by the cognitive systems serve as *internal* input (internal feedback) to the system along with possible exteroceptive input.

Pylyshyn specified further this semantic-rational relation in terms of inference: if a system is cognitively penetrable by the cognitive systems, the content of representations processed in this system depends *inferentially* on the content of representations outputted by the cognitive systems. The term ‘inference’ is used here in a specific way, as Pylyshyn (2003: 124) acknowledges:

I prefer to reserve the term ‘inference’ for a process that Stich (1978) calls ‘inferentially promiscuous’—i.e., that is not restricted in a principled way to what information it can use.

Pylyshyn makes this qualification because, according to the RCTM, the processes that take place within non-cognitive systems, like the various perceptual systems, are explained in computational terms, namely as syntactic transformations of symbolic representations. Thus, many researchers consider these processes as inferential when they describe them at the semantic-intentional level. For example, Marr (1982: 68) states: 'the true heart of visual perception is the inference from the structure of an image about the structure of the real world outside.'

Although both the states of the visual system and the states of the cognitive systems are involved in relations that can be characterized as inferential in the broad sense of the term, only the latter are inferentially promiscuous. The paradigmatic states of the cognitive systems are beliefs. Specifying inferential promiscuity, Stich (1978: 508) notes: 'Provided with a suitable set of supplementary beliefs, almost any belief can play a role in the inference to any other.' This inferential integration of beliefs is an expression of their holism; and since any belief is possible to play a role in the inference of any other, the inferential relations among them are not domain-specific.

Thus, although the visual system has states that are inferentially related to one another, it can be cognitively impenetrable if it is inferentially insulated from the states of the cognitive systems. At this level of generality, the cognitive impenetrability of a computational system does not seem to imply that the content of its states and their inferential relations should be of a different type from the content of beliefs and their inferential relations. The only restriction that cognitive impenetrability seems to set concerns the *source* of the contents used. As Pylyshyn (1999b: 412) notes:

Describing the computations carried out by early vision in Bayesian terms is perfectly reasonable and has indeed led to some useful insights. The crucial point that is relevant to the present thesis is that the Bayesian formulations, though they can be viewed as probabilistic inferences, are cast over optico-spatial properties and do not take into account such things as the probability that what one sees is an X, given that one knows from general considerations that Xs are likely to be at this place at this time.

But, perhaps, the way Pylyshyn defines the cognitive impenetrability of a state sets an additional restriction to its content, namely that it must be unconscious. Fodor (1983) examines the relation between cognitive impenetrability (or, in his terminology, informational encapsulation) and unconsciousness but he finds it extrinsic, since there are unconscious states that are not encapsulated. He gives as an example of unencapsulated unconscious state one's subdoxastic acquiescence in the rule of modus ponens:

Sub-doxastic knowledge of such principles must be accessible to practically all mental processes, since practically all inferential processes exploit them in one way or another. One's subdoxastic beliefs about validity and confirmation are thus quite unlike one's subdoxastic beliefs about the rules of grammar; though both are unconscious, the former are paradigms of promiscuous and unencapsulated mental states. So the connection between unconsciousness and encapsulation cannot be intrinsic. (Fodor 1983: 85)

Pylyshyn's and Fodor's approach to cognitive impenetrability concerns primarily the sub-individual level. For example, their discussion of the cognitive impenetrability of visual system deals with the processes and states in this system from the moment input affects the retina up to the point of the appearance of visual experience. Only the final output of these processes, visual experience, is conscious and has a phenomenal character. Thus, the problem of cognitive impenetrability, as was initially formulated by Pylyshyn and Fodor, concerns primarily sub-individual processes and states. Current discussion focuses also on the individual level and examines the cognitive impenetrability of perceptual experience.¹ But if one accepts the framework of RCTM, then the cognitive penetrability of the sub-individual states processed in the perceptual systems implies the cognitive penetrability of, at least, a part of perceptual experience. In the first part of the chapter (up to the end of Section 2), I will focus mainly on the discussion about the cognitive impenetrability of sub-individual processes and states, and I will presuppose Pylyshyn's semantic criterion of cognitive penetrability.

To further clarify this semantic criterion, it is helpful to contrast the possible semantic-rational dependence of perception on cognition with an 'external' way cognition may influence perception, namely through an action affecting the input to the perceptual system. For example, when I intend to see what is on my left, I turn my eyes to the left and, as a result, my perceptual experience changes. But this change in the perceptual content depends directly only on external input, namely the part of reality that happens to be in view. The movement of the body and of the eyes serve just as a *means* to change external input and, through it, perceptual content. This is what Raftopoulos (2009: 84), interpreting Pylyshyn's approach, calls 'indirect cognitive penetrability'.²

Indirect cognitive penetrability is not cognitive penetrability proper, since the content of thought and of the ensuing action does not bear any semantic-rational relation to the content of perception. This is illustrated by the fact that if, in the absence of the relevant motivating thought and of the consequent action, the perceiver had been moved by someone else so that his eyes focused on the same location in the same lighting conditions, then his perceptual experience would not have been different. Thus, the influence of thought on perception must be *internal* to count as a case of direct cognitive penetrability.

Still, not every internal influence can be a semantic-rational influence. For example, it might be the case that a top-down signal internally modulates the functioning of a perceptual system without affecting the content of the representations processed. This would still be a case of indirect cognitive penetrability, which could be called 'internal'

¹ See e.g. Macpherson (2012) and Siegel (2011).

² In one respect, the notion of instrumental dependence of perception on the output of action that Susan Hurley (1998: 362) introduces is similar to the notion of indirect cognitive penetrability: '[t]he dependence of the contents of *perception on output* is instrumental when it operates via input rather than directly. Output plays the role of means to input, on which perception depends directly.' It is important to note, however, that Hurley works in a radically anti-representational framework.

to distinguish it from the former kind, the 'external' indirect cognitive penetrability. In the next section we will see a particular example of internal indirect cognitive penetrability.³

2 Restricting Cognitively Impenetrable Perception to Early Vision

Unlike Fodor's initial position presented in his seminal book on the modularity of mind (Fodor 1983), the main contemporary proponents of the cognitive impenetrability of visual processes restrict their claim to early vision.⁴ Only early vision is considered to be cognitively impenetrable, whereas late vision processes, unlike what Fodor used to hold, are conceded to be cognitively penetrable.

But what is the output of early vision? This is an open question, as Pylyshyn (2003: 136) acknowledges:

There is a great deal that is unknown about the output, for example, whether it consists of a combinatorial structure that distinguishes individual objects and object parts, and whether it encodes nonvisual properties, such as causal relations, or primitive affective properties, like 'dangerous', or even some of the functional properties that Gibson referred to as 'affordances'. In principle, the early-vision system could encode any property whose identification does not require accessing general memory, and in particular that does not require inference from general knowledge.⁵

Pylyshyn takes cognitive influences to be effected mainly by different kinds of attention, and he attempts to show that attention does not affect directly early vision, but only processes that take place either before the onset of early vision or after its completion:

Our hypothesis is that cognition intervenes in determining the nature of perception at only two loci. In other words, the influence of cognition upon vision is constrained in how and where it can operate. These two loci are:

- (a) in the allocation of attention to certain locations or certain properties *prior to* the operation of early vision . . .
- (b) in the decisions involved in recognizing and identifying patterns *after* the operation of early vision. (Pylyshyn 1999a: 344)⁶

³ Fodor (1990: 261) speculates on the possibility of what we called 'internal indirect cognitive penetrability': 'Heaven knows what psychological function "descending pathways" subserve. . . . One thing is clear: if there is no cognitive penetration of perception, then at least "descending pathways" aren't for that.'

⁴ See Pylyshyn (1999a) and Raftopoulos (2009).

⁵ In a more positive vein, Raftopoulos (2009: 319) states that the 'information delivered by that process is spatio-temporal (that is, information about location, spatial relations, orientation, and motion) and information about size, color, orientation, and viewer-centered shape, and is used for object individuation and tracking.'

⁶ See also Pylyshyn (2003: 122–3 and 157).

Pylyshyn's strategy allows him to reject the suggested cases of cognitive penetrability by placing them on a time-scale that either precedes or follows early vision. However, the way he formulates the first locus is incomplete and imprecise. It refers only to cases of external indirect cognitive penetrability, namely cases in which attention causes some kind of bodily movement that results to a change of the exteroceptive input. But there might be also cases where attention influences internally the perceptual system, and in these cases what is of importance is not whether attention takes place prior or even during early vision but whether it does (or not) affect inferentially the content of the representations processed during early vision. For example, an attentional process prior to early vision could cognitively penetrate it in a direct way by sending a signal that affects inferentially the content of the representations processed during early vision. On the other hand, an attentional process during early vision might not affect early vision inferentially but in some other way that does not constitute a case of direct cognitive penetrability. For example, it has been argued that the enhancement of the activity of all the neurons that correspond to the attended location does not modulate cognitively in a direct way the processing in early vision because it does not introduce a bias between targets and non targets.⁷ Thus, exempting cases of cognitive processes that take place after the process of early vision (see locus (b) in the quotation above), what is crucial in deciding whether a cognitive process influences cognitively early vision is not whether it is prior or concurrent with early vision, but whether or not it affects early vision inferentially.

2.1 *Problems with the connection between early vision content and the world*

It has been argued that the cognitive impenetrability of early vision entails that its output is nonconceptual and affords a direct connection with the world.⁸ Pylyshyn calls this direct connection 'visual indexing.' A visual index, which Pylyshyn calls 'FINST' (for FINger of INSTantiation), performs 'a demonstrative or preconceptual reference function' (Pylyshyn 2001: 127), which simply picks out the referent without describing it: 'Like natural language demonstratives (such as "this" or "that") this direct connection allows entities to be referred to without being categorized or conceptualized' (p. 127). Thus, since the content of the states processed by early vision is causally constituted and cognitively impenetrable, it is nonconceptual and provides a direct connection with the perceived objects.

Here it needs to be argued independently that the system of early vision has states with some kind of referential function, since a system can be cognitively impenetrable without having any states with referential function. So, one has to argue on independent grounds that early vision states have a referential function. Pylyshyn, following Fodor and Dretske, opts for a kind of causal theory of mental content. Whether or not a causal theory can account for the representational content of perceptual states is a debatable subject itself. For present purposes, I will simply argue that the cognitive

⁷ See Raftopoulos (2009: 85).

⁸ See Raftopoulos (2009).

impenetrability of early vision, as defined by Pylyshyn, does not necessarily entail that its output depends exclusively on the world.

As we have seen, Pylyshyn's semantic criterion of cognitive penetrability is based on a strong notion of inference which is exemplified in the inferential promiscuity of beliefs. However, this leads to a very restricted notion of cognitive penetrability, since the kind of inference it introduces presupposes, among other things, that the inferentially connected representations must have contents that are (a) propositional-discursive (given that they can be contents of beliefs) and (b) domain-general, in the sense that they are not necessarily about a specific domain. If one accepts this strong version of cognitive penetrability, then a system *A* with representations that depend inferentially on certain representations of a system *B* without satisfying (a) and/or (b) has to be considered as cognitively impenetrable. This is the case if, for example, the representations of system *A* can depend inferentially only on domain specific representations⁹ or/and on non-propositional representations of system *B*. In this case, system *A* must be considered as cognitively impenetrable although it is not informationally encapsulated, since information from another system directly influences rationally the content processed in system *A*. In other words, the conception of cognitive penetrability based on the strong notion of inference applies only to systems that process domain-general representations with propositional-discursive contents.

Thus, if one defines the notion of cognitive penetrability in terms of the strong notion of inference, the scope of the concept of cognitive impenetrability becomes too broad: even a system the representations of which depend in a non-promiscuously inferential way on representations of other systems has to be considered as cognitively impenetrable. Thus, the claim that early vision is not cognitively penetrable, in the sense that it does not depend in an inferentially promiscuous way on the representations of other systems, does not necessarily entail that early vision is exclusively data-driven, since it may also inferentially depend on propositional domain-specific and/or non-propositional representations of other systems. Moreover, as we will see in Section 3, there might be some kind of rational dependence which is not inferential. For example, the task dependence of vision¹⁰ could be conceived as a non-inferential dependence on some kind of practical nonpropositional knowledge.

To recapitulate, between the informationally encapsulated systems and the systems that exhibit strong cognitive penetrability, a variety of systems can be specified that are neither informationally encapsulated nor strongly cognitively penetrable. I will call this kind of dependence of a system on other systems 'weak cognitive penetrability'.

Weak cognitive penetrability, if tenable, threatens the direct connection with the world that early vision supposedly affords, since, in this case, early vision content

⁹ This could be the dependence of motor systems on central systems, if motor systems are to be taken as not cognitively penetrable in the strong way.

¹⁰ See Raftopoulos (2009: 273).

does not depend only on the stimulus. But, even if one grants that the content of the representations processed during early vision is not cognitively penetrable either in the strong or in the weak sense, this claim does not suffice to establish the direct connection with the external world that Pylyshyn assumes. This is because early vision outputs depend not only on the stimulus but also on the kind of processing that takes place during early vision. As Pylyshyn (2003: 112) holds, the processing during early vision is modulated by a number of intrinsic principles that are hard-wired in the visual system:

The visual system follows a set of intrinsic principles independent of general knowledge, expectations, or needs. The principles express the built-in constraints on how proximal information may be used in recovering a representation of the distal scene.

These intrinsic principles constitute a kind of implicit knowledge encapsulated in the visual modules. But still, the penetration of the content of early vision by implicit knowledge impugns the purported direct connection with the external world.¹¹ It has been argued that the implicit principles reflect the geometry of our world and higher-order physical regularities that govern the behaviour of objects, since only in this way the evolutionary success of vision could be explained.¹² However, even if one adopts this 'reflection' metaphor, it is more plausible, I think, to suppose that the intrinsic principles 'reflect' geometrical and physical regularities of the world *in relation to the particularities of the embodied perceiver*. After all, a visual system is not like a camera that just registers the incoming light; it processes and transforms the information from the incoming light in a way that is also sensitive to the geometry and certain physical properties and capacities of the eyes and body of the perceiver.¹³ In other words, even if one grants that early vision processes representations with content that is not cognitively penetrable either in the strong or in the weak sense, the intrinsic principles do not simply 'reflect' the unmediated effect of the world on the organism.

Moreover, even if one grants that early vision is not cognitively penetrable either in the strong or in the weak sense and its intrinsic principles do not change, differences at the level of the output of early vision depend exclusively on the proximal stimuli. Thus, if two proximal stimuli are the same, the early vision system will produce the same output, even if the etiology of the two proximal stimuli is different—say, they are produced by different distal stimuli. So, the cognitive impenetrability of early vision does not secure in any way the perceiver's direct access to the world, since early vision processing is indifferent to differences in the etiology of proximal stimuli. For what matters, the processing could be the same even if all proximal stimuli were produced not by the physical world but by a computer.

¹¹ See Churchland (1989: 258).

¹² See Raftopoulos (2009: 105 and 339).

¹³ This is one way to understand the claim that perception is essentially embodied.

2.2 Problems with the connection between early vision and visual experience

But, even if one ignores these objections and grants that early vision outputs representations with content directly connected with the world, the question that remains is how this connection, which at this stage is encapsulated in early vision, allows the *perceiver* direct access to the world. This problem concerns the transition from the sub-individual to the individual-level of description; in particular, it concerns the way the encapsulated content of early vision affects the cognitively penetrated content of late vision processes and finally the content of visual experience that is available to the perceiver. Formulating the problem at the level of visual experience, the main question is: how does the content of early vision influence the distinctive content of visual experience? If the content of visual experience does not depend appropriately on the content of early vision, the latter proves to be disconnected from experience and even more so from thought. Of course, much hangs on how exactly this dependence should be understood.

Given that we are dealing with a dependence between representational states, it seems that it should be some kind of semantic-rational dependence; if the content of the representations outputted by early vision did not have any semantic-rational relation with the content of the representations processed in late vision and finally with the content of visual experience, then the dependence of visual experience on early vision could not be described at the intentional level. In such a case, early vision should not be appropriately characterized as a kind of *vision*, but just as an enabling condition of visual experience.¹⁴

The most crucial problem at this juncture is to specify what is required for a sub-individual content to become content appropriately accessible by an individual. This intimate relation between the individual-level representations and their possessor is notoriously elusive and difficult to account for. Individual-level representations, unlike sub-individual representations, are not just representations *of* something but also representations possessed by and attributed to an individual.¹⁵ But an individual *A* can possess a mental representation, attributed to her by individual *B* on the grounds of publicly available evidence, without *A* being able to have a more immediate access to her mental representation than *B*. This more immediate access to one's own mental representations—not available to an external observer—is a first-personal access. Formulated in these terms, the crucial problem is what is required for a sub-individual content to become first-personal content.

Pylyshyn does not raise this problem; but he briefly discusses a related problem, namely how to interpret the notion of conscious experience. His aim is not to advocate a particular way of interpreting this notion but just to show that 'whether something is or is not part of the content of our experience is not self-evident' (Pylyshyn 2007: 108).

¹⁴ See McDowell (1994).

¹⁵ Cf. Kriegel (2012).

To this effect he refers to Dretske's, Block's, and Rosenthal's approaches on this issue. In what follows, I will focus on Block's approach.¹⁶

The output of early vision has a peculiar status. On the one hand, if we grant that it is the product of a cognitively impenetrable process, it is not cognitively penetrated. On the other hand, if it is to play a role in the conceptual processes of late vision, it must be appropriately *poised* for use by this system, i.e. it must be cognitively penetrable by late vision. But in order for the output of early vision to be cognitively penetrable by late vision in Pylyshyn's strong sense, its content must be *inferentially promiscuous*. Block (1995: 231) introduces the notion of access consciousness to generalize this idea:

A state is access conscious (A-conscious) if, in virtue of one's having the state, a representation of its content is (1) inferentially promiscuous (Stich 1978), that is, poised for use as a premise in reasoning, (2) poised for rational control of action, and (3) poised for rational control of speech.

If the output of early vision is access-conscious, then it is cognitively accessible by late vision and other cognitively penetrated systems. Access consciousness is a functional notion. The content of a representation in a system is access-conscious relative to a different system that uses the content of the representation in a semantic-rational relation. As Block (1995: 232) notes:

What makes content A-conscious is not something that could go on inside a module, but rather informational relations *among* modules. Content is A-conscious in virtue of (a representation with that content) reaching the Executive System, the system in charge of rational control of action and speech.

But does access consciousness suffice to make the content of the output of early vision individual-level content, let alone first-personal content? This does not seem to be the case. After all, there is not yet any individual in the picture, just one part of the brain receiving input from another part. Unless the individual is identified with a certain part of the brain, it cannot be said to have access to the output of early vision.

Block (2007a: 491) adopts Dehaene's model of broadcasting in a global workspace to make more explicit the idea of cognitive accessibility involved in the notion of access consciousness:

Think of perceptual mechanisms as suppliers of representations to consuming mechanisms which include mechanisms of reporting, reasoning, evaluating, deciding, and remembering. There is empirical evidence that it is reasonable to think of perceptual systems as sending representations to a global active storage system, which is closely connected to the consuming systems. Those representations are available to all cognitive mechanisms without further processing.

This model, though it emphasizes the central role that global workspace plays, remains a description of the functional organization of the mind at the sub-individual level: the

¹⁶ See also Raftopoulos (2009: 215).

global workspace is just a subsystem of the brain. So there is no individual at this level of description that could access cognitively the output of early vision.

But even if we were to identify the individual with a subsystem of his brain that can access cognitively the output of early vision, nothing in this picture could account for the subjective character of experience when accessed first-personally, since the individual could have had exactly the same cognitive access without being conscious of it.

One might suggest that the difference between sub-individual and individual-level content is that the former lacks phenomenal character. When I experience the blue of the ocean, there is something it is like for me to have this experience. Indeed, Block (1995) introduces phenomenal consciousness as distinct from access consciousness. He conceives phenomenal consciousness as an intrinsic property of certain mental states that is independent of whether they are access conscious: 'P-consciousness is not a functional notion. . . . [C]ontent gets to be P-conscious because of what happens *inside* the P-consciousness module' (Block 1995: 232).

Block (1995) holds that the content of a state can be phenomenally conscious independently of whether the subject is aware of this content. Though he acknowledges that phenomenal states *often* involve a 'me-ishness' about them,¹⁷ he does not consider it as a constitutive element of phenomenal states, but just as an extra quale that may characterize some of them.

However, a phenomenal state that has not a subjective character or—in Block's terms—a 'me-ishness' is a free-floating state, not yet related first-personally to any individual. There is nothing it is like *for me* to have this supposed phenomenal state. As Levine (2007: 514) notes: 'Phenomenal states/properties are not merely instantiated in the subject, but are experienced by the subject. Experience is more than mere instantiation, and part of what that "more" involves is some kind of access.'

Block (2007a: 485) concedes Levine's point and introduces a constitutive non-cognitive access relation of phenomenal states to the subject that he calls 'awareness access'. This kind of awareness is not a higher-order relation to the phenomenally conscious state, since that would make it a kind of cognitive access consciousness—extrinsic to the state. But still it is a kind of access: 'Something worth calling "accessibility" may be intrinsic to any phenomenally conscious state, but it is not the cognitive accessibility that underlies reporting' (p. 485). He further specifies this non-cognitive access in terms of a reflexive relation: 'A conscious experience is reflexive in that it consists in part in an awareness of itself'. Block (2007b: 536) holds that a same-order or a deflationary view is adequate to account for what in his previous work called 'me-ishness' and now conceives as an element that characterizes any phenomenally conscious state:

¹⁷ See Block (1995: 235). 'P-conscious states often seem to have a "me-ishness" about them; the phenomenal content often represents the state as a "state of me".'

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In 1995, the only option I saw for explaining awareness-access in noncognitive terms was as a kind of phenomenal property I called 'me-ishness.' But now I see that awareness-access can be adequately understood in terms of 'same-order' and deflationary theories, so there is no need for cognitive or other 'higher-order' accounts.'

Thus, if we follow Block's suggestion, we can attribute the first-personal character of phenomenal content to the noncognitive awareness access involved in it, which can be further specified as a same-order reflexive relation. This same-order noncognitive reflexive relation is what accounts for the subjective character of phenomenal states. I think that the general idea of this approach is on the right track, but it certainly needs further clarification. However, I would like first to raise some objections about the use of this general idea in the context of early vision.

If we take for granted that the phenomenal content (and the awareness-access intrinsically involved in it) is constituted in the encapsulated process of early vision, it is legitimate to hypothesize that this content could have been produced even in the absence of any cognitive system. This means that even an early vision module-in-the-vat would suffice to produce individual-level contents. But this is certainly a counterintuitive result because it allows for individual-level content in the absence of any individual.

Moreover, conscious occurrent thoughts and other purely cognitive episodes are also given first-personally and, thus, have subjective character. This is what differentiates them from unconscious thoughts and other unconscious purely cognitive states.¹⁸ Thus subjective character is not only an intrinsic element of perceptual episodes but also of conscious occurrent thoughts. But conscious occurrent thoughts do not have phenomenal content.¹⁹ It follows that subjective character is not exclusively an intrinsic characteristic of phenomenal states.

If we insist on accounting for the subjective character of conscious occurrent thoughts and other cognitive episodes in terms of a corresponding same-order noncognitive reflexive relation, then we should clarify how is it possible for this reflexive relation not to be 'contaminated' by the cognitive relations that conscious occurrent thoughts bear to other cognitive states. This calls for a deeper understanding of the kind of noncognitive reflexive access that is involved in the first-personally given conscious episodes. What kind of access is this and how can we avoid the unwelcome consequence of attributing individual-level contents to the outputs of encapsulated modules? In section 3.2 I will make a specific suggestion on this issue to the effect that the proper kind of access is a nonreceptive practical access.

There is, however, another general issue with the connection between early vision and visual experience. This issue concerns the very content of the output of early vision and whether it (or a part of it) contributes to the phenomenology of visual experience. We may distinguish two ways the output of early vision could be related to the content

¹⁸ See, also, Kriegel (2009: 311–12).

¹⁹ At least not the phenomenal content of perceptual states.

of visual experience: the output (or a part of it) could be available to visual experience either with or without further processing.

If it is available through further processing and given that this processing would take place in the late vision system which is cognitively penetrated, the content of the output of early vision would first be transformed into a kind of cognitively penetrated content before it becomes part of the content of visual experience. But then, this transformed content is, by Pylyshyn's strong notion of cognitive penetrability, inferentially promiscuous and propositional-discursive. However, a propositional-discursive content cannot account for visual phenomenology, since a thought could have the same content without exhibiting any visual phenomenology.

If the output of early vision (or a part of it) is available to visual experience without further processing, then the content of visual experience would involve a cognitively impenetrable part. The problem with this option is that the phenomenology of visual experience is quite unlike the presumed phenomenology of the content of the output of early vision. The stability and the seamlessness of our visual phenomenology cannot be accounted for in terms of the evanescent and volatile content of early vision. After all, we experience the blue of the ocean and not the blue of the fleeting output of early vision.

One could object that, as Pylyshyn claims, early vision indexes to worldly objects, and hence that the blue we experience is the blue of the indexed object.²⁰ So there is no intermediate object introduced by early vision. This is certainly right, if we take for granted Pylyshyn's use of visual indexes. However, as Pylyshyn (2001: 154) acknowledges: 'The individual items that are picked out by the visual system and tracked primitively are something less than full-blooded individual objects.' This is because the visual index allocated to the picked out object does not yet represent its properties or its location.²¹ It is for this reason that Pylyshyn calls the particular objects 'visual objects' or 'proto-objects'. Thus, initially, the visual index does not encode the colour of the picked-out object. But early vision does not just allocate visual indexes to visual objects, it gradually builds representations of certain properties of the indexed object. As Pylyshyn (2003: 136; emphasis added) holds:

In principle, the early-vision system could encode *any property* whose identification does not require accessing general memory, and in particular that does not require inference from general knowledge.

Thus the real issue is the following: if the representations of the properties of an indexed object, such as colour, outputted by early vision are available to visual experience without further processing, can the content of these representations account for visual phenomenology?

²⁰ Thanks to an anonymous referee for raising this objection.

²¹ See e.g. Pylyshyn (2007: 23): 'What we need is a way to refer to individual things in a scene *independent of their properties or their locations*. This is precisely what FINSTs provide.'

The stability and the seamlessness of our visual phenomenology is characterized by the fact that what we visually experience is not exhausted by what is sensorily present. This is a widespread characteristic of perceptual content, namely that it presents various perceptual constancies. Experiencing such constancies is the ability to perceive physical properties of objects as unchanging, although their sensory presence changes due to the changing physical relation one has to the object. In these cases, the unchanging properties are perceptually present even though they are not sensorily present. But the representations of properties of an indexed object outputted by early vision are restricted to what is sensorily present. Thus, early vision representations cannot account for this aspect of the phenomenology of visual experience.²²

Another distinctive feature of perceptual phenomenology is the presentational character of perceptual content. To take the case of vision, the presentational character is what differentiates the phenomenology of visual experience from the phenomenology of quasi-visual states such as visual imagination or visual recall: when I visually imagine or visually recall something, it does not appear to me as bodily present in the external environment. The presentational character has to do with the distinctive directness of visual phenomenology compared to the directness of the phenomenology of quasi-visual states such as visual imagination or visual recall: vision provides us access to *bodily present* objects.

However, the presentational character of visual experience cannot be accounted for just by what is sensorily present to early vision, since the same sensory qualities could be represented in visual imagination or visual recall without having presentational character. But, perhaps, one could object that the mental representations involved in visual imagination and visual recall are *less vivid*. This objection, however, is inadequate, since presentational character is not a matter of degree of vividness: a visual experience could also be less vivid, without this affecting its presentational character. For example, even in dense fog the objects seen display presentational character. The same holds for the visual experience of a myopic person who is not wearing her glasses: though her visual field is blurry, the perceived objects continue to have presentational character. Thus, the presentational character of visual experience cannot be accounted for simply in terms of the sensory character of the cognitively impenetrable representations available to early vision.²³

But if the cognitively impenetrable content of early vision cannot account for the phenomenology of visual experience, and late vision is cognitively penetrable—which, according to the strong interpretation, means that its content is inferentially promiscuous and propositional-discursive—how could one account for visual phenomenology?

²² It can further be argued, following Smith (2002: ch. 6), that perceptual constancies cannot be attributed to the presence of some descriptive content. But if there are aspects of perceptual content that are neither sensory nor descriptive, then we should look for a third source that might determine perceptual content besides the external world and, possibly, the higher cognitive systems. In Section 3, I will suggest practical non-propositional knowledge as a factor that determines perceptual content.

²³ For a more detailed argumentation see Pagondiotis (2013).

3 Restricting Penetrating Cognition to Practical Nonpropositional Knowledge

Thus far, I have examined Pylyshyn's approach to cognitive penetrability of vision—an approach that restricts the dependence of vision on cognition—by restricting the scope of the first relatum to late vision. Moreover, this move takes for granted the second relatum, cognition, since it does not make any distinction between different kinds of penetrating cognition. This implies that late vision is considered as penetrable by the same kind of cognition by which states of the central systems are penetrable. I have called this kind of cognitive penetrability 'strong cognitive penetrability'. I argued that this approach disconnects early vision content from the world and from the cognitively penetrated visual content first-personally available to the perceiver, and cannot account for visual phenomenology. Moreover, the approach blurs the distinction between the cognitively penetrated visual content and the content of thought, since no principled distinction between them is introduced.

For these reasons, in the remainder of the chapter I explore an alternative suggestion based on the opposite move. I formulate this suggestion at the level of visual experience. In particular, I take the first relatum, visual experience, for granted, and introduce a restriction on the kind of cognition that can directly penetrate visual experience. My suggestion is that visual experience, unlike thought, is directly penetrated only by practical nonpropositional knowledge. This implies that the cognitive penetrability of vision should be distinguished from the cognitive penetrability of thought, since vision is cognitively penetrated only by practical nonpropositional knowledge.

This is one possible way to specify what I called 'weak cognitive penetrability'. As we have seen in Section 2.1, if one remains in the context of the representational and computational theory of mind, weak cognitive penetrability can be further specified as a non-promiscuous inferential dependence of the content of visual representations on the content of representations of some cognitive system. A non-promiscuous inferential dependence could be a dependence on propositional domain-specific and/or nonpropositional representations of other systems.

However, in the remainder of the chapter I will focus on weak cognitive penetrability of vision, understood as the dependence of vision on practical nonpropositional knowledge. This is a more radical option on cognitive penetrability found in the work of a number of philosophers and scientists²⁴ who reject the framework of RCTM and support anti-representationalist approaches to perception and cognition. In these approaches, the processes subserving perceptual and cognitive capacities are not taken as consisting in computational transformations of symbolic representations. This precludes an understanding of cognitive penetrability in terms of a (promiscuous or not) inferential dependence of symbolic representations of the perceptual systems on

²⁴ See e.g. Dreyfus (1992), Haugeland (1998), Hurley (1998), Noë (2004), O'Regan (2011).

symbolic representations of the cognitive systems. Thus, Pylyshyn’s semantic criterion of cognitive penetrability is not applicable to the anti-representational approaches. For this reason, I have to develop an account of weak cognitive penetrability that is not based on the inferential dependence of symbolic representations of the perceptual systems on symbolic representations of higher-level systems. Before examining this problem, let us see why perception has to depend on practical nonpropositional knowledge.

Churchland (1989) pointed to this direction in his exchange with Fodor. Churchland accepts that the way we perceive the world does not change immediately after we change our beliefs about it. It takes training and practice to change the way we perceive the world:

Who ever claimed that the character of a scientist’s perception is changed simply and directly by his embracing a novel belief? None of the theorists cited in Fodor’s paper have defended such an unrealistic view. And all of us have, at some point or other, emphasized the importance of long familiarity with the novel idiom, of repeated practical applications of its principles, and of socialization within a like-minded group of researchers. (Churchland 1989: 263–4)

It is for this reason that Churchland opts for a *diachronic* cognitive penetrability of perception by cognition. This amounts to holding that perceptual processing is not innately specified but exhibits a plasticity over time due to the acquisition of new skills. Thus, Churchland (1989: 264), can be seen as suggesting a restriction of the scope of cognition that can *directly* penetrate perception to some kind of practical nonpropositional knowledge involved in skills of applying the newly acquired propositional knowledge in a wide variety of circumstances.

But what exactly is the kind of dependence perception has on practical nonpropositional knowledge? Alva Noë (2004) has recently explored in detail this dependence, so his work is a good entry point to the problem of specifying weak cognitive penetrability in anti-representational terms.²⁵

3.1 *The proper dependence of visual experience on sensorimotor knowledge*

Noë (2004: 33) holds that ‘perception depends on the possession and exercise of a certain kind of practical knowledge’. He understands this dependence as constitutive. More specifically, starting from a direct realist position—namely that perception presents us directly with the external objects and some of their intrinsic properties²⁶—he attempts to show that perceptual content rests on practical knowledge of the way perspectival properties of objects would change as we move relative to them. Thus, we manage to see a coin as circular, even when, seen from an angle, its perspectival shape

²⁵ See also Hurley (1998). Hurley has devoted a significant part of her book on the intimate interrelation between perception and action. Her basic idea is that the intimate interdependence between perception and action at the personal level rests on the fact that they both emerge from the same complex dynamic sensorimotor system as described at the subpersonal level. Thus, according to Hurley, perception is not subserved by some kind of subpersonal input system that functions as an interface between world and mind, nor action emerges, correspondingly, from a subpersonal output system.

²⁶ See Noë (2004: 85).

is not circular but elliptical, because we possess practical knowledge of the way the perspectival shape of the coin would change as our point of view changed in relation to the coin. Noë (2004: 163) holds that perceptual content presents both the intrinsic and the perspectival properties of objects, and for this reason he considers it as having a dual aspect: 'The plate looks to be circular (it really does) *and* it looks elliptical from here (it really does).'

Noë's main idea is that perceptual content depends constitutively on the possession of this kind of practical knowledge which he calls 'sensorimotor knowledge'. But how should we understand the particular constitutive relation? One way is to take perceptual content as *consisting*, even partly, of the content of this sensorimotor knowledge. Thus, to visually experience a coin as circular is to know how its current perspectival shape would change relative to my visual exploration of the coin. This approach seems to reduce the perceptual presentation of an intrinsic property to practical knowledge of how the presentation of a corresponding perspectival property changes relative to the perceiver's exploratory movements. It is for this reason that Noë considers the circularity of the coin as *virtually* present in perceptual content, but he insists that this '*virtual* presence is a kind of presence, not a kind of non-presence or illusory presence' (Noë 2004: 67). In other words, the perceived intrinsic properties of objects are '*present as available*, rather than as represented.'

However, one could note that, even after the reduction suggested by Noë, the perspectival properties of the object continue to figure in the content we get after the reduction. More specifically, the reductive approach we are examining is in fact an attempt to reduce one aspect of perceptual content to the other plus the relevant sensorimotor knowledge: the perceptual presentation of intrinsic properties is taken to consist in knowing how the presentation of perspectival properties would change relative to one's exploratory movements.

Noë (2004: 164) is keen to emphasize that the presentation of perspectival properties is not a mere sensation, some kind of sense-datum; it is about 'genuine, relational properties of things'. However, his account creates new problems about how to deal with the perceptual presentation of perspectival properties. Noë (p. 87) admits that there is a threat of regress if the experience of perspectival properties is taken as primitive: 'Do we *see them* by seeing how *they* look? This would threaten to lead to infinite regress (after all, one would need to experience the looks of the looks in order to see how things are, and so on, ad infinitum).' For this reason, he opts for an approach that reduces the presentation of perspectival properties to the practical knowledge involved in a set of more basic sensorimotor skills: 'The plate looks elliptical to me, because, to indicate its shape, I can (and indeed, in some sense, *must*) move my hand in a characteristic manner. That is, to experience a thing as elliptical is precisely to experience it as occupying a particular kind of region in one's egocentric, sensorimotor space' (Noë 2004: 89). It is this reduction that allows (p. 134) to hold that the content of experience is virtual *all the way in*, namely, that it is all present as available, as accessible.

However, this result does not fit well with the phenomenology of perceptual experience and with direct realism with respect to perception, because, if things are

as Noë describes, then vision, for example, would not allow us to distinguish what is occurrent, bodily present in front of us, from what is not. Moreover, we do not experience the mere availability of the intrinsic properties of objects relative to our exploratory movements; we experience the very properties themselves. In other words, the perceived intrinsic properties of objects are given categorically and not dispositionally to the perceiver. If perceptual content is reduced to 'a set of counterfactual implications for sensorimotor activity', then, as Campbell notes, '[t]he ordinary world, there independent of us, there for us to explore, has simply disappeared' (Campbell 2008: 701). Unlike what Noë claims, perceptual content is not virtual all the way in.

Noë seems to presuppose here that, if perceptual content is not present as available, the only alternative is to be present as represented, a claim that he rejects since he takes it to necessarily entail the acceptance of mental representations. However, these are not the only available options. Alternatively, the perceptual relation could be taken as an acquaintance relation with the objects and properties,²⁷ or as an intentional relation where perceptual content consists of object-dependent senses.²⁸ Both these alternatives are versions of direct realism. In what follows, I will adopt the latter.²⁹

The endorsement of this alternative entails the rejection of Noë's claim that sensorimotor knowledge is a constituent of perceptual content. But, then, in what way is perceptual content dependent on sensorimotor knowledge?

I will employ McDowell's use of the Sellarsian idea that, besides the logical dependence of our beliefs on observation reports, there is a logical dependence in the opposite direction, namely a dependence of observation reports on our world-view that is rational but non-inferential. McDowell, in using this idea, puts *perceptual experiences* in the epistemological position in which Sellars puts reports of observation:

Unlike the dependence that traditional empiricism focuses on, this dependence in the opposite direction is not inferential. Suppose one knows by looking that some object is green. That the lighting conditions are appropriate for telling what colours things have is not a premise in an inferential justification one could appropriately give for one's claim that the thing is green. On the contrary, one's justification for the claim is simply that one sees that the thing is green. But it is a way of putting what Sellars urges in introducing the second dimension of dependence, as exemplified in the case of colour experience, to say that the very possibility of one's having that justification—a justification consisting in the fact that one sees that the thing is green—depends on one's having suitable knowledge about the effects of lighting conditions on colour appearances. And though it is not inferential, this dependence is rational.

(McDowell 2006a: 115)

McDowell concedes that the background knowledge on which certain fundamental kinds of experience depend may be rather practical, not theoretical-propositional. He uses the example of colour experience:

²⁷ For a recent use of this Russellian idea in favour of a direct realist approach, see Campbell (2002).

²⁸ See McDowell (1984).

²⁹ See Pagondiotis (2013) for a defence of a version of this alternative.

It would be infelicitous to describe the bit of our world view that is embodied in colour experience . . . as a theory. The general knowledge (so called) that Sellars invokes need not be acceptance of a body of propositions at all, inferentially articulated or not. It might be simply a responsiveness in practice to differences in lighting conditions, a practical rather than theoretical grasp of their significance for the possibility of telling what colours things have by looking. So the dependence of colour experience on background knowledge need not be a case of experience being theory-laden. (McDowell 2006a: 118–19)

This is a weaker notion of constitutive dependence which does not impugn the presentational character of fundamental kinds of perceptual experience; rather, it concerns the conditions that justify the authority of the perceiver. This is reflected in the way a viewer responds in case his observational judgment about the colour of an object is challenged. The viewer can initially respond that the colour is, say, red, because he sees it. But if pressed to provide further justification, he cannot give any premises that lead to the conclusion that what he sees is red. The viewer does not offer 'premises for an inference to the truth of . . . [his] claim' (McDowell 2010: 138). Instead, he justifies his own authority to make judgments of this kind in general. Thus, he may respond that he knows how to recognize red or that he knows how to distinguish whether the illumination conditions are appropriate for telling what the colour is. In this line, McDowell (2006b: 132) suggests that the background knowledge on which perceptual content depends 'may be a purely practical ability to discriminate appropriate from inappropriate conditions.'

To summarize my suggestion about how to specify weak cognitive penetrability in anti-representational terms, I proposed that we should understand the constitutive dependence of perceptual content on sensorimotor knowledge in a weak way: sensorimotor knowledge is not a constituent of perceptual content, but something on which perceptual content depends in a rational, non-inferential way. This solution avoids the danger of reducing perceptual knowledge to some kind of practical knowledge.

Moreover, it is compatible, as we saw, with a direct realist approach to perception, since perceptual content consists of object-dependent senses. More specifically, the weak constitutive dependence of perceptual content on sensorimotor knowledge allows the perceptual content of the embodied perceiver to be anchored to the world. This is because the acquisition of sensorimotor knowledge requires an intimate cooperation between the embodied perceiver and the world. Just as one cannot become an expert tango dancer if he does not learn to be in tune with his partner, so one cannot become an expert perceiver if one does not learn to be in tune with the way the perceived scene changes as a function of, among other things, the change of distance, angle, and movement between the perceiver and the perceived scene.

This attunement between perceptual content and world does not suffice to make perceptual content a 'reflection' of the world. After all, perception is not infallible and often, as in the case of illusions, it systematically presents the world in a nonveridical way. However, even though the attunement between perceptual content and world does not suffice to make the former a reflection of the latter, it establishes a systematic

dependence of the modifications of the perceptual content on the changes of the world. What is crucial for perception is to present the changes of the world in a stable and systematic way even if not always veridically. This is a sufficient ground for scientists and ordinary observers to communicate and to find out what is or is not veridical.³⁰ More specifically, the fact that perceptual experience is cognitively penetrable in a different way from thought allows the constitution of two different modes of presentation of the world, the perceptual and the discursive. The relative autonomy of each mode makes possible the mutual testing of the coherence between the two modes as well as within each one of them.

My suggestion on the constitutive dependence of perceptual content on sensorimotor knowledge is a way to specify weak cognitive penetrability in anti-representational terms. This dependence is not a dependence on a distinct cause on which perceptual content depends inferentially. The sensorimotor knowledge involved in perceptual content does not necessarily entail that perception depends on some actual bodily movement, since there is perception even in the absence of any bodily movement. However, any perception depends on sensorimotor knowledge in the sense that it involves anticipations. Anticipations concern the future and, in that sense, cannot be efficient causes of perceptual content. Thus, the dependence of perceptual content on sensorimotor knowledge is not (efficiently) causal. If we have to use the idea of causation to characterize the dependence of perceptual content on sensorimotor knowledge, then we could hold that the latter constitutes part of the formal cause of perceptual content. I have already characterized this dependence, involved in weak cognitive penetrability, as rational non-inferential. In the next section, I will further specify the particular dependence as nonreceptive and implicit.

3.2 *The presentational character of visual experience and its dependence on sensorimotor knowledge*

Let me finish with a suggestion about how we should understand more specifically weak cognitive penetrability in anti-representational terms. I will focus on the presentational character of visual content and I will suggest an account of it that will make clearer the way visual content depends on sensorimotor knowledge. As we have seen in Section 2.2, the presentational character has to do with the distinctive directness of visual phenomenology compared to the directness of the phenomenology of quasi-visual states such as visual imagination or visual recall: vision provides us access to *bodily present* objects. Visual content is not just object-dependent, but it is dependent on bodily present objects.

To account for the presentational character of visual experience, we have to examine the interdependency between the perceived object and the perceiver. My suggestion is that the presentational character of the perceived object is due to the intimate relation between the perceiver's awareness of the object and the implicit bodily self-knowledge

³⁰ Cf. Fodor (1990: 253–4).

of the perceiver. To take a simple example, when we look at a static object and move our eyes, we do not experience the object as moving; we experience it as remaining still due to our implicit bodily self-knowledge. Thus, there is a close coordination, or rather coupling, between the awareness of the object and the implicit bodily self-knowledge of the perceiver. When this coordination breaks down, what we are aware of loses its presentational character. This is why the appearance of an after-image in our visual field is not experienced as *perceiving*. The after-image does not afford us any appropriate way to explore it, since it is completely dependent on the movement of our eyes.

My suggestion is that the presentational character of an experienced object does not rest simply on our awareness of the way things visually-sensorily look or of how the way they visually-sensorily look changes. Rather, it rests on our awareness of how the way things visually-sensorily look changes *relative to our bodily movement or rest*. In other words, the presentational character involves amodal elements and does not amount just to a kind of sensory-like presence. Thus, even if it were possible to have a visual-like experience where the changes in how things sensorily look were indistinguishable from such changes in a genuine visual experience, the subject could still be aware of a difference that would be revealed as a sense of *passivity* that would characterize the former case of awareness. This can be exemplified in the case of hallucination. Hallucinatory content is not dependent on any objects in the subject's visual field, so it is not dependent on any retinal image, and this makes it also independent from the subject's bodily movements—a fact that explains the sense of passivity that may accompany a hallucinatory experience.

This approach to the presentational character of a perceived object requires analyzing the act of perceptual awareness. This act seems to involve a *double consciousness*: besides the consciousness of the perceived object, visual perception also involves a consciousness of perceiving, namely a self-knowledge that concerns the very act of perceiving. The consciousness of perceiving is integral to the act of perceptual awareness. As we have seen, Block (2007a) considers this as a noncognitive access that is not a higher-order awareness, but it is involved constitutively in perceiving as a same-order reflexive relation. We may now further specify the consciousness of perceiving as implicit and nonreceptive.³¹ The implicitness and nonreceptiveness of the consciousness of perceiving account for the transparency of perceptual experience, since the only object we are receptively aware of is the perceived object.

One aspect of the consciousness of perceiving is bodily self-knowledge. Bodily self-knowledge is not a kind of receptive knowledge: it does not inform us of our experiencing body as something that involves qualities for which the distinction

³¹ Cf. Rödl (2007). A related notion has been elaborated in the phenomenological tradition. For a recent discussion of it, see Gallagher (2003), Zahavi (2005), and Thompson (2008). See also Longuenesse (2008). There is, though, an important differentiation between Rödl's approach and the phenomenological approach: only the former approach considers the self-conscious relation as intentional. However, the examination of this issue is beyond the scope of this chapter.

sensorily given vs. nonsensorily given applies. My suggestion is that this is so because bodily self-knowledge does not rest on an organ that is to some extent under our voluntary control.³² Our voluntary control on the organ of vision makes possible for us to change what we see by changing our view on what we see, and for the same reason, it makes possible for us to interrupt our seeing by closing our eyes. Bodily self-knowledge does not afford us any corresponding degrees of freedom. We cannot interrupt it, neither can we change our way of access to our body. It is for this reason that bodily self-knowledge does not afford us 'views' of our body. This inability to make a distinction between different 'views' of our body does not allow us to distinguish *based on bodily self-knowledge* between the way our body appears and the way it is. It is for this reason that bodily self-knowledge does not inform us of our experiencing body receptively.

The fact that perceptual awareness involves constitutively the consciousness of perceiving—an aspect of which is bodily self-knowledge—accounts for the egocentric elements of perceptual experience. Thus, when we see an object, we are not only conscious of the object, we are also implicitly and nonreceptively conscious of our orientation, our distance and our movement in relation to the object. This is a necessary condition for seeing the world as independent of us. More particularly, our ability to move our eyes and our body makes possible for us to change views on the world. Thus the same object can be viewed from different angles, and this allows us to distinguish the way the object appears from the way it is. In this sense, vision presents its objects as independent of the awareness of them. Thus, vision presupposes that the perceiver has bodily self-knowledge of the motion or rest of his visual organ (and, more generally, of his body to the effect that his body influences the motion or rest of his visual organ). The mere movement or rest of the visual organ without an accompanying bodily self-knowledge of these changes would make the relation of vision to its subject matter analogous to the relation of bodily consciousness to the body. That is, every change, that such kind of 'vision' would make us aware of, would appear as a change of its subject matter. And it would be impossible to distinguish the way things visually appear from the way they are. That would not allow us to experience the objects of vision as independent of our visual awareness of them.

If what I have said is tenable, then bodily self-knowledge of the motion or rest of the visual organ must be a constituent part of the consciousness of perceiving and necessary for experiencing the perceived objects as independent of the visual awareness of them. Thus, my awareness of the sensible qualities of an object and of the way they change relative to my bodily movement or rest involves also a nonreceptive self-knowledge of the kind of experience I entertain—namely, of whether, for example, I see, hear, or just visually imagine the object. Of course, I can be wrong about the kind of conscious act I undergo, but the point is that there must always be a

³² See Armstrong (1968: 212–13). Cf. Shoemaker (1994: 204–5).

nonreceptive consciousness of this sort when I am perceptually directed towards something; perceiving something, as opposed to, say, imagining it, has a different cognitive significance for the subject: when I visually imagine a lion, as opposed to seeing it, I do not have, ordinarily, the tendency to run away. The consciousness of perceiving is not inferred at a later stage from the content of perception, but it is an integral part of the act of conscious perception. This precludes that there are free-floating perceptual experiences not yet related first-personally to any individual.

If my suggestion about the double consciousness involved in perception is tenable, it provides a more specific way to understand weak cognitive penetrability in anti-representational terms. In particular, it gives an account of how sensorimotor knowledge penetrates perception: what makes available to the perceiver the sensorimotor knowledge on which perceptual content depends is the implicit nonreceptive bodily self-consciousness constitutively involved in the act of perceiving.

I suggested that specifying weak cognitive penetrability in anti-representational terms allows us to account for the distinctive content of visual experience in a way that preserves the distinction between vision and thought without disconnecting visual content from the world and the embodied perceiver. This suggestion raises further questions for future investigation, the most pressing of which is, I think, how thought depends on the visual content available to the embodied perceiver. But I hope to have shown that the suggestion is worth pursuing.³³

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